

Elizabeth Line

Central Operating Section Rule  
Book

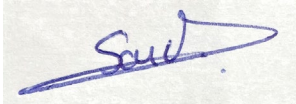
RFLI-GEN-SM-RUL-0038



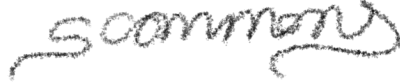
# RfLI - Rail for London (Infrastructure) Ltd

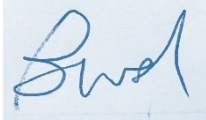
**Document Number:** RFLI-GEN-SM-RUL-0038  
**Revision:** 14.0  
**Revision Date:** 06/08/24

## RfLI Elizabeth Line Central Operating Section Rule Book

**Originated by:** Name: Sarra Mannai  
Title: RfLI Quality Manager, TfL Elizabeth Line  
Signed:  Date: 01/07/24

This document requires the originator's signature for review or publication

**Checked by:** Name: Sam Commons  
Title: RfLI Operations Assurance Manager, TfL Elizabeth Line  
Signed:  Date: 22/07/24

**Authorised by:** Name: Ben West  
Title: RfLI Network Assurance Manager, TfL Elizabeth Line  
Signed:  Date: 05/08/24

This document may not be published for use or information unless authorised

**The classification of this document is TfL RESTRICTED**

Elizabeth Line

Central Operating Section Rule  
Book

RFLI-GEN-SM-RUL-0038



Ref		Title	Issue	Date
<b>Modules</b>				
1	COS/AC	AC electrified lines in the central operating section	5	09/12/22
2	COS/G1	General safety responsibilities and personal track safety for non-track workers	6	09/12/22
3	COS/M1	Dealing with a train accident or train evacuation in the central operating section	5	21/12/21
4	COS/M2	Train stopped by failure in the central operating section	4	21/12/20
5	COS/M3	Managing incidents, floods and snow in the central operating section	5	21/12/21
6	COS/OTM	Working of on-track machines (OTM) in the central operating section	5	21/12/21
7	COS/P2	Working to and from the point of obstruction by pilotman	5	09/12/22
8	COS/Plumstead	Plumstead special instructions and rescue of a 345 in Plumstead sidings	1.1	01/06/21
9	COS/PTP	Point to point working in the central operating section	5	02/06/22
10	COS/S4	Trains or shunting movements detained on the running lines	4	21/12/20
11	COS/S5	Passing an end of authority (EoA) without a movement authority (MA) in the central operating section	6	09/12/22
12	COS/S7	Observing and obeying signalling indications Train warning systems Reporting signalling failures and irregularities	6	09/12/22
13	COS/SP	Speeds	4	21/12/20
14	COS/SS1	Station duties, train dispatch and platform screen doors	7	01/03/23
15	COS/SS2	Shunting in the central operating section	5	09/12/22
16	COS/T10	Duties of a designated person (DP) and people working on rail vehicles	3	09/12/22
17	COS/T3	Possession for engineering work in the central operating section	6	01/10/23
18	COS/TS1	General signalling regulations in the central operating section	9	31/08/24
19	COS/TS10	CBTC train signalling regulations	4	21/12/20
20	COS/TS11	Failure of, or work on, signalling equipment – signaller's regulations	5	21/12/21
21	COS/TW1	Preparation and movement of trains in the central operating section	8	31/08/24
22	COS/TW5	Preparation and movement of trains: defective or isolated vehicles and on-train equipment in the central operating section	5	21/12/21

Ref	Title		Issue	Date
<b>Handbooks</b>				
23	COS/HB1	General duties and track safety for track workers	5	21/12/21
24	COS/HB3	Duties of the lookout and site warden	4	21/12/20
25	COS/HB4	Duties of a points operator and route-setting agent – moving and securing points by hand	4	21/12/20
26	COS/HB7	General duties of a controller of site safety (COSS)	5	21/12/21
27	COS/HB8	COSS blocking a line	5	02/06/22
28	COS/HB9	Engineering supervisor (ES) setting up safe systems of work in a work site within a possession	5.1	09/11/22
29	COS/HB10	Duties of the ES and person in charge when using a hand trolley	4	21/12/20
30	COS/HB11	Duties of the person in charge of possession (PICOP)	5	01/10/23
31	COS/HB12	Duties of the engineering supervisor (ES)	4	21/12/20
32	COS/HB13	Duties of the person in charge of the siding possession (PICOS) at Plumstead maintenance sidings	4	21/12/20
33	COS/HB14	Duties of the person in charge of loading and unloading rail vehicles during engineering work within a possession	5	21/12/21
34	COS/HB15	Duties of the machine controller (MC) and on-track plant operator	4	21/12/20
35	COS/HB16	AC electrified lines on the central operating section	4	21/12/20
36	COS/HB19	Work on signalling equipment – duties of the signalling technician in the central operating section	4	21/12/20

<b>Information modules</b>				
37	COS/CBTC	General CBTC information for the central operating section	4	21/12/20
38	COS/GSMR	GSMR Handbook	1	09/12/22

COS/AC

AC electrified lines in the  
central operating section

**Module AC**



Issue 5

Date December 2022

Comes into force Jan 7<sup>th</sup> 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2022

© Copyright 2020  
Rail for London Infrastructure Limited

This module details the rules regarding electrified lines in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- train driver
- shunter
- designated person (DP)
- signaller
- person in charge of sidings

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller





## Contents

- 1 Definitions**
- 2 Competence**
- 3 Dangers of the system**
  - 3.1 Treating the OLE as being live
  - 3.2 Objects on or near to the OLE
  - 3.3 Reporting objects and defects
  - 3.4 Reporting defects to the signaller
- 4 Personal safety**
  - 4.1 When not working on traction units or other vehicles
  - 4.2 When working on traction units or other vehicles
  - 4.3 Using long items
- 5 Communicating with the ECO**
  - 5.1 Directly or by another person
  - 5.2 Identifying yourself and the location
- 6 Emergency switch-off**
  - 6.1 Immediate actions
  - 6.2 Further actions
  - 6.3 Managing the emergency switch-off
- 7 Rescuing a person from the OLE**
- 8 Isolation of the OLE**
- 9 Overhead line permits**
  - 9.1 Issuing an overhead line permit
  - 9.2 During the work
  - 9.3 Changes of personnel within the work group
  - 9.4 When the work is suspended or completed
- 10 Blocking sidings to electric trains if local isolation is not allowed**
  - 10.1 Blocking sidings to electric trains
  - 10.2 When the isolation is no longer needed

- 11 Electric trains moving to or from non-electrified lines or lines blocked to electric trains**
  - 11.1 Towards an isolated section
  - 11.2 To and from non-electrified lines
  - 11.3 To and from a line blocked to electric trains
  
- 12 Driver's instructions following a loss of line light, ADD operation, tripping or damage to the OLE**
  - 12.1 When a train must be stopped as soon as possible
  - 12.2 When the train can continue to a suitable location
  - 12.3 When the train can continue normally
  - 12.4 Tripping
  - 12.5 Telling the signaller about problems or incidents with the OLE
  - 12.6 Examining the train or OLE
  - 12.7 Providing electric train supply when the train cannot proceed
  - 12.8 Isolating the ADD
  
- 13 Signaller's instructions following a report of a defect or tripping of the OLE**
  - 13.1 If tripping, a loss of line light, ADD operation or suspected damage to the OLE is reported
  - 13.2 Examining the train or OLE
  - 13.3 Arranging a switch-off
  - 13.4 After the train and pantograph have been examined
  - 13.5 If a driver reports a fault on the train
  - 13.6 Resuming normal working
  - 13.7 Bi-mode trains
  
- 14 Instructions for examining the OLE**
  - 14.1 When the OLE must be examined
  - 14.2 Examining the OLE using a train
  - 14.3 Responsible person arriving on site
  - 14.4 OLE personnel examining the OLE
  
- 15 Moving trains after an OLE incident**
  - 15.1 When a pantograph has been damaged and there is no other pantograph available
  - 15.2 When a pantograph has been damaged but another is available or the train is a bi-mode train
  - 15.3 When a damaged pantograph cannot be dealt with or there is evidence that the train has contacted the OLE
  - 15.4 Allowing trains to coast at 20 mph (30 km/h) with pantographs lowered

**15.5 Not used**

**15.6 Bi-mode trains**

**16 Preventing damage or danger from on-train equipment overheating**

**17 Electric trains driven off the contact wire**

**18 Defective automatic power control (APC) track inductor or APCO balise**

**18.1 Signaller's actions**

**18.2 APC inductor: Driver's actions**

**18.3 Defective APCO balise**

## 1

## Definitions

### Bi-mode train

A train that can either provide its own tractive power or take this from the electrification system on an ac electrified line.

### Dual-voltage train

A train that can operate on more than one electrification system.

### Electric train

A train that takes its tractive power from the electrification system on an ac electrified line. A bi-mode train that is operating in electric mode will normally be treated as an electric train.

### Emergency switch-off

An emergency switch-off is carried out by the electrical control operator (ECO) when it is essential to switch off the electrical supply immediately, when someone is in danger from live overhead line equipment (OLE).

The ECO will switch off the electrical supply to all lines:

- Between neutral sections, or
- Between a neutral section and the end of an electrified line.

In certain locations, equipment is provided to shorten the area of the emergency switch off.



The neutral sections are Westbourne Park sidings on the west and Pudding Mill Lane junction on the east. The engineering road at Abbey Wood is where the OLE terminates (end of wire).

### Overhead line permit

A permit (known as form C) that is signed and issued by the nominated person (NP) and given to a designated person (DP), who is to carry out work on or near to the OLE.

This permit states exactly what electrical equipment is isolated and earthed and on which, or near to which it is safe for the specified work to begin.

If an overhead line permit has been issued, it does not mean train movements have been stopped.

## 2 Competence

*The persons responsible: all concerned*

You must not go on or near the line in an area with OLE unless your regular competence assessment also contains the track-safety rules that relate to lines electrified by the AC overhead system as shown in this module.

all  
concerned



**The whole of the central operating section is electrified by the AC overhead system.**

If the OLE is being installed, or an electrified area is being extended, the instructions in this module will not apply until the equipment has been declared live.

You will be told about this in an energisation warning notice.

If you are not sure whether the OLE is live, you must treat it as live and dangerous to life.

## 3 Dangers of the system

*The persons responsible: all concerned, driver*

### 3.1 Treating the OLE as being live

all  
concerned



**OLE, pantographs and all roof-mounted electrical equipment on trains are extremely dangerous. It may be fatal if you touch or go near any of them, or if you allow anything to touch or go near them.**

**You must treat all parts shown in diagram AC.1 and AC.2 (except for the mast or structures) as being live at all times unless they have been made safe as shown in the instructions in this section.**

If you have been told that the ECO has given an assurance that the electricity has been switched off, you must still treat any OLE, pantographs and associated roof-mounted equipment as dangerous and not touch any of those parts.

You do not have to treat the OLE, pantographs and associated roof-mounted equipment as being live and dangerous to life if at least one of the following applies.

- An overhead line permit has been issued to the DP.
- The OLE has been isolated and earthed and an assurance has been received as shown in local isolation instructions.

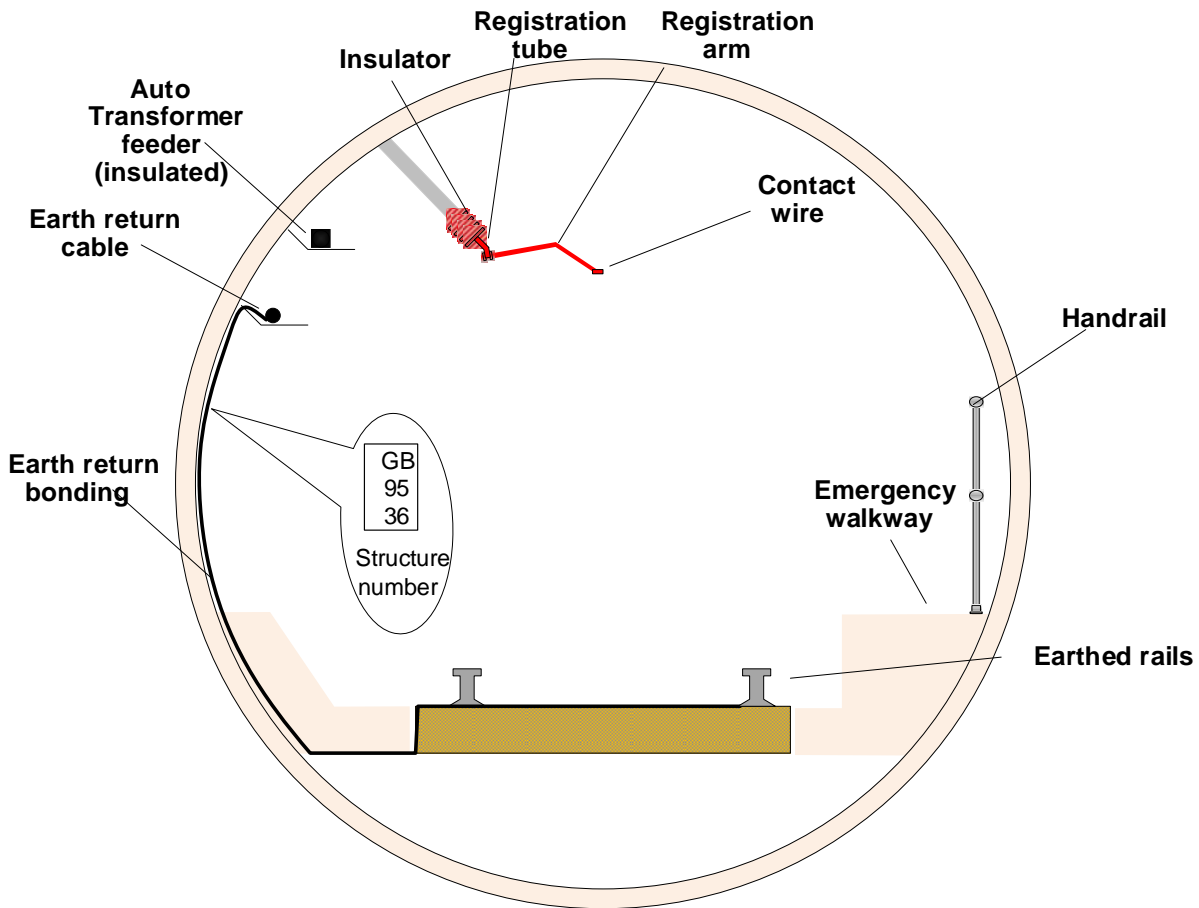
### 3.2 Objects on or near to the OLE

all  
concerned

You must treat broken or displaced wires and anything attached to, or near to, the OLE as live and dangerous to life.

You must not remove or approach anything attached to, or near to, the live OLE.

You must not try to remove or approach an object hanging from, in contact with, or close to the OLE, unless you have been specially trained and authorised to do so.



*Diagram AC.1*

*AC in single bore tunnel*

If you see anything in the OLE that could cause damage if it comes into contact with the pantographs on your train, you must immediately lower the pantographs.

driver

You must stop the train as soon as possible and report the incident to the signaller.

When you have told the signaller, you will not have to tell the ECO, as the signaller will do this.



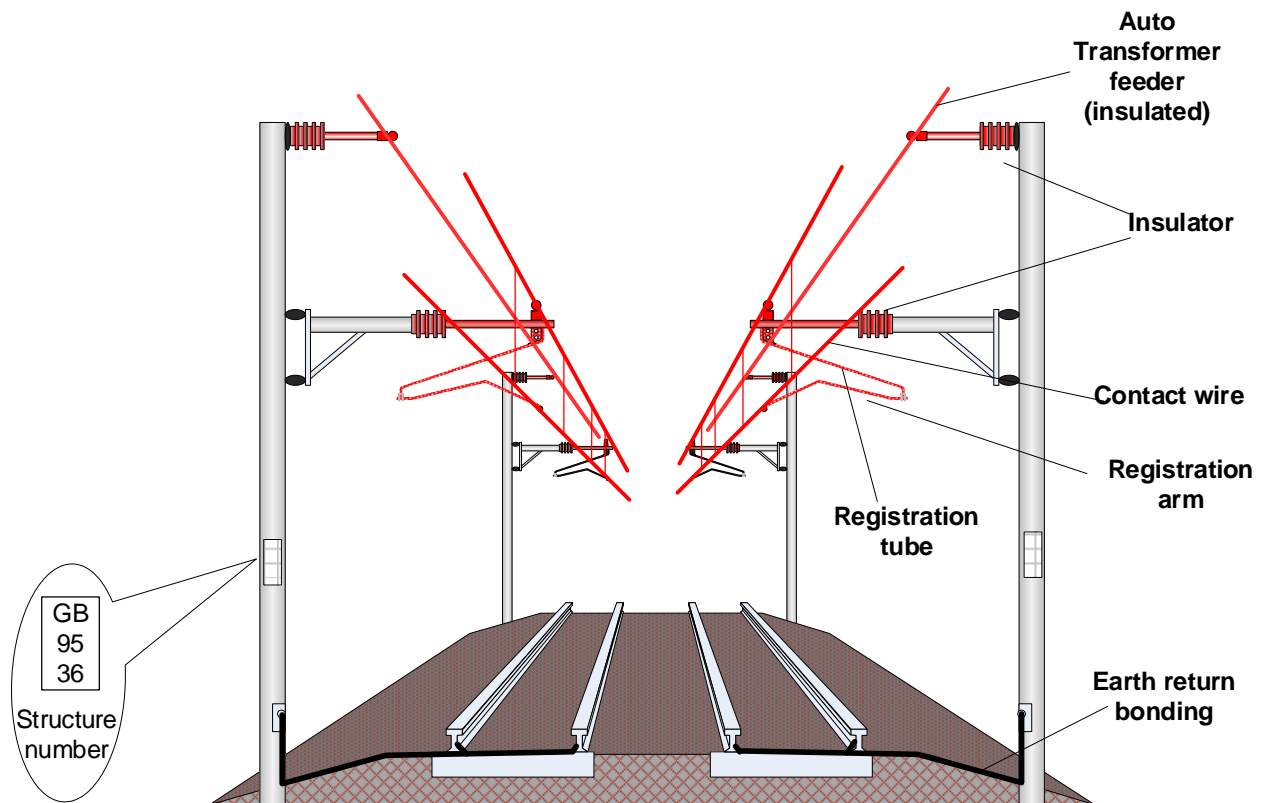


Diagram AC.2

Typical OLE construction on the open sections

### 3.3 Reporting objects and defects

You must immediately make sure the following are reported to the ECO, or if you do not normally speak directly to the ECO, you should report it to the signaller.

all  
concerned

- Objects that have been thrown onto, are hanging from, or are otherwise touching the OLE.
- Damage to the OLE.
- OLE that is smoking, excessively flashing or fusing.
- Broken or displaced along-track conductors.
- Broken or displaced wires connected to the OLE.
- Damaged or loose automatic power control (APC) track inductors.
- A broken or parted rail.
- A broken or defective bond, in which case you must state the colour of the bond.

You must not touch the rails if they are broken or parted, neither must you touch a broken or defective bond, nor any equipment connected to the bond.

If the damage or defect will affect the safe operation of trains, you must first report this to the signaller.

### 3.4 Reporting defects to the signaller

You must make sure that a damaged, loose or malfunctioning APCO balise, or a missing sign associated with power changeover locations, is reported to the signaller.

all  
concerned

If the damage or defect will affect the safe operation of bi-mode trains, you must make sure that all drivers of bi-mode trains are told about this before they pass over the balise.

signaller

## 4 Personal safety

*The persons responsible: all concerned*

### 4.1 When not working on traction units or other vehicles

all  
concerned

You must make sure, you and anything you are carrying are no nearer than 2.75 metres (9 feet) from live OLE, pantographs and associated roof-mounted electrical equipment on trains unless both the following conditions apply.

- The specific conditions in your company instructions have been met and the precautions to manage danger from live OLE, pantographs and associated roof-mounted electrical equipment on trains are in place.
- You are carrying out precautions shown in your company instructions.

## 4.2 When working on traction units or other vehicles

You and anything you are holding must never go above the cant rail or and you must not climb above the floor level of the driving cab, or climb on the roof or open upper deck of a vehicle, or on the steps giving access to the roof of any vehicle unless one of the following applies.

- You are on a line where there is no OLE above or adjacent to the vehicle.
- The OLE has been isolated and earthed as shown in the in Rail for London Infrastructure (RFLI) ECO instructions and the designated person (DP) has been issued with an overhead line permit.
- The specific conditions in local instructions have been met and you carry out the specified precautions required to manage danger from the OLE, pantographs and associated roof-mounted electrical equipment.
- Local isolation is allowed, and you are sure that the OLE is isolated and earthed (as required) and an electrical safety document has been issued where required in the applicable local isolation and earthing instructions.

all  
concerned

all  
concerned

You must carry out the following activities only at authorised locations where company instructions are in place and you carry out the specified precautions to manage danger from live OLE, pantographs and associated roof-mounted electrical equipment.

- Cleaning the outside of carriages by hand.
- Cleaning vehicle ends, traction cab windows and destination indicator
- Loading or unloading open rail wagons by hand.

Hosepipes must not be used for cleaning purposes. Each brush or other appliance used for cleaning must have an electrification warning sign.

### 4.3 Using long items

all  
concerned

You must carry out the precautions specified in your company instructions to manage danger from live OLE, pantographs and associated roof-mounted electrical equipment, including taking extreme care when:

- holding, using and moving long items
- using brake sticks and shunting poles
- selecting and using the correct type of electrically-insulated ladders.

You must carry long items horizontally and, if necessary, get other people to help you.

# 5 Communicating with the ECO

*The persons responsible: all concerned*

## 5.1 Directly or by another person

You can contact the ECO, or you can ask another person, such as the signaller, to contact the ECO on your behalf.

all  
concerned

If another person asks you to contact the ECO, you must make sure that you get the necessary information from that person before speaking to the ECO. You must also get any other information that the ECO asks for.

## 5.2 Identifying yourself and the location

When contacting the ECO, you must state:

all  
concerned

- your name, job title and employer
- the line or lines concerned
- the location (for example, the nearest bridge, station, signal, block marker or other structure)
- the number on the nearest OLE structure or identifying plate (this will tell the ECO exactly where you are)
- the telephone number or radio call number (whichever you are using) so that the ECO can contact you, if necessary.

If the ECO gives you a message identification number, you must state it each time you speak to the ECO.



**It is important that you give the ECO as much information as possible.**

## 6

**Emergency switch-off***The people responsible: all concerned, driver, signaller, PICEE***An emergency switch-off of the OLE does not mean that train running has been stopped.****6.1 Immediate actions****6.1.1 Types of incident****all  
concerned**

You must immediately contact the ECO (or arrange for this to be done) if you become aware of:

- a derailment
- a lineside fire
- a fire on a vehicle or train
- person in contact with, or in danger of coming into contact with, the OLE
- an incident or other emergency requiring, or likely to require, the electricity supply to be switched off.

If you receive a message from another person about an emergency, you must pass on all this information to the ECO.

**6.1.2 Reporting the emergency**

When you contact the ECO, you must first say, '**This is an emergency call**'.

You must tell the ECO:

- the reason why you want the electricity to be switched off
- whether any person is in danger from live OLE
- whether the emergency services are waiting to give assistance.

If you are not at the site, you must relay information from the ECO to the site and from the site to the ECO.

all  
concerned



**It is important that you give the ECO as much information as possible.**

### 6.1.3 Additional instructions for train crew

If it is necessary to protect an obstruction on a line other than the one your train is travelling on as shown in section 43 of module TW1 *Preparation and movement of trains*, you must do this before asking for the electricity to be switched off.

driver

### 6.1.4 Additional instructions for signallers

If you become aware of an emergency, you must carry out the appropriate train signalling regulations before asking for the electricity to be switched off.

signaller

## 6.2 Further actions

You must stay in contact with the ECO or, if you have reported the incident through another person, stay in contact with that person until you have been assured that:

all  
concerned

- the electricity has been switched off and the OLE has been made safe to be approached but not touched, or
- other arrangements have been made.

If the ECO agrees to the emergency switch-off, the ECO will decide who will be regarded as the person in charge of electrical emergency (PICEE).

The ECO can act as the PICEE until another person is appointed.

If you are a person passing on this information on behalf of someone else, you must stay in contact with the ECO until an assurance has been given that one of these arrangements has been put in place.



### 6.3 Managing the emergency switch-off

#### PICEE

If you are appointed by the ECO as the PICEE, the ECO will tell you the limits of the emergency switch-off.

You must identify yourself to anyone arriving on site. If the emergency services arrive on site, you must tell the officer in charge from each emergency service about the presence of the OLE and which parts have been switched off.

The ECO will tell you before shortening the area of the emergency switch-off. You must tell everyone at the site about the new limits.

If passengers are to get out of a train which is not at a platform, you must make sure that all passengers are kept clear of the OLE.

If you hand over the responsibility of the emergency switch-off to someone else, you must tell the ECO immediately. You must give the name, job title and employer of the person taking over from you.

When you take over the responsibility of the emergency switch-off, you must immediately confirm the arrangements with the ECO.

As soon as the emergency is over and the affected section can be switched on, you must warn everyone involved that the electricity is about to be switched on and make sure they are clear of the OLE.

You must then tell the ECO that the emergency is over and wait for further instructions.

If the emergency will go on for a long time or it will be necessary to issue an overhead line permit, the nominated person (NP) will be appointed who will contact you when arriving on site.

You and the NP must both contact the ECO so that responsibility for the emergency switch-off can be transferred from you to the NP.

## 7

**Rescuing a person from the OLE**

*The people responsible: all concerned*

You must make sure the electricity is switched off, remote earthing has been applied and an overhead line permit has been issued before you approach a person who:

all  
concerned

- is above the live OLE, or
- is within 2.75 metres (9 feet) of the live OLE.

## 8

**Isolation of the OLE**

*The people responsible: all concerned*



**An isolation of the OLE does not mean that train running has been stopped.**

**all  
concerned**

When a section or sub-section of OLE has been isolated, you must continue to treat it as being live until an overhead line permit has been issued.

# 9 Overhead line permits

*The person responsible: DP*

## 9.1 Issuing an overhead line permit

When the NP has made sure that the OLE has been isolated and earthed, the NP will hand you an overhead line permit. DP

You must understand:

- the working limits on the overhead line permit
- where live equipment is adjacent to, or crosses over, earthed equipment, which equipment is live and which is earthed
- the issue of the overhead line permit does not mean that train movements are stopped on the lines concerned.

You must sign the overhead line permit to show that you understand the conditions. You must then make sure that each person you are responsible for fully understands the conditions shown above before you allow work to start.

## 9.2 During the work

You must keep the overhead line permit until: DP

- work is completed and you, and those you are responsible for, are clear of the line, or
- you are relieved by another DP, in which case you must hand the overhead line permit to that person and both sign it.

You must tell the new DP about the conditions shown in section 9.1 of this module.

If you are the new DP, you must always try to tell the NP directly that you have taken over the duties of the DP. If you cannot speak directly to the NP you must pass the message on through the ECO.

- DP You must immediately tell the NP if you have lost your overhead line permit. The NP will arrange to issue you with another overhead line permit, endorsed 'Duplicate'.

### 9.3 Changes of personnel within the work group

- DP If other personnel for whom you are responsible come on duty, you must make sure that each person coming onto the site of work after the overhead line permit has been issued, fully understands the conditions shown below before allowing them to start work.

- The working limits on the overhead line permit.
- Where live equipment is adjacent to, or crosses over, earthed equipment, which equipment is live and which is earthed.
- Whether trains are continuing to run on the lines concerned and, if so, the arrangements that have been made for the protection of staff.

### 9.4 When the work is suspended or completed

- DP When the work is suspended or completed, you must make sure all personnel and materials are removed from, and are no closer than 2.75 metres (9 feet) from, the OLE.

You must then:

- instruct each person for whom you are responsible to treat the OLE as live and dangerous to life
- complete the overhead line permit
- give the overhead line permit to the NP who will countersign it.

If you have lost your OLE permit, you must tell the NP. You must carry out a visual inspection with the NP to make sure that all personnel and materials are clear of the OLE.

# 10 Blocking sidings to electric trains if local isolation is not allowed

*The person responsible: person in charge of sidings*

## 10.1 Blocking sidings to electric trains

When an isolation is needed in the sidings, you must consult Operations Control or the signaller as shown in the local instructions.

person in  
charge of  
sidings

You must then arrange with the ECO for the isolation to take place. Operations Control or the signaller will contact you and tell you:

- the numbered message received from the ECO
- the electrical sections or sub-sections to be blocked as shown in the isolation instructions
- the agreed time of the isolation.

You must record the message in Part 1 of Form AE-AS.

You must make sure all personnel working in the sidings are told about the limits of electric train movements.

You must make sure that either:

- reminder appliances are placed on or adjacent to levers of hand points that control access to the sidings to be isolated
- hand points controlling access to the sidings to be isolated are clipped and padlocked for other routes that are not affected by the isolation
- the protection arrangements shown in the isolation instructions are applied.

You must complete Part 2 of Form AE-AS and attach it to the authorised document.

You must then tell Operations Control or the signaller as shown in the local instructions, when you have done this.

## 10.2 When the isolation is no longer needed

person in  
charge of  
sidings

When the isolation is no longer needed and all personnel working in the sidings have been told that normal working will be resumed, you must arrange with the ECO to cancel the isolation.

Operations Control or the signaller as shown in the local instructions will contact you to complete Part 3 of Form AE-AS.

You may then remove the protection applied to the sidings.

# 11 Electric trains moving to or from non-electrified lines or lines blocked to electric trains

*The people responsible: signaller, driver*

## 11.1 Towards an isolated section

You may authorise the movement of an electric train or bi-mode train if it becomes necessary to:

signaller

- go beyond the signal or block marker protecting an isolated section or sub-section towards the limiting point as shown in isolation instructions
- make an unsignalled movement towards the limiting point as shown in isolation instructions.

However, you must be sure that the approach to the isolated section is protected in the COS by an Engineering Possession Area (EPA).

You must be sure that the approach to the isolated section from Network Rail has been protected by getting an assurance from the signaller concerned.

## 11.2 To and from non-electrified lines

You must make sure that all pantographs are lowered before moving an electric train or bi-mode train to or from a non-electrified line or through a non-electrified crossover.

driver



### 11.3 To and from a line blocked to electric trains

driver

If a portion of line is blocked to electric trains, and it is necessary for an electric train or a bi-mode train operating in electric mode to be assisted to, through or from that section of line, or a bi-mode train is to operate using its own tractive power, you must:

- lower all pantographs
- tell the driver of the assisting train when this has been done
- keep all pantographs in the lowered position throughout the movement
- keep the APCO equipment on a bi-mode train isolated throughout the movement
- disregard all lineside signs associated with a traction changeover
- not resume ac electric traction mode until you have arrived at or passed either the location the signaller has told you about or the locations indicated by signage.

Lineside signs will be provided if the location is designated as a permanent changeover location, or if a temporary changeover location is not at an easily identifiable location.

# 12 Driver's instructions following a loss of line light, ADD operation, tripping or damage to the OLE

*The person responsible: driver*

## 12.1 When a train must be stopped as soon as possible

If any of the circumstances shown in 12.1 a), b) or c) of this module apply, you must:

driver

- operate the pantograph down button, if you are driving any train with a pantograph in the raised position
- stop the train as soon as possible
- report the incident to the signaller.

### a) Damage to the OLE

If you become aware of:

- something in the OLE that could cause damage if it comes into contact with a pantograph or any other part of a train
- any damage to, or anything that appears unusual with the OLE
- any unusual noises from, or movement of, the OLE.

### b) ADD operation

If the automatic dropping device (ADD) on your train has operated, except if there is more than one pantograph on the train, the ADD operates but the line light does not go out.

### c) The line light goes out

If the line light goes out and you have made one attempt to reset, which was not successful, and either of the following applies.

- The only pantograph in use is not on one of the first three vehicles.
- There is more than one pantograph in use on the train.

## 12.2 When the train can continue to a suitable location

driver

If the line light goes out, you can continue to a suitable location, if possible, and then report the incident to the signaller in the following situations.

- There is only one pantograph in use and it is on one of the first three vehicles.
- The ADD is not isolated and has not operated.
- There is no unusual movement of, or noises from, the OLE.
- You have made one attempt to reset, which was not successful.

You can also do this if, when there is more than one pantograph raised on the train, the ADD has operated but the line light does not go out.

## 12.3 When the train can continue normally

driver

If the line light goes out, you can continue normally if:

- the ADD is available but has not operated
- there is no unusual movement of, or noises from, the OLE
- you can reset at the first attempt, or the line light is restored
- you can regain power.

## 12.4 Tripping

driver

If the signaller tells you that your train may have caused tripping, you will be told whether it is necessary for you to visually examine the OLE and all the pantographs on your train for signs of damage.

If you can check without leaving the cab, including by using a pantograph camera or any other closed-circuit television equipment on the train, and you do not see any damage, you must tell the signaller.

The signaller will tell you if you need to leave the train to check for damage to the OLE, pantograph or a train. You must tell the signaller whether you consider the conditions at your location to be darkness or that you may have difficulty in getting a clear view of the pantograph or OLE owing to conditions such as fog or bright sunlight.

driver

The signaller will tell you when you can leave the cab.

Before you leave the train, you must make sure that there is no damaged OLE in the vicinity of the door through which you would leave the train. If there is, you must tell the signaller and stay in the train.

If it becomes dark or visibility becomes worse while you are carrying out the examination, you must:

- stop the examination
- tell the signaller
- wait until the signaller tells you that the OLE has been switched off before you continue with the examination.



**You must continue to treat the OLE as being live and dangerous.**

If there is evidence that something other than a pantograph has been in contact with the OLE, or that a pantograph is damaged, you must tell the signaller.

## 12.5 Telling the signaller about problems or incidents with the OLE

driver

In all cases when you have stopped the train, you must tell the signaller:

- what has happened
- where the incident happened
- the location where the train has stopped
- the nearest OLE structure number, if you can see this from the train

If you can already do so, you must also tell the signaller:

- the extent of any damage to the OLE
- if there is any damage to a pantograph

If you can check for damage without leaving the train, including by using a pantograph camera or any other closed-circuit television equipment on the train, and you do not see any damage, you must tell the signaller.

The signaller will tell you if you need to leave the train to check for any damage to the OLE, a pantograph or the train. You must tell the signaller whether you consider the conditions at your location to be darkness or that you may have difficulty in getting a clear view of the pantograph or OLE owing to conditions such as fog or bright sunlight.

The signaller will tell you when you can leave the cab.

Before you leave the train, you must make sure that there is no damaged OLE in the vicinity of the door through which you would leave the train. If there is, you must tell the signaller and stay in the train.

If it becomes dark or visibility becomes worse while you are carrying out the examination, you must:

driver

- stop the examination
- tell the signaller
- wait until the signaller tells you that the OLE has been switched off before you continue with the examination.



**You must continue to treat the OLE as being live and dangerous.**

If there is evidence that something other than a pantograph has been in contact with the OLE, or that a pantograph is damaged, you must tell the signaller.

## 12.6 Examining the train or OLE

If you have stopped your train because the line light has gone out, the ADD has operated, or you have become aware of damage to the OLE, and you have been asked to examine the OLE and all the pantographs, you must tell the signaller whether you can see any damage.

driver

If you have stopped your train as a result of the line light going out or the ADD operating, but you find a fault on the train other than damage to a pantograph, you must tell the signaller so that normal working can be resumed.

driver

If your train is a bi-mode train operating in electric mode and after examining the train and OLE you can continue using the train's own tractive power, you must tell the signaller. If the signaller authorises you to proceed, you can change to self-powered mode and continue the journey.

If your train is a bi-mode train operating on its own tractive power, after examining the train you can continue your journey, if it is safe to do so.

## 12.7 Providing electric train supply when the train cannot proceed

driver

If the train cannot proceed because of damage to the pantograph but the damage is not severe, the pantograph may be raised to supply electrical power. This is so that equipment such as train heating and lighting will be available while waiting for an assisting train.

Immediately after raising the pantograph, you must check that it is correctly in contact with the OLE and that there is no arcing.

No movement of the train is allowed with the pantograph raised. You must make sure the pantograph is lowered before the assisting train is attached.

## 12.8 Isolating the ADD

driver

If it becomes necessary to isolate the ADD, you must:

- isolate the ADD as shown in the instructions for the type of traction concerned and your company instructions
- tell the signaller
- carry out the instructions you are given.

When the train is to proceed with the affected pantograph raised, you must not exceed 60 mph (96 km/h) until the pantograph has been examined and the ADD reset.

Where possible, you may be told to use another serviceable pantograph, or if the train is a bi-mode train, to continue using the train's own tractive power.

# 13 Signaller's instructions following a report of a defect or tripping of the OLE

*The person responsible: signaller*

## 13.1 If tripping, a loss of line light, ADD operation or suspected damage to the OLE is reported

If the ECO tells you that tripping has taken place, you must stop the train involved (or arrange for this to be done if the train is no longer in your area of control).

signaller

If you receive a report of a line light going out, the ADD operating or possible damage to the OLE, you must protect any line that may be affected, as shown in the train signalling regulations.

## 13.2 Examining the train or OLE

You must find out whether the driver can provide information about the cause of the incident without leaving the train.

signaller

You must agree with the ECO whether the driver needs to examine the train for evidence of contact with the OLE or damage to a pantograph, or whether someone else will do this.

You must tell the driver whether they will need to leave the train to examine it for evidence of contact with the OLE or damage to a pantograph.

You must find out from the driver, or anyone else who is going to carry out an examination whether they consider the conditions at the location of the train to be darkness or whether it would be difficult to get a clear view of the pantograph or OLE owing to conditions such as fog or bright sunlight.



**signaller**

In the open sections, you must ask the driver of a train passing on an adjacent line to tell you if they can see any damage to the OLE at the location where the train is standing.

You must not tell the driver to leave the train, or allow anyone else to carry out an examination until you have agreed the protection arrangements needed, and the OLE has been switched off, unless at least the following applies.

- It is daylight and the person who is carrying out the examination considers that it will not be difficult to get a clear view if the pantograph or OLE.
- It has been confirmed that there is no damage to the OLE at the location where the train is standing.

You must tell the driver when they can leave the train to examine the train for damage to the OLE, a pantograph or the train. If the examination is to be carried out by anyone else, then you must tell that person when the examination can start.

You must tell anyone carrying out an examination of the OLE, pantograph or the train to tell you when the examination is complete and whether any damage was seen.

If the driver tells you before leaving the train that there is damaged OLE in the vicinity of the door through which they would leave the train, the driver will stay in the train, and you must tell the ECO.

If you are told by the person carrying out the examination that they have stopped the examination because it has become dark, or difficult to get a clear view of the OLE, pantograph or the train, you must tell the ECO that it will be necessary to switch off the OLE.

When the ECO tells you that the OLE has been switched off, you must tell the person undertaking the examination of the OLE, pantograph or train that they can continue the examination.

### 13.3 Arranging a switch-off

If it is necessary to switch off the OLE, you must:

signaller

Reach a clear understanding with the ECO about the area that would be affected by an emergency switch-off

Agree with Operations Control when the switch-off can take place, taking into account whether electric trains that would be affected can be cleared from the affected area or held in stations.

### 13.4 After the train and pantograph have been examined

If the examination shows evidence that something other than a pantograph has been in contact with the OLE or a pantograph is damaged, you must tell the person who carried out the examination to:

- visually examine the OLE immediately behind the train
- tell you if there appears to be any damage.

You must tell the ECO the outcome of the examination and carry out the instructions you are given.

If you are told that there is damage to a pantograph or the OLE, you must:

- come to a clear understanding with the ECO about the lines which the OLE will be examined on and the type of examination that will be carried out (see section 14 of this module)
- report the incident to Operations Control.

If the driver tells you that the ADD has operated and has been isolated, you must pass on this information to Operations Control.

### 13.5 If a driver reports a fault on the train

signaller

If tripping has taken place or a driver reports a loss of line light or ADD operation, but at any stage confirms there is a fault on the train, you may resume normal working.

This does not apply if the driver reports there is damage to a pantograph.

### 13.6 Resuming normal working

signaller

However, if the ECO tells you that examination of the OLE is needed, you must:

- protect the affected lines as shown in the train signalling regulations
- come to a clear understanding with the ECO about the lines on which the OLE is to be examined and whether examination will be carried out by train or on foot
- arrange for the OLE to be examined as shown in section 14 of this module.

### 13.7 Bi-mode trains

signaller

If the train is a bi-mode train and the driver tells you there appears to be no damage to the train, and it is possible to regain traction using the train's own tractive power, you may authorise the movement if it is safe to do so. You must tell the ECO before the movement begins.

You must authorise the driver to proceed forward using the train's own tractive power and signal the train normally.

You must tell Operations Control.

If the train is to return to electric mode, you must agree with the driver a suitable and recognisable location to do so.

# 14 Instructions for examining the OLE

*The people responsible: signaller, driver, responsible person*

## 14.1 When the OLE must be examined

The OLE must be examined following:

signaller

- a tripping of the OLE when the ECO asks you to arrange examination of the OLE - the OLE must be examined between the locations the ECO gives you
- a driver reporting an ADD operation - the OLE must be examined from the location where the ADD operated to the location where the train came to a stand
- a report of damage to the OLE involving a train - the OLE must be examined from the location of the reported damage to the location where the train came to a stand
- a report of damage to the OLE with no train involved – the OLE must be examined at the location of the reported damage.

## 14.2 Examining the OLE using a train

### 14.2.1 How the OLE is to be examined

The OLE can be examined from a train on the affected line or an adjacent line.

signaller

If it is examined from an adjacent line and no defect is found, you must tell the driver of the next electric train over the affected line to proceed at caution and not to exceed 20 mph (30 km/h).

Only the affected line needs to be examined within the COS, however it may be necessary to examine both lines if examination is required over an interface with Network Rail.

If a train on an adjacent line is used to examine the line, you must also ask the driver to establish whether it is safe for trains to coast with pantographs lowered over the affected line.

**driver**

If you are asked to examine the OLE, you must:

- be accompanied by a competent person during darkness, poor visibility or where there is a tunnel in the affected section (you do not need to be accompanied in the tunnel section if the tunnel lighting has been switched on),
- proceed at caution and not exceed 20 mph (30 km/h) and look out for any damage or other problem with the OLE.

If a train on the adjacent line on the open section is used for this, you must ask the driver to establish whether it is safe for trains over the affected line to pass, if the trains are unable to operate using the train's own tractive power, or to coast under the OLE with pantographs lowered.

The signaller may also ask you to establish whether it is safe for trains over the affected line to proceed using the train's own tractive power or to coast under the OLE with pantographs lowered.

In this case, you must check that:

- any obstruction is not more than 150 mm (6 inches) below the contact wire
- not more than two consecutive droppers have come off
- the object or defect is more than three OLE structures away from a tunnel or overbridge
- no other defect is obvious.

### 14.2.2 If a train can operate using its own tractive power or coast with pantographs lowered

If you are sure that all of these apply, you must tell the signaller that you believe it is safe for a train over the affected line to proceed using its own tractive power or to coast under the OLE.

driver

If the driver considers that a train can coast or proceed using its own tractive power through the affected signaller area, you must get an assurance from the driver that:

signaller

- any obstruction is not more than 150 mm (6 inches) below the contact wire
- not more than two consecutive droppers have come off
- the object or defect is more than three OLE structures away from a tunnel or overbridge
- no other defect is obvious.

You must get a clear description from the driver of the exact location name or description that can be used so a driver, who is to coast under the defective OLE, can recognise it.

You must then deal with following trains that are to pass over the affected line, as shown in section 15.4 of this module.

### 14.2.3 If after the examination trains cannot pass

If after the examination it is found that trains cannot pass through the affected area, you must arrange for the OLE to be examined by OLE personnel.

signaller

#### 14.2.4 If no object or defect is found

signaller

If after the examination it is reported there is no obvious damage to the OLE, you may allow normal working to resume on all lines with the exception of the following.

- If the examination was carried out from a train on an adjacent line, the driver of the next electric train on the affected line must be told to proceed at caution and not exceed 20 mph (30km/h).
- If the examination was as a result of an ADD operation or reported damage to the OLE, you must stop each train on the affected line and instruct the driver to proceed at caution and not to exceed 20 mph (30km/h).

signaller

You must continue to do this until the OLE has been examined by OLE personnel, as shown in section 14.4 of this module.

### 14.3 Responsible person arriving on site

responsible person

When you arrive on site, you must establish whether the object or defect to the OLE is such that trains, including trains with pantographs lowered, can run or continue to run safely through the affected area.

If trains can run or continue to run but electric trains must coast with the pantographs lowered, you must decide whether the driver can easily identify the location. You must take account of the weather conditions and any other factor that may make this difficult.

### 14.4 OLE personnel examining the OLE

signaller

When the OLE is to be examined by OLE personnel, you must not resume normal working until the examination has been completed and this person tells you it is safe to do so.



# 15 Moving trains after an OLE incident

*The people responsible: driver, signaller*

## 15.1 When a pantograph has been damaged and there is no other pantograph available

**driver**

If, after you have lowered the pantograph, it cannot be used because of damage, the train may be assisted forward at reduced speed to the first location where the pantograph can be dealt with.

You must give the signaller an assurance that the damaged pantograph is clear of any possible contact with the OLE.

However, you must not move the train until a competent person has carried out the necessary repairs if:

- the clearance between the damaged pantograph and the OLE cannot be assured, or
- the damaged pantograph is foul of the loading gauge.

## 15.2 When a pantograph has been damaged but another is available or the train is a bi-mode train

**signaller**

If the train has an undamaged pantograph or is a bi-mode train, you may allow the train to proceed after any damaged pantograph has been dealt with as shown in section 15.1 of this module.

### 15.3 When a damaged pantograph cannot be dealt with or there is evidence that the train has contacted the OLE

If the damaged pantograph cannot be dealt with as shown in section 15.1 or any part of the train or its load has been in contact with the OLE, you must only allow the train to move if one of the following applies.

driver,  
signaller

- The OLE has been switched off and you have received authority from a member of OLE personnel for the train to be moved to a location away from the OLE for the defect or damage to be repaired. You have been told that the defect has been repaired or made safe for the train to move.
- The train must be moved in an emergency.

### 15.4 Allowing trains to coast at 20 mph (30 km/h) with pantographs lowered

Following an examination of the OLE, if you receive an assurance that it is safe to do so, you may allow all trains, including electric trains with pantographs lowered, to pass under objects or defects to the OLE as shown in section 14.2.2.

signaller

You must identify a signal that can be maintained at danger or a block marker at which the route can be closed, which is a sufficient distance from the affected area that will allow a train to reach 20 mph (30 km/h) before arriving at the affected area. If the signal or block marker is controlled by another signaller, you must carry out your local instructions.

Trains already beyond this signal or block marker must be dealt with individually. The driver of any electric train must be asked if they can reach enough speed to coast with pantographs lowered through the affected area.

**signaller**

You must stop each train at this signal or block marker and explain to the driver:

- there is a problem with the OLE
- the location name and description of the affected area.

You must then instruct the driver:

- to lower pantographs if fitted, in enough time to make sure that the train coasts through the affected area at not more than 20 mph with the pantographs lowered
- that the pantographs, if fitted, must not be raised until the driver is sure all pantographs on the train are clear of the affected area
- to obey all signals or obey the DMI.

When the driver has confirmed that all instructions have been understood, you may clear the signal or issue an MA.

You must make sure that the route is clear through the affected area so that the driver will not encounter any signal at danger or an end of authority.

**driver**

Following an examination of the OLE, the signaller may allow all trains, including electric trains with pantographs lowered, to pass under objects or defect to the OLE.

The signaller will tell you:

driver

- there is a problem with the OLE
- the location name and description of the affected area.

The signaller will then instruct you:

- to lower pantographs, if fitted, in enough time to make sure that the train coasts through the affected area at no more than 20 mph (30 km/h) with the pantographs lowered
- that the pantographs, if fitted, must not be raised until you are sure all pantographs on the train are clear of the affected area
- to obey all signals or obey the DMI.

When the signaller is sure that you have understood all the instructions, the signaller will clear the signal or issue an MA for you to proceed.

You must make sure that all pantographs, if fitted, are lowered before coasting through the affected area.

You can raise the pantographs when you are sure all the pantographs have passed the affected area.

You may then proceed normally.

## 15.5 Not used

## 15.6 Bi-mode trains

You can carry out the instructions in sections 15.4 and 15.5 for a bi-mode train operating in electric mode.

driver,  
signaller

You can agree that the bi-mode train will operate in a self-powered mode instead of coasting.

In either case you must:

driver

- lower all the pantographs on the train
- keep the APCO equipment on the train isolated throughout the affected area until you reach the location where you are allowed to raise the pantograph.

# 16 Preventing damage or danger from on-train equipment overheating

*The person responsible: driver*

driver

If you become aware of any serious defect or the electrical equipment overheating, you must immediately lower the pantograph and stop the train if possible at the next station.

If lowering the pantograph cures the fault, you must:

- isolate the defective equipment, or
- if this is not possible and the train has more than one traction unit, isolate the pantograph on the defective unit and raise the pantograph on the other unit
- isolate the APCO equipment on the train if provided.

If you cannot lower the pantograph and there is still a fault, you must tell the ECO or arrange for this to be done so that the electricity can be switched off on the appropriate section of OLE.

# 17 Electric trains driven off the contact wire

*The person responsible: driver*

If an electric train has been driven off the contact wire with the pantograph raised, you must arrange for the incident to be reported to the ECO.

driver

You must not move the train back under the OLE until a competent person has examined the pantograph and, if necessary, it has been secured in a safe position.

# 18 Defective automatic power control (APC) track inductor or APCO balise

*The people responsible: driver, signaller*

## 18.1 Signaller's actions

If you have seen, or are told about, a loose, defective or broken APC track inductor, you must immediately report it to the ECO.

signaller

If the defective APC track inductor is on the approach side to a neutral section, you must stop each affected train and tell the driver to shut off power when passing through the neutral section.

## 18.2 APC inductor: Driver's actions

When you have been told about a defective APC track inductor, you must make sure you shut off power immediately before entering the neutral section.

driver

## 18.3 Defective APCO balise

If you see, or are told about, a loose, defective or broken APCO balise, you must immediately report it to the fault control.

signaller

If the defective APCO balise is on the approach to an electric to self-powered changeover location, you must stop each affected train and tell the driver to manually change to self-powered mode at the pantograph lower sign.

When you have been told about a defective APCO balise, you must make sure that you change to self-powered mode at the pantograph lower sign.

driver

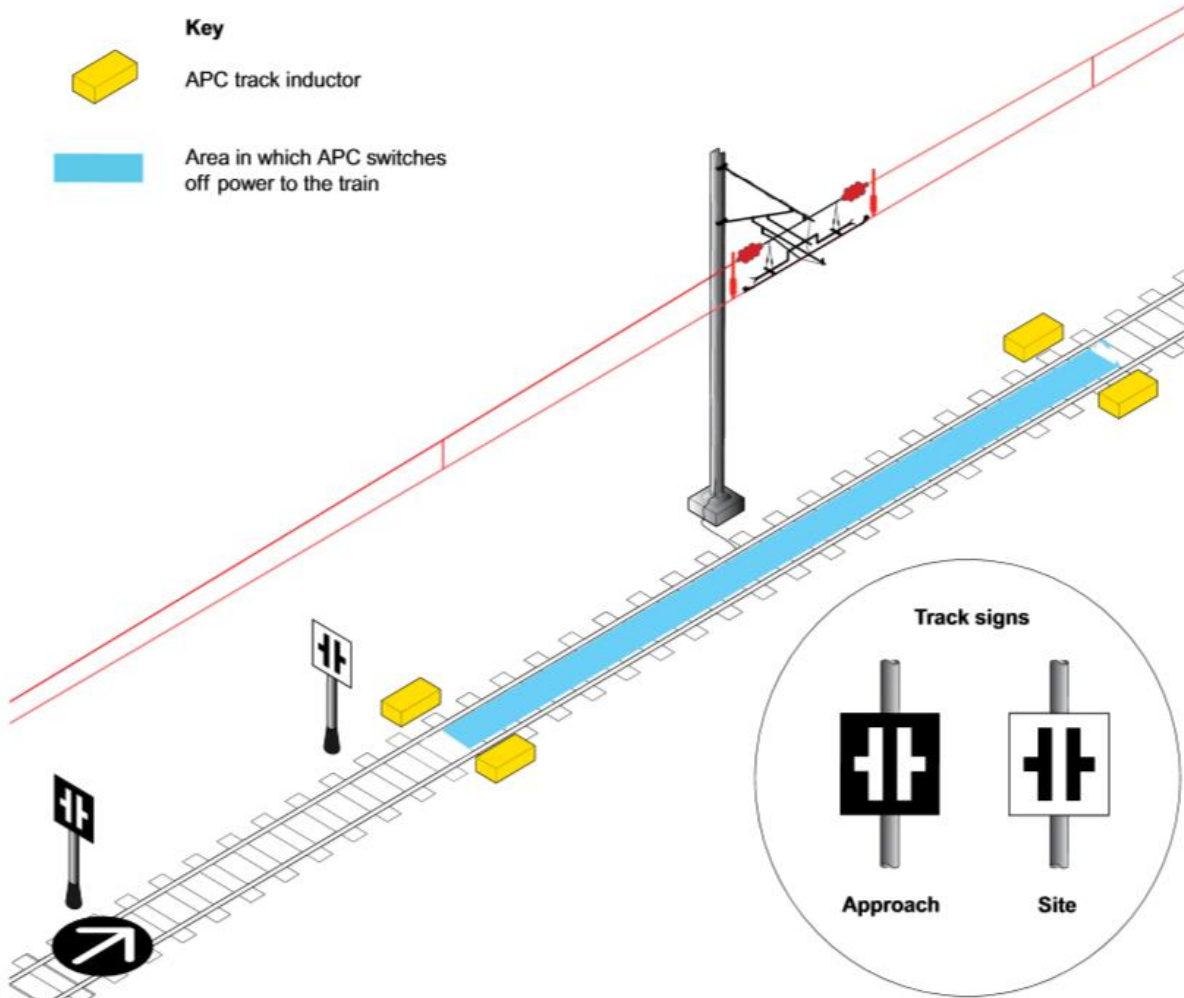




Diagram AC.3

Arrangement of signs and APC track inductors for a typical neutral section



Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

# COS/CBTC

## General CBTC information for the central operating section

## Module CBTC



Issue 4

Date December 2020

Trial running

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 4, December 2020

© Copyright 2020  
Rail for London Infrastructure Limited

This module details general information regarding the central operating section and the CBTC system, what it provides and how it is operated.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

This module contains information only.

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

### **1 General information**

- 1.1 Description of the central operating section
- 1.2 CBTC signalling
- 1.3 Driver machine interface (DMI)
- 1.4 CBTC Operating modes
- 1.5 Tunnel ventilation system
- 1.6 Platform screen doors
- 1.7 Possession and protection management
- 1.8 Train detection and axle counters
- 1.9 Non-preferred and prohibited stopping locations

### **2 Signs and information boards**

- 2.1 Lineside telephones

### **3 Lineside signs and markers**

- 3.1 Block markers, signs and boards
- 3.1 Train radio signs
- 3.2 Safety signs

# 1 General information

## 1.1 Description of the central operating section

The Central Operating Section (COS) is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The COS is controlled and signalled from the Route Control Centre (RCC) located at Romford.

Communication Based train control (CBTC) is fitted throughout the COS and in the overlay transition areas at the eastern portal at Pudding Mill Lane and Westbourne Park at the western portal on Network Rail infrastructure.

There are no track connections in the section of line between the Plumstead portal of the Thames tunnel and Abbey Wood between the Elizabeth Line route and Network Rail's North Kent Line.

However, there is a physical connection to the east of Abbey Wood sidings. This is not electrified and access is gained under controlled (signal protected) arrangements for engineering trains.

## 1.2 CBTC signalling

CBTC uses a dedicated telecommunications link between the train and trackside equipment to provide traffic management and infrastructure control. CBTC allows a highly accurate and reliable train position location to be known without relying on additional train detection technologies such as track circuits and axle counters.

### **What CBTC provides**

CBTC is a continuous, automatic train control system which allows high-capacity, bidirectional train operation using trackside data communications; and trainborne and trackside equipment to provide:

- Automatic Train Protection (ATP)
- Automatic Train Operation (ATO)
- Automatic Train Supervision (ATS).

Automatic route setting (ARS) is also provided.

### **How trains transition from conventional signalling to CBTC**

The class 345 Elizabeth Line trains are fitted with a European Train Control System (ETCS) onboard computer, and specific transmission modules (STM) for Train Protection Warning System (TPWS) and CBTC. By providing commands to the ETCS onboard computer from the trackside, the train can transfer control between ETCS, CBTC and TPWS/AWS signalling control as required.

Only trains fitted with CBTC are permitted to enter and operate within the COS. Some engineering trains are fitted with CBTC and TPWS/AWS systems, and will follow local procedures for entering the COS. Any other vehicle not fitted with CBTC will only be permitted to enter the COS using a possession of the line.

### 1.3 Driver machine interface (DMI)

CBTC provides several different modes which offer levels of supervision to the speed and distance the train can travel. The mode of the train is shown on the DMI and is also provided to the signaller in the RCC. These modes and the circumstances in which they can be used are shown below.

Mode	Use
Automatic Train Operation (ATO)	This is the normal operating mode of the train within the central operating section (COS). The traction and braking effort of the train is supervised by information provided by CBTC. The driver is required to remain vigilant in the forward cab.
Auto reverse (AR)	Auto reverse is as ATO except the driver is not required to remain vigilant in the forward cab. In general, this mode is used for empty coaches but could be requested in an emergency.
Protected Manual (PM)	This mode allows the driver to control the train within supervised speed and distance limits, and is displayed on the DMI. Warnings will be sounded to the driver if these limits are exceeded, with train brakes applied if the speed or distance travelled exceeds the limits. This mode is used when the driver is required to control the train and ATO is not to be used.
On-sight movement authority (OSMA)	This mode allows the train to be driven over infrastructure where the signaller has operated an interlocking override. The speed of the train is supervised up to 25 mph (40km/h). For example, an OSMA would be provided by CBTC when the signaller overrides a failed platform screen door, open cross passage doors, disturbed axle counter section, or points with failed flank protection.
In-possession movement authority (IPMA)	An IPMA is an on-sight movement authority provided by the signaller only when a train is required to enter a possession.
Staff Accountable (SA)	This mode is used when the train is not able to receive a CBTC movement authority or does not have valid position information. The train is supervised to 25 mph (40km/h) but has no distance limit. CBTC is still active on the train.



<p>ETCS Level 0</p>	<p>The ETCS onboard computer provides a mode called Level 0 which allows the 345 train to be moved without supervision from a movement authority. Level 0 has a supervised speed limit determined by national values, and the driver should only move the train in this mode when authorised by the signaller.</p>
---------------------	--

The DMI will show the permissible speed for the location of the train by highlighting the edge of the ‘speedometer’ indication. This is dependent on the distance of the remaining movement authority.

The permissible speed shown should never exceed the maximum permitted speed of the train. Although trains should be driven to the speed shown on the DMI this is not necessary if circumstances or rules dictate that a lower speed is appropriate.



The actual speed is shown as a number in the centre of the ‘speedometer’ display. The DMI is capable of showing speeds in kph or mph depending upon what is required by the infrastructure.

## 1.4 CBTC Operating modes

### Automatic Train operation (ATO)

This is the normal method of operation in the Central Operating Section. However, if restrictions are applied to the movement of the train, and these restrictions are not supervised, you should drive the train in a manual mode and not accept ATO operation.



While in motion the driver's role is to supervise the working of the train and intervene if necessary. The driver is required to be vigilant at all times and understand the location of the train in relation to direction of travel, stations, and other locations such as cross-passages.

Drivers will also sound the horn if trackside staff are seen in the open sections.

The driver always has the ability to apply the emergency brake.

Failure of the ATO will be indicated to the driver on the DMI.

### Autoreverse

The symbol will be displayed on the DMI with a yellow flashing border when an auto reverse movement is available. Once selected, the border stops flashing and shows grey. The driver is permitted to leave the driving cab through the saloon door, if necessary, and walk through the train to the other driving cab.



**Protected manual (PM)**

The driver has control of the train within the safe speed profile imposed by the ATP, which takes account of speed restrictions with limit of movement authority.

PM

If necessary, the driver can take control of the train by changing the mode from ATO to PM without stopping the train.

**On Sight mode**

The driver has control of the train and ATP is giving full protection and the signalling system issues and supervises a Movement Authority but restricts the speed so that the driver can stop short of any obstruction.

OS

**Staff Accountable mode (SA)**

Staff accountable mode is a degraded mode of operation that can only be implemented with the signaller's permission. SA has no train protection or automatic driving. When operating in SA the train speed is limited to 25 mph (40 km/h).

SA

## 1.5 Tunnel ventilation system

A tunnel ventilation system is used to provide cooler, clean air to; and extract dirty air from, the tunnel sections of the central operating section, and to control the flow of air caused by the movement of the trains. The single bore tunnels are divided into ventilation sections. The ventilation of a section is forced if a train is at a standstill for a period of time, or other events are taking place such as maintenance activities.

The signalling system will ensure that no more than two trains will occupy a ventilation section at any one time, and where a ventilation fan is not operating, the ventilation section will be extended to include the failed section. This can reduce the number of trains that can be signalled through the COS due to the longer distance required between trains.

## 1.6 Platform screen doors

As trains move through the single bore tunnels, they move large volumes of air at high speed around them. This can give rise to considerable discomfort to people in the platform areas. To reduce the discomfort and improve the safety at the platform edge in the underground platform areas, full-height platform screen doors have been fitted. This allows the generated air flows to be directed to extraction shafts rather than through the station openings.

The opening and closing of the platform screen doors is controlled by the signalling system and linked to the train being in the correct position along the platform. Train and screen door opening and closing are synchronised automatically to provide safer passage for customers. The platforms and trains are enabled for driver only CCTV operation.

## 1.7 Possession and protection management

### Possession Management

The CBTC signalling system provides maintainers with an automated process for taking and giving up protection of the line. On the Central Operating Section this method of protection is used for possession and incident management, and requires engineering possession areas (EPA) to be programmed into the signalling system.

Possessions are planned in advance of when they are required, and the details are sent electronically to the signalling system to provide a high level of protection to trackworkers.

Maintainers can then use a handheld terminal (HHT) device to identify, request and receive authority for their possession from a place of safety.

Radio frequency devices (RFId) are placed at locations where maintainers will require access to the railway. These are scanned using a handheld terminal to ensure that the maintainer accesses the railway at the correct location for the possession, and the possession will not be granted until the correct RFId is scanned.

### Methods of Protection for incident investigation

Where it is necessary to go on or near the line to investigate an incident, the same handheld protection system should be used. This provides the highest level of protection to the person on the track carrying out the investigation. Where protection is needed at short notice, areas of protection can be created by the signaller blocking the line using EPAs, rather than using the possession planning process. The incident investigator will be given the required information for the protection, which can then be activated using the handheld terminal.

If a handheld terminal is not available, EPA protection should still be used as it provides the highest level of protection. In this case it will be manually created and authorised by the signaller using the signalling system.

Other methods of protection are permitted, such as using a train for protection or requesting signalling protection, but these should only be considered if the process of using an EPA is not appropriate or not possible.

When determining which method of line blockage is appropriate, the situation and conditions surrounding the incident should be considered. For example, if the incident location is to be reached and accessed by train, then protection by train would be an appropriate method of protection. However, if the investigator needs to walk a distance along the track, then it would be more appropriate to use EPA protection.

If the incident investigation identifies that work on or near the line is required to restore operational service, then simple rectification work can be carried out in the line blockage (provided a safe system of work is put in place) or for major work a T3 possession must be planned and used.

## 1.8 Train detection and axle counters

The CBTC signalling system uses moving block principles to determine where trains are. This means that the train is constantly communicating to the trackside its position using balise information and that the train is complete.

Axle counters, and in some locations track circuits, are provided as a secondary means for detecting the trains. If a train has lost communication with the CBTC signalling system, it can still be detected as occupying a section of track. The train will not be capable of running with a supervised movement authority until it has re-established communication, confirmed its integrity and track location.

## 1.9 Non-preferred and prohibited stopping locations

There are locations in the COS where stopping the train is not preferred or is prohibited, as this may cause operational or technical difficulties.

The CBTC signalling system will hold a train until the route is long enough to allow the train to completely clear the prohibited stopping location, to avoid the train stopping if the movement authority is not updated. It is not always possible to avoid stopping the train in these locations, but under normal conditions the signalling system will avoid stopping the train.

Prohibited stopping locations are identified below, and the signaller must be immediately told if the train stops at one of these locations and cannot proceed.

- Connaught tunnel twin bore section.
- Within neutral section.
- Evacuations crossings.
- Within the switches and crossings areas.
- At station platforms when not at the correct stopping point.

## 2 Signs and information boards

### 2.1 Lineside telephones

Telephones have been positioned within the COS to be accessible by maintenance personnel. Protection must have been provided before going on the lineside to use an emergency telephone.



Some telephones are positioned where there is limited clearance between the telephone and the adjacent lines. These telephones may only be used in an emergency and then only if no other form of communication is available.



These signs mean that a train driver may use the signal post telephone because it is in a position of safety in relation to the adjacent line and protection is provided by the presence of the train.

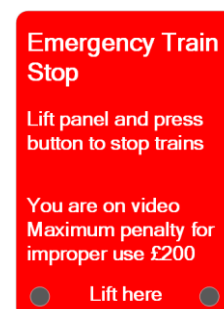


The telephone may only be used by other staff to contact the signaller:

- in an emergency
- if told that the line to which it applies has been blocked.

### Emergency Stop Plungers

These devices have been placed on Abbey Wood and Custom House Platforms, and also within the Plumstead stabling sidings. Pressing the plunger will remove the movement authority from a communicating train in that area.





## 3 Lineside signs and markers

### 3.1 Block markers, signs and boards

#### CBTC block markers

A CBTC block marker consists of a reflective square sign showing a yellow arrow on a blue background. The arrow shows which line the marker applies to.



Each block marker is provided with a unique identification plate, of white characters on a black background.

In some locations co-acting block markers have been provided to assisting with sighting.

#### Start of CBTC cab signalling board

This board indicates the start of CBTC cab signalling.



#### End of cab signalling board

This board indicates the end of CBTC signalling.



#### Cross passage and shaft train stopping marker

This board indicate where the train is to be stopped to align with the tunnel or shaft exit doors.



**Reversing sign**

These signs indicate the location where a 345 train is clear of points if performing a reversing operation. These signs are positioned at locations where the 345 trains are planned to be turned back.

**Chainage markers**

These signs indicate the chainage for the COS. The distance shown is metric and will be identified every 100 metres.

64km

64km  
600**Cross passage**

This sign is provided to inform the driver that they have stopped at a location adjacent to a cross passage door.

CROSS PASSAGE

**Bridge identity plates**

These signs identify the location of bridge structures.



### 3.1 Train radio signs

#### GSM-R alias plate

In places where there is no signal or where there may be confusion over the number to enter when registering the cab radio, an alias plate may be provided.



#### GSM-R signalbox phone number plate

At certain signals the GSM-R network may not be able to automatically route calls from the driver to the signaller who controls the area. This sign is a reminder to drivers of the number



#### GSM-R radio area

This sign indicates the start of a GSM-R radio section.



#### GSM-R signalbox short code plate

An alternative method has been developed to avoid a driver having to dial the long 8-digit number. This is achieved by dialling a short code number. This sign displays the correct signaller's GSM-R short code number.



### Infrastructure Boundary Sign

This sign indicates the boundary for the infrastructure manager's rules. The sign indicates where NR rules end and RFLI rules begin.



### Accurate stop sign

This sign is positioned at locations where the driver is required to stop the train accurately with the lineside infrastructure.



## 3.2 Safety signs

### Limited clearance signs

This sign means there is no position of safety on this side of the railway for the length of the structure. No-one must enter or stand at that location when a train is approaching.



### No refuges warning sign

This sign means there is no position of safety on this side of the railway for the length of the structure.

However, there are positions of safety, or refuges, on the opposite side of the railway line.





### Prohibition sign

This sign means you must not pass beyond this sign while trains are running unless you are carrying out emergency protection. This is because you would not be able to reach a position of safety or refuge safely. If you are carrying out emergency protection, you must take extreme care.



Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/G1

# General safety responsibilities and personal track safety for non-track workers

## Module G1



Issue 6

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 6, December 2022

© Copyright 2022  
Rail for London Infrastructure Limited



This module details the rules regarding general safety responsibilities and personal track safety for non-track workers.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this module if you carry out the duties of a:

- train driver
- shunter
- designated person (DP)
- signaller
- platform staff

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

### **1 General instructions**

- 1.1 Rules, regulations and instructions
- 1.2 Getting on and off rail vehicles
- 1.3 Mechanical and electrical plant or other equipment
- 1.4 Travelling in driving cabs
- 1.5 Gates and lineside fences
- 1.6 Reporting lineside fires
- 1.7 Reporting trespassers
- 1.8 Flowing or pooling water that might affect structures or earthworks
- 1.9 Defective rail vehicles
- 1.10 Overhead power lines, which belong to an electricity company, collapsing
- 1.11 Not used
- 1.12 Tunnel lighting

### **2 Danger to trains**

### **3 Stopping a train in an emergency**

### **4 Accidents**

- 4.1 Reporting an accident
- 4.2 Calling the emergency services
- 4.3 Preserving evidence at a serious accident
- 4.4 Reporting a dangerous goods incident

### **5 Communications procedure**

- 5.1 Communicating clearly
- 5.2 Using communications equipment
- 5.3 Lead responsibility
- 5.4 Using phrases
- 5.5 Using the phonetic alphabet
- 5.6 Signaller instructing a driver

### **6 Trackside definitions**

### **7 Going on the operational railway**

- 7.1 General
- 7.2 Local knowledge
- 7.3 While walking

### **8 Limited clearances and related warning signs**

- 8.1 Limited clearance signs
- 8.2 Limited clearance at telephones

# 1 General instructions

*The people responsible: all concerned*

## 1.1 Rules, regulations and instructions

Rules, regulations and instructions apply to the task being carried out and to those carrying out the task, no matter what grade or job title they have.

all  
concerned

Unless you are being instructed by a competent person, you must be competent to correctly apply the rules, regulations and instructions of the tasks you are authorised to carry out.

Safety must always be your first concern. If there is no rule that allows or prevents you doing something you believe must be done, you must do it in the safest way you know taking into account your training and experience.

## 1.2 Getting on and off rail vehicles

You must not:

- get off a moving rail vehicle unless it is designed for continuous slow-speed movement such as the high-output ballast cleaner
- get on a moving rail vehicle unless it is absolutely necessary, and then only if you can do so safely
- ride on the steps of a locomotive or vehicle
- ride on a hand trolley or any other vehicle not designed for this purpose.

all  
concerned

## 1.3 Mechanical and electrical plant or other equipment

You must not operate mechanical or electrical plant or any other equipment unless you have been trained and are authorised to do so. If necessary, you must also hold a certificate of competency in operating the plant or equipment.

all  
concerned

## 1.4 Travelling in driving cabs

all  
concerned

You must only travel in the driving cab of a train if it is in connection with your duties shown in the Rule Book or you have authority to do so.

If you are in possession of a cab pass, you must:

- show your cab pass to the driver before entering the cab
- show the driver any necessary permission issued by the train operator when asking for access to the cab of a train carrying high consequence dangerous goods
- tell the driver the reason for travelling in the cab and where you plan to travel to
- arrange for the train to be stopped specially if necessary
- check you have any personal protective equipment your company policy requires if you plan to leave the train somewhere other than a station platform
- check with the driver if any mobile electronic devices are to be switched off before entering the cab.

When travelling in the driving cab, you must not distract the driver.

## 1.5 Gates and lineside fences

### a) Not used

### b) Gates and lineside fences

all  
concerned

You must keep closed any gates giving access to the railway and if you can, lock them to prevent people from trespassing and causing vandalism.

If you come across a damaged fence, you must secure it if you can, and report any defects to the signaller or Operations Control.

## 1.6 Reporting lineside fires

all  
concerned

You must immediately report a lineside fire to the signaller or Operations Control.

### 1.7 Reporting trespassers

You must report anyone you believe to be trespassing to the signaller or Operations Control.

all  
concerned

### 1.8 Flowing or pooling water that might affect structures or earthworks

You must immediately report any flowing or pooling water that might affect structures or earthworks to the signaller or Operations Control.

all  
concerned

Examples of this include:

- water rising up from the track or the cess
- unusual amounts of water pooling next to the track or in the cess
- water flowing down or pouring out of the sides of embankments or cuttings.

You must tell the signaller or Operations Control if the water is displacing any material.

### 1.9 Defective rail vehicles

You must not remove or obscure a NOT TO GO or other repair label on a defective rail vehicle unless you are authorised to do so.

all  
concerned

## 1.10 Overhead power lines, which belong to an electricity company, collapsing

all  
concerned

If an overhead electric power line belonging to an electricity company falls onto or near the railway line, all affected lines must be protected. If necessary, you must carry out the instructions shown in section 3 of this module.

You must not go closer than 5 metres (approximately 5 yards) to the fallen power line or anything in contact with it, until it has been confirmed by the electricity company that it is safe to do so.

## 1.11 Not used

## 1.12 Tunnel lighting

### Requesting a change to the tunnel lighting

all  
concerned

If during the course of your duties you need the tunnel lights to be switched on or off, you must ask the signaller to do so.

The signaller will either,

- switch the tunnel lights on or off as requested, or
- tell you the reason why this cannot be done.

### Signaller's actions

signaller

If you are requested to switch the tunnel lighting on or off, you must take into consideration any operational risks that might occur in doing so.

You must then either:

- switch the tunnel lights on or off as requested, or
- tell the person requesting the tunnel lights why they cannot be changed.

## 2 Danger to trains

*The persons responsible: all concerned*

Whenever you can, you must check a moving train for anything that looks unsafe such as:

all  
concerned

- a door not closed properly
- an insecure load
- a vehicle on fire
- a hot axle box
- the headlight not lit
- the tail lamp missing or not lit
- the driver sounding the train in distress warning (which is a continuous series of long blasts on the high/loud tone of the horn)
- the driver displaying a red handsignal
- the hazard warning indicator (flashing headlights).
- If you become aware of any of these hazards or warnings or other dangers, you must immediately tell the signaller, or if this is not possible, the person in charge.

# 3

## Stopping a train in an emergency

*The persons responsible: all concerned*

all concerned

The following hazards might put approaching trains in danger.

- A track defect.
- A flood.
- An obstruction.
- A fire.
- Damage to structures or earthworks above or below the line.
- A large animal within the boundary fence (even if it is not an immediate danger to trains).
- Any other animals on or near the line.

If you become aware of any of these hazards or other dangers, you must immediately tell the signaller. If this is not possible, you must tell the person in charge (who must tell the signaller).

As well as reporting the hazard, you must take any other necessary action, such as:

- stopping trains
- calling the emergency services.

In some locations, emergency stop plungers have been provided to assist with stopping a train running in automatic mode. You must tell the signaller the reason for activating the emergency stop plunger if it is used.



**Emergency stop plungers are provided in the following locations.**

Plumstead sidings Abbey Wood and Custom House platforms
--

all  
concerned

If you have to stop a train in an emergency, you must use an emergency stop plunger if one is provided, or show a hand danger signal clearly to the driver using one of the following methods.

**During daylight**

You must show a red flag. If you do not have a red flag, raise both arms above your head. If you are riding on a vehicle, raise one arm held out horizontally.

**During darkness or in poor visibility**

You must show a red light to the driver or wave any light violently.

**Auto Reverse Operation**

In locations where auto reverse is permitted, a driver may not be present in the leading end of the train. If the train is to be stopped in an emergency or other exceptional cause, you must:

- immediately contact the signaller or person in charge of the movement, or
- use the emergency plunger (if one is provided) and then tell the signaller.

# 4 Accidents

*The people responsible: all concerned*

## 4.1 Reporting an accident

all concerned

You must report an accident as quickly as possible to the signaller or Operations Control.

When reporting an accident, you must first say 'This is an emergency call'. This is important, as you will get the immediate attention of the person you are speaking to. You must then state:

- your name
- your job title
- your employer
- where you are speaking from
- your telephone or radio call number.

You must give the exact location and details of the accident including which lines:

- are definitely obstructed, and
- those lines you think could be obstructed.

You must also say which emergency services are needed.

You must report all accidents, including near misses, to your supervisor or manager.

- A rail incident officer (RIO) (if appointed) will take charge at a scene of an accident.

## 4.2 Calling the emergency services

You must make sure you know how to call the emergency services from your usual place of work. From most railway locations you should call 999.

all  
concerned

You must use a fixed railway telephone if one is available (this helps the emergency services to locate where you are calling from).

If no fixed railway telephone is available, you may use a mobile or non-railway telephone.

In all cases, when calling the emergency services, you must:

- give the exact location of the accident
- give details of the accident.

## 4.3 Preserving evidence at a serious accident

Accident investigators will need to examine the site for evidence of the cause of the accident. You must not interfere with, disturb or remove any evidence of the possible cause of the accident except to help the injured or to prevent further injury or damage. This applies to equipment such as:

all  
concerned

- driving controls
- signalling equipment
- rolling stock
- lineside equipment.

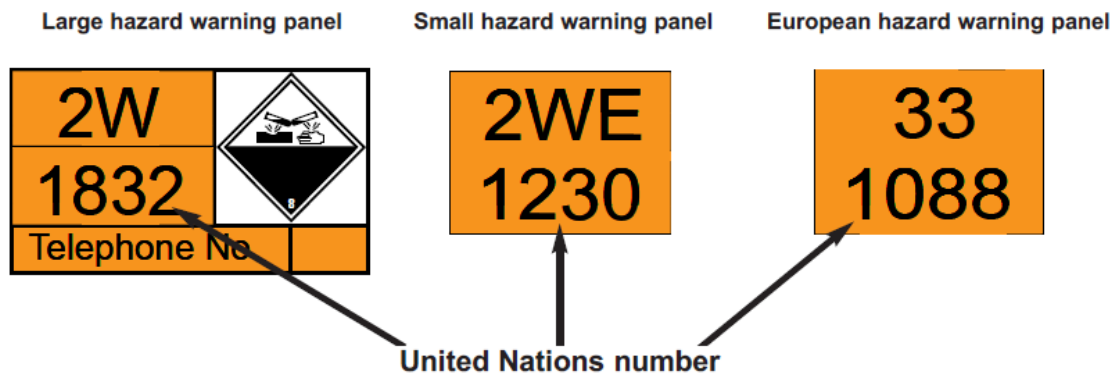
## 4.4 Reporting a dangerous goods incident

all  
concerned

If there are dangerous goods on a train, you must tell the signaller, Operations Control or the local manager 'This is a rail dangerous goods emergency' and give the following information (as well as the information set out in section 4.1).

United Nations number - this is displayed on the hazard warning panel on the side of a vehicle (or container).

A hazard warning panel will look like one of these:



You must:

- keep well clear
- keep the wind behind you as you face any affected vehicles or packages
- avoid low-lying places where gas may gather
- keep unauthorised people well clear
- try to put out any fire, without putting yourself or anyone else at risk
- keep naked lights and lamps well clear
- not smoke, use matches or pocket lighters
- or use a mobile phone near any vehicle carrying flammable loads.

More information about dangerous goods can be found in the Railway Group Standard *RS524 List of Dangerous Goods and their United Nations Number*.

If you are contaminated by dangerous goods you must:

- if your eyes are affected, wash them with plenty of cold water
- take off all contaminated clothing, trying to avoid further contamination while doing so
- wash any affected parts of your body with plenty of cold water
- get medical help quickly
- give the United Nations number of the substance
- get advice from the specialist assistance contact. If this is not known Operations Control can provide it.

all  
concerned

You can tell if there are dangerous goods in a vehicle or in a package because it will carry a hazard warning label like one of these.



# 5

## Communications procedure

*The people responsible: all concerned, driver, signaller*

### 5.1 Communicating clearly

all concerned

You must make sure you properly understand the meaning of all messages whether they are communicated by phone, radio or face-to-face.

You must:

- make sure you are talking to the right person
- give your exact location, if you are using a phone or a radio
- give your name and that of your employer
- state what task you are carrying out
- if necessary, let the person know how you can be contacted
- use the phonetic alphabet to make sure names and locations that are difficult to pronounce are fully understood
- never use the words 'not clear' to describe a line that is obstructed, always use 'line blocked'.

You must say numbers one at a time. You should say 8107 as 'eight, one, zero, seven'. There are exceptions to this such as when giving the time or when referring to a rule book module or handbook.

If you are receiving a message, make sure you fully understand it.

To help make sure your message is fully understood when using a telephone or radio:

all  
concerned

- speak with the mouthpiece close to your mouth and speak directly into the mouthpiece
- talk slightly slower than normal using a natural rhythm
- use your normal level of volume when speaking
- avoid using hesitation sounds for example 'um' and 'er'
- use clear sentences, and
- get the person to repeat your message back to you.

## 5.2 Using communications equipment

You must not use communications equipment if it may cause a distraction or affect safety.

all  
concerned

If you are on or near the line, make sure you are in a position of safety before using mobile communications equipment.

Unless it is an emergency, you must not use the group call, general call or conference-call facility for passing instructions to do with:

- passing signals at danger
- passing an end of authority without a movement authority
- protecting trains.

### 5.3 Lead responsibility

all concerned

During any conversation, one person must always take lead responsibility. The person who must take lead responsibility depends on the task being carried out. Examples are shown below.

Lead responsibility	When communicating with
Electrical control operator (ECO)	anyone
Signaller	anyone except the ECO
Person in charge of a possession (PICOP)	anyone except the ECO or signaller
Route-setting agent	points operator
Shunter	driver
Pilot	driver
Person conducting assisting train	driver of assisting train
Conductor driver	driver of train or machine being conducted
Designated person (DP)	members of the work group

If it is not clear who has lead responsibility, or if two people carrying out the same task are communicating with each other, the person who starts the conversation must always take lead responsibility.



## 5.4 Using phrases

### a) Phrases to use when using a radio or telephone

all  
concerned

Phrase	Meaning
This is an emergency call	This message provides information which needs immediate action to prevent death, serious injury or damage.
Repeat back	Repeat all of the message back to me.
Correction	I have made a mistake and will now correct the word or phrase just said.

### b) Other phrases to use when using a radio and only one person can be heard at a time

Phrase	Meaning
Over	I have finished my message and I am expecting a reply.
Out	I have finished my message no reply is expected.

## 5.5 Using the phonetic alphabet

You must use the phonetic alphabet:

all  
concerned

- to identify letters of the alphabet
- to spell words and place names that are difficult to say, or may be misunderstood
- if there is interference on the radio or phone
- when quoting the identity of signals or points
- when quoting train descriptions.

all  
concerned

This is the phonetic alphabet.

A - alpha	N – november
B – bravo	O – oscar
C – charlie	P – papa
D – delta	Q – quebec
E – echo	R – romeo
F – foxtrot	S – sierra
G – golf	T – tango
H - hotel	U – uniform
I – india	V – victor
J – juliet	W – whiskey
K – kilo	X – x-ray
L – lima	Y – yankee
M - mike	Z - zulu

## 5.6 Signaller instructing a driver

signaller

You must give all instructions to a driver in one of the following ways:

- direct (via telephone or radio)
- through the shunter or pilot
- through any other person who is competent in the relevant rules.

driver

You will receive all instructions from a signaller in one of the following ways:

- direct (via telephone or radio)
- through the shunter or pilot
- through any other person who is competent in the relevant rules.

## 6 Trackside definitions

*The people responsible: all concerned*

### Operational railway

The term operational railway includes the area called on the lineside and the area called on or near the line.

all  
concerned

### The lineside

You are on the lineside (shown green in diagram G1.1) if you are between the railway boundary fence and the area called 'on or near the line'.

You are not on the lineside if you are on a station platform.

### On or near the line

You are on or near the line (shown orange in diagram G1.1, G1.2, G1.3 and G1.4) if you are:

- within 3 metres (10 feet) of a line and there is no permanent fence or structure between you and the line
- on the line itself.

You are not on or near the line if you are on a station platform unless you are carrying out engineering or technical work within 1.25 metres (4 feet) of the platform edge. This does not apply where platform screen doors are provided and working normally.

### Positions on or near the line

The following terms are used to describe the different positions on or near the line.

The terms shown are not exact measurements.

**The cess** is the space alongside the line or lines on the outside edge of the running rail.

**The four-foot** is the space between the rails of one line.

**The six-foot** is the space between one line and another (where the rails are the normal distance apart).

## General safety responsibilities and personal track safety for non-track workers

**The ten-foot** is the space between one line and another where there is a wide space between a pair of lines and there are three lines or more. This distance may be less than 10 feet.

### A position of safety

If the maximum speed is 100 mph (160km/h) or less, you are in a position of safety if you are at least 1.25 metres (4 feet) from the nearest line on which a train can approach.

If the maximum speed is over 100 mph (160 km/h), the distance increases to 2 metres (6 feet 6 inches).

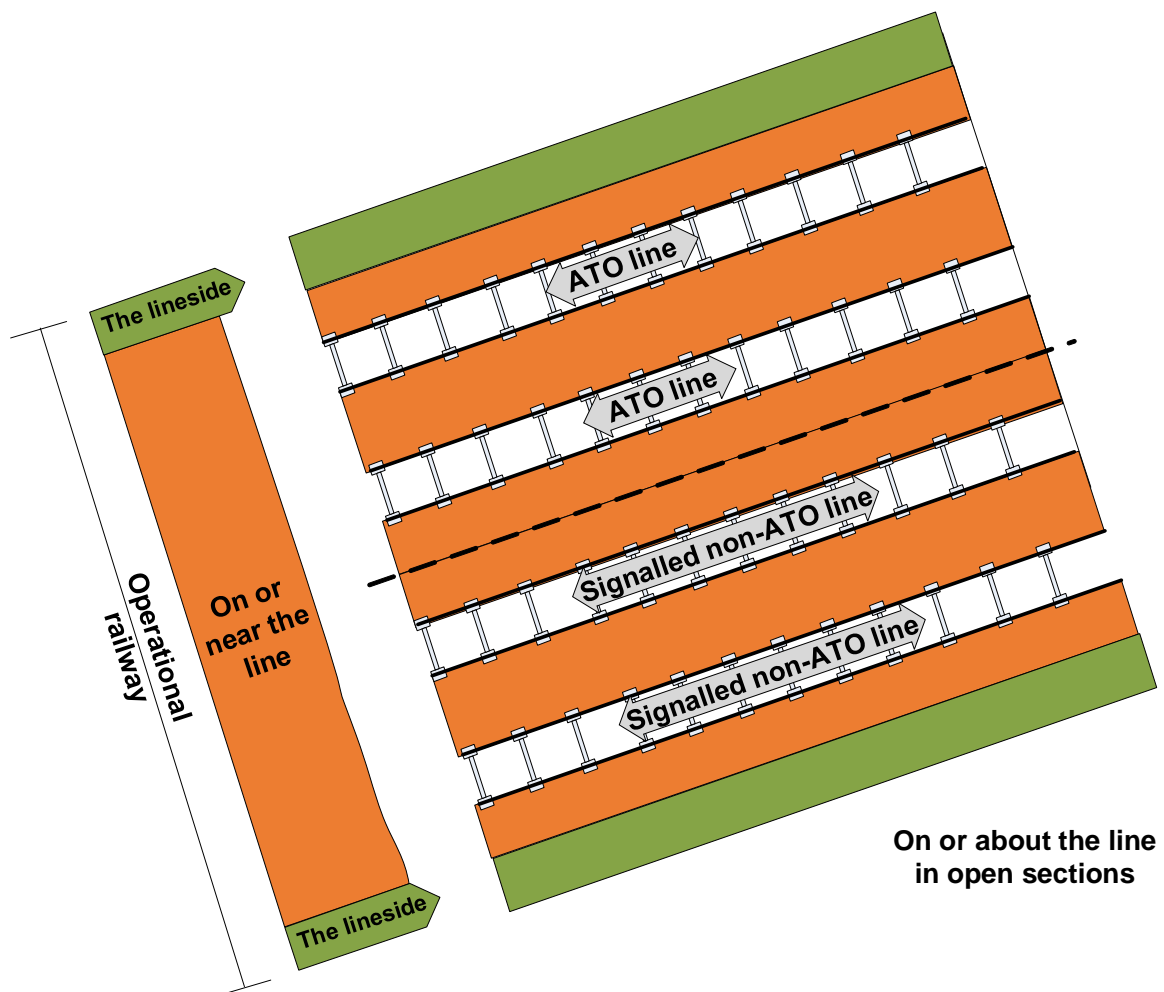


Diagram G1.1

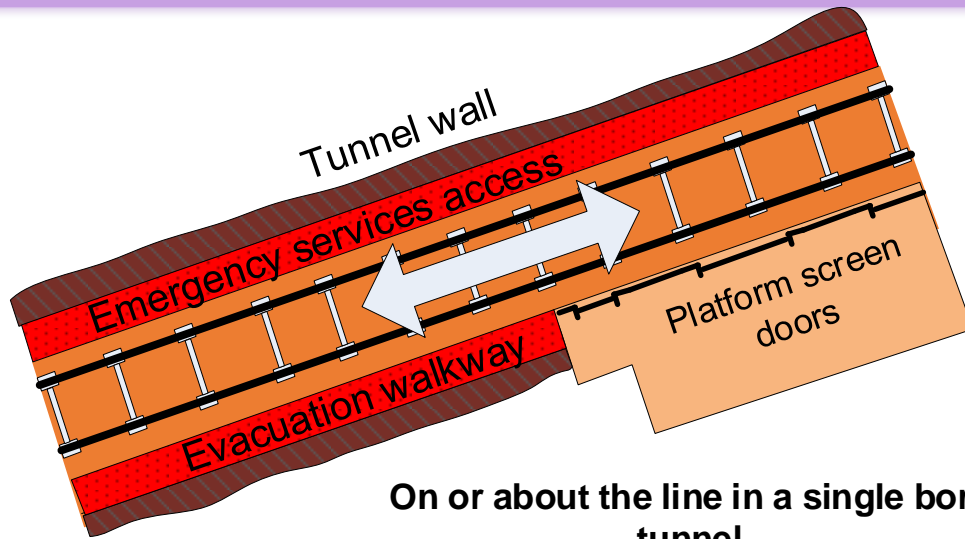


Diagram G1.2

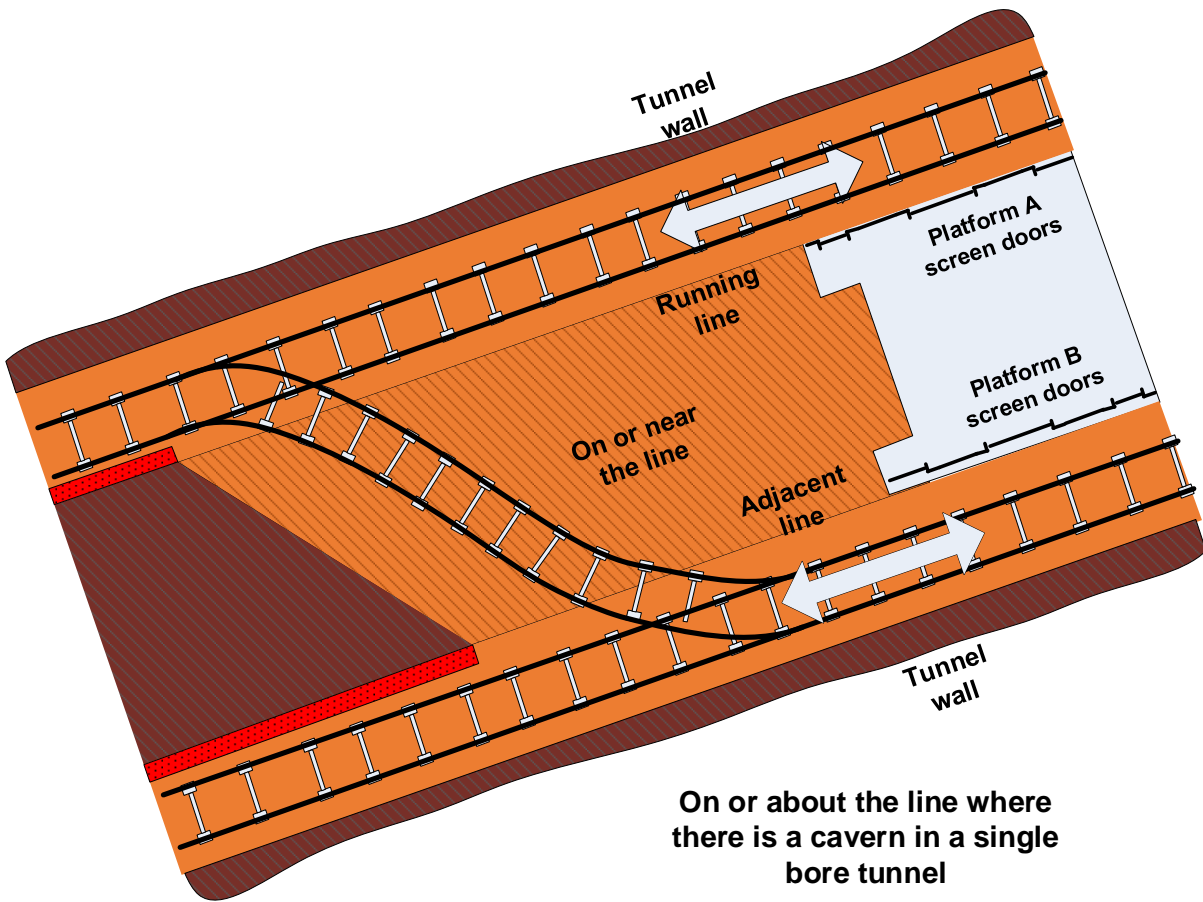


Diagram G1.3

General safety responsibilities and personal track safety for non-track workers

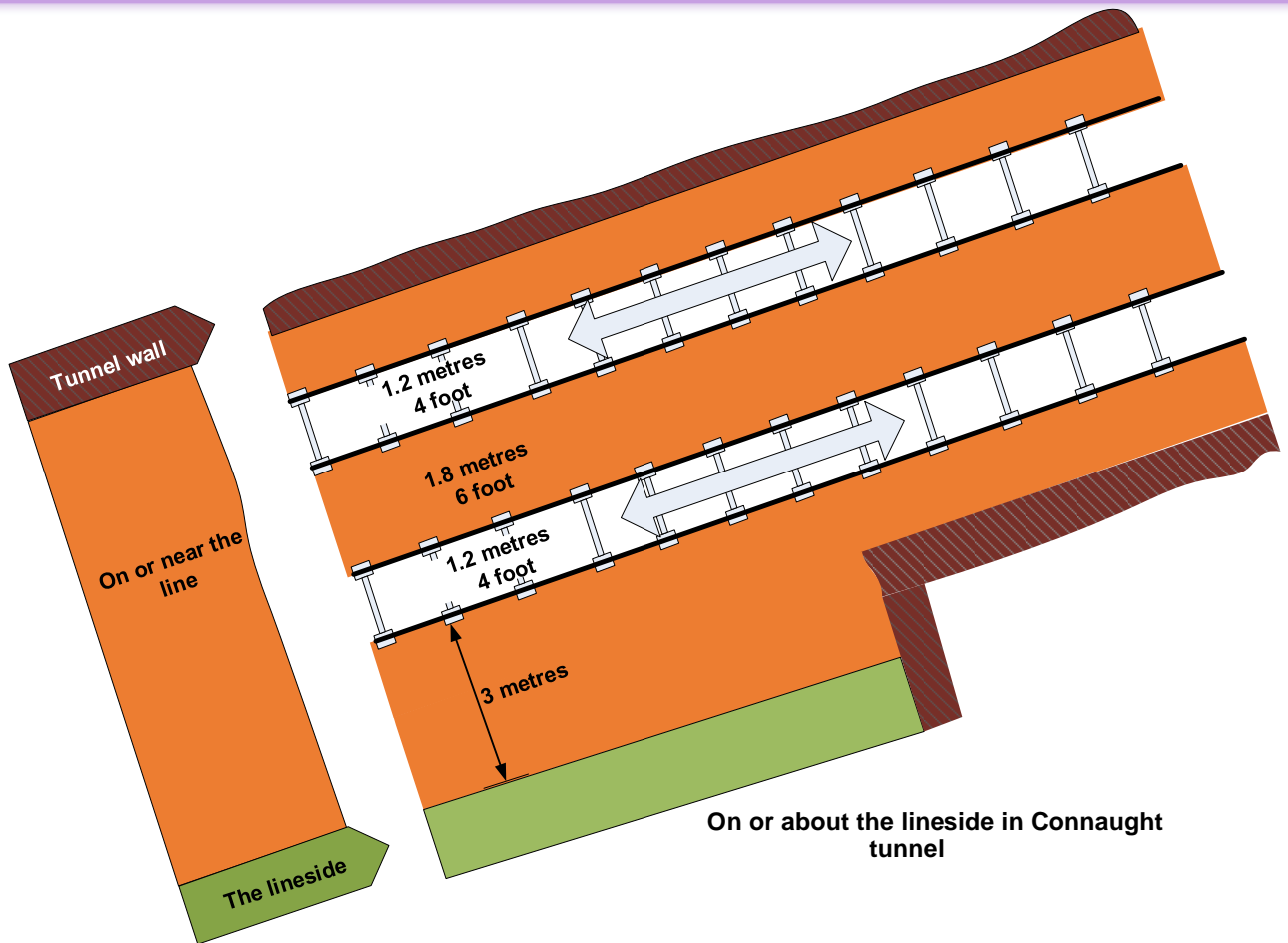


Diagram G1.4

# 7

## Going on the operational railway

*The people responsible: all concerned*

### 7.1 General

You do not need to carry a certificate showing that you are competent in the track-safety rules shown in this module as long as your regular assessment contains track-safety rules.

all  
concerned

You must get the authority of the signaller before going on the line, and have a method of protection in place.

You must wear clean high-visibility clothing of an approved type in the correct way whenever you are on the operational railway.

You may carry small items with you. Any items you do carry with you must not affect your ability to walk safely or to see or hear and acknowledge approaching trains.

Make sure you have a suitable hand lamp with you during poor visibility, darkness, or within an unlit tunnel.

### 7.2 Local knowledge

Before you go on or near the line, you must know about all of the following for each line:

all  
concerned

- the maximum speed
- the direction from which trains normally approach
- the location of any area where you must not go while trains are running
- any location with limited clearances
- the location of cross passage doors.

### 7.3 While walking

all  
concerned

You must use authorised walking routes if they are provided.

If you have to cross the line, you must not step on rails or sleepers or between movable parts of points.

If you have to use a mobile phone, first move to a position of safety and then stand still until you have finished using the phone.

Do not wear anything that makes you less able to see or hear approaching trains.

Do not allow yourself to be distracted by anyone or anything.

Keep a good lookout for approaching trains.

Make sure you look up at least every 5 seconds so that you can reach a position of safety and be in it no less than 10 seconds before an approaching train arrives.

#### **When a train approaches**

When a train approaches you must immediately move to a position of safety or, if already in a position of safety, stay there.

If the driver sounds the warning horn, raise one arm above your head to show you have heard the warning.

You must stay in your position of safety until the train has passed clear or you are certain you will not be put in danger by that train or any other train.



## 8

**Limited clearances and related warning signs***The people responsible: all concerned***8.1 Limited clearance signs****Limited clearance warning sign**

There is no position of safety on this side of the railway for the length of the structure. You must not enter or stand at that location when a train is approaching.

all  
concerned**No refuges warning sign**

There is no position of safety on this side of the railway for the length of the structure. However, there are positions of safety, or refuges, on the opposite side of the railway line.

**Prohibition sign**

You must not pass beyond this sign while trains are running. This is because you would not be able to reach a position of safety or refuge safely.



## 8.2 Limited clearance at telephones

all  
concerned

Some telephones are positioned where there is limited clearance between the telephone and the adjacent lines. You may use these telephones only in an emergency and then only if no other form of communication is available.



Emergency  
telephone




## Core operational aim


The core aim of the fundamental operational principles is to enable the safe and timely delivery of people and goods to their destination.

## Fundamental operational principles

- 1 The method of signalling must maintain a space interval between trains that is safe.
- 2 Before a train is allowed to start or continue moving, it must have an authority to move that clearly indicates the limit of that authority.
- 3 Trains proceeding over any portion of line must not be obstructed in a way that threatens their safety.
- 4 Trains must be prevented from proceeding onto a portion of line if it is known or suspected that it would not be safe for them to pass.
- 5 Trains must not be allowed to begin or continue their journeys until it is clear that it is safe for them to do so.
- 6 Trains must only be allowed to operate over any portion of line as long as the rolling stock is compatible with the infrastructure on that portion of line.
- 7 Trains must not continue to operate after they have been found to be unsafe in any respect, until measures have been taken to allow them to continue safely.
- 8 People must be kept a safe distance from moving trains.
- 9 The workforce must be protected from the particular hazards associated with electrified railways.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

# COS/GSMR

## COS GSMR Handbook Issue 1



Issue 1

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First issued December 2022

Issue 1, December 2022

© Copyright 2022  
Rail for London Infrastructure Limited

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

This module contains information for:

- drivers
- signallers
- operations controllers
- train operations controller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Information**
- 2 Equipment**
  - 2.1 Train radio functions
  - 2.2 Fixed terminal functions
- 3 Powering up**
  - 3.1 Train radio
  - 3.2 Fixed terminal
- 4 Registration**
  - 4.1 Registration of the train radio
  - 4.2 Pending registration
  - 4.3 Company wild card codes (99x)
  - 4.4 Preregistration
  - 4.5 Registration problems
- 5 Radio communications**
  - 5.1 GSM-R call types
  - 5.2 Urgent calls
  - 5.3 Railway emergency group calls
  - 5.4 Short dial codes
  - 5.5 Using the train radio phonebooks
  - 5.6 Cab-to-cab calls



**5.7 Misrouted calls**

**5.8 Role profiles**

**5.9 Role transfer**

**5.10 Call transfer**

## **6 PA calls and DSD alarm**

**6.1 DSD alarm calls**

**6.2 PA calls**

## **7 Operational text messages**

**7.1 Standing at signal message**

**7.2 Contact signaller message**

**7.3 Contact train operator control message**

**7.4 Wait message**

**7.5 Acknowledge message**

**7.6 Messages between signal boxes**

## **8 Broadcast calls**

**8.1 Types of broadcast calls**

**8.2 General broadcast calls**

**8.3 Advisory broadcast calls**

**8.4 Acknowledged (safety) broadcast calls**

## **9 Deregistration**

**9.1 Deregistration of the train radio**

**9.2 Deregistration problems**

## **10 Faults**

**10.1 GSM-R to TD failure**

**10.2 Train radio failures**

**10.3 Network coverage issues**

**10.4 Call failure and dropped calls**

**10.5 Checking the train radio can make and receive calls (echo call test)**

**10.6 Loss of a signaller's fixed terminal**

**10.7 Loss of train operator's fixed terminal**

**10.8 Use of hand portable devices**

**10.9 Use of transportable devices**

**10.10 Widespread failure of the GSM-R network**

# 1

## Information

This handbook is intended as guidance to users of the GSM-R system used on the GB mainline railway and specifically the Central Operating Section of the Elizabeth Line.

It has been designed as a day-to-day reference guide for the less frequently used processes and functions of the GSM-R system. The handbook looks at these from the perspective of a driver, operations controller, signaller and train operator's' controller.

**NOTE:** This handbook contains radio and fixed terminal information typically found on the Great Britain mainline railway. Other equipment may differ in functionality.

## 2 Equipment

### 2.1 Train radio functions

These are some of the buttons found on the GSM-R driver's control panel (DCP) and an explanation of their functions.



**Accept:** Used to answer calls and accept user entries on the display.

**Reject or cancel:** Used to reject or delete entries on the display or to end a call.

**Menu:** Provides access to the in-built menu.

**TOC phonebook:** Provides access to the train operator's phonebook.

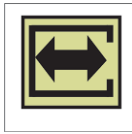
**Up within menu or increase volume:** Used to scroll up through the screen or menu options or to increase the volume.

**Down within menu or decrease volume:** Use to scroll downwards through the screen or menu options or reduce the volume.

**Test button:** Used to test the train radio.

**Increase brightness/scroll right:** Increases the brightness of the display or used to scroll to the right when text on the screen is longer than 20 characters.

**Reduce brightness/scroll left:** Reduces the brightness of the display or used to scroll to the left when the text on the screen is longer than 20 characters.



**Registration/turn on:** Enables registration and deregistration of the train radio. Turns driver's control panel on when pressed for two seconds.

**Standing at signal:** Used to inform the signaller that the train is at a stand at a stop signal.

**ST:** Used to acknowledge to the signaller that a broadcast call has been received and understood.






**Call signaller:** To make a call to a signaller.










**Railway emergency group call:** Used to make a railway emergency group call.

**Urgent call:** Used to make an urgent call to the signaller.

## 2.2 Fixed terminal functions

These are some of the buttons on the fixed terminal and their functions.

		<p><b>Incoming message:</b> To acknowledge a message.</p>
 Hold		<p><b>Hold:</b> Used to place a call on hold.</p>
 Forward		<p><b>Forward:</b> Allows a call to be forwarded to a third party.</p>
 Conf.		<p><b>Conference:</b> Allows third parties to be dialled in to a call.</p>
 Dial		<p><b>Dial pad:</b> Used to dial telephone numbers.</p>

 PhoneBk	<b>Phonebook:</b> Makes phonebook entries visible.
 Broadc.	<b>Record and broadcast:</b> To record and broadcast messages.
 More	<b>More:</b> To display more functions.
 Less	<b>Less:</b> To display fewer functions.
 Setting	<b>Settings:</b> To adjust the brightness of the display and volume controls.
 Rules	<b>Roles:</b> To change signaller roles.
 SMS	<b>SMS:</b> To compose and send a message.
 About	<b>NR about:</b> Displays the software version of the fixed terminal.
 Emerg.	<b>Emergency dial pad:</b> Display a sub menu that will display the speed dial keys for group call areas.

## 3 Powering up

### 3.1 Train radio

The train radio system is generally connected to the train battery supply, this enables usage of any train radio on which the batteries are switched on. During normal operation the supply to the train radio is provided when the master switch is moved away from the off position. The driver control panel can also be powered up by pressing the **Registration/ Deregistration** button for more than two seconds.

### 3.2 Fixed terminal

If the power supply to the signaller's or controller's fixed terminal is interrupted, it will reboot and return to the log in screen.

## 4 Registration

### 4.1 Registration of the train radio

When preparing a train for service the train radio is always required to be registered with the GSM-R network. This enables the registration of a headcode and will allow the signaller to contact the train radio. It will also support the correct routing of calls from the train radio to the signaller.

Drivers should always make sure that the correct headcode is displayed on the train radio.

### 4.2 Pending registration

If GSM-R network coverage is not available, pending registration will be used. Pending registration enables the train radio to be prepared to register once GSM-R network coverage becomes available.

**NOTE:** Pending registration is not available through the menu.

In order for the pending registration to be completed, the driver needs to follow these steps.

1 Press the **Registration** button.

2 Press the **Accept** button.

After five seconds the 'Reg code saved' message is cleared and replaced by a 'Searching networks – Please wait' message.

The registration process will only be complete once GSM-R coverage is detected and the driver has responded to the prompt from the train radio to press the **Accept** button.

The pending registration state can be cancelled by pressing the **Cancel** button at any time.

### 4.3 Company wild card codes (99x)

The '99x' company wild card code should only be used when registration problems are being experienced.

If a train radio has been registered using a company wild card code, it will not be possible for a call to the signaller to be routed to the controlling signaller. It may be necessary to use the phonebook to contact the correct signaller.

The company wild card codes can be found in the *Sectional Appendix*.

### 4.4 Preregistration

The preregistration function is available by using the menu.

If it is necessary for trains to be preregistered at a location where this is not normally done, the signaller will normally arrange for drivers to be told. This will avoid delay in registering the train radio.

When preregistering the train radio, the company wild card code should be used.

Preregistration can be triggered manually by the driver pressing the **Accept** button.

### 4.5 Registration problems

#### 4.5.1 Registration failure

There may be times when 'Registration failed' is displayed after an attempt has been made to register the train radio. The driver would normally check the registration code was entered correctly by attempting to register the train radio a second time.

If the second attempt also fails, the first point of contact would be the signaller who may know about a problem that is causing registration failures.

Two attempts should be made at registration using the details provided before contacting the signaller. The call to the signaller will need to be made using the phonebook. This step also confirms that the train radio is correctly connected to the network and calls can be made.

After contacting the signaller, one further attempt can be made using a '99x' company wild card code if necessary.

When a train is registered with the '99x' company wild card code, voice calls and operational text messages may be routed to the wrong



signaller. The driver should always check the train radio display to make sure the connection is to the correct signaller and to confirm the correct identity of the signaller once communication is established.

The driver would tell the signaller if the '99x' company wild card code has also failed to register the train.

This flowchart indicates the process that a driver can follow to determine their actions when experiencing a train radio registration failure.

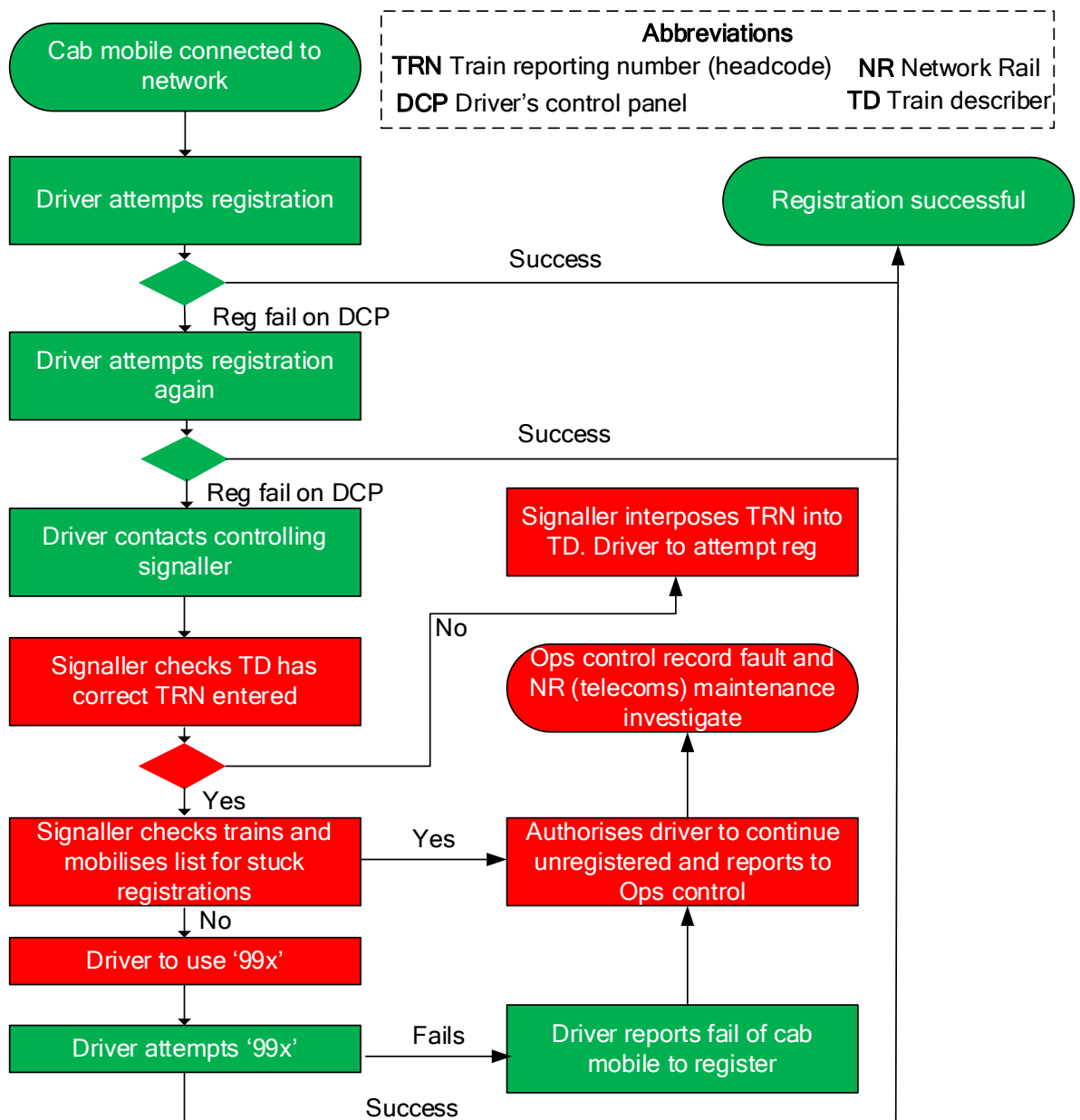


Fig.1 Registration failure flowchart

#### 4.5.2 Wrong train reporting number displayed

If the headcode displayed on the driver's control panel is incorrect, the train radio should be deregistered and reregistered using the correct headcode and location code.

#### 4.5.3 Duplicate registration identity

There may be instances when a registration code is already in use by another train radio. Any new registration will be rejected and the message 'Duplicate' will appear on the display. If it appears that the correct code has been entered, contact can be made with the signaller for a new code. In most cases, the signaller would advise the driver to use the '99x' company wild card code.

If the attempt using the '99x' company wild card code also results in 'duplicate' being displayed on the train radio, the driver will need to contact the signaller for an alternative '99x' company wild card code.

**NOTE:** As the train radio is not registered, the driver would be required to find the signaller's telephone number from the phonebook or dial the signaller's full number using the '12nn' short code if this is available.

#### 4.5.4 Loss of registration

If the train radio loses registration at any time, a reregistration is required.

#### 4.5.5 Failure of the train radio to deregister

If the train radio fails to deregister, the driver should attempt to deregister. If this also fails it should be reported to the signaller.

#### 4.5.6 Unregistered trains

A train can continue in service following unsuccessful attempts to register the train radio. Provided GSM-R GB is displayed on the screen, the core functionality of the radio system is still available.

If the signaller needs to contact an unregistered train they may make a broadcast call to the area in which the unregistered train is travelling and request the driver to contact them.

The signaller can use the train headcode to gain the attention of the driver.

The driver will need to use the phonebook to contact the controlling signaller.

A railway emergency group call will still operate correctly on an unregistered train but it is important to confirm that the correct signaller has been contacted.

#### **4.5.7 Display is blank, shows a failure message or remains stuck at 'Searching Networks'**

If the display is not showing the expected message, the driver can contact the signaller to ascertain if a network failure has occurred.

There is an option that allows the driver to manually select the GSM-R GB network via the menu using 'Settings' and 'Select Network'.

#### **4.5.8 Radio unable to identify the GSM-R GB network**

If the train radio connects to a network but only displays 'Network?' in the 'Network Name' field, then a manual selection of the network is required. The driver can access the menu and use 'Settings' and 'Select Network' to manually select the required network.

#### **4.5.9 The radio connects to the wrong network**

In GB the train radio would normally default to the 'GSM-R GB' network. In the unlikely event that it logs on to another network, the driver can change to the GB network via the menu using 'Settings' and 'Select Network'.

## **5 Radio communications**

### **5.1 GSM-R call types**

There are two types of GSM-R calls, point-to-point and group calls.

#### **5.1.1 Point-to-point calls**

Point-to-point calls can be separated into four types.

##### **Normal call and urgent call**

These are similar to telephone calls in which both people can speak at the same time.

##### **Driver's Safety Device (DSD) alarm**

This is an alarm sent from the train radio to the fixed terminal in the event that the driver does not acknowledge and reset the DSD in the allocated timescale for the traction type being driven.

##### **Public address (PA) calls**

These are calls made by the signaller or train operator's control and are a one-way method of communication. The driver will also be able to hear the PA announcement over the train radio loudspeaker.

### **Berth-triggered broadcast calls**

A berth-triggered broadcast call is a pre-recorded message received by the train when it enters a selected berth. The berth-triggered broadcast can be acknowledged when instructed to do so by pressing the **ST** button once the message has completed, the call terminated, and the instructions understood. The berth-triggered broadcast allows the signaller to caution a train in certain circumstances without the need to bring the train to a stand first.

#### **5.1.2 Group calls**

Group calls can be separated into three types.

##### **Railway Emergency Group Call (REC)**

This is a multi-party method of communication but only one person can speak at a time.

##### **Broadcast area call**

This is a method of communication which allows a signaller to broadcast a message to several trains within a given area.

##### **Shunting group calls**

These are conference calls where multiple drivers and shunters can participate in the call.

## **5.2 Urgent calls**

An urgent call is given a higher priority by the GSM-R system and will override a normal call. An urgent call can be made in relation to an incident affecting one train only.

### **5.2.1 Driver actions and indications**

If the signaller makes an urgent call to a train, the message will begin with the following script.

**‘This is an urgent call from the signaller at \_\_\_\_\_ to the driver of \_\_\_\_\_ (train reporting number)’.**

If this call is received the driver should respond as quickly as possible.

### **5.2.2 Signallers actions and indications**

If a driver makes an urgent call, the call will be displayed on the signaller’s incoming call screen. The active call button will flash yellow.

An urgent call must be answered as a priority over existing calls except for a REC call.

## 5.3 Railway emergency group calls

A REC is the highest priority call and can be made from any terminal or train radio that is connected to the GSM-R network. The **Press to Talk** button (PTT) must be used by the driver to speak during the REC. If the PTT button is not used correctly, the signaller is able to override it, see 5.3.3.

On receiving a REC the driver must stop the train and confirm that they are at a stand by pressing the **ST** button.

A REC can be used during any emergency situation affecting more than one line or more than one train.

It is important that, when a REC is initiated, the details of the incident are established quickly in order for the incident to be dealt with correctly and for unaffected trains to proceed as soon as possible.

### 5.3.1 Signaller and route controller actions and indications (Lead and non-lead signallers)

#### Making a REC

In an emergency situation the signaller may need to initiate a REC.

The lead signaller who initiates the REC call will be the lead signaller during the conversation. All other signallers will be able to monitor the call.

After the REC has been made and the signaller is sure that the emergency has been protected, the lead signaller will close the REC.

#### Receiving a REC

If receiving a REC, an alarm will sound on the fixed terminal and the call will be answered automatically. The call will be heard over the loudspeaker.

The lead signaller will be able to participate in the call, any non-lead signallers will only be able to monitor the call.

### 5.3.2 Driver actions and indications

#### Making a REC

In an emergency situation the driver may need to initiate a REC.

Once the REC has commenced the PTT button should be used to speak.

#### Receiving a REC

If you receive a REC the train radio will sound the audible alarm and display the message '**STOP EMERGENCY**'.

It is good practice for other drivers not to speak unless requested by the lead signaller or if they have important information to add to the call.

After the audible alarm, the call will be automatically connected. If a signaller is making the REC you will hear the following message.

**'This is a railway emergency call. I repeat this is a railway emergency call from the signaller at \_\_\_\_\_ to all trains in the \_\_\_\_\_ area.'**

The lead signaller will indicate the end of each REC by stating **'end of railway emergency group call.'**

An emergency group call is not considered completed until this phrase has been heard.

When the railway emergency group call has ended, any train that has not been instructed by the lead signaller to remain at a stand, can proceed if the driver is certain that the train is not affected by the incident.

### **5.3.3 PTT override**

When a driver is pressing the PTT button the lead signaller cannot be heard.

If the driver forgets to release the PTT, then the lead signaller can override the PTT by pressing the override button on the fixed terminal.

### **5.3.4 REC closure**

The call can only be ended by the lead signaller. It is important that the call is closed correctly to avoid unnecessary delays.

### **5.3.5 Accidental use of REC**

If you accidentally initiate a REC you should speak to the lead signaller and explain the circumstances. This is to avoid extensive delays whilst the initiator of the REC is determined.

## **5.4 Short dial codes**

The train radio includes a function which enables short dial code calls to the signaller (1200), operations control (1300) and electrical control operator (ECO) (1400) with the use of the keypad. When using these short dial codes, the call will normally be connected to the correct controlling area in which the train radio is registered. The train must be correctly registered in order for the short dial codes to work correctly.

## 5.5 Using the train radio phonebooks

If it is necessary to contact a signaller not controlling the signalling on the line on which the train is located or the train radio is unregistered, the train radio phonebooks should be used.

The phonebook has details of signallers, operations controllers and ECOs. The train operator's phonebook contains contacts specific to the train operator.

The entries in the train radio phonebooks are listed alphabetically and can be searched using the scroll buttons to move the cursor up and down the list. Alternatively, the first three letters of the location can be entered into a search field using the keypad.

## 5.6 Cab-to-cab calls

Examples of when cab-to-cab calls are authorised in the Rule Book are:

- Locomotives coupled in tandem,
- Working trains with a locomotive at each end,
- Assistance from the rear of a failed train,
- Locomotive assisting in the rear (where banking is authorised in the *Sectional Appendix*),
- Driving a traction unit from other than the leading cab (for example if the controls in the leading cab are defective).

A cab-to-cab call can be made via the menu and requires both drivers to enter the same headcode and location code.

## 5.7 Misrouted calls

The train radio does not provide an indication of network problems that may prevent calls being routed to the correct signaller. If the signaller is aware of such a fault they should set up a broadcast call to alert trains entering the area of the known fault.

In these circumstances a normal call may be wrongly routed to another signaller who does not control the signalling in that area. Drivers should always check that they are communicating with the correct signaller using the normal communications protocols.

If a driver receives a broadcast telling them about network problems in a specific area and they need to contact the signaller, they should do so

using the phonebook or by dialling the telephone number shown in the *Periodical Operating Notice (PON)*.

The signaller should record and report details of any misrouted calls.

## 5.8 Role profiles

The role profiling sets the limits of a signaller's area of responsibility for receiving GSM-R messages.

If appropriately configured, a single role can be used by more than one user at the same time. For example, by a signaller and signal box supervisor.

## 5.9 Role transfer

A single role profile can be transferred to another signaller's terminal. This should only be done in the following circumstances.

- A signal box is to be closed or opened with a switching out facility.
- A signaller is unable to log into the system or the fixed terminal has failed.
- A signaller is to leave the signal box for other than normal duties.

A clear understanding should be reached between the signallers concerned before the transfer takes place.

## 5.10 Call transfer

Signaller are able to forward calls to third parties such as other signallers, drivers, maintenance control or the emergency services.

The signaller should come to a clear understanding with all parties involved in the call when a call transfer is taking place.

If the signaller receives a misrouted call, the call transfer facility can be used to direct the call to the correct signaller. Please refer to section 5.7.

REC calls cannot be transferred.



## 6 PA calls and DSD alarm

### 6.1 DSD alarm calls

The train radio will send a DSD alarm message to the signaller after one minute if:

- the master switch is on the 'forward' or 'reverse' position, and
- no action is taken by the driver to reset the DSD.

If a DSD alarm message is received the signaller should attempt to contact the driver.

If a driver is aware that a DSD alarm call has been triggered, they should inform the signaller and advise them that the alarm was triggered in error.

### 6.2 PA calls

If the signaller is unable to contact the driver, it may be necessary for the signaller to make a PA announcement to a driver-only operated (DOO) passenger train. This allows the signaller to seek assistance if the driver is suspected of being incapacitated.

If the driver is able to respond to the PA announcement, a point-to-point call should be made after the PA announcement has terminated.

## 7 Operational text messages

### 7.1 Standing at signal message

This is used by drivers to indicate that their train is standing at a signal at danger, or an end of authority and it is not immediately obvious why the train has been brought to a stand.

The signaller can respond to this message by:

- clearing the signal or issuing a new movement authority,
- sending a 'wait' message,
- making a voice call to the driver to explain why the train is being detained.

## 7.2 Contact signaller message

This is normally the first method a signaller uses to contact the driver.

The driver should only reply when it is safe to do so by pressing the **Accept** button.

## 7.3 Contact train operator control message

This will be received if the train operator wishes to speak to the driver.

The driver should only reply when it is safe to do so by pressing the **Accept** button.

## 7.4 Wait message

The driver may receive a 'wait' message in response to sending the 'standing at signal' message.

The driver would need to wait for further instructions, clearance of the signal of the issuing of a new movement authority.

## 7.5 Acknowledge message

The driver can acknowledge a broadcast message by pressing the **ST** button.

Once the driver has acknowledged a broadcast message, the signaller will receive an acknowledgement message on the fixed terminal.

## 7.6 Messages between signal boxes

Signallers can send text messages to adjacent signal boxes for regulation purposes only. These messages are automatically recorded and saved on the fixed terminal.

# 8 Broadcast calls

## 8.1 Types of broadcast calls

Broadcast calls are a method of communicating by which the signaller can pass on information to individual drivers or groups of drivers.

These calls are answered automatically by the train and the driver will hear the call over the loudspeaker in the driving cab.

There are two types of broadcast calls.

#### **Berth-triggered broadcast call**

This type of call is activated once the train enters the berth relevant to the broadcast. The message is pre-recorded by the signaller. The signaller will receive either a 'failed' or 'not sent' message if the call has not been received by the train radio. These types of calls include advisory and acknowledged (safety) broadcast calls.

#### **Cell-based group broadcast call**

This type of call is applicable to a pre-defined service area and will be received by all drivers within that area. These calls can be pre-recorded or live.

The content of the broadcast calls can be separated into three categories: general, advisory and safety. Messages in the safety category must be acknowledged by the driver. General broadcast calls are cell based.

## **8.2 General broadcast calls**

The following communication protocol for a general broadcast call would begin with:

**'This is a general broadcast from the signaller at \_\_\_\_\_ to all trains in the \_\_\_\_\_ area.'**

Once the message has been communicated, the call is terminated with:

**'End of general broadcast.'**

## **8.3 Advisory broadcast calls**

An advisory broadcast call can be used to provide advice to drivers, for example, concerning line congestion and delays to the service.

The following script must be followed.

**'This is an advisory broadcast from the signaller at \_\_\_\_\_.'**

Once the advice has been communicated, the call is terminated with:

**'End of advisory broadcast.'**

In this situation acknowledgement of the broadcast is not required.

## 8.4 Acknowledged (safety) broadcast calls

Safety broadcast calls are used to reach a clear understanding by using non-verbal acknowledgement.

After listening to the message in its entirety and after the call has been terminated, the driver acknowledges their understanding of the messages by pressing the **ST** button.

### Uses for safety broadcasts

Safety broadcast calls can be used for the following scenarios.

- Poor rail conditions.
- Animals on the line (not tunnels).
- Open or defective platform screen door.
- Unusual events (not track or signalling).

### Scripts for safety broadcasts

The following scripts set out the content of a pre-recorded safety broadcast:

#### Poor rail conditions

'This is a safety broadcast from the signaller at \_\_\_\_\_. There are reportable railhead conditions at/on\* the approach to \_\_\_\_\_. Only acknowledge this message if you have fully understood this message. To acknowledge, press the **ST** button. End of safety broadcast.'

\*Delete as appropriate.

#### Animals on or near the line

'This is a safety broadcast from the signaller at \_\_\_\_\_. There are animals on or near the line at/between\* \_\_\_\_\_ and\* \_\_\_\_\_, proceed at caution. Only acknowledge this message if you have fully understood this message. To acknowledge, press the **ST** button. End of safety broadcast.'

\*Delete as appropriate.

#### Open or defective platform screen door

'This is a safety broadcast from the signaller at \_\_\_\_\_. There is an open/defective\* platform screen door at \_\_\_\_\_ station on the \_\_\_\_\_ bound line. You will be offered an automatic authority/on-sight movement authority\* to enter the platform. A speed restriction may also be applied. Only acknowledge this message if you have fully understood this

message. To acknowledge, press the **ST** button. End of safety broadcast.'

\*Delete as appropriate.

### Unusual events

'This is a safety broadcast from the signaller at \_\_\_\_\_. \* \_\_\_\_\_. Only acknowledge if you have fully understood this message. To acknowledge, press the ST button. End of safety broadcast.

\*Insert details of the incident, location and any speed restriction or special instructions in the main body of the broadcast.

**Note:** unusual events can include overcrowding on station platforms. The location of the events must be easily identifiable by the signaller and the driver.

## 9 Deregistration

### 9.1 Deregistration of the train radio

If the train radio is not correctly deregistered at the end of the journey, subsequent attempts to register that train radio may not be successful.

Incorrect deregistration could also result in the headcode remaining on the signaller's fixed terminal.

If the train radio is not correctly deregistered, a 'duplicate' headcode fault message may be displayed on the train radio.

#### 9.1.1 Deregistration – end of journey

The train radio will automatically begin the deregistration process once the driving desk is moved to the off position.

The radio can be allowed to complete the deregistration process automatically or stopped by following the instructions on the screen.

#### 9.1.2 Deregistration – mid journey

If the train is to change headcode mid journey this can be done by manually deregistering and re-registering using the train radio menu.

#### 9.1.3 Deregistration – reversing movement

It is important that the train radio is deregistered during a reversing movement before trying to register the same headcode on the radio of the cab that will become leading in the new movement.

## 9.2 Deregistration problems

### 9.2.1 Train radio failed to deregister from previous journey

If the train radio has failed to deregister from the previous journey, the driver will not be able to register a new TRN. If the previous TRN or the registration code is shown in the train number field the driver should attempt to deregister the radio.

**Note:** The signaller may be able to identify a 'stuck registration' on the fixed terminal. It may be possible to register to the exact same registration code but only if the train is standing at the same signal as the previous train. Otherwise the signaller will report this as a fault.

### 9.2.2 PA deregistration failure

If during registration the train radio displays 'Deregistration failed PA', fixed terminal users will be unable to initiate a call to the train's PA system. This is referred to as a stuck headcode.

If the cancel button is pressed the display will show 'No PA Reg'd'.

The driver should attempt to deregister the train radio but if the fault persists the driver should report it to the signaller and await further instructions. The signaller may be able to clarify that the PA is shown on the fixed terminal and will therefore be able to call the PA.

# 10 Faults

## 10.1 GSM-R to TD failure

If the GSM-R connection to the train describer fails, the signaller will receive a 'GSM-R TD' failure message.

During such a failure, calls from trains will not be routed to a signaller based on its GSM-R radio cell location and not its signalling location. In cell fringe areas this may mean that calls are not directed to the controlling signaller.

As a result of a TD failure, drivers should need to be informed. The best method of communicating this is via a broadcast call.

Due to the nature of the failure the phonebook should be used.

Any misrouted calls should be dealt with as described in section 5.7.

## 10.2 Train radio failures

### 10.2.1 Power-up self-test facilities

If the train radio fails the power-up self-test, the driver will see a failure message. Failures can be split into service affecting failures and non-service affecting failures.

#### Service affecting failures

If the train radio experiences a service affecting failure it will not be permitted to enter service, unless the Train Operator's Control gives permission.

#### Non-service affecting failures

If the train radio experiences a non-service affecting failure the train can continue in service.

Generally, as long as the train radio can make and receive a REC, the radio will not be considered defective.

### 10.2.2 Service affecting failures

These can be either specific messages, a blank screen or a 'Radio Failure' message associated with a fault number. These faults should be reported to the signaller immediately using alternative methods of communication.

A blank screen, or any of the following faults, should be treated as indicating a defective radio. The driver should carry out the instructions in COS Rule Book module TW5 *Preparation and movement of train Defective or isolated vehicles and on-train equipment*.

- Failure XX (range 01-07).
- Radio failure.
- Cab radio Flt.
- EPROM/RAM Flt.

RAM Test failure and the EPROM test fault message will occur when the control panel initialises.

### 10.2.3 Non-service affecting faults

Non-service affecting faults are identified by a 'Warning' followed by a number which identifies the type of fault to the maintainer. This type of fault means that the train radio will work but may be limited in its functionality.

If the train is being prepared to enter service it can do so without restriction but the driver should advise the Train Operator's Control before departure.

#### 10.2.4 Cancelling fault messages

If the message relates to a service affecting failure, the driver will be unable to remove this from the train radio display and the radio would be treated as a failure.

With certain failure types the train radio will attempt to re-boot five minutes after displaying the failure. It may be possible to manually re-boot the radio before this time (as shown in company instructions) to attempt to clear the fault.

The driver will need to acknowledge the fault message by pressing the **Cancel** button.

A reminder of this fault will remain on the display until the radio display is switched off.

#### 10.2.5 Train radio displays a foreign language

The train radio will normally use English when powered up. If the previous user has changed the language and the train radio has been switched off but not powered down, it may display a foreign language. The language can be changed back to English by using the menu short cut. The menu short cut is **MENU, 3,2,1**.

### 10.3 Network coverage issues

Although the GSM-R system provides full coverage of the managed infrastructure, there may be times when there is a temporary break in coverage, for example, a base station fault. There will be a warning tone sounded through the loudspeaker and a message 'Searching networks – Please wait' on the cab mobile display.

#### 10.3.1 No network message

The 'No Network' message appears when the train radio attempts to connect to the network at power up and:

- receives a corrupted or unintelligible message, or
- receives no response at all, or
- is denied access.

The user can manually reselect the GSM-R GB network through the menu using the following procedure.



Press the **MENU** key.

Select Option [3] 'Settings'.

Select Option [1] 'Select Network'.

Select 'GSM-R GB' and press the **Accept** button.

This process would be followed at a location where there is known to be GSM-R GB coverage.

### **10.3.2 If the train radio does not find the network at the starting location**

Unless advice of a network failure has been received, the driver should contact the signaller to establish if there is a GSM-R failure.

In locations affected by GSM-R network issues, the train radio can be pre-registered and the train can enter into service as normal.

If network coverage is not regained once the train has passed through the affected area, the train radio should be considered as defective.

The driver should carry out the instructions in COS Rule Book module TW5 *Preparation and movement of trains Defective or isolated vehicles and on-train equipment*.

### **10.3.3 Public mobile network interference**

In some circumstances, a train radio may be affected by public radio network interference. This interference prevents the train radio automatically connecting to the GSM-R GB networks and will result in the train radio displaying the message 'Searching Networks'. This is most common in terminal stations when a service terminates, and the driver changes ends.

In a high proportion of cases the fault can be rectified by using the following procedure.

Press the **MENU** key.

Select Option [3] 'Settings'.

Select Option [1] 'Select Network'.

Select 'GSM-R GB' and press the **Accept** button.

If the fault has been successfully rectified the train radio will connect to the GSM-R GB network.

If the above actions do not rectify the fault, the actions in section 10.3.2 should be followed.

## 10.4 Call failure and dropped calls

The driver should report any instances of call failures or dropped calls to the signaller.

The signaller should log the details of any failed or dropped calls in the train register and report the fault as set out in the COS Operator instructions.

## 10.5 Checking the train radio can make and receive calls (echo call test)

If the driver believes that the train radio may not be making and receiving calls, this can be checked by making an 'echo call' to the network. To do this, use the keypad to dial '1900', record a short message and then wait a few seconds for the recorded message to be played back. If the message is not played back the signaller should be informed, if necessary, by using an alternative method of communication.

## 10.6 Loss of a signaller's fixed terminal

A complete failure of the fixed terminal should be reported to the infrastructure manager. The most likely reason is the loss of data connection to the GSM-R network. If the signaller is aware of the failure a general broadcast can be made to alert drivers.

If this occurs a notification will appear. The message should be acknowledged by a driver.

If the connection is lost for a significant period of time, the fixed terminal will log out and revert to a pink screen.

When the connection is restored, the display on the fixed terminal will return to the normal log in screen.

In the event of the loss of the fixed terminal, the procedures concerning role transfer and role rescue should be followed. Please refer to section 5.9.

## 10.7 Loss of train operator's fixed terminal

A complete failure of the fixed terminal should be reported to the infrastructure manager. The most likely reason is the loss of data connection to the GSM-R network.

## 10.8 Use of hand portable devices

In the event of a train radio failure the train may be allowed to remain in service with an operational hand portable device.

This device will not be registered onto the GSM-R system.

COS Rule Book module TW5 *Preparation and movement of trains Defective or isolated vehicles and on-train equipment* includes information regarding the use of hand portable devices.

## 10.9 Use of transportable devices

In the event of a train radio failure the train may be allowed to remain in service with an operative transportable device.

The transportable device can be registered onto the GSM-R network in the same manner as the normal train radio.

COS Rule Book module TW5 *Preparation and movement of trains Defective or isolated vehicles and on-train equipment* includes information regarding the use of hand portable devices.

## 10.10 Widespread failure of the GSM-R network

The GSM-R network is in use across several connecting railways, where train control is transferred from one infrastructure manager to another. In a situation where the GSM-R network fails for several infrastructure managers, contingency plans will need to be put in place which take this into account.

### For Signallers and Operations Control

When the failure initially occurs, determine how widespread the failure is. Is it:

- part of the Elizabeth Line Central Operating Section (COS) being affected?
- all of the Elizabeth Line COS being affected?
- the Elizabeth Line COS and Network Rail infrastructure being affected?

Arrange for a message to be provided to station and platform staff (affected by the failure), alerting drivers within the COS about the GSM-R failure.

When Operations Control become aware or are told about a failure of the GSMR system, report the failure to Stoke Technical Engineering Centre, providing the information given by the signaller on the GSMR failure form and liaise with the telecommunications asset engineer or the on-call maintenance engineer to obtain further information.

The train service is to operate only at a maximum of 12 trains per hour, until the failure has been resolved or timetabled traffic has ceased. Station working mode should be considered as the most preferable method of controlling trains as this will help to prevent trains becoming stuck between stations in the event of an incident occurring.

Without a continuous secondary means of communication between signallers and drivers (i.e. mobile telephone coverage), the train service will need to be reduced to 12tph. If a continuous secondary means of communication is available, the train service can continue once drivers have been informed about how to contact the signaller.

If any further failures occur whilst the GSMR system is not available, a dynamic risk assessment will need to be undertaken to determine if the current service can continue and if so, any additional mitigations that must be applied.

If the failure affects more than 30% of the expected train service, remember to also report this to TfL Cyber Security as a potential cyber incident RFLI-ENG-SY-SDD-006 Cyber Security Management Standard.

### **For train drivers**


In the event that GSMR becomes unavailable to drivers, they will receive an alert on their train radio to draw their attention to the failure. Should this occur, they should:


- stop their trains at the next station
- follow the instructions provided by platform or station staff, or if staff are not present contact the signaller using a fixed line telephone.

Be aware that there may be a delay in resuming train service while the RCC staff are dealing with the GSMR failure. Platform and station staff will relay service update messages to you.

Should you need to contact the signaller in an emergency, you should stop your train at the nearest fixed line telephone and contact the signaller. The location of telephones are shown in the Sectional Appendix and can be found at cross passages, portals, platforms and point zones. Under these failure conditions, you can leave your train to contact the signaller, using your train for protection, provided that you do not need to cross or go near another line which could be open to traffic.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/M1

Dealing with a train accident or  
train evacuation in the central  
operating section

**Module M1**



Issue 5

Date December 2021

Comes into force 21<sup>st</sup> December

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 5, December 2021




© Copyright 2021  
Rail for London Infrastructure Limited

This module details the rules for dealing with a train accident or train evacuation in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	



## Contents

- 1 Definitions**
- 2 What to do after a train accident**
  - 2.1 Driver's actions
  - 2.2 Not used
  - 2.3 Signaller's actions
- 3 Emergency protection**
  - 3.1 Providing emergency protection
  - 3.2 Not used
  - 3.3 Providing protection on lines operated by other operators
  - 3.4 Not used
  - 3.5 Not used
  - 3.6 Not used
  - 3.7 Not used
  - 3.8 Not used
- 4 Fire on a train**
  - 4.1 Stopping the train
  - 4.2 Operating the tunnel ventilation system
  - 4.3 Safety of passengers
  - 4.4 Separating burning vehicles
  - 4.5 If the train cannot proceed
  - 4.6 If the train can proceed
- 5 Accidental train division**
  - 5.1 Passenger train - safety of passengers
  - 5.2 Securing the divided train
  - 5.3 If the two portions can be recoupled
  - 5.4 If the two portions cannot be recoupled
- 6 Evacuating a train**
  - 6.1 Preconditions
  - 6.2 Not used
  - 6.3 Controlled evacuation
  - 6.4 Emergency evacuation
  - 6.5 Passenger safety
  - 6.6 Uncontrolled evacuation
  - 6.7 Signaller's actions

# 1

## Definitions

### Signalling protection

This means closing routes or keeping routes closed.

### Train Accident

For the purposes of this module, the term train accident includes:

- a derailment
- a collision involving trains or rail vehicles
- a collision with an obstruction
- a collision with a road vehicle
- a collision with a person
- a fire on a train which might put other trains passing the location in danger
- a fire on a train which might mean that passengers are evacuated onto running lines
- an accidental train division which has caused another line to be obstructed.

### Signaller blocking the line

Using the signalling controls to provide protection around an incident on the line. Signaller blocking the line is not the same as applying a Line Blockage as the protection is an immediate response to an incident and may need to be changed by the signaller throughout an incident.

## 2 What to do after a train accident

*The people responsible: driver, signaller*

### 2.1 Driver's actions

driver

You must immediately:

- switch on the hazard warning indication where provided, and
- display a red light forward.

You must then check:

- if any other lines are obstructed (if in doubt, treat them as obstructed), and decide the quickest way to stop any approaching trains
- the exact location of your train.

You must tell the signaller about the accident by the quickest way possible and whether the electric traction current needs to be switched off.

You must then check:

- if any other lines are obstructed (if in doubt, treat them as obstructed), and decide the quickest way to stop any approaching trains
- the exact location of your train.

### 2.2 Not used

## 2.3 Signaller's actions

If you are alerted to a train accident, you must:

signaller

- immediately protect each obstructed line or arrange for this to be done
- take any other action needed to prevent trains approaching the accident as shown in the appropriate Train Signalling Regulations
- make an emergency broadcast to trains in the area concerned, or arrange for this to be done
- if possible, tell the person involved that you have provided protection
- arrange for the emergency services to be called if they are needed.

# 3

## Emergency protection

*The person responsible: driver*

### 3.1 Providing emergency protection

driver

If you are not able to contact the signaller using GSM-R, you must make an announcement using the PA system and inform the passengers there will be a delay.

#### **In the single bore tunnels**

You must contact the signaller by the quickest means. You must provide the signaller with the information required in section 2.1 of this module, and carry out any instructions you are given.

#### **Anywhere else in the COS**

You must contact the signaller by the quickest means. If you are not able to contact the signaller from the cab, use the horn to warn any approaching trains about the emergency, or walk forward to the next point where a call can be made to the signaller.

### 3.2 Not used

### 3.3 Providing protection on lines operated by other operators

#### **Network Rail**

driver

If you are required to carry emergency protection on other lines running next to the COS belonging to Network Rail, for example the North Kent Lines, you must carry out the instructions in GE/RT8000 module M1 *Dealing with a train accident or train evacuation*.

#### **Docklands light railway (DLR)**

If you are required to carry emergency protection on lines outside the COS belonging to DLR, you must carry out the instructions in the Sectional Appendix.

**3.4** Not used

**3.5** Not used

**3.6** Not used

**3.7** Not used

**3.8** Not used

## 4 Fire on a train

*The people responsible: driver, signaller*

### 4.1 Stopping the train

#### In all cases

driver

You must immediately tell the signaller about the fire.

You must consider your own safety and the safety of the passengers before attempting to put out a fire.

signaller

If you become aware of a fire on a train, you must use the signalling controls to bring the train to a stand at the next station. If you are told about the fire by someone other than the driver, you must then tell the driver about the reported fire.

#### In the single bore tunnels

driver

You must try to stop your train in a station platform.

If this is not possible but you are exiting the tunnel, you must proceed out of the tunnel and stop the train there.

If you are not exiting the tunnel but cannot reach a station, you must:

- immediately stop the train if possible adjacent to an evacuation shaft or cross-passage door
- attempt to put out the fire.

#### Anywhere else in the COS

driver

If possible, you must try to put out the fire on the train within a station.

You must avoid:

- stopping the train within a tunnel
- entering a tunnel.

If it is not possible to get the train to a station, you must

- immediately stop the train, and
- attempt to put out the fire.

Drivers of engineering trains must consider the situation around the train before continuing if there is a fire onboard. It may be safer to stop immediately than to continue to a station.

driver

## 4.2 Operating the tunnel ventilation system

You must arrange for:

signaller

- the tunnel ventilation controls to be operated to remove smoke from the area that the train on fire is occupying, and
- the station controller to be told about the incident.

You must stop any trains following the train on fire from entering the tunnel section, if possible holding them at stations.

## 4.3 Safety of passengers

You must:

driver

- tell passengers to move, if possible, to vehicles which are not affected by the fire,
- if passengers have to leave the train, carry out an evacuation.

## 4.4 Separating burning vehicles

If there is a risk of the fire spreading you must, if it can be done, separate the burning vehicles from the rest of the train.

driver

## 4.5 If the train cannot proceed

If the fire is out but the train cannot proceed, you must tell the signaller.

driver

If any passengers are left on the train and they are safe, you must if it is necessary, carry out a controlled evacuation when this can be done.

If any passengers have left the train, you must make sure they are in a safe position and not at risk from electrified lines or trains continuing to run on any other lines.

You must make sure they stay in a safe position until arrangements can be made to escort them from the site.



## 4.6 If the train can proceed

driver

If the fire is out and the train can proceed safely, you must tell the signaller as soon as possible.

# 5

## Accidental train division

*The person responsible: driver*

### 5.1 Passenger train - safety of passengers

You must:

driver

- find out whether anybody might have fallen from the train
- secure gangway doors
- make sure passengers are in a safe position on the train.

### 5.2 Securing the divided train

You must make sure both portions of the train are secure and all the vehicles are accounted for.

driver

You must then check the couplings where the train has divided to see if:

- they might have damaged the track or lineside equipment (if so, tell the signaller)
- there is any damage to them which prevents recoupling the portions.

### 5.3 If the two portions can be recoupled

If the two portions can be recoupled, you must get the personal authority of the signaller for the movement.

driver

When the two portions have been recoupled, you must tell the signaller the train is again complete.

You must get the signaller's authority to proceed.

## 5.4 If the two portions cannot be recoupled

driver

You must tell the signaller:

- that the rear portion is to be left in the section
- the exact location of the rear portion.

You must then carry out the instructions you are given by the signaller.

# 6 Evacuating a train

*The people responsible: driver, signaller*

## 6.1 Preconditions

You must carry out an evacuation of a train only if it is absolutely necessary.

driver

## 6.2 Not used

## 6.3 Controlled evacuation

You must tell the signaller that the train is to be evacuated and ask the signaller to provide signalling protection on all lines that may be affected. If necessary, you must also ask for the electric traction current to be switched off.

driver

## 6.4 Emergency evacuation

You must tell the signaller that an emergency evacuation is taking place or is necessary and ask the signaller to provide immediate signalling protection on all lines that may be affected. If necessary, you must also ask for the electric traction current to be switched off.

driver

If you cannot contact the signaller using GSM-R, you must contact the signaller by the quickest way possible.

## 6.5 Passenger safety

You must decide the best way to evacuate the train safely, taking into account:

driver

- how the passengers will be moved from the site
- the need for passengers to cross the least number of lines, if possible, to reach a safe position.

**driver** You must warn passengers to stay in a safe position until they can be escorted from the line or through a cross-passage door to another train.

## 6.6 Uncontrolled evacuation

**driver** You must tell the signaller that an uncontrolled evacuation is taking place and ask the signaller to provide immediate signalling protection on all lines that may be affected. If necessary, you must also ask for the electric traction current to be switched off.

If you cannot contact the signaller using GSM-R, you must contact the signaller in the quickest way possible.


You must try and prevent passengers making an uncontrolled evacuation and warn passengers that have evacuated, of any risks.


## 6.7 Signaller's actions

**signaller** When told about the evacuation of a train, you must:

- block all lines that may be affected
- tell the driver when you have provided protection
- tell any other signaller whose route may be affected that an uncontrolled evacuation is taking place.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/M2

Train stopped by train failure  
in the central operating section

**Module M2**



Issue 4

Date December 2020

Trial running

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 4, December 2020

© Copyright 2020  
Rail for London Infrastructure Limited



This module details the rules for dealing with a train stopped by train failure in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

### **1 If the train fails**

- 1.1 Telling the signaller**
- 1.2 Agreeing the arrangements**
- 1.3 Making sure the failed train is safe**
- 1.4 Not used**
- 1.5 Not used**

### **2 Not used**

### **3 Providing assistance**

- 3.1 Not used**
- 3.2 Signaller's precautions**
- 3.3 Assisting train moving towards the failed train**
- 3.4 Not used**
- 3.5 Before and after coupling to the failed train**
- 3.6 Before moving the combined trains**
- 3.7 Not used**
- 3.8 When the combined trains are ready to proceed**
- 3.9 During the movement**

## 1

**If the train fails**

*The people responsible: driver, signaller*

**1.1 Telling the signaller**

If your train is stopped by failure, you must immediately tell the signaller about the circumstances and whether you need an assisting train.

driver

**1.2 Agreeing the arrangements**

If an assisting train is needed, you must tell the signaller immediately.

driver,  
signaller

You must then both agree:

- the exact location of the failed train
- that the failed train will not be moved
- the type of assisting train needed
- the direction from which the assistance is needed.

**1.3 Making sure the failed train is safe**

After you have asked for assistance, you must not move your train until:

driver

- the assisting train arrives, or
- you have agreed alternative arrangements with the signaller and anyone else concerned.

You must make sure that:

- if assistance will be coming from the rear, a red light is displayed at the rear of your failed train
- if assistance will be coming from the front, a white light is displayed at the front of your failed train. If you are required to leave the failed train for any reason, you must inform the signaller.

signaller

If the driver of the failed train informs you that they must leave the failed train, you must not allow any train to approach the failed train until the driver has told you that it safe to do so.

**1.4** Not used

**1.5** Not used

**2** Not used

## 3 Providing assistance

*The people responsible: driver, signaller*

### 3.1 Not used

### 3.2 Signaller's precautions

signaller

You must tell the driver of the assisting train:

- the exact location of the failed train
- the station where the assisting train must be empty of passengers (where possible)
- if an auto-reverse move will be required
- where the failed train must be taken to.

You must signal the train using the protection of the signalling system as far as possible, allowing time for all passengers to be detrained from the assisting train at a station if required.

If low rail adhesion controls have been applied, you must inform the driver.

### 3.3 Assisting train moving towards the failed train

driver  
(assisting  
train)

When you are told by the signaller that your train will be assisting a failed train, you must inform the passengers.

Before you commence any movement towards the failed train you must make sure that you:

- inform the passengers, and
- detrain passengers if told to do so.

You must agree with the signaller:

- the method for assisting the failed train including what mode will be used to approach the failed train, and
- the point from which the train is to proceed at caution.

Before you commence any movement towards the failed train, you must make sure that all passengers have left the train (if required).

When the assisting train has come to a stand at the end of authority (EoA), you must instruct the driver to pass the EoA without a movement authority (MA) to approach the failed train.

signaller

You must proceed at caution and stop the train five metres before the failed train.

driver  
(assisting  
train)

### 3.4 Not used

### 3.5 Before and after coupling to the failed train

#### Before coupling to the failed train

Before coupling the trains, you must both agree:

- the method of coupling the trains,
- any on-board equipment that must be isolated.

You must tell the signaller if it is necessary to isolate the on-board CBTC on the failed train.

driver,  
driver  
(assisting  
train)

#### After coupling to the failed train

You must make sure that:

- your train is coupled to the failed train
- you have communication with the driver of the failed train
- the automatic brake, if compatible, is connected.

### 3.6 Before moving the combined trains

#### Agreeing how the combined trains will be controlled

driver,  
driver  
(assisting  
train)

You must:

- before the movement starts make sure that CBTC is in the correct mode
- when the movement is finished not make any further movement until you have the correct authority to do so.
- make sure that the CBTC is correctly configured to the new train length and any other safety system is also configured with the correct train data or isolated if it may cause an unintentional emergency brake application.
- agree who will be the lead driver to speak with the signaller
- agree how the train will be controlled

#### Agreeing the station arrangements

driver,  
driver  
(assisting  
train)

You must both agree who will be controlling the train movement and the arrangements for detraining passengers including:

- how alignment with the PSDs will be achieved (if required)
- who will operate the train doors
- who will operate the PSDs (if required).

### 3.7 Not used

### 3.8 When the combined trains are ready to proceed

lead driver

When the combined train is ready to proceed, you must tell the signaller.

signaller

If another signaller is involved you must agree how the movement is to be made.

You must then tell the lead driver exactly how far the train is to proceed and any other instructions that are required to make the movement safely.

lead driver

You must carry out the signaller's instructions.




### 3.9 During the movement


You can use the train radio to speak to the other driver at any time during the journey about how the movement is to be started, stopped and controlled.

driver,  
driver  
assisting  
train

When the movement is finished, you must not make any further movement until you have the correct authority to do so.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

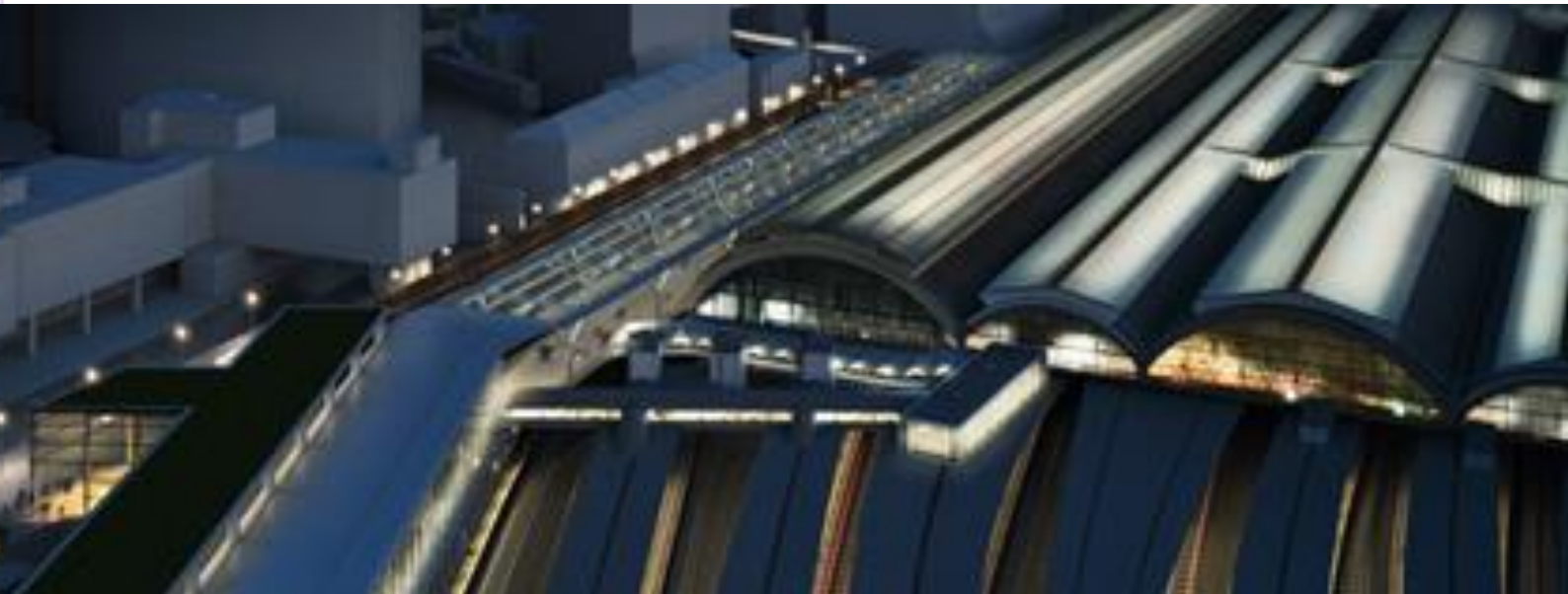
**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/M3

Managing incidents, floods  
and snow in the central  
operating section

**Module M3**



Issue 5

Date December 2021

Comes into force 21<sup>st</sup> December

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2021

© Copyright 2021  
Rail for London Infrastructure Limited




This module details the rules for managing incidents, floods and snow in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

You will also need this module if you are likely to be involved in or reporting a serious accident.

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	

## Contents

- 1 Preserving evidence after a serious accident**
  - 1.1 Carrying out emergency action**
  - 1.2 Leaving evidence undisturbed**
  - 1.3 Entering a driving cab**
  - 1.4 Locking cab doors**
  - 1.5 Signalling equipment**
  
- 2 Derailments, collisions or heavy impacts**
  - 2.1 Derailments**
  - 2.2 Collisions or heavy impacts with other vehicles or buffer stops**
  - 2.3 Trains colliding with obstructions on the line**
  
- 3 Bodies on the line**
  - 3.1 Signaller's actions**
  - 3.2 Dealing with trains**
  
- 4 Floods**
  - 4.1 Reporting procedure**
  - 4.2 Train running**
  
- 5 Snow**
  - 5.1 Reporting procedure**
  - 5.2 Train running**
  
- 6 Independent snow ploughs**
  - 6.1 Working on adjacent lines**
  - 6.2 Operating on electrified lines**
  
- 7 Damage to structures or earthworks above or below the line**
  - 7.1 Reporting procedure**
  - 7.2 Train running when damage to structures or earthworks are reported**
  - 7.3 Train running when flowing or pooling water that might affect structures or earthworks is reported**
  - 7.4 Report of extreme weather from Operations Control**

# 1 Preserving evidence after a serious accident

*The people responsible: anyone involved*

## 1.1 Carrying out emergency action

As a priority over preserving and recording evidence, if it is your responsibility you must:

anyone  
involved

- secure the train
- protect the line
- get the electric traction current switched off
- call the emergency services
- make sure the public and other personnel are safe.

## 1.2 Leaving evidence undisturbed

You must not disturb or interfere with evidence of the cause of a serious accident, unless told by:

anyone  
involved

- a rail incident officer (RIO)
- a police incident officer
- a rail accident investigation branch (RAIB) investigator
- any other senior investigator.

You must immediately make a note of evidence that might be lost by the passage of time, such as wheel-tyre and brake-block temperatures, and brake-gauge readings.

## 1.3 Entering a driving cab

### a) Reasons

anyone  
involved

You must only enter a driving cab if you have to:

- secure the train
- carry out rescue operations
- use the cab radio to call the emergency services or speak to the signaller
- get equipment to carry out protection of the line or extinguish a fire
- make a note of short-life evidence.

If you enter a driving cab for any of these reasons, you must be careful not to disturb equipment, handles, buttons or switches, including CBTC controls, displays and indications, unnecessarily.

### b) Noting information

anyone  
involved

After you have carried out any of the actions shown above, you must:

- make a detailed note of the original position or location of equipment and gauges
- before you leave the scene, give this information to an investigating officer such as, the RIO, police incident officer, RAIB investigator or other senior investigator.

## 1.4 Locking cab doors

anyone  
involved

You must arrange to prevent unauthorised entry to the cab from which the train was being driven and if possible:

- lock the doors to that cab
- make sure other driving cab doors are locked.



## 1.5 Signalling equipment

### a) Equipment not to be moved

You must not move, even for testing purposes, signalling equipment directly associated with the accident until you are authorised to do so.

anyone  
involved

This does not apply to equipment that must be used to protect the accident.

### b) Noting information

You must:

- make a detailed note of the position the relevant signalling equipment was in at the time of the accident
- record any subsequent changes to the position of the signalling equipment concerned.

signaller

## 2 Derailments, collisions or heavy impacts

*The people responsible: driver, signaller*

### 2.1 Derailments

driver,  
signaller

If any vehicle has been derailed, you must not allow it, or any part of the train, to enter or continue in service until it has been examined by a rolling stock technician.

However, if the derailment was at slow speed, vehicles that were not derailed or coupled next to a derailed vehicle can be examined at the first suitable location.

### 2.2 Collisions or heavy impacts with other vehicles or buffer stops

driver,  
signaller

If any vehicle has suffered a collision or heavy impact, you must not allow it, or any part of the train, to enter or continue in service until it has been examined by a rolling stock technician.

### 2.3 Trains colliding with obstructions on the line

#### a) Checking the train

driver

Following a collision with an obstruction on the line, you must bring your train to a stand and not move until you have checked for any damage that:

- might have been caused by the collision, and
- might affect its safe movement.

You must also speak to your train operating company's control if you think that damage may have increased the width or height of the train.

You will then be told one of the following.

driver

The train operating company's control considers that the train is fit to proceed.

The train operating company's control does not consider the train fit to proceed until a rolling stock technician has examined the damaged vehicle and decided that it is fit for further movement.

In either case you will be told about any restrictions that would apply, for example a maximum speed when proceeding.

When you have been told that the train is fit to continue its journey, you must **not** consider this as permission for the train to proceed. You must tell the signaller what you have been told by the operating company's control.

You must tell Operations Control what the driver has told you, and not allow the train to proceed on its journey until Operations Control tell you that you can. You must tell the driver about any instructions you have been given by Operations Control.

signaller

You must not proceed on your journey until the signaller gives you permission. You must carry out any instructions the signaller gives you.

driver

**b) Detaching and moving a vehicle****driver**

If any part of a vehicle has become loose and cannot be secured, or might make contact with the track or lineside structures, you must arrange for the vehicle to be cleared from the running line at the first suitable location.

Before moving the vehicle, you must:

- get the signaller's permission
- get authority from a rolling stock technician if you are not sure the movement can be made safely
- if possible move passengers from the vehicle.

During the movement, you must not exceed 10 mph (15 km/h) or 5 mph (10 km/h) over points and crossings.

**signaller**

Before you give permission for the vehicle to be moved, you must make sure trains are stopped on any adjacent lines that might be affected.

## 3 Bodies on the line

*The person responsible: signaller*

### 3.1 Signaller's actions

If you are told about a body that is on or near the line, you must:

signaller

- find out the location of the body in relation to running lines
- if necessary arrange for an emergency switch-off of the electric traction current.
- tell Operations Control about the circumstances.

### 3.2 Dealing with trains

You must arrange for trains to be stopped on all lines until you have found out where the body is.

signaller

You may allow trains to proceed if:

- you have been told that the body is clear of the line
- the body cannot be struck by a passing train
- the body parts are not recognisable.

You may allow a train to pass recognisable body parts if they are in a position where they cannot be seen by passengers on passing trains (for example when the remains are very close to the line but not foul of it).

You must tell each driver about the circumstances and get the driver's agreement to the movement.

# 4

## Floods

*The people responsible: driver, signaller*

### 4.1 Reporting procedure

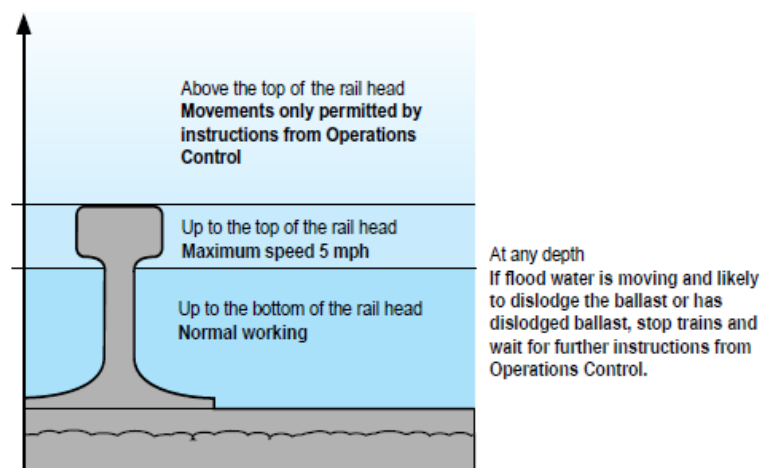
**driver**

You must report to the signaller, stopping your train specially to do so if necessary, if you see any flood water that might affect the passage of trains. You must tell the signaller if you believe the flood water:

- is up to the bottom of the rail head
- is up to the top of the rail head
- is above the top of the rail head
- is moving and likely to dislodge the ballast
- has dislodged the ballast.

**signaller**

You must contact Operations Control if vehicles are stabled in or pass through flood water above the bottom of the axle box.



*Diagram M3.1*

*Flood water levels*

## 4.2 Train running

When you receive a report of flood water, you must tell Operations Control immediately.

signaller

You must find out if the flood water:

- is up to the bottom of the rail head
- is up to the top of the rail head
- is above the top of the rail head
- is moving and likely to dislodge the ballast
- has dislodged the ballast.

As long as the flood water is not moving and likely to dislodge the ballast or the ballast has not been dislodged, you may allow trains to:

- continue normally if the water is up to the bottom of the rail head
- run at a maximum speed of 5 mph (10 km/h) if the water is no deeper than the top of the rail head.

If the water is deeper than the top of the rail head, you must:

- suspend the normal running of trains
- tell Operations Control and wait for further instructions.

# 5 Snow

*The people responsible: driver, signaller*

## 5.1 Reporting procedure

driver

You must report to the signaller, stopping your train specially to do so if necessary, if you see any build up of snow that might affect the passage of trains. You must tell the signaller if you believe the snow is deeper than 200 mm (8 inches) above the top of the rail head.

## 5.2 Train running

signaller

Normal running can take place unless you are told that snow is deeper than 200 mm (8 inches) above the top of the rail head.

If you are told that snow is deeper than 200 mm (8 inches) above the top of the rail head, you must:

- suspend the normal running of trains
- tell Operations Control and wait for further instructions.



## 6 Independent snow ploughs

*The person responsible: signaller*

### 6.1 Working on adjacent lines

You must make sure that adjacent lines are clear of trains when ploughing is in progress.

signaller

You do not need to carry out this instruction when ploughs are set to push snow to the cess side only, as long as the person in charge of the ploughing has made sure that:

- there is no danger to trains on the other line, and
- you have been told about this arrangement.

### 6.2 Operating on electrified lines

Before ploughing starts on an electrified line, you must:

signaller

- tell the electrical control operator
- arrange for the electricity to be switched off on a line which has overhead line equipment, if the depth of snow is more than 900 mm (3 feet).

# 7

## Damage to structures or earthworks above or below the line

*The person responsible: driver, signaller*

### 7.1 Reporting procedure

#### 7.1.1 Damage to structures or earthworks above or below the line

*driver*

You must immediately tell the signaller, stopping your train specially to do so if necessary, if you see any damage to structures or earthworks above or below the line.

This includes events such as:

- landslips
- washouts
- embankment failures
- retaining wall failures.

You must give the exact location and details of the damage including which lines are affected.

#### 7.1.2 Flowing or pooling water that might affect structures or earthworks

You must also immediately tell the signaller, stopping your train specially to do so if necessary, if you see any of the following

- that might affect structures or earthworks:
- water rising up from the track or the cess
- unusual amounts of water pooling next to the track or in the cess
- water flowing down or pouring out of the sides of embankments or cuttings.

You must tell the signaller the exact location and details, including if the water is displacing any material.

## 7.2 Train running when damage to structures or earthworks are reported

### 7.2.1 Damage to structures or earthworks

When you receive a report of damage to structures or earthworks you must reach a clear understanding with the person making the report about:

signaller

- the location and details of the damage
- which lines are affected.

For any line that is affected by damage to structures or earthworks, you must immediately carry out the instructions in regulation 4 of the appropriate *Train signalling regulations*.

You must tell Operations Control what has happened and carry out any instructions you are given.

You must arrange for a competent engineer to examine the line at the location where the damage is reported.

You must take any other actions as shown in the *Signal Box Special Instructions*.

### 7.2.2 Lines that are reported to be affected by damage to structures or earthworks

You must not use a train to examine any lines that are reported to be affected.

You must not allow trains to run on any line that is reported to be affected until a competent engineer has made sure that the line is safe for trains to pass.

Lines at the same location that are not reported to be affected by damage to structures or earthworks

On each line that is not reported to be affected, you must arrange for the first train to examine the line at the location where the damage was reported unless Operations Control tells you to do something different.

signaller

If, after examining the line, the driver reports that the line appears to be unaffected, you may allow trains to continue to run on that line at caution.

You must not allow trains to run normally on any line that appears to be unaffected unless one of the following applies.

- Operations Control has given you permission to do so.
- The Signal Box Special Instructions allow you to do so.
- A competent engineer has told you it is safe to do so.

### 7.3 Train running when flowing or pooling water that might affect structures or earthworks is reported

signaller

When you receive a report of flowing or pooling water that might affect structures or earthworks, you must reach a clear understanding with the person making the report about:

- the location of the water
- whether the water is flowing or pooling
- whether the water is displacing any material
- what is being affected by the water, for example the track, the cess, an embankment, a cutting or another structure.

If the report is of flood water on the track, you must carry out the instructions as shown in section 4.2 of this module.

If the report is of water affecting the cess, an embankment, a cutting or another structure, you must tell Operations Control what has happened and carry out any instructions you are given.

You must arrange for a competent engineer to examine the line at the location where the flowing or pooling water is reported.

You must take any other actions as shown in the *Signal Box Special Instructions*.

On each line that is not reported to be affected, you must arrange for the first train to examine the line at the location where the flowing or pooling water was reported unless Operations Control tells you to do something different.

If, after examining the line, the driver reports that the line appears to be unaffected, you may allow trains to continue to run on that line at caution.

signaller

You must not allow trains to run normally on any line at the location where the flowing or pooling water is reported unless one of the following applies.

- Operations Control has given you permission to do so.
- The *Signal Box Special Instructions* allow you to do so.
- A competent engineer has told you it is safe to do so.

## 7.4 Report of extreme weather from Operations Control


If you have not received any reports of possible damage to structures or earthworks, but are told by Operations Control about extreme weather within your area of control, you must carry out the instructions you are given. These instructions may include arranging for:


signaller

- affected lines to be examined
- cautioning trains through the affected area
- an emergency or blanket speed restriction within the affected area.

You must not allow trains to return to running normally until Operations Control gives you permission to do so.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/OTM

Working of on-track machines  
(OTM) in the central operating  
section

**Module OTM**



Issue 5

Date December 2021

Comes into force 21<sup>st</sup> December

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2021

© Copyright 2021  
Rail for London Infrastructure Limited



This module details the rules regarding the working of on-track machines (OTM) in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- a driver of an on-track machine
- an operator of an on-track machine
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 When these instructions apply**
- 2 Entering service**
  - 2.1 Before starting a journey
  - 2.2 Carrying out a running brake test
  - 2.3 Entering the COS from Network Rail
  - 2.4 OTM use of turnback sidings at Westbourne Park
- 3 Plumstead sidings special instructions**
  - 3.1 Movement of engineering trains from the maintenance facility
  - 3.2 Movement of engineering trains towards the maintenance facility
  - 3.3 Engineering train use of Plumstead sidings
- 4 Not used**
  - 4.1 Not used
  - 4.2 Not used
  - 4.3 Not used
- 5 Working within a possession**
  - 5.1 Maintaining clearance from other lines
  - 5.2 Driving position
- 6 Getting on and off the train**
  - 6.1 Driver changing ends
  - 6.2 At a PSD station

## 1

**When these instructions apply**

*The persons responsible: driver, operator, signaller*

The instructions in this module apply to on-track machines (OTM) when under their own power. They are additional to all other instructions applying to train working shown in other modules.

driver,  
operator,  
signaller

These instructions also apply to OTM that is hauled into a possession by an engineering train, such as:

- track-relaying machines
- ballast cleaners
- rail-delivery trains
- rail cranes.

## 2 Entering service

*The person responsible: driver*

### 2.1 Before starting a journey

Before you start a journey on a running line, you must tell the signaller:

driver

- the type of OTM
- its maximum speed.

### 2.2 Carrying out a running brake test

You must test that the automatic brake is working effectively by carrying out a running brake test as shown in your train operating company instructions.

driver

### 2.3 Entering the COS from Network Rail



Sieving allows the OTM CBTC to be sent a movement authority for the route set ahead.

Robel on-track machines will not perform a successful sieve to CBTC if driven above 10 mph.

#### Changing ends at GEML

When changing ends on GEML Network Rail (NR) infrastructure, and the mode offered is staff accountable, you must contact the NR signaller for authority before moving.

driver

On approach to signals L256 or L238, when they are cleared for you to proceed towards the Central Operating Section, you must remember to operate the TPWS train stop override control to pass the protecting TPWS loop.

You must not operate the TPWS train stop override control if the signal is not showing a proceed aspect. You must contact the signaller and request authority to proceed.

### Changing ends at GWML

When changing ends on GWML Network Rail (NR) infrastructure, and the mode offered is staff accountable, you must contact the NR signaller for authority before moving.

driver

On approach to signals SN90 or SN92, when they are cleared for you to proceed towards the Central Operating Section, you must remember to stop your train and operate the TPWS train stop override control to pass the protecting TPWS loop.

You must not operate the TPWS train stop override control if the signal is not showing a proceed aspect. You must contact the signaller and request authority to proceed.

### Entering the COS using turnback A

When entering the COS using turnback A, you must stop at the OTM sign and contact the signaller for authority to approach the block marker XR012.



TPWS protection is provided at the exit to the siding to prevent unauthorised movement of vehicles onto the running lines.

## 2.4 OTM use of turnback sidings at Westbourne Park

*The people responsible: driver, signaller*



When OTM use either Turnback A, B or C to perform a turnback movement, the OTM must be driven the full length of the siding.

driver

Turnback A should only be used for a turnback movement if sidings B or C are not available.

Signs are provided for OTM drivers in the sidings to remind them about how to exit the siding when in Staff Accountable mode.

Before requesting authority from the signaller to move the train to the block marker, you must check that CBTC and TPWS are active in your cab.

You must request authority from the signaller to move the OTM to the block marker at the exit of the siding.

- signaller** Before authorising the driver to approach the block marker at the turnback siding exit, you must check that no other train movements could conflict with the OTM, using the instructions *COS S5 Passing an EOA without a movement authority*.
- driver** When you have controlled the OTM to a stop at the block marker, you can request authority from the signaller to proceed onto the running line.



CBTC location and sieving balises are provided in the sidings to allow the OTM to step up to protected manual (PM) mode at the block marker.

TPWS protection is provided at the exit to the siding to prevent unauthorised movement of vehicles onto the running lines.

## 3 Plumstead sidings special instructions

### 3.1 Movement of engineering trains from the maintenance facility

When the shunter and signaller have agreed the train is to leave, the shunter will authorise you to approach and stop at XR561. driver

You must request authority from the signaller to pass XR561 in staff accountable mode using COS S5 *Passing an EOA without an MA or Passing a Signal at Danger*.

You must confirm with the driver that the train reporting number on their train is the same as the train reporting number on your display. signaller

You must only pass the position light signal to leave the maintenance depot when two white lights indicate that a route is set and locked for your train, and the CBTC equipment onboard your train is communicating with the trackside equipment. driver

### 3.2 Movement of engineering trains towards the maintenance facility

When you have received authority from the signaller to proceed towards the maintenance facility entrance, you may select the mode of the engineering train to remain in Staff Accountable mode. driver

You must request authority from the signaller to pass XR522 in staff accountable mode using COS S5 *Passing an EOA without an MA or Passing a Signal at Danger*.

You must stop at the maintenance depot entrance 'Stop Board' and proceed only when you receive instructions from the shunter.

### 3.3 Engineering train use of Plumstead sidings

Engineering trains must not be driven past the raised platforms in the 8 siding roads except in an emergency. The raised platforms have handrails fitted along their length which may prevent access or egress for the driver. driver

## 4 Not used

4.1 Not used

4.2 Not used

4.3 Not used



## 5 Working within a possession

*The persons responsible: driver, operator*

### 5.1 Maintaining clearance from other lines

You must make sure that the OTM, including any load, can work without fouling any other line on which a movement can take place.

driver,  
operator

If this is not possible the following will apply:

- If the line affected is a running line within a possession, you must make sure the affected portion of line is within a work site and the engineering supervisor (ES) for that work site has given you permission to foul that line.
- If the line affected is a running line not under possession, you must make sure that a controller of site safety (COSS) has arranged a blockage of the affected portion of line.
- If the line affected is a siding, you must make sure that the affected portion is under possession, and the person in charge of the siding possession (PICOS) has given you permission to foul that siding.

### 5.2 Driving position

You can drive from another driving cab when an OTM is working within a work site as long as this forms part of the safe system of work shown in the method statement.

driver,  
operator

You must make sure that there is a competent person riding in the leading cab or controlling the movement from the ground.

## 6 Getting on and off the train

*The person responsible: driver, signaller*

### 6.1 Driver changing ends

driver

You must tell the signaller when you are changing ends on your train, and if you need protection from other train movements when changing ends.

You do not need to request protection where the trackside allows you to change ends safely without needing to block other lines, such as:

- within a single bore tunnel
- using an open platform where platform screen doors (PSD) are not provided
- a location with a safe cess.

### 6.2 At a PSD station



The platform screen doors are designed for the alignment of class 345 trains. OTM will not align with the driver's access doors.

driver

If you need access to a station fitted with PSDs, you must make the necessary arrangements with your operations control.

operation control (GBRf)

If a driver tells you that they need to access a station fitted with PSDs, contact the station controller to inform them and inform the RCC operations control.

driver

To access the station from your OTM, you must stop and secure your train close to the end of the platform. You must tell the signaller when you are leaving the cab, and how much time you need.

When the driver tells you they are leaving the OTM to access a station, make sure that no other routes are set towards the OTM and reminders are applied around the train.

signaller

Leave your OTM by accessing the emergency walkway, and access the platform using the platform end door.

driver




**Platform end doors will activate an alarm in the Route Control Centre. This alarm can be accepted if the signaller knows the reason for the door being opened.**


You must make sure the platform end door is closed and secured once you have passed through it to prevent unauthorised access to the railway.


A member of station staff is required to open the platform end door to allow you to gain access to the OTM when you return. You must follow the instructions provided at the platform end door before opening it.

Tell the signaller when you have returned to the OTM.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/P2

Working to and from the point  
of obstruction by pilot

**Module P2**



Issue 5

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2022

© Copyright 2022  
Rail for London Infrastructure Limited

This module details the rules regarding the working of bi-directional lines by Pilot.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- pilot
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 When working by pilot must be introduced**
  - 1.1 Circumstances
  - 1.2 Not used
  
- 2 Setting up working to and from the point of obstruction**
  - 2.1 Appointment and identification of the pilot
  - 2.2 Agreeing the arrangements
  - 2.3 Completing the pilot's and signaller's forms
  - 2.4 Not used
  - 2.5 Not used
  - 2.6 Not used
  - 2.7 Completing the arrangements
  
- 3 During working to and from the point of obstruction**
  - 3.1 Authority for movements
  - 3.2 Pilot instructing driver
  - 3.3 Entering the section
  - 3.4 Not used
  - 3.5 Not used
  - 3.6 Travelling over the section
  - 3.7 Not used
  - 3.8 Recording in the Occurrence Log
  - 3.9 Change of pilot or signaller
  
- 4 Not used**
  
- 5 Dealing with a failed train**
  - 5.1 Pilot's actions
  - 5.2 Not used
  - 5.3 Getting permission from the pilot
  
- 6 Withdrawing working to or from the point of obstruction**
  - 6.1 Pilot's actions
  - 6.2 Signallers actions
  
- 7 Not used**



# 1 When working by pilot must be introduced

## 1.1 Circumstances

Working by pilot must be introduced when trains have to work to and from a point of obstruction when the signalling system has failed and is unable to issue movement authorities.

## 1.2 Not used

## 2 Setting up working to and from the point of obstruction

*The people responsible: pilot, signaller*

### 2.1 Appointment and identification of the pilot

pilot

You will be appointed to act as a Pilot by Operations Control. You must wear on your left arm a red armband with PILOT in white letters.

### 2.2 Agreeing the arrangements

pilot,  
signaller

If you are required to introduce working by pilot to and from the point of obstruction, you must do so between the obstruction and the nearest appropriate location.

Before introducing working to and from the point of obstruction, you must reach a clear understanding with each other and any other signaller concerned about:

- the arrangements which will apply
- which ends of authority (EoA) will need to be passed without an MA
- the EOAs at which an MA must be obtained
- any other relevant instructions.

### 2.3 Completing the pilot's and signaller's forms

#### a) Pilot's form

pilot

At the agreed time, and only when the line is clear, you must:

- complete and sign your pilot's form (CR3154)
- dictate it to each signaller who controls an entrance to the section
- enter the name of each signaller on your form.

**b) Signaller's form**

You must complete your Signaller's Form for Working to and from the point of obstruction (CR3155), as dictated by the pilot.

signaller

**2.4** Not used**2.5** Not used**2.6** Not used**2.7** Completing the arrangements

You must make sure all the requirements in this section have been completed before authorising the first train to travel over the section.

pilot

You must make a suitable entry in the occurrence log.

signaller

You may then start working to and from the point of obstruction.

pilot,  
signaller

## 3

**During working to and from the point of obstruction***The people responsible: driver, pilot, signaller***3.1 Authority for movements**

pilot

You must make sure that an EoA at which the signaller has closed the route is provided at the place where trains will have to stop on the approach to the obstruction.

You must accompany every train over the section.

These arrangements may be introduced on both sides of the obstruction, but separate pilots will need to be appointed on each side.

**a) Pilot's authority**

You must:

- be present and personally authorise movements which will enter or foul the section (except as shown in section 3.1 b)
- before authorising the movement, get permission from the signaller who controls the entrance to the section
- get the signaller's permission before authorising a driver to pass any EoA without an MA.

**b) Signaller's authority**

signaller

As long as you have the permission of the pilot, you may authorise a movement of an assisting train to enter an occupied section without the pilot being present.

**3.2 Pilot instructing driver**

pilot

When the signaller has given permission for the train to enter the section, you must:

- give the driver any necessary instructions
- instruct the driver to pass an EoA at the entrance to the section without an MA.

### 3.3 Entering the section

Before entering the section, you must make sure:

driver

- you can properly identify the pilot who will wear the PILOT armband
- you clearly understand all the instructions the pilot has given to you
- you have the personal authority of the pilot to enter the section.

### 3.4 Not used

### 3.5 Not used

### 3.6 Travelling over the section

You may travel at the permissible speed except when the pilot tells you otherwise.

driver

The arrangements for working by pilot must continue to apply until the train reaches the end of the pilot working section even if you receive an MA during the movement.

### 3.7 Not used

### 3.8 Recording in the Occurrence Log

You must record the time that the train enters and leaves the section in the Occurrence Log.

signaller

### 3.9 Change of pilot or signaller

pilot

#### a) Change of pilot

When you are relieved, you must:

- make sure the new pilot understands the arrangements for working by pilot
- tell the signaller the name of the new pilot
- not ride in the driving cab of any train over the section.

pilot

If you are the new pilot, you must sign the pilot's form.

signaller

You must record the name of the new pilot and the time on your signaller's form.

#### b) Change of signaller

pilot

When you are relieved, you must make sure the new signaller understands the arrangements for working by pilot and signs the signaller's form.

signaller

If you are the new signaller, you must tell the pilot your name as soon as possible.

pilot

You must record the new signaller's name and the time on your pilot's form.



**4** Not used

# 5

## Dealing with a failed train

*The people responsible: pilot, signaller*

### 5.1 Pilot's actions

pilot

You must tell the signaller about the circumstances, giving the location of the failed train.

If assistance is required, you must arrange with the signaller for this to be provided. If the driver asks you to do so, you may carry out the appropriate protection as shown in module M2 *Train stopped by train failure in the central operating section*.

You must get the signaller's permission before making any movement if the train is to return to the same end of the section from which it entered.

### 5.2 Not used

### 5.3 Getting permission from the pilot

signaller

You must get permission from the pilot before authorising an assisting train to proceed into the occupied section.



## 6 Withdrawing working to or from the point of obstruction

*The people responsible: pilot, signaller*

### 6.1 Pilot's actions

Only you can authorise the withdrawal of working to and from the point of obstruction.

pilot

When the last train is clear of the section, you must tell each signaller that working by pilot has been withdrawn and then:

- cancel your pilot's form
- instruct each signaller to cancel their signaller's form
- get an assurance from the signaller that this has been done.

You must hand in the cancelled pilot's form as shown in company instructions.

### 6.2 Signallers actions

When instructed to do so by the pilot, you must cancel your signaller's form, and tell the pilot when this has been done.

signaller


You must make a suitable entry on the occurrence log.


Where working by pilot had been introduced on both sides of an obstruction, you must not resume normal working until you have been told by the pilots on either side of the obstruction that working by pilot is withdrawn.

7

**Not used**

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

## COS/Plumstead

Plumstead special instructions.  
Rescue of passenger train from  
Plumstead sidings in the Central  
Operating Section

**Module  
Plumstead**



Issue 1.1

Date June 2021

Comes into force July 2021

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2020

Issue 1.1, June 2021




© Copyright 2021  
Rail for London Infrastructure Limited

This module is for the personnel who are involved in movement of trains and locos from Plumstead sidings.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- signaller
- passenger train driver
- assisting train driver
- PICOP

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	

## Contents

- 1 Definitions**
- 2 Not used**
- 3 Planning to move the failed 345**
  - 3.1 Considerations before using this procedure**
  - 3.2 Where the possession is applied**
- 4 Bringing in the unfitted loco**
  - 4.1 Before activating the possession**
  - 4.2 Moving the unfitted loco**
  - 4.3 Coupling to the failed 345**
  - 4.4 Moving the rescue train formation**
- 5 Uncoupling the failed 345 train**

## 1

## Definitions

### Unfitted loco

A train or loco which does not have CBTC onboard equipment capable of supervising a safe movement authority from the lineside signalling equipment.



A train or loco not fitted with CBTC must only be permitted to enter the Central Operating Section (COS) within a possession. The vehicle must always remain within a possession when it is on the COS.

### Failed passenger train

A CBTC fitted train which is not capable of moving using its own traction power and cannot be repaired in its current location.

### Plumstead Sidings

For the purpose of this module, when Plumstead Sidings is referenced it includes the access road and headshunt from the Eastbound line and the 8 stabling sidings.





Plumstead special instructions and rescue of a passenger train in Plumstead sidings in the Central Operating Section

2 section

2 Not used



## 3 Planning to move the failed 345

### 3.1 Considerations before using this procedure

This procedure must be planned ahead of when it is needed and published in the *Weekly Operating Notice* (WON) or *Engineering Notice* (EN).

all  
concerned

Worksites are not permitted in the possession when this procedure is being used.

This procedure is only to be used when all other methods of moving a failed passenger train from Plumstead sidings have been considered and rejected, and the use of a train or loco not fitted with CBTC must be used.

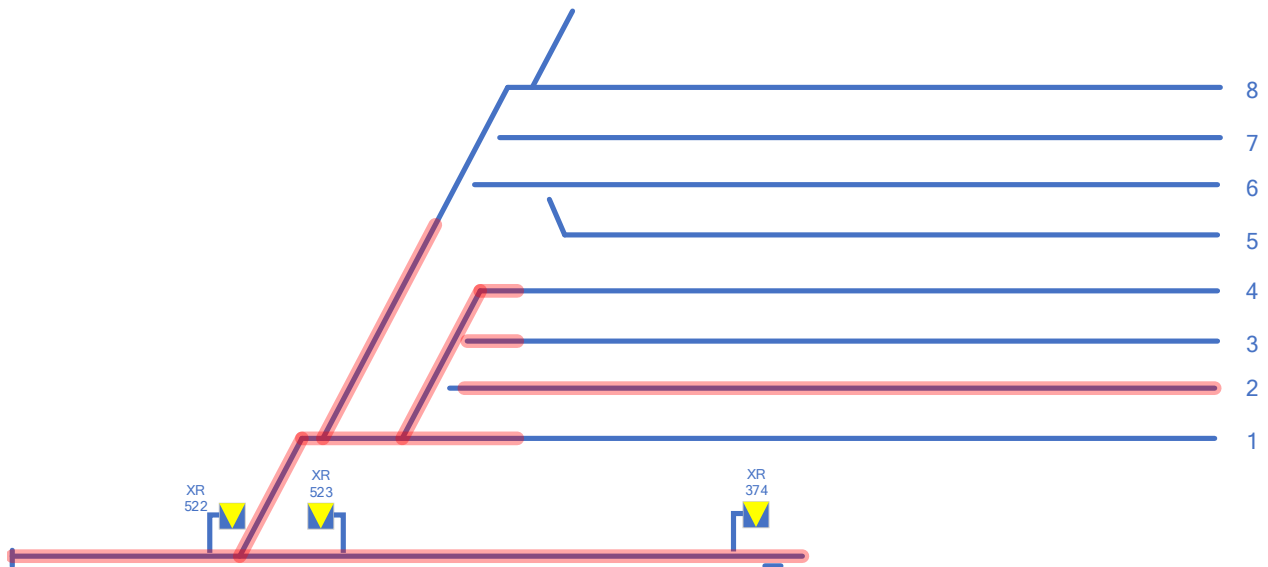
The overall train length (unfitted loco and passenger train coupled together) must not exceed 234m. The length of the headshunt at Plumstead will not allow a longer train combination to enter and to clear the points.

There must be a method of radio communication between the drivers of the two trains at all times.

### 3.2 Where the possession is applied

all  
concerned

There are 8 passenger train sidings in Plumstead Sidings. The possession plan should only include the siding road that the failed 345 train is occupying (see the example below).



In the example above, the failed 345 is occupying siding 2. The possession is shown as red highlighted tracks. Although the entrance roads to sidings 1 to 4 are shown as under possession, sidings 1 and 3 and 4 do not have to be included in the possession.



**It is not permitted for a worksite to be used within this possession. This possession can only be used for the movement of the unfitted loco.**

## 4 Bringing in the unfitted loco

### 4.1 Before activating the possession



**Unfitted locos must always remain within a possession at all times when on the COS.**

**There is a risk of train collision if unfitted locos are permitted to move outside of a possession.**

You must confirm with the signaller at Ashford IECC that the unfitted loco will be at NK120 signal at the time the possession is planned to be activated.

signaller

You must inform the PICOP when the unfitted loco is at signal NK120 on the North Kent Line.

You must check that no other movements are being made within or towards the area that is to be under possession.

You must brief the driver of the failed 345 and the driver assisting the unfitted loco about the movements that will be made in the possession, and the location where the failed 345 will be moved out of the possession.

PICOP,  
drivers

You must carry out the instructions in *COS/T3 Possessions* to activate the possession.

PICOP,  
signaller

### 4.2 Moving the unfitted loco

You must instruct the driver assisting the unfitted loco about each movement to be made.

PICOP

You must contact the signaller to agree the position of points required for each movement.

### 4.3 Coupling to the failed 345

Assisting driver

You must agree with the driver of the failed 345 the method of coupling to be used.

When changing direction of the train, you must check that the coupling is secure.

### 4.4 Moving the rescue train formation

lead driver, assisting driver

You must agree who is to be the lead driver. The PICOP will communicate instructions with the lead driver, and the lead driver will provide instructions to the assisting driver when required.

assisting driver

When driving into Plumstead headshunt, you must make sure the train is controlled to a stop at the Stop board. The train formation must be driven beyond the Stop board for the rear portion of the train to be clear of the points.

You must contact the signaller for authority to pass the Stop board.

The assisting driver or the PICOP can provide an instruction to you when the rear of the train formation is clear of the headshunt points.



**A track circuit interrupter is installed near to the Plumstead headshunt buffer. If the rescue train is driven too far past the Stop board it will cause an alarm in Romford RCC.**

signaller

If the track circuit interrupter alarm is activated in Plumstead headshunt while this procedure is taking place, you must contact the driver to determine if the train has hit the buffer stop. Any suspected damage must be investigated by a maintenance team.

You must record the details as an operational incident.

If the driver reports that the buffer stop was not hit, you may accept the alarm.

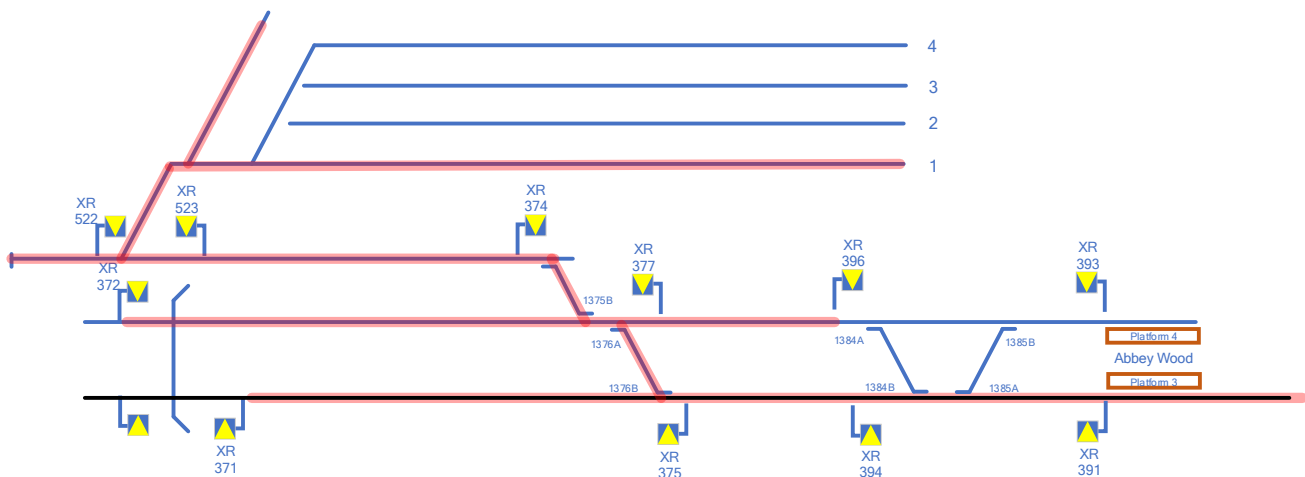
## 5 Uncoupling the failed 345 train



The unfitted loco must always remain within the possession. The failed 345 train can be pushed out of the possession once agreement between the PICOP and signaller has been reached.

You must agree with the signaller when the failed 345 train is ready to leave the possession at XR396.

PICOP



You must carry out the instructions in *COS/T3 Possessions* to allow the failed 345 train to leave the possession.

PICOP,  
signaller

You must make sure that the unfitted loco does not leave the area under possession.

assisting  
driver

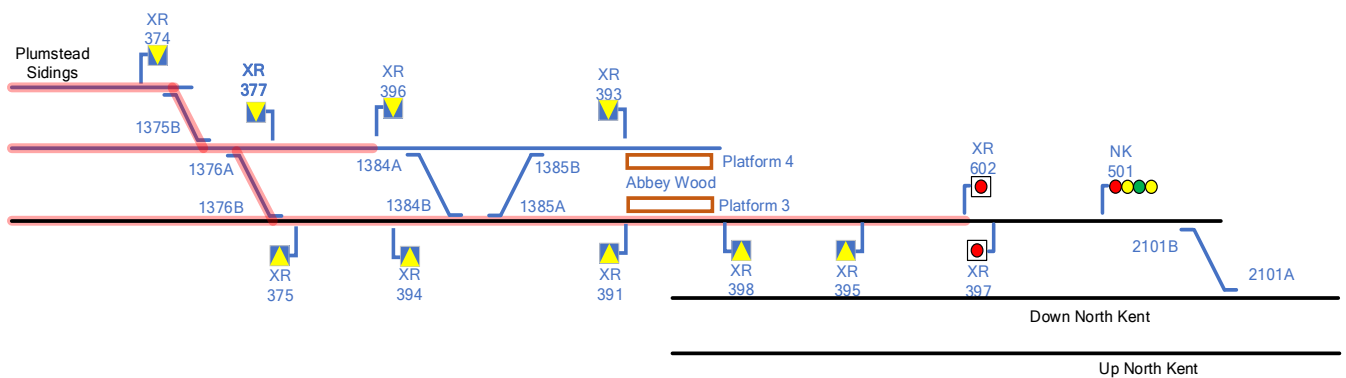
When the failed 345 train has passed XR396 and no more movements are to be made, you must secure your train and tell the lead driver.

You must inform the signaller that the failed 345 train is now standing past block marker XR396 and is outside of the possession.

## Rescue of passenger train in Plumstead sidings in the Central Operating Section

**assisting driver** You can remove the coupling between the unfitted loco and the failed 345 train, then tell the PICOP when you are ready to move within the possession.

**PICOP** When the unfitted loco is no longer coupled to the failed 345, you may contact the signaller to request the points are set to allow the train not fitted with CBTC to leave the possession and return to the North Kent Lines.



When the train not fitted with CBTC is at XR602, you must tell the signaller that the train is to leave the possession and return to the North Kent Lines.


**driver of unfitted loco** When your train is at XR602, and the PICOP has removed the possession limit boards, you must contact the signaller for authority to proceed to NK501.


**signaller, PICOP** You must carry out the instructions in *COS/T3 Possessions* to authorise the train to leave the possession.

**PICOP** When the train is clear of XR602, you must carry out the instructions in *COS/T3 Possessions* to give up the possession.

**signaller** When the PICOP has confirmed to you that the possession is clear of obstructions and safe to continue normal operation, carry out the instructions in *COS/M2 Train failure* to arrange recovery of the failed 345 train.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS



COS/PTP

Point to point working in the central  
operating section

**Module PTP**



Issue 5

Date June 2022

Comes into force July 2022

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, June 2022

© Copyright 2022  
Rail for London Infrastructure Limited

This module details the rules within the central operating section regarding the use of point to point working.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this module if you carry out the duties of a:

- driver
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents


- 1 Point to point working in the COS**
  - 1.1 Principles**
  - 1.2 Identifying the extent of the failure**
  - 1.3 Dealing with points**
  - 1.4 Dealing with trapped trains**
  - 1.5 Introducing point to point working**
  - 1.6 Authorising a train to enter the point to point section**
  - 1.7 Driver's duties during point to point working**
  - 1.8 Arriving at the exit location**
  - 1.9 Ending point to point working**

# 1 Point to point working in the COS

*The people responsible: driver, signaller, Operations Control*

## 1.1 Principles

I



If there is a failure of trackside signalling equipment in the COS, and Operations Control have authorised point to point working to be introduced, then trains can be authorised to pass more than one block marker at a time through the section.

The introduction of point to point working is authorised by Operations Control. Point to point working will apply between:

- a block marker at a station on the approach to the affected area at which the route can be closed, and
- a block marker at a station where the signalling system is known to be working normally beyond the affected area (exit location).

Only one signaller can be in control of the point to point section.

A point to point ticket is used to identify:

- the entrance
- the stations and block markers which can be passed
- the exit location where the driver will contact the signaller.

The GSM-R radio for voice communication between the signaller and the driver must be available.

all concerned

## 1.2 Identifying the extent of the failure

You must identify a station where a movement authority (MA) can be supervised by the signalling system on the approach to the affected area.

signaller

**signaller**

You must identify the location where a movement authority can be given once trains have passed through the affected area.

You must confirm these details with Operations Control, before introducing point to point working.

You must make sure the affected area is protected by closing routes (including bi-directional routes) and keeping them closed.

### 1.3 Dealing with points

**signaller**

You must arrange for all points in the affected area for which you do not have the correct normal or reverse indication to be secured in the correct position.

Before you allow any train movement to pass over any points in the affected area, you must stop any train on a line which could be fouled by the movement if the points have not been set correctly.

When one train has passed safely over the points concerned, you may allow other trains to pass those points on the same and other lines affected.

During the time point to point working is in operation, you must not allow any points within the affected area to be moved.

### 1.4 Dealing with trapped trains

**signaller**

Before you allow any movement to take place within the affected area or allow another train to enter it, you must identify the location of each train on each line within the affected area.

You must arrange for each train to be removed from the affected area in turn by applying the relevant instructions in module S5 *Passing an end of authority (EoA) without a movement authority (MA)*.

## 1.5 Introducing point to point working

You may introduce point to point working only when:

signaller

- any points have been secured in the correct position,
- all trapped trains have been cleared from the affected area,
- Operations Control have authorised the arrangements.

### An example of point to point working

The diagram below shows how point to point working can be introduced.

The extent of the signalling failure is from block marker XR086 on platform 1 at Tottenham Court Road to block marker XR106 on platform 1 at Farringdon. Point to point working is to be introduced between these two points.

The following routes must be closed and kept closed:

- From XR086 to XR106.
- From XR107 to XR087.

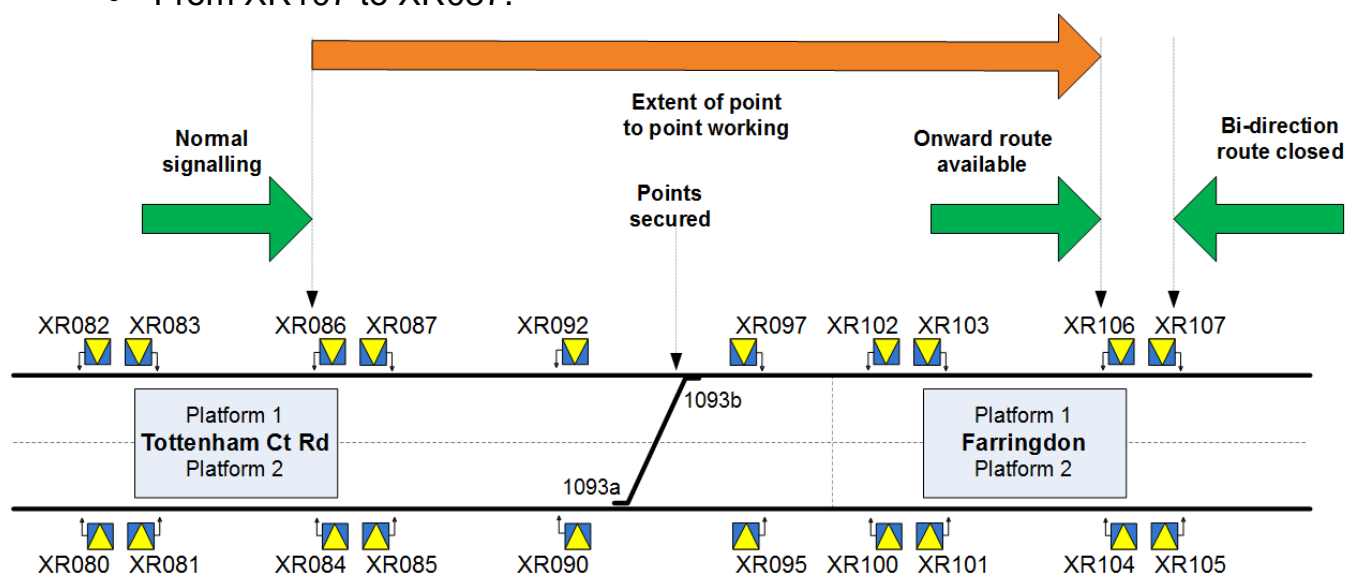


Diagram 1 – PTP example

## 1.6 Authorising a train to enter the point to point section

signaller

You must not allow a train to enter the point to point section until the forward route has been set from the block marker at the exit location.

When you set the route, you must:

- operate the points to the position shown on the route card
- check that you have the correct 'normal' or 'reverse' indications
- unless there are exceptional circumstances the route setting must be checked by another competent person.

When a train is to enter the point to point section, you must tell the driver that point to point working has been introduced.

You must then dictate a Point to Point Working Ticket (CR3190) to the driver.

When doing so, you must tell the driver:

- the stations to be worked within the point to point section
- the block markers which can be passed without requesting additional signaller authority
- the location and speed of any permissible, temporary or emergency speeds lower than the staff accountable ceiling speed
- the station where the driver must stop to request a movement authority.

signaller

When you are sure the driver has understood your instructions, you must tell the driver to pass the EoA without an MA at the entrance to the point to point working section.

When the driver of this train reports it has arrived complete at the exit location, you must tell the driver that the train will now be signalled forward with a movement authority.

You must make sure the train is correctly identified in the signalling system by re-entering the Train Running Number (TRN) if required.



When the train has passed clear of the block marker at the exit location, you may allow the next train to enter the point to point working section.

signaller

You must record in the Occurrence Book:

- the line affected
- the TRN
- the time permission is given to pass the entrance block marker without an MA
- the time that the train has passed clear of the point to point working section.

### 1.7 Driver's duties during point to point working

The signaller will tell you that point to point working has been introduced.

driver

You must then complete a Point to Point Working Ticket (CR3190) at the signaller's dictation.

The signaller will tell you:

- the details of the stations and block markers within the point to point section
- the location and speed of any permissible, temporary or emergency speeds lower than the staff accountable ceiling speed

When the signaller is sure that you have understood what is required, you will be given authority to pass the EoA without an MA at the entrance to the point to point working section.

You must make sure the train is operating in Staff Accountable (SA) mode before entering the affected section.

You must proceed at no greater than the ceiling speed to the specified location or any lower speed advised by the signaller

## 1.8 Arriving at the exit location

driver

When you arrive at the exit location, you must:

- report to the signaller that your train has arrived complete
- obey the instructions given regarding resumption of normal working
- cancel the point to point working ticket by writing the word 'CANCELLED' across it.


## 1.9 Ending point to point working


signaller

You must not resume normal working, until the last train authorised to enter point to point working is clear of the section.

You must make sure that any points that have been secured are restored to normal working.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/S4

Trains or shunting movements  
detained on running lines

**Module S4**



Issue 4

Date December 2020

Trial running

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 4, December 2020

© Copyright 2020  
Rail for London Infrastructure Limited

This module details the rules regarding trains or shunting movements detained in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Contacting the signaller**
  - 1.1 When to contact the signaller**
  - 1.2 How to contact the signaller**
  - 1.3 When speaking to the signaller**
  - 1.4 When speaking to the driver**
  - 1.5 Driver being conducted**
  
- 2 Not used**
  
- 3 Not used**
  
- 4 Not used**

# 1

## Contacting the signaller

*The people responsible: driver, signaller*

### 1.1 When to contact the signaller

When your train is detained on a running line without a movement authority (MA), you must contact the signaller immediately.

driver

If the signaller has told you to wait for an MA, you must contact the signaller again every two minutes unless the signaller has given you other instructions.

### 1.2 How to contact the signaller

You must contact the signaller by using the train radio.

driver

If it is not possible to use the train radio you must use a mobile phone, if available.

If you still cannot contact the signaller, you must use a lineside or tunnel telephone.

### 1.3 When speaking to the signaller

You must first make sure:

driver

- you are speaking to the correct signaller
- the signaller clearly understands at which block marker, and on which line, your train is standing.

If you are detained without an MA and you are not at block marker, you must reach a clear understanding with the signaller of the location of your train and the line on which it is standing.

You must tell the signaller your train reporting number.



## 1.4 When speaking to the driver

signaller

If the train is required to wait at an end of authority or a block marker, you must:

- tell the driver the reason for the delay
- instruct the driver to 'wait for an MA'.

## 1.5 Driver being conducted

driver

If you do not have the required route knowledge and are accompanied by a conductor driver, the conductor driver must contact the signaller. The conductor driver must pass on to you any instructions given by the signaller.


**2** Not used


3

**Not used**

**4** Not used

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/S5

Passing an end of authority (EoA) without a movement authority (MA) or passing a signal at danger in the central operating section

**Module S5**



Issue 6

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 6, December 2022

© Copyright 2021  
Rail for London Infrastructure Limited

This module details the rules within the central operating section regarding:

- passing of an EoA without an MA in modes not supervised by the signalling system
- a driver passing an EoA without authority.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this module if you carry out the duties of a:

- driver
- shunter
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller





## Contents

- 1 When an EoA can be passed without an MA or a signal passed at danger**
  - 1.1 Signaller's authority**
  - 1.2 Driver getting authority**
  - 1.3 Authorising a driver to pass two or more EOAs without an MA**
- 2 Signaller's precautions before authorising the movement**
  - 2.1 Making sure the line is safe**
  - 2.2 Setting the route correctly**
  - 2.3 Not used**
  - 2.4 If the interlocking is out of order**
- 3 Signaller authorising the movement**
  - 3.1 Instructions from the signaller**
  - 3.2 Instructions through a pilot**
  - 3.3 Passing an EoA without an MA for shunting purposes**
- 4 During the movement**
  - 4.1 Points and crossings**
  - 4.2 Train speed**
  - 4.3 Not used**
  - 4.4 Not used**
  - 4.5 Signaller protecting the movement**
- 5 Not used**
- 6 Not used**
- 7 Not used**
- 8 Not used**
- 9 Driver passing a signal at danger or an EoA without authority**
  - 9.1 Passing a signal at danger or an EoA without authority**
  - 9.2 Not used**
  - 9.3 Signaller's actions**

## 1

## When an EoA can be passed without an MA or a signal passed at danger

*The people responsible: driver, signaller*

### 1.1 Signaller's authority

You may authorise an end of authority (EoA) to be passed without a **signaller** movement authority (MA) or a signal to be passed at danger only in the following circumstances.

- 1 Signalling equipment has failed, is defective and is preventing a signal from clearing or an MA from being issued or received.
- 2 A train is not reporting and an EoA has to be passed without an MA or a signal passed at danger.
- 3 In an emergency, and then only when authorised by the Operations Control an EoA is to be passed, so that a train carrying passengers can enter an occupied section to use a station platform.
- 4 An engineering train is to:
  - move towards a possession, or
  - leave a line under a possession.
- 5 The line is to be examined to check that it is clear.
- 6 A train is to enter the section after:
  - a train or vehicle that has proceeded without authority has been removed, or
  - the front portion of a divided train has passed through the section.
- 7 A train is to enter the section to:
  - assist a failed train
  - evacuate passengers from a failed train
  - remove a portion of a divided train
  - remove a train or vehicles that have proceeded without authority.
- 8 Working by Pilot applies.

## 1.2 Driver getting authority

driver

You can only pass an EoA without an MA or a signal at danger in any of the circumstances described in section 1.1 of this module apply.

Before passing an EoA without an MA or signal at danger, you must get the personal authority of:

- the signaller, or
- the shunter acting on the signaller's instructions when making a shunting movement, or
- the Pilot acting on the signaller's instructions, or
- another competent person where authorised in the rules.



**You must clearly understand what is required and how far the movement can go.**

## 1.3 Authorising a driver to pass two or more EOAs without an MA

signaller

If there is a failure of the signalling equipment and it is necessary to authorise the driver to pass two or more consecutive block markers without an MA under the same authority, Point to Point working must be introduced.

## 2 Signaller's precautions before authorising the movement

*The person responsible: signaller*

### 2.1 Making sure the line is safe

You must make sure:

signaller

- the portion of line concerned is clear and safe for the movement as required by the train signalling regulations
- all points are in the required position and are locked.

You must not manually authorise a train into a section if it will cause the number of trains to exceed two trains in a tunnel vent section.

You must not authorise a train into a platform screen door (PSD) platform if the condition of the PSD is not safe for the train or for passengers.

### 2.2 Setting the route correctly

#### a) Operating individual point controls

signaller

When the route needs to be set manually, you must:

- operate the points to the position shown on the route card
- check that you have the correct 'normal' or 'reverse' indications
- unless there are exceptional circumstances the route setting must be checked by another competent person.

#### b) Calling the route

After you have set the route, you must call the route, if you can.

However, you must not call the route if you need to keep the route closed for any reason unless the signalling technician has told you the signalling equipment is unable to issue an MA.

You must also not call the route if there is an axle counter or track circuit failure in the route concerned.

**c) When it is not possible to call the route**

signaller

Before you authorise the movement, you must stop any train on an adjacent or opposite line that could be fouled by the movement if the route is set incorrectly.

When one train has passed safely over the affected route, you may allow trains to run without restriction on other lines.

However, you must not do this if you have changed the position of any points in the route.

**2.3 Not used****2.4 If the interlocking is out of order**

signaller

If the interlocking is out of order, you must make sure:

- the facing points on any other line are set to avoid conflicting movements normally prevented by the interlocking
- the signals for these conflicting movements are at danger (if applicable)
- routes for any conflicting movements are closed.

## 3

**Signaller authorising the movement***The person responsible: signaller***3.1 Instructions from the signaller**

You must tell the driver:

signaller

- why the signal needs to be passed at danger or the EoA needs to be passed without an MA
- any conditions that might affect the train
- how far the movement can proceed.
- the location and speed of any permissible speed lower than the ceiling speed
- the location and speed of any temporary or emergency restriction lower than 20 mph (30km/h).

You must instruct the driver to proceed at caution.

Unless the train is to enter the section as an assisting train or to examine the line, you do not have to instruct the driver to proceed at caution when Point to Point Working is in operation or working by Pilot is in operation.

**3.2 Instructions through a pilot**

You must make sure that the pilot clearly understands:

signaller

- what the driver must be told
- to work only to your instructions.

**3.3 Passing an EoA without an MA for shunting purposes**

If you need to pass a signal at danger or an EoA without an MA for shunting purposes, you must get the authority of the signaller.

driver,  
shunter

If you get authority to pass a signal at danger or an EoA without an MA from the signaller, you must tell the driver.

shunter

When you have completed the shunting, you must not proceed on the journey until the signal is cleared or you receive an MA, unless the signaller gives you authority to do so.

driver

## 4 During the movement

*The people responsible: driver*

### 4.1 Points and crossings

driver

If possible, you must make sure that any points are in the correct position for your train.

You must not pass over these points or crossings at more than 15 mph (25 km/h).

You may pass over points at up to 20 mph (30 km/h) during point to point working if the signaller tells you that they have been secured and padlocked.

### 4.2 Train speed

#### a) Proceeding at caution

driver

Except as shown in sections 4.2 b) you must proceed at caution, even if the line appears to be clear.

#### b) Proceeding up to 20 mph (30 km/h)

You may travel at a speed not exceeding 20 mph (30 km/h), other than locations where you are told to proceed at caution during Point to Point Working or during working by pilot.

### 4.3 Not used

### 4.4 Not used

### 4.5 Signaller protecting the movement

signaller

You must not work any signalling control that has been operated to protect the movement.

Until you are sure that the movement has passed clear of any points in the route involved, or the axle counter or track circuit controlling these points, you must not allow any points that have been secured to be released.



You must contact the driver immediately to stop the train if an emergency stop plunger is activated in the route where the driver is authorised to move.

signaller

You must carry out the instructions in module *SS1 Station duties and train dispatch* before allowing the movement to continue.



5

**Not used**



**6** Not used

7

**Not used**



**8** Not used

# 9

## Driver passing a signal at danger or an EoA without authority

*The people responsible: driver, signaller*

### 9.1 Passing a signal at danger or an EoA without authority

If you pass a signal at danger or an EoA without authority, you must: driver

- stop the train immediately
- tell the signaller that the signal has been passed at danger or the EoA has been passed without authority.

You must answer the questions the signaller asks you.

You must not proceed until the signaller gives permission.

### 9.2 Not used

### 9.3 Signaller's actions

When a train has stopped after any of the following, the driver should contact you immediately. signaller

- A train has been subject to a trip.
- A train has passed an EoA without authority (SPAD).
- A train has passed a signal at danger (SPAD).
- Any other unauthorised movement has taken place.

You must make sure the driver is aware of the circumstances.

If a train is subject to a trip, you do not need to carry out the rest of this instruction if either of the following applies:

- you and the driver are sure the trip was not caused by the train exceeding its movement authority
- the tripping was caused by a failure of the trackside equipment.

You must get the driver's answers to the questions on form CR3189 (SPAD or CBTC Train trip or unauthorised movement) as appropriate.

You may allow the train to be moved to a more convenient place to complete the form (for example, the next station platform) as long as:

signaller

- the driver is prepared to make the movement
- the driver considers that there is no defect that would make it unsafe to move the train
- the movement will not proceed beyond another block marker or main aspect signal.

You must:


- get sufficient information from the driver to be able to report the incident to Operations Control.
- complete the rest of the CR3189 form
- report the incident to Operations Control.


You must not allow the train involved to proceed until authorised by Operations Control.

If the driver reports that the SPAD resulted from reportable railhead conditions, you must also carry out the instructions in section 28 of module TW1 *Preparation and movement of trains*.

You must also tell Operations Control about, and treat as defective, any points that may have been 'run through' during the incident, whether or not damage is obvious.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**  
EVERY JOURNEY MATTERS

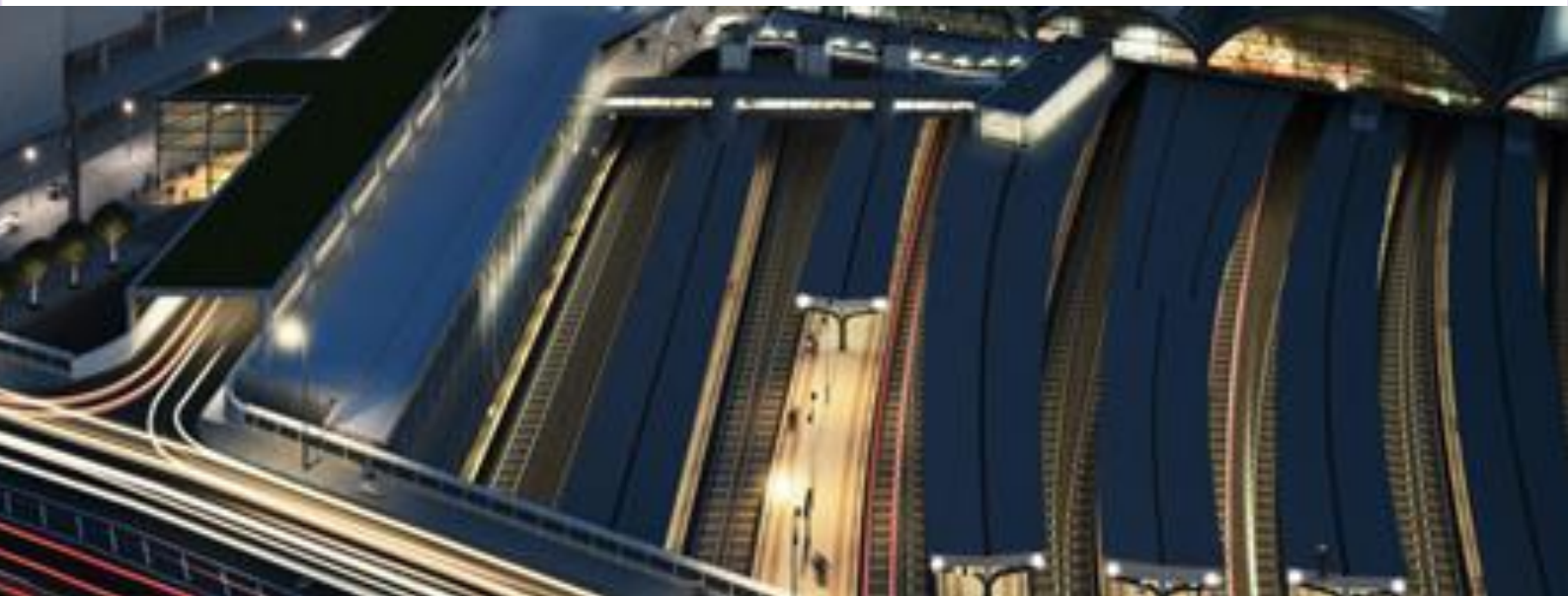
COS/S7

Observing and obeying signalling  
indications

Train warning systems

Reporting signalling failures and  
Irregularities

**Module S7**



Issue 6

Date December 2022

Comes into force 7<sup>th</sup> January 2023



Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 6, December 2022

© Copyright 2021  
Rail for London Infrastructure Limited

This module details the rules regarding observing and obeying signalling indications, train warning systems and reporting signalling failures and irregularities.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 General duties**
  - 1.1 Obeying the driver machine interface (DMI) and block markers
  - 1.2 Train signalled towards a wrong route
  - 1.3 Entering the COS from Plumstead maintenance siding
  - 1.4 Position light signal not showing or not showing correctly
  - 1.5 Not used
  
- 2 Train stopped on the approach to an end of authority (EoA)**
  - 2.1 Train stopped on the approach to an end of authority (EoA)
  - 2.2 Train stopped before the whole train has passed a signal that is showing 'proceed'
  
- 3 Movements made on the authority of a position-light signal**
  - 3.1 Not used
  - 3.2 Not used
  - 3.3 Returning to the approach side of a signal
  
- 4 When a train or shunting movement is required to reverse**
  - 4.1 Authority for the movement to be made
  - 4.2 Train standing beyond a signal
  
- 5 Automatic warning system (AWS)**
  - 5.1 Not used
  - 5.2 Not used
  - 5.3 AWS warning when there is no AWS track equipment
  
- 6 Train protection and warning system (TPWS)**
  - 6.1 TPWS activation where there is no TPWS trackside equipment
  - 6.2 Not used
  - 6.3 Not used
  - 6.4 Not used
  - 6.5 Not used
  
- 7 Reporting signalling failures and irregularities**
  - 7.1 Signalling equipment
  - 7.2 Boards and indicators
  - 7.3 Not used
  - 7.4 Lineside boards and signs becoming difficult to see because of trees, foliage or other obstructions

- 7.5 Shunting movements
  - 7.6 CBTC failures or irregularities
  - 7.7 Reporting a signal/AWS/CBTC/TPWS failure or irregularity
- 8 Train fails to transition when entering or exiting the CBTC area and a train trip occurs**
- 8.1 Train fails to transition when entering or exiting the CBTC area
  - 8.2 Train trip

## 1

**General duties**

*The people responsible: driver*

**1.1 Obeying the driver machine interface (DMI) and block markers**

driver

**a) When operating the train in Automatic Train Operation (ATO)**

You are responsible for observing the indications displayed on the driver machine interface (DMI).

**b) When operating the train in other than ATO**

You are responsible for observing each indication displayed by the train and trackside communication-based train control (CBTC) equipment.

You must obey the indications provided on the DMI except when it is necessary, as shown in the rules, to travel at a lower speed than indicated.

If you have received a movement authority (MA) that extends beyond a signal at danger you must stop the train as quickly as possible and immediately tell the signaller.

**1.2 Train signalled towards a wrong route**

driver

If a train has been signalled towards a wrong route, you must:

- stop the train as soon as it is possible to do so safely
- tell the signaller.

**1.3 Entering the COS from Plumstead maintenance siding**

driver

While waiting for the signal to clear or an authority to exit the sidings, you must not allow the front of the train to stand foul of any other siding. This applies unless the person in charge of movements gives you permission to do so.

### 1.4 Position light signal not showing or not showing correctly

If the position light signal at Plumstead Maintenance Siding is not showing or not showing correctly, you must treat it as being at danger.

driver

You must do this if any of the following applies:

- no signal is shown when there should be one
- there is no light at all
- one light is showing when there should be two.

### 1.5 Not used

## 2 Train stopped on the approach to an end of authority (EoA)

*The person responsible: driver*

### 2.1 Train stopped on the approach to an end of authority (EoA)

driver

If you have to stop a train before the end of the MA, you must make sure you still have an MA to proceed before you re-start the train.

If the train has an MA, but cannot continue, you must tell the signaller immediately.

### 2.2 Train stopped before the whole train has passed a signal that is showing 'proceed'

driver

If you have stopped the train before the whole train has passed a signal that is showing 'proceed', you may act on the aspect or indication that was being displayed when you passed the signal.

This applies unless you are instructed that the train is not to proceed.

# 3

## Movements made on the authority of a position-light signal

*The person responsible: driver*

**3.1** Not used

**3.2** Not used

**3.3** Returning to the approach side of a signal

If you have made a shunting movement on the authority of a position-light signal, you must not proceed on your journey until:

driver

- the movement has returned to the approach side of a signal
- the signal displays the appropriate proceed aspect or indication for the movement.

If the shunting movement cannot return to the approach side of the signal, you must carry out the instructions shown in section 4.2.



# 4

## When a train or shunting movement is required to reverse

*The person responsible: driver*

### 4.1 Authority for the movement to be made

driver

When a train or shunting movement is required to reverse, you must only allow the movement to take place when one of the following applies.

- An appropriate MA is received.
- The signal controlling the movement is cleared.
- The signaller gives you permission to move towards a signal which will control the further movement of the train.
- The leading end of the train is standing beyond the signal controlling the movement and the signal cannot be cleared, and the movement is to proceed in accordance with section 4.2 b).

### 4.2 Train standing beyond a signal

#### a) When the signal can be cleared for the reverse movement

driver

If any part of your train is standing beyond the signal controlling the movement, you must not start the movement until the signal is cleared.

#### b) When the signal cannot be cleared for the reverse movement

If the signal cannot be cleared, you must:

- find out whether a movement can be made which will allow the whole train to be positioned on the approach side of the signal
- if necessary ask the signaller for permission to do this.

If it is not possible for the train to return to the approach side of the signal, you must ask the signaller for permission to proceed beyond the signal in the direction to which it applies.

driver

# 5

## Automatic warning system (AWS)

*The person responsible: driver*

### 5.1 Not used

### 5.2 Not used

### 5.3 AWS warning when there is no AWS track equipment

driver

If you receive an AWS warning indication and you are certain that the train has not passed over any AWS on track equipment, you must:

- proceed normally
- report this to the signaller at the earliest opportunity.

## 6 Train protection and warning system (TPWS)

*The person responsible: driver*

### 6.1 TPWS activation where there is no TPWS trackside equipment

If your train is stopped by a TPWS activation and you are certain that the train has not passed over any TPWS on track equipment, you must:

driver

- temporarily isolate the on board TPWS equipment
- proceed normally
- report this to the signaller immediately
- carry out the instructions you are given.

**6.2** Not used

**6.3** Not used

**6.4** Not used

**6.5** Not used

# 7 Reporting signalling failures and irregularities

*The people responsible: shunter, driver, signaller*

## 7.1 Signalling equipment

driver

You must tell the signaller immediately, stopping the train specially if necessary, if you become aware of a signalling failure or irregularity on any line. This may include:

- a missing block marker
- a failure or irregularity in the working of the on-board CBTC equipment
- an MA beyond a signal at danger
- a signal showing a proceed indication but no MA received

However, you must tell the signaller at the first opportunity without causing delay if you see any failures or irregularities of a position light signal which apply to another line.

You do not need to stop the train specially to do this.

If you become aware of an error message on your DMI which has not caused a brake application, you do not have to tell the signaller immediately but must do so at the first convenient opportunity.

## 7.2 Boards and indicators

driver

You must tell the signaller immediately if any of the following is missing, or unlit when it should be lit.

- A block marker
- A 'start of cab signalling' board.
- An 'end of cab signalling' board.
- A stop board.
- Any other lineside board or sign.

You do not need to stop the train specially to do this.

driver

If a driver reports that any of these are difficult to see because of sunlight, street lights or reflections, you must:

signaller

- tell Operations Control
- tell the driver of the next approaching train what has happened
- instruct that driver to report the state of the signal, board or indicator
- signal the train normally.

If the driver you have instructed to check the signal, board or indicator reports to you that it is not difficult to see, you may signal the following trains normally.

However, if the driver reports to you that the signal, board or indicator is difficult to see because of sunlight, street-lights or reflections, you must treat it as defective and carry out the appropriate instructions in regulation 7 or 11 of module TS11 *Failure of, or work on, signalling equipment*.

### 7.3 Not used

### 7.4 Lineside boards and signs becoming difficult to see because of trees, foliage or other obstructions

If a lineside board or sign is becoming difficult to see because of trees, foliage or other obstructions, you must tell the signaller at the first convenient opportunity. You do not need to stop the train specially to do this.

driver

You must tell Operations Control but you do not need to treat the signal, board or sign as being defective.

signaller

### 7.5 Shunting movements

If you become aware of signalling failures or irregularities when you are shunting, you must immediately tell the driver. You do not need to tell the signaller.

shunter

## 7.6 CBTC failures or irregularities

**driver** If you experience a failure of the CBTC signalling system including the platform screen doors system, you must immediately tell the signaller. If necessary, you must stop your train specially to do this.

**signaller** If a driver reports a CBTC failure or irregularity, you must:

- tell Operations Control
- tell the driver of the next train on which CBTC is in operation what has happened
- instruct that driver to report whether the expected CBTC indications are received
- signal the train normally.

If the driver reports back that the CBTC signalling is working normally, you may signal following trains normally.

**signaller** If the driver reports that the expected CBTC indications were not received, you must treat the signalling equipment concerned as defective.

## 7.7 Reporting a signal/AWS/CBTC/TPWS failure or irregularity

### a) Completing form CR3185

**driver, signaller** When CBTC failure or irregularity is reported, you must both complete form CR3185 with all the required details.

Completed CR3185 forms must be handed in as shown in your company instructions.

### b) Reporting to Operations Control

**signaller** You must tell Operations Control and make a suitable entry in the occurrence log.

### c) Exceptions

**signaller** You do not need to complete form CR3185 if:

- the fault is clearly a right-side failure, or
- you can explain the failure or irregularity to be a right-side failure and you are fully aware of the circumstances of the failure.

You must still tell Operations Control and make a suitable entry in the occurrence log.

signaller

You do not need to immediately complete form CR3185 if the signaller:

driver

- can tell you the fault or irregularity is clearly a right-side failure, or
- can explain why it is a right-side failure and can confirm the circumstances of the failure.

You must then complete CR3185 at the first convenient opportunity.

**d) Not used**





## 8 Train fails to transition when entering or exiting the CBTC area and a train trip occurs

*The people responsible: driver, signaller*

### 8.1 Train fails to transition when entering or exiting the CBTC area

If the train fails to transition automatically after the train has passed the 'start of cab signalling' board when entering, or 'end of cab signalling' board when exiting the CBTC area, you must:

driver

- make sure the train comes to a stand
- tell the signaller.

You must then carry out the instructions shown in module TW5 *Preparation and movement of trains Defective or isolated vehicles and on-train equipment.*

driver,  
signaller

### 8.2 Train trip

#### Train receiving a trip

If the train is tripped and has been brought to a stand, you must:

driver

- acknowledge the trip
- not move the train
- tell the signaller what has happened
- carry out the instruction you are given by the signaller.

You must establish the reason for the trip and carry out the appropriate rules and or instructions before authorising the train to proceed.


signaller


#### Resuming normal working

If following a failure of CBTC, it is again possible to return to normal working, you must inform the driver.

signaller

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/SP

Speeds

Module SP



Issue 4

Date December 2020

Trial running

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 4, December 2020




© Copyright 2020  
Rail for London Infrastructure Limited

This module details the rules regarding speeds.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	

## Contents

- 1 Definitions**
- 2 Drivers instructions**
  - 2.1 Permissible and temporary speed restrictions**
  - 2.2 Emergency Speed restrictions**
- 3 Signaller's instructions**
  - 3.1 Arrangements for TSRs**
  - 3.2 Changes to planned TSRs**
  - 3.3 TSRs incorrectly applied**
  - 3.4 Arrangements for ESRs**

# 1

## Definitions

### **Emergency speed restriction (ESR)**

An unplanned speed restriction which has been imposed, but has not yet been entered into the CBTC system.

### **Permissible speed**

The speed which is published in Table A of the Sectional Appendix.

### **Temporary speed restriction (TSR)**

A speed restriction which is lower than the permissible speed, and has been imposed by means of CBTC supervision.

A TSR may be applied because of an entry published in the *Weekly Operating Notice* or because of the need for an immediate operational restriction. When a restriction is applied that has not been published, it is referred to as an unpublished speed restriction.

In both cases, the details of the TSRs are planned, but one TSR is published before it is required, and the other is unpublished but required due to an operational event.



## 2 Drivers instructions

*The people responsible: driver*

### 2.1 Permissible and temporary speed restrictions

driver



When driving in ATO the CBTC system will control the speed of the train. This does not require any input by the driver.

When driving in other than ATO, you must:

- control the speed of your train to no more than the speed shown on the DMI or the speed you are told by the signaller
- make sure the whole of your train has passed clear of a section of line with a lower speed before increasing your speed.

### 2.2 Emergency Speed restrictions

driver

When driving over an ESR, you must:

- cancel ATO and proceed in a manual driving mode (if applicable)
- control the speed of your train to travel over the affected portion of line at no more than the speed the signaller tells you
- make sure the whole of your train has passed clear of a section of line with a lower speed before increasing your speed or resuming driving in ATO (if applicable).

## 3 Signaller's instructions

*The people responsible: signaller*

### 3.1 Arrangements for TSRs

You must make sure that planned TSRs are programmed into the system in enough time before they become active.

signaller

If available, a second competent person must check that each TSR is correctly:

- programmed into the system
- activated at the required time
- removed or changed at the required time.

You must not activate a TSR if it will cause a brake activation to a train in the section concerned.

If for any reason you cannot activate the TSR, you must treat the restriction as an ESR as described in section 3.4 of this module.

### 3.2 Changes to planned TSRs

An amendment to a planned TSR must be entered into the system as soon as possible by you or any other person responsible for programming the system if a previously published temporary speed restriction:

signaller

- is no longer required
- needs to be eased
- needs to be removed early
- needs to be introduced again after being cancelled, eased or removed early
- needs to remain for a longer time than planned
- needs to be moved.

You and any other person responsible for programming the system must take the appropriate action to put the change into effect.

**signaller** You must make a suitable entry in the Occurrence Log recording who and when you were advised of the change and the time the TSR was entered in the system.

### 3.3 TSRs incorrectly applied

**signaller** If you become aware that a published temporary speed restriction is not being applied correctly, you must report this to Operations Control.

If there is a risk to safety, you must apply the restriction as an emergency speed restriction.


### 3.4 Arrangements for ESRs


**signaller** If it is necessary to allow trains to pass over the ESR before the details have been programmed into the system, you must stop each train which will travel over the ESR and tell the driver:

- the location where the ESR begins and ends
- the speed limit imposed.

You must continue with these arrangements until the details have been programmed into the system.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/SS1

Station duties, train dispatch  
and platform screen door  
failures

**Module SS1**



Issue 7

Date March 2023

Comes into force 13<sup>th</sup> March 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 7, March 2023

© Copyright 2022  
Rail for London Infrastructure Limited

This module details the rules regarding station duties and train dispatch within the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- signaller
- driver
- platform screen door maintainer
- platform staff

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Definitions**
- 2 Safety at station platforms**
  - 2.1 Equipment on platforms
  - 2.2 Defective platform DOO-CCTV
  - 2.3 Items falling onto the line
  - 2.4 Communicating with the Route Control Centre
  - 2.5 Communicating with platform staff
  - 2.6 Not used
  - 2.7 Maintenance and servicing to be completed
  - 2.8 Not used
  - 2.9 Not used
  - 2.10 Use of the emergency stop plunger
- 3 Train dispatch**
  - 3.1 Train dispatch arrangements in the COS
  - 3.2 Not used
  - 3.3 Not used
  - 3.4 Not used
  - 3.5 Not used
  - 3.6 Not used
  - 3.7 Not used
  - 3.8 Drivers duties on an open platform
  - 3.9 Driver's duties on a platform with platform screen doors
  - 3.10 Not used
  - 3.11 Not used
  - 3.12 Not used
  - 3.13 Not used
  - 3.14 Not used
  - 3.15 Not used
- 4 PSD equipment failures and local irregularities**
  - 4.1 PSD equipment failure caused by the signalling system
  - 4.2 Duties of the driver
  - 4.3 Duties of the platform staff
  - 4.4 Duties of the signaller
  - 4.5 Duties of the maintainer
  - 4.6 Operating the Interlock override (Local Control Panel)



# 1

## Definitions

### DOO-CCTV

Platform based cameras that transmit images of the train to the on-board driver only operated (DOO) monitors for use during train dispatch.

### Competent person

A person who is competent to assess the condition of the platform screen doors and whether the platform can safely be used for passenger service.

### Emergency stop plunger

A device which when activated will remove the CBTC movement authority of trains in a defined area. The area where the device was activated is indicated to the signaller. Trains not communicating with the signalling system will not be affected.

### Platform Screen Door (PSDs)

A controlled physical barrier across the length of the platform, used to control airflow as trains pass through the station. The PSDs are operated by the signalling system and will only open to allow public access when a train is present.

PSDs are fitted at the following stations:

Stations	
Paddington	Liverpool Street
Bond Street	Whitechapel
Tottenham Court Road	Canary Wharf
Farringdon	Woolwich

### Platform staff

A person who is responsible for the safety of the public on a station platform.

**Platform screen door maintainer**

A person who is competent to maintain and make safe the platform screen door equipment.

**Rolling stock technician**

A person who is authorised and has the necessary technical competence to examine or repair specified items of equipment forming part of a train or vehicle.

**Unstaffed platform**

An unstaffed platform includes a platform when platform staff are not in attendance.

## 2 Safety at station platforms

*The people responsible: platform staff, driver*

### 2.1 Equipment on platforms

You must make sure that any trolleys or mobile station equipment left unattended are placed at least 1.8 metres (6 feet) from the platform edge and are properly secured.

platform staff

### 2.2 Defective platform DOO-CCTV

If you see that a platform camera is defective, you must immediately tell the signaller. You do not need to do this if you have been informed about the defect.

driver

### 2.3 Items falling onto the line

If anything falls onto the line which you consider is a danger to trains, you must immediately tell the signaller.

platform staff

If you need to go onto a platform line to retrieve a dropped item, you must:

- have been trained to do so at the location concerned
- tell the signaller your name, location and your employer and why you need to go onto the line
- make sure that the signaller clearly understands on which line trains are to be stopped, including any adjacent line
- only go onto the line when the signaller gives you permission.



**You must not go onto the track unless the signaller has given you an assurance that it is safe to do so**

platform staff

When you have retrieved the item, you must tell the signaller that you have returned to the platform and that the line is clear and trains can run as normal.

## 2.4 Communicating with the Route Control Centre

platform staff

If you need to talk to the signaller you must use the telephones provided on the headwalls of the platforms or at the platform staff control point. If for any reason these phones are not in use and there is a train present in the platform, you may ask the driver to contact the signaller on your behalf.

If there is no train present and you are working on one of the following platforms, you must contact the MTR local manager and ask for the call to be relayed to the RFLI RCC signaller.

## 2.5 Communicating with platform staff

signaller, operations control

To talk to platform staff, you must contact the station customer services manager at LU stations and ask for the platform staff to contact you.

London Underground controlled station		
Bond Street	Tottenham Court Road	Liverpool Street
Farringdon	Whitechapel	

To talk to platform staff at MTR controlled stations, you must contact the local controller and ask for the platform staff to contact you.

MTREL controlled station		
Paddington	Abbey Wood	Custom House
Canary Wharf	Woolwich	

## 2.6 Not used

## 2.7 Maintenance and servicing to be completed

driver

If the train has been examined by a rolling stock technician, or other servicing has been carried out, you must make sure, before starting the train that:

- the work has been completed
- NOT TO BE MOVED boards are not attached
- all vehicles are fit to travel.

## 2.8 Not used

## 2.9 Not used

## 2.10 Use of the emergency stop plunger

platform  
staff

If you operate the emergency stop plunger or it has been operated by someone else, you must immediately inform the signaller of the circumstances surrounding its operation.

# 3 Train dispatch

*The people responsible: driver, platform staff*

## 3.1 Train dispatch arrangements in the COS

all  
concerned



The normal mode of dispatching a train in the COS is DOO, using the indications provided in the driving cab and the indications provided by platform equipment.

A 'door interlock' indication is provided in the driving cab, and where platform screen doors are in operation an indication is also provided on the trackside.

Doors will not automatically open in a platform which has been set to 'skip' by the signalling controls.

An automatic movement authority will not be provided if 'door interlock' is not achieved.

**3.2** Not used

**3.3** Not used

**3.4** Not used

**3.5** Not used

**3.6** Not used

**3.7** Not used

### 3.8 Drivers duties on an open platform

You must first check that start automatic train operation (ATO) is offered or a movement authority (MA) has been received.

driver

If start ATO is not offered and an MA cannot be issued, you must get the signaller's permission to pass the end of authority (EoA) without an MA before beginning dispatch arrangements.

You must check the whole length of the train using the CCTV to make sure that it is safe to close the doors.

You must then close the train doors.

Where possible, you must check that the external orange hazard lights have gone out, and the traction interlock light is illuminated.



**You must not rely only on the external orange hazard lights or the traction interlock light as an indication that it is safe to start.**

You must carry out the 'train safety check', using the CCTV by making sure that:

- the train doors are properly closed
- nobody is trapped in the doors, for example by clothing
- nobody is in contact with the train.

You must only start the train if it is safe to do so.

If you cannot make sure it is safe to close the doors or carry out the 'train safety check' from the cab, because of defective CCTV or poor visibility, you must do so by other means, as shown in your train operating company instructions.

If the driver informs you that self dispatch due to defective CCTV is in use, you must tell Operations Control.

signaller

Self dispatch due to defective CCTV is only permitted for 30 minutes. If platform staff are not available to assist drivers at the location after 30 minutes, the platform must be closed.

operations  
control

### 3.9 Driver's duties on a platform with platform screen doors

driver

You must first check that start automatic train operation (ATO) is offered or a movement authority (MA) has been received.

If start ATO is not offered and an MA cannot be issued, you must get the signaller's permission to pass the end of authority (EoA) without an MA before beginning dispatch arrangements.

You must check the whole length of the train using the CCTV to make sure that platform screen doors and train doors can be closed without trapping any large objects.

You must then close the train doors and platform screen doors.

You must check that the traction interlock light is illuminated and the door interlock light is illuminated. Where possible, check that the external orange hazard lights have gone out.



**The door interlock light (when illuminated) provides assurance that the platform/train interface is safe.**

You must carry out the 'train safety check', using the CCTV by making sure that:

- the train doors and PSDs are properly closed
- nobody is trapped in the doors, for example by clothing
- nobody is in contact with the train.

You must only start the train if it is safe to do so.

If you cannot make sure it is safe to close the doors or carry out the 'train safety check' from the cab, because of defective CCTV or poor visibility, you must do so by other means, as shown in your train operating company instructions.

signaller

If the driver informs you that self dispatch due to defective CCTV is in use, you must tell Operations Control.

operations control

Self dispatch due to defective CCTV is only permitted for 30 minutes. If platform staff are not available to assist drivers at the location after 30 minutes, the platform must be closed.



**3.10** Not used

**3.11** Not used

**3.12** Not used

**3.13** Not used

**3.14** Not used

**3.15** Not used

## 4

**PSD equipment failures and local irregularities**

*The people responsible: driver, platform screen door maintainer, platform staff, signaller, operations control*

**4.1 PSD equipment failure caused by the signalling system**

A competent person could be the platform staff when deciding if the platform is safe for passengers, or a maintainer when deciding if the train service can continue with an operational restriction put in place.

**Immediate actions**

If you notice an irregularity with the PSDs or glass screens, you must report it to the signaller if it might make the platform unsafe. If the platform remains safe for passengers to use, report the irregularity to Operations Control and ask for a maintainer to investigate.

platform staff

You will be informed of a failure of the PSDs by the signalling system, the driver, Operations Control or a competent person.

signaller

If you become aware of a failure affecting the PSDs, you must:

- tell Operations Control,
- not allow a train to pass through the platform until a competent person is managing the failure or you are told that the platform has been closed,
- tell the driver about the PSD failure before allowing the train to pass through the platform.

When you are advised that there is a PSD failure at a station platform, you must confirm with platform staff that the failure is being managed. You must then arrange for a platform screen door maintainer to attend the station concerned to investigate the failure (if required) and report back.

operations control

**operations control**

If the PSDs failure happens again it may be necessary to position a competent person at the platform or close the platform until the fault can be safely managed or is rectified.

**signaller**

You must not allow a train to enter or depart a platform that has defective PSDs until you can confirm that the failure has been investigated, or that a competent person is managing the failure at the station or the platform has been closed.

## 4.2 Duties of the driver

### Platform screen doors fail to open

**driver**

If the platform screen doors fail to open automatically, you must:

- use the trains door controls to attempt to manually open the doors
- make a PA announcement if doors cannot be opened telling passengers there will be a short delay before doors are opened.

Platform staff if available will attempt to assist you by using the PSD local control panel on the platform.

If platform staff are not available and you have tried using the train door controls:

- open the driver's door to operate the driver's control panel
- use the driver's control panel to open the PSDs
- use the train door open buttons to allow passengers to alight and board.

If the PSDs have not opened, you must make a PA announcement to tell passengers to use the PSD egress devices.

You must tell the signaller about the failure of the platform screen doors and that you have attempted operating the driver's control panel. You may need the assistance of platform staff to make sure all PSDs and glass panels are closed if they have been pushed through by passengers.

If a driver reports that the PSDs failed to open at a station platform, you must tell Operations Control.

signaller

If you are informed that the PSDs have failed to open at a station platform, you must arrange for a competent person to investigate and report back their findings.

operations control

If the PSDs failure happens again it may be necessary to:

operations control

- position a competent person at the platform to manage the PSDs, or
- close the platform until the fault is rectified.

### **Platform screen doors fail to close**

If the PSDs fail to close and platform staff are available, they will assist with the operation of the PSDs.

driver

If the PSDs fail to close and platform staff are not available, you must:

- check that a movement authority is available
- make a PA announcement advising passengers to stand clear of the closing doors
- open the driver's door to operate the driver's control panel
- use the driver's control panel to close the PSDs
- use the train door close buttons to close the train doors
- complete the train safety check.

### **Other irregularities**

You may be offered an on-sight movement authority to enter or leave the platform if door interlocking cannot be made. The signaller will tell you the reason why before authorising the movement of the train.

driver

A speed restriction may be applied to the platform if a PSD or panel remains open but interlocking can be achieved. The train can enter and leave the platform in automatic mode, but at the reduced speed.

### 4.3 Duties of the platform staff

platform  
staff



Local faults or irregularities of the PSDs may include:

- Train movement is obtained with one or more platform screen doors open or with the platform status indicator visual not illuminated when an override has not been activated.
- One or more platform screen doors close without any commands being given and no faults can be found.
- The platform status indicator visual is illuminated with a door status indicator or indicators illuminated.
- A train departs a platform with one or more platform screen doors open when no platform screen doors are isolated or under staff control or when an override has not been activated.

platform  
staff

You must tell operations control the extent of the failure and if you are able to make the platform safe for trains and passengers.

**PSD Door Mode Switch**



Operating the door mode switch to the Interlock Override position could allow a train to move suddenly. Always make sure the PSD is closed and locked or if open, place a barrier across the PSD and make sure people are kept away, and authority from Operations Control (via the signaller) received before operating the door mode switch to the Interlock Override position.

platform staff



*Diagram SS1.1 – Individual door mode switch*

The table below provides information about how different door failures must be dealt with.

Fault	Action on platform using door mode switch	RCC operations control
<p>One PSD closed but door interlock not displayed</p>	<p>Attempt cycling of doors to clear fault.</p> <p>If fault remains, attempt cycling individual door using door mode switch.</p> <p>Report to SOR and operations control if door cannot obtain interlock.</p> <p>If the doors can be closed and locked but interlock is not achieved ('pull test' performed), or if pull test fails with doors closed and safety seals applied. contact SOR to ask for a barrier and when authorised select 'Interlock Override' on the door mode switch.</p> <p>If the doors cannot be closed and locked, place a barrier across the doors then select 'Interlock Override' on the door mode switch when authorised.</p> <p>Remain at the door with the barrier.</p>	<p>When told one door is being managed as closed and locked but not detected or closed with safety seals applied and the door mode switch has been set to 'Interlock Override', trains can run normally. Staff will remain at the door and a barrier will be provided by other staff.</p> <p>The door will be indicated as out of service when a door override has been applied.</p> <p>When told one door cannot be closed and locked, the door will be managed as an open door with a barrier provided.</p>
<p>One PSD closed with door interlock (difficulty getting interlock)</p>	<p>Attempt cycling of individual door using door mode switch to clear fault.</p> <p>If door remains difficult or slow to close, make sure the door is closed and locked ('pull-test' performed, isolate the door using the door mode switch and report to SOR.</p> <p>You do not need to remain at the PSD.</p>	<p>The door will be indicated as interlocked but out of service.</p> <p>There is no further action required.</p>
<p>More than one PSD closed but door interlock not displayed</p>	<p>Attempt cycling of doors using local control panel to clear fault.</p> <p>If faults remain, report to SOR, operations control and close the platform or close the station if it is not possible to close just one platform.</p>	<p>Operations control to tell signaller to skip the platform until PSDs are operating normally.</p> <p>PSMA to be applied to the platform until fault is rectified.</p> <p>Trains can leave the platform once the platform or station is closed.</p>

<p>One PSD open (glass panels cannot be pushed closed)</p>	<p>Attempt to close the PSD using the door mode switch.</p> <p>If door remains open, report to SOR and operations control.</p> <p>Place barrier across door and when authorised select 'Interlock Override' on the door mode switch.</p> <p>Remain at the barrier.</p>	<p>When told one door is being managed as open with a barrier in place, and a request for interlock override on the door mode switch is requested tell the signaller to apply a 30mph speed restriction, once confirmed by signaller that 30mph speed restriction is in place authorise the door mode switch to be placed to interlock override and resume train operation.</p>
<p>More than one PSD open</p>	<p>Attempt cycling of doors using local control panel to clear fault.</p> <p>If faults remain, report to SOR, operations control and close the platform or close the station if it is not possible to close one platform.</p>	<p>Operations control to tell signaller to skip the platform until PSDs are operating normally.</p> <p>PSMA to be applied to the platform until fault is rectified.</p> <p>Trains can leave the platform once the platform or station is closed.</p>

platform staff

If you are informed that a PSD is failing to close you must go to the affected platform and use the door mode switch to close the door. If more than one door has failed to close and you cannot secure the doors yourself, you must arrange for other competent staff to assist you.

If you are dealing with the failure of the PSDs to close, you must observe that all PSDs remain closed until the entire train has departed the platform.

If you are unable to close the PSD and a suitable barrier is not available, you must remain at the PSD until the fault has been rectified or the platform has been closed. If the affected platform cannot be closed then you must ask for both station platforms to be closed.

If a barrier is available, and the train remains in the platform, you may position a barrier across a PSD that cannot be closed, and tell Operations Control when the barrier is in place. You must then remain at the barrier while the platform



is open, or until you are relieved by another competent person.

If you are told by a competent person on the platform that a barrier has been placed across an open PSD and the failure is being managed, the signaller must confirm that a 30mph speed restriction has been imposed you can authorise the competent person to select interlock override on the door mode switch and the signaller to allow trains to leave and enter the platform,

operations  
control

### Cracked or broken glass

platform staff

If you notice the glass is cracked, broken or shattered in a PSD, you must immediately tell Operations Control:

- the location and panel number
- the details of the damage.

If there is a hole, something protruding through the panel or it is leaning or extending towards the track, you must tell Operations Control to stop trains immediately.

You must then:

- make arrangements for broken glass to be inspected by a platform screen door maintainer
- make arrangements for a barrier to be placed in front of the affected area.

You must remain at the location until the platform screen door maintainer has made the panel safe and a barrier is fixed in place to prevent access, or another member of staff takes over from you.



**If a member of staff cannot be placed at the affected PSD, you must keep the platform closed.**

operations control

If you are told the glass panel has a hole in it, anything protruding or leaning or extending towards the track, you must close the platform until you:

- have made arrangements for the shattered glass to be removed
- have made sure a barrier is placed across the affected PSD or glass panel
- have made sure a member of staff is placed by the affected PSD panel.

## 4.4 Duties of the signaller

When you become aware that there is an irregularity with the PSDs, you must:

signaller

- tell Operations Control
- not allow a train to pass through the platform until a competent person is managing the irregularity, or you are told that the platform has been closed.

If the glass on the PSD equipment is shattered, you must close the platform until you:

operations control

- have made arrangements for the shattered glass to be removed
- have made sure a barrier is placed across the affected PSD panel
- have made sure a member of staff is placed by the affected PSD panel.

If you are told that the glass in a PSD is cracked, broken or shattered, you must tell Operations Control immediately. Platform staff or a platform screen door maintainer will tell you if the platform can be used and if a speed restriction needs to be applied while glass screens remain broken. A competent person must place a barrier across any open or shattered panels, and remain at the barrier.

signaller

If Operations Control tell you that it is safe for the train to enter or depart the platform, you must signal the train in the highest level of supervision available.

A PSMA must be applied if a door is reported as open and you cannot signal the train normally or PSD interlock is not achieved.

A 30 mph speed restriction must be applied between the block markers leading into the platform if a PSD is reported open but the train can be signalled normally (platform staff will have to place the door control switch in the 'Interlock Override' position).

- signaller** If Operations Control tell you that the train must enter or depart the platform at reduced speed, you must tell the driver:
- about the failure, and
  - to pass through the platform at caution and to examine the line in case anyone has fallen on to the track.

If it is not possible to issue an MA you must carry out the instructions in module S5 *Passing an EoA without an MA*.

## 4.5 Duties of the maintainer

- competent person (maintainer)** If you are instructed to attend a station following reports of failure of the PSDs, or cracked, broken or shattered glass, you must tell Operations Control:

- the extent of the failure,
- whether repairs can be made or if equipment is to be made safe,
- whether it is safe for trains to pass through the platform,
- any restrictions to be put in place.

You must inspect the PSD structure and make sure that it is safe for trains to use the platform. If any part of the PSD structure has moved towards the track, trains must not use the platform until this has been corrected.

- operations control** You must tell the signaller when it is safe to allow a train to approach or depart the platform if the failure is being managed by a competent person.

You must tell the signaller that the station must be skipped if it is necessary to close the platform due to the PSD failure, or any restrictions that must be applied to the passing trains.

## 4.6 Operating the Interlock override (Local Control Panel)



**The interlock override control may only be operated when authorised by Operations Control, as this will allow trains to move while PSDs are open.**

all concerned

The interlock override control must not be operated whilst the platform is open to passengers. You may only authorise the interlock override control to be operated by a platform screen door maintainer to allow a train to enter or leave a closed platform.

operations control

To operate the interlock override control, you must only do this:


competent person (maintainer)


- when you have confirmed to operations control that it is safe for the train to move
- a barrier has been placed across any open PSDs or broken panels
- when authorised by operations control
- for the current train in the platform.

You must tell the signaller when the interlock override has been operated.

You must return the interlock override to the normal position once the entire train has entered or departed the platform.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/SS2

Shunting in the central  
operating section

**Module SS2**



Issue 5

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2022

© Copyright 2022  
Rail for London Infrastructure Limited



This module details the rules regarding shunting within the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- shunter
- signaller

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Definitions**
- 2 Prohibitions and restrictions**
  - 2.1 Using a traction unit
  - 2.2 Not used
  - 2.3 Not used
- 3 Shunter's personal safety**
  - 3.1 Riding on the step of a locomotive or vehicle
  - 3.2 Coupling and uncoupling
  - 3.3 Dealing with the automatic brake
  - 3.4 Not used
- 4 Precautions before shunting**
  - 4.1 Reaching a clear understanding
  - 4.2 Safety checks before making any movement
- 5 Safeguards while shunting**
  - 5.1 General
  - 5.2 Controlling movements
  - 5.3 Controlling movements not driven from a cab at the leading end of the movement
  - 5.4 After each movement
  - 5.5 Not used
  - 5.6 Not used
  - 5.7 Not used
  - 5.8 Not used
- 6 Driving a traction unit from the leading cab**
- 7 Attaching and detaching vehicles**
  - 7.1 Not used
  - 7.2 Attaching a traction unit to a train or vehicles
  - 7.3 Detaching a traction unit or vehicle from a train
  - 7.4 Not used
- 8 Movements over points worked by the signaller**
  - 8.1 Getting the signaller's permission
  - 8.2 Not used

**8.3 Not used**

**8.4 Not used**

**9 When shunting is completed**

**9.1 Leaving vehicles in a safe position**

**9.2 Securing vehicles and traction units**

**9.3 Leaving vehicles or traction units on a running line**

**9.4 Leaving vehicles or traction units on a dead-end line**

**9.5 Protecting running lines**

**9.6 Checking that all running lines are clear**

**10 Additional instructions for shunting within a possession**

**10.1 Headlight on propelling movements**

**10.2 Before giving a signal to move**

**10.3 Propelling outside a work site**

**10.4 Dealing with the electrical train supply (ETS) connections**

**11 Loading and unloading rail vehicles during engineering work**

**11.1 Agreeing the requirements**

**11.2 During the movement**

# 1

## Definitions

### **Propelling**

Pushing vehicles by a traction unit. This does not include push-pull trains.

### **Shunter**

The person in control of a specific shunting movement.

### **Shunting movement**

Any movement of a train or vehicle other than a train passing normally along a running line.

### **Unaccompanied driver**

For the purpose of this module, a driver carrying out a shunting movement without an accompanying shunter.

## 2 Prohibitions and restrictions

*The people responsible: driver, shunter*

### 2.1 Using a traction unit

You must start any shunting movement with a traction unit. Defective platform DOO-CCTV

driver,  
shunter

### 2.2 Not used

### 2.3 Not used

## 3 Shunter's personal safety

*The person responsible: shunter*

### 3.1 Riding on the step of a locomotive or vehicle

shunter

You must not ride on the step of a locomotive or vehicle. If one is provided, you may ride on the special platform of the shunting locomotive.

### 3.2 Coupling and uncoupling



**You must never go between vehicles unless you are sure they will not move.**

shunter

If you have to go between vehicles, you must:

- wait until the vehicles have stopped completely
- display a hand danger signal to the driver or instruct the driver not to move.



**You must never remain between vehicles during an ease-up.**

If you have to go between vehicles to deal with automatic couplers, you must first stop the vehicles at least 2 metres (6 feet 6 inches) apart.



**If there is any possibility that other vehicles might be shunted against those you are going to work between, you must instruct the other shunters not to make any movements towards them.**

If you have to go between vehicles to couple or uncouple multiple units, you must:

shunter

- make sure the driver is present
- reach a clear understanding with the driver as to what is to be done.

### 3.3 Dealing with the automatic brake

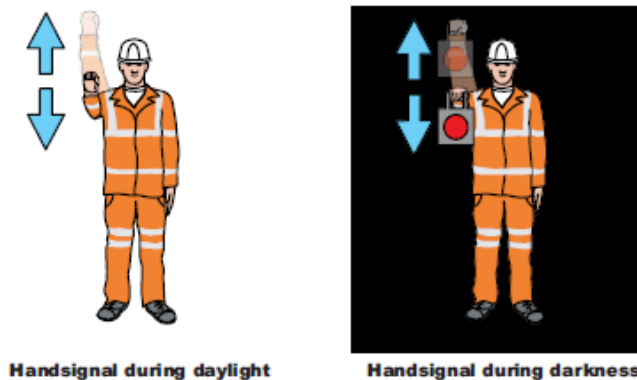
When going between vehicles to uncouple, you must disconnect the brake pipes before any other connections.

shunter

When dealing with the other connections (including the automatic couplers), you must prevent any movement of the vehicles by leaving the air-brake pipe cocks open.

When going between vehicles to couple, you must connect the brake pipes after any other connections.

You must use the handsignals shown in diagram SS2.1 to tell the driver to create brake-pipe pressure.



**Diagram SS2.1**  
**Create brake-pipe pressure**

### 3.4 Not used

## 4 Precautions before shunting

*The people responsible: driver, shunter*

### 4.1 Reaching a clear understanding

driver,  
shunter

Before starting any shunting, you must reach a clear understanding with each other about:

- what exactly needs to be done
- how the shunting movements will be controlled.

### 4.2 Safety checks before making any movement

shunter,  
unaccompanied  
driver

You must make sure that:

- the vehicles can be moved safely
- no NOT TO BE MOVED boards are placed on the vehicles
- other vehicles are not foul of the movement to be made
- any road vehicle or equipment is clear
- anyone who could be put in danger is warned to move to a safe position
- anyone who is working on the outside of vehicles on an adjacent line is warned to keep clear
- any derailer or scotch block has been removed.

You must check that any hand points the movement will go over in the facing direction are fitting correctly and that any locking mechanism has engaged.

You must check that hand points have been set correctly for the movement in the trailing direction.



# 5 Safeguards while shunting

*The people responsible: driver, shunter*

## 5.1 General

You must work only to the shunter's instructions.

driver

You must only make a movement, even when a movement authority or a verbal authority has been received, if the shunter has:

- authorised the movement, or
- operated a shunting or other indicator which authorises the movement.

Except where specifically authorised, you must not:

- pass a block marker when making a movement
- exceed 5 mph (10 km/h) in a siding.

Unless specifically authorised, you must not allow a shunting movement to pass a block marker without authority.

shunter

## 5.2 Controlling movements

### a) By handsignals

You must use the handsignals shown in diagram SS2.2 and SS2.3 to control a movement.

shunter

You must make sure the driver can see your handsignals at all times.

You must make sure no other driver acts on your handsignals.

You must work only to the handsignals shown below.

driver

You must not start or continue with a movement unless:

- you clearly understand the shunter's handsignal
- you are sure that the handsignal applies to you.

**driver**

You must:

- stop the movement immediately if you lose sight of the shunter or the shunter's handsignals
- restart only when the shunter has given you the correct handsignal.

**b) By radio****shunter**

You must:

- clearly identify the correct train and driver
- speak continuously or transmit a continuous bleep signal throughout each movement
- instruct the driver to stop immediately if you notice the transmission is failing.

**driver**

If there is a break in transmission, you must stop immediately and restart only when the shunter tells you.



**Move away from the shunter**



**Move towards the shunter**



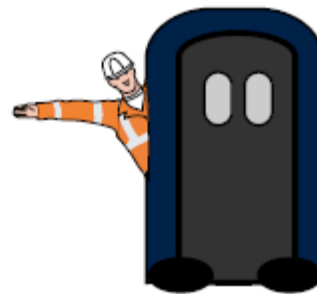
**Slow down**



**Stop immediately**



**Ease up**



**Stop immediately when on a vehicle**

*Diagram SS2.2  
Handsignals during daylight*

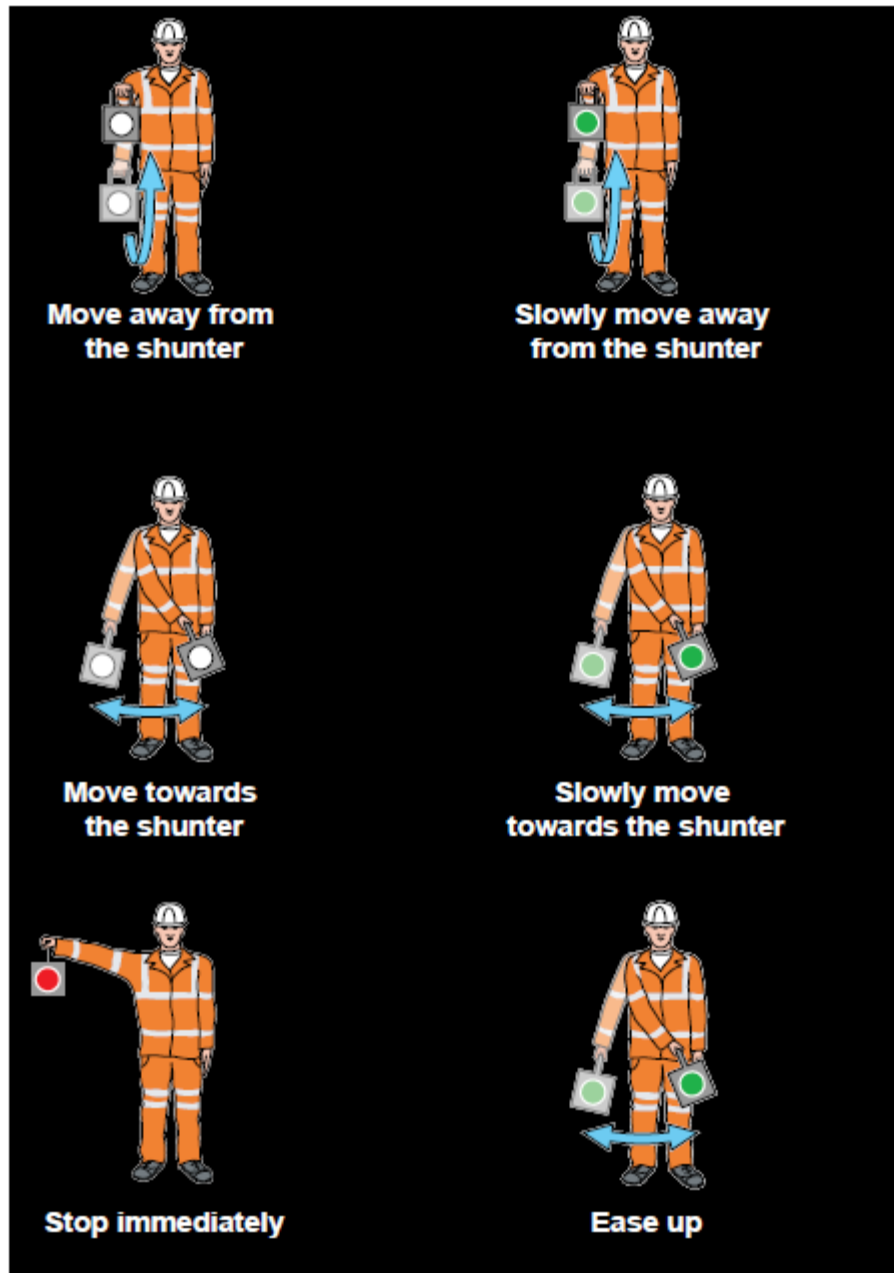


Diagram SS2.3

Handsignals during darkness

### 5.3 Controlling movements not driven from a cab at the leading end of the movement

#### a) General

When a traction unit making a propelling movement or a shunting movement is not being driven from a cab at the leading end of the movement, you must:

shunter

- ride in the leading cab, if this is at the leading end of the movement, or
- ride in the vehicle at the leading end of the movement, if this is suitable, from which you can control the movement and apply the automatic brake, or
- control the movement from a safe place on the ground, ahead of the movement, where you are in contact with the driver or where the driver can see you.

During the movement, you must:

- keep a good lookout
- not pass a block marker without authority
- warn anyone on or near the line about the approaching movement
- if anyone on or near the line appears to be in danger, stop the movement.

You must control the movement so that it is made at a safe speed which will allow you to instruct the driver to stop the movement within the distance that you can see the line is clear.

#### b) Riding in the leading cab or at the leading end

If you are riding in the leading cab or at the leading end of the movement, you must signal to the driver as necessary by:

shunter

- using the bell or buzzer code
- cab-to-cab telephone
- driver-guard communication equipment
- radio
- handsignal.

You must use the warning horn or a portable horn as necessary. In an emergency, you must stop the movement by using the automatic brake.

## 5.4 After each movement

shunter

After each movement, you must make sure vehicles are secured, where necessary, by handbrakes.

You must scotch vehicles which have no handbrake or on which the handbrake is not working. You do not have to do this if the vehicle is attached to other vehicles:

- on which handbrakes can be applied
- which are capable of holding the unbraked vehicle.

If you are shunting vehicles against stationary vehicles, you must secure any vehicles which are to remain at a stand before you make a draw-away movement.

You must not rely on the automatic brake to secure any vehicle.

**5.5** Not used

**5.6** Not used

**5.7** Not used

**5.8** Not used

# 6

## Driving a traction unit from the leading cab

*The person responsible: driver*

You must always drive a light locomotive (single or in multiple), on-track machine or multiple-unit from the leading cab when a shunting movement is:

driver

- within a depot or stabling siding
- proceeding onto vehicles
- approaching buffer stops.

However, you can drive from another cab, as long as a shunter is controlling the movement by radio, and it is not necessary for you to observe signals or handsignals.

You must drive from the leading cab whenever possible when making any other shunting movement. If you cannot do so, you may drive from another cab, providing a shunter can control the movement, as shown in section 5.3 of this module.

# 7 Attaching and detaching vehicles

*The people responsible: driver, shunter*

## 7.1 Not used

## 7.2 Attaching a traction unit to a train or vehicles

driver

You must:

- always stop the traction unit 2 metres (6 feet 6 inches) from the vehicle
- stop again at any distance set out in the instructions for the class of traction unit involved
- if the movement is being controlled by a shunter, move forward only when authorised by the shunter.

## 7.3 Detaching a traction unit or vehicle from a train

shunter

Before detaching a traction unit, you must secure the train. If the train is on a gradient, you must secure it at the lower end.

Before detaching a vehicle from a train, you must secure the vehicle.

You must not rely on the automatic brake to secure the train or vehicle.

driver

Before a dead traction unit is detached from a train, you must make sure it is properly secured.

## 7.4 Not used



## 8

**Movements over points worked by the signaller**

*The people responsible: driver, shunter*

**8.1 Getting the signaller's permission**

Before authorising a movement over points worked by the signaller, you must:

- get the signaller's permission
- check the points are fitting correctly, where possible.

shunter,  
unaccompanied  
driver

**8.2 Not used****8.3 Not used****8.4 Not used**

# 9

## When shunting is completed

*The people responsible: driver, shunter, signaller*

### 9.1 Leaving vehicles in a safe position

shunter,  
unaccompanied  
driver

You must make sure that vehicles are:

- not left on a running line, except as shown in section 9.3
- not fouling any other line
- clear of any points which need to be moved
- left within the protection of any trap points, derailleurs or scotch blocks.

You must also make sure that there is enough room at fouling points for anyone to pass safely between:

- the vehicles which are to be left
- any movement on the adjoining line or siding.

### 9.2 Securing vehicles and traction units

shunter

You must make sure that vehicles are properly secured to prevent them moving.

driver

You must make sure that traction units are properly secured to prevent them moving.

### 9.3 Leaving vehicles or traction units on a running line

shunter

When leaving vehicles on a running line, you must:

- first tell the signaller
- place a red light on the rear end of the vehicles, or on both ends when on a single or bi-directional line.

driver

When leaving traction units on a running line, you must:

- first tell the signaller
- place a red light on the rear end of the traction units, or on both ends when on a single or bi-directional line.

## 9.4 Leaving vehicles or traction units on a dead-end line

When leaving vehicles on a dead-end line which has a red or white light on the buffer stops, you must make sure a light of the same colour is placed on the end of the vehicles which faces approaching movements.

shunter

When leaving a traction unit on a dead-end line which has a red or white light on the buffer stops, you must make sure a light of the same colour is placed on the end of the traction unit which faces approaching movements.

driver

## 9.5 Protecting running lines

To protect running lines, you must make sure that:

- derailleurs are left in the normal position
- scotch blocks, where provided, are placed on the rails.

shunter

## 9.6 Checking that all running lines are clear

If necessary, you must ask the shunter or driver to confirm that all running lines are clear.

signaller

# 10 Additional instructions for shunting within a possession

*The people responsible: driver, shunter*

## 10.1 Headlight on propelling movements

shunter

If there is no fixed headlight on the leading vehicle of a propelling movement, you must place a portable headlight on the leading vehicle before the movement starts.

## 10.2 Before giving a signal to move

shunter

Before giving the driver authority to move, you must make sure that the driver has been given authority to make the movement from:

- the person in charge of the possession (PICOP), or
- the engineering supervisor (ES) if within a work site.

## 10.3 Propelling outside a work site

driver,  
shunter

You must not make propelling movements outside a work site unless the details have been published in the *Weekly Operating Notice* or *Engineering Notice*.

If it is necessary to propel outside a work site when details have not been published, you must ask the PICOP if permission to propel has been given by Operations Control.

Before a movement begins, you must sound a warning by horn or whistle.

## 10.4 Dealing with the electrical train supply (ETS) connections

You must make sure the ETS is switched off or the shore supply is disconnected before:

shunter

- opening the dust caps on cable sockets
- coupling or uncoupling the ETS.

If you can safely reach the connections from alongside the vehicles, you may couple or uncouple them before dealing with the brake pipes.

When coupling or uncoupling the connections, you must make sure the cables do not trail on the ground.

# 11 Loading and unloading rail vehicles during engineering work

*The people responsible: driver, shunter*

## 11.1 Agreeing the requirements

driver,  
shunter

You must come to a clear understanding with the person in charge who is appointed for the safe loading or unloading of moving or stationary vehicles:


- when the person in charge will take over control of movements
- how the movement will be controlled
- when the control of movements will be handed back to the driver or shunter.


## 11.2 During the movement

driver

You must carry out the instructions given by the person in charge.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/T3

# Possession for engineering work in the Central Operating Section

Module T3



Issue 6

Date October 2023



Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 6 October 2023




© Copyright 2022  
Rail for London Infrastructure Limited

This module details the possession arrangements for engineering work.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	

## Contents

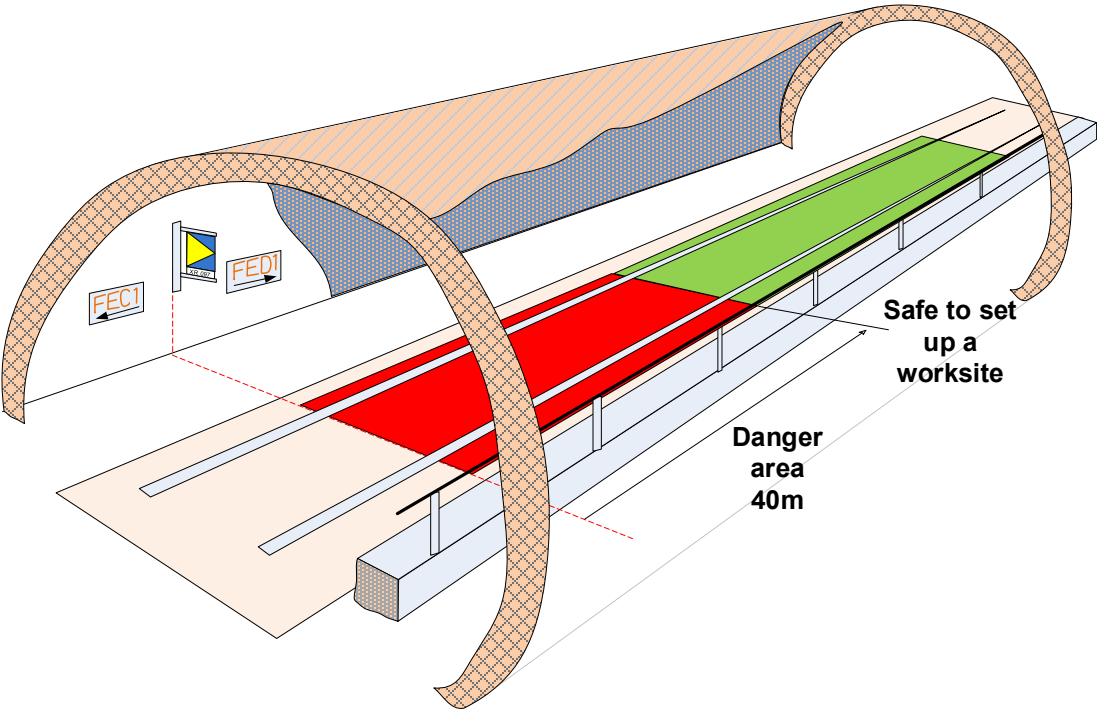
- 1 Definitions**
- 2 Responsibilities**
  - 2.1 Signallers
  - 2.2 Drivers
  - 2.3 Operations control
- 3 Planning a possession**
  - 3.1 Work to be planned
- 4 Taking a possession**
  - 4.1 Types of EPA
  - 4.2 PICOP requesting an EPA to take a possession
  - 4.3 Approving an EPA request
  - 4.4 Granting an EPA request
  - 4.5 Taking a possession around an engineering train
  - 4.6 Carrying out signalling work in the possession
- 5 Movement of engineering trains**
  - 5.1 Entering a possession from a protecting block marker
  - 5.2 Entering the possession at an intermediate point – between work sites
  - 5.3 Entering the possession at an intermediate point - directly into a work site
  - 5.4 Engineering trains leaving a possession
- 6 Change of Personnel**
  - 6.1 Change of PICOP
  - 6.2 Change of signaller
- 7 Giving up a possession**
  - 7.1 Giving up a possession
  - 7.2 If the work is not completed
  - 7.3 Giving up the possession when the HHT is not working
  - 7.4 If the PICOP fails to give the possession up
  - 7.5 Giving up a possession around an engineering train
- 8 Driver's duties**
  - 8.1 Authority for movement of engineering trains

- 8.2 Reaching a clear understanding with others**
  - 8.3 Headlights and tail lamps**
  - 8.4 Indicating work sites within the possession**
  - 8.5 During the movement**
  - 8.6 When a possession is to be taken around one or more engineering trains**
- 9 When the signalling system cannot be used or can no longer be relied on to protect the possession**
- 9.1 If the signalling system fails prior to taking a booked possession**
  - 9.2 If the signalling system cannot be relied on to give protection during the possession**
  - 9.3 If the signalling system cannot be relied upon to give protection during testing and commissioning**

# 1 Definitions

## Danger area

The danger area is 40 metres from the block marker protecting the engineering possession area (EPA).



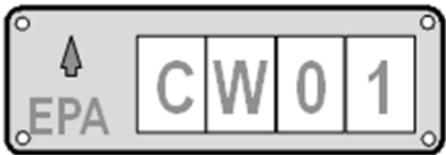
## Driver

This includes an operator of an on-track machine.

## Engineering possession areas (EPAs)

An EPA is a section of line where normal signalling controls are inhibited. An EPA when activated within the signalling system prohibits the normal movement of trains.

EPAs are marked on the line side, they look like this:



### **Engineering supervisor (ES)**

The person responsible for:

- the safety of staff working inside a work site
- authorising the movements of engineering trains and OTMs into a work site
- authorising movements into a work site at an intermediate point
- authorising the movements of engineering trains, OTMs and OTP inside a work site
- authorising OTP to be placed on/removed from the track within a work site
- authorising the movements of OTP

### **Engineering train**

A train used in the transportation of staff, equipment or materials intended to carry out engineering works. The term 'engineering train' also includes on-track machines (OTM) but not on-track plant (OTP)

Unfitted engineering trains can only enter the COS:

- if the possession starts at the NR boundary, or
- are hauled in by a CBTC fitted traction unit.

### **Hand held terminal**

A wireless device which connects to the signalling system allowing pre-programmed possessions and protection to be taken and given up.

### **In-possession movement authority (IPMA)**

An IPMA is an On-Sight Driving Mode and is a sub mode of Protected Manual Mode with a maximum speed limited to 25 mph (40 km/h).

An IPMA is issued by the signaller where an EPA is active.

An indication is displayed on the DMI to enable the driver to recognise when the IPMA has been applied by the signaller.

The driver is required to confirm the mode change to On-Sight Driving when indicated on the DMI.

**Line Clear Verification (LCV)**

A process used in axle counter areas where the PICOP confirms to the signaller that all 'train wheels' have been counted in and out of the possession. This process allows the signaller to use the unconditional reset control for any disturbed axle counters

**On-track plant (OTP)**

Also known as 'in possession only rail vehicles' and includes road-rail vehicles (RRV), rail-mounted maintenance machines (RMMM) and their trailers and attachments with guidance wheels.

OTP can only be on and off tracked within a possession of a siding or in a work site on a running line that is under possession.

**Person in charge of the possession (PICOP)**

The person on the ground who is responsible for:

- on site management of the possession area
- movements of all engineering trains and OTMs inside a possession area but not in a work site
- giving authority to create work sites
- authorising movements into the possession
- authorising movements into the possession at an intermediate point but not in a work site.

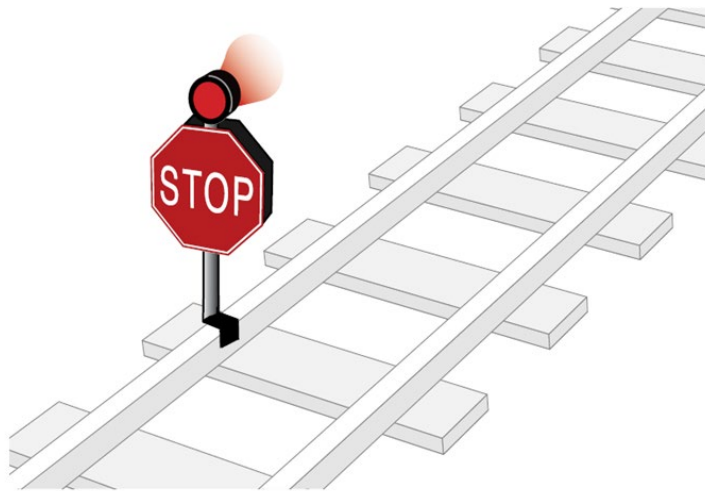
A possession can consist of many work sites but only one PICOP can be responsible for a particular possession.

### **Possession limit board**

Possession limit boards mark the extremities of the possession.

The board is red, double-sided and is visible along the line in both directions.

It will also have a steady or flashing red light visible along the line in both directions. If a PLB is passed without authority, it is a signal passed at danger.



*Possession limit board*

### **Radio frequency identification (RFId) tag**

A radio frequency identification (RFId) tag is a wireless data tag fixed to infrastructure to give a location reference.

### **Temporary speed restriction (TSR)**

A speed restriction which is lower than the permissible speed, and has been imposed by means of Communication-based train control (CBTC) supervision.

### **Work site**

A work site is a section of line within a possession where the work or activity is carried out and is marked by work-site marker boards.



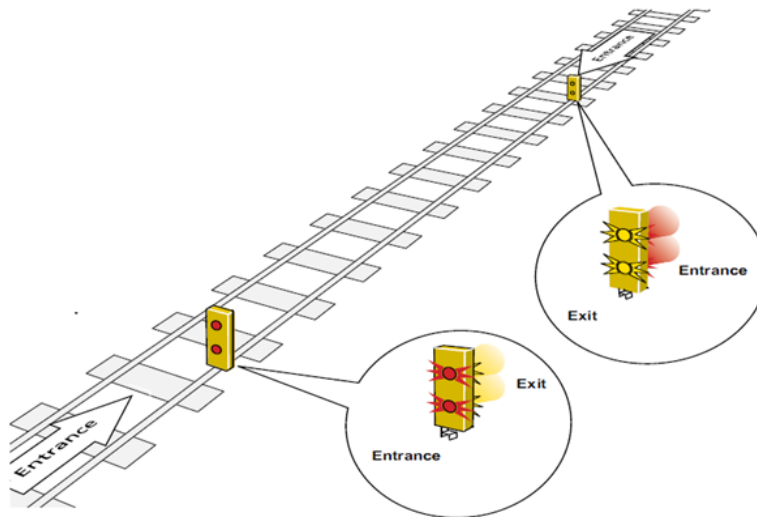
### Work-site marker boards

Work site marker boards (WSMB) mark the extent of work sites within the possession. Each work-site marker board is yellow, double-sided and is visible along the line in both directions.

It has two red flashing lights which indicate an entrance to a work site. The authority of the ES is needed to pass it.

It has two yellow flashing lights which indicate an exit from a work site. The authority of the PICOP is needed to pass it

Both indications must be treated as a stop signal.



## 2 Responsibilities

*The people responsible: driver, signaller*

### 2.1 Signallers

You are responsible for:

signaller

- granting the possession
- setting the points within the possession area to the Normal position before the possession is taken unless requested otherwise by the PICOP
- liaising with the PICOP and drivers in connection with movements into and out of the possession
- accepting the infrastructure back after the possession has been given up.

### 2.2 Drivers

You are responsible for properly controlling your train when acting in accordance with instructions given by the signaller, PICOP or ES.

driver

### 2.3 Operations control



Operations Control are responsible for agreeing and authorising the arrangements for unplanned works with the PICOP and Signaller.

## 3 Planning a possession

*The people responsible: all concerned*

### 3.1 Work to be planned

When it is necessary to carry out engineering work within the COS, the work, including the associated EPA(s) will always be planned in advance and entered into the signalling system.

The plan will identify:

- the extent of the work
- the EPA(s) needed to be created and their unique reference number
- the movement of any engineering trains or OTP associated with the work
- the name of the PICOP
- the name or names of the ES
- the time the possession is to be taken,
- the last train to pass before the possession area is granted
- if the possession area is to be imposed around a stationary engineering train
- if the possession area is to be given up around a stationary engineering train
- the time the possession is to be given up
- and the identity and time the first train to pass after the possession is given up.

If the work extends across more than one running line, sufficient EPAs will be created.



If an isolation of overhead line equipment is necessary, the appropriate arrangements will be planned at the same time.

If the work involves the use of tunnel vent modes and the arrangements that will apply.

If the work will result in the application of a temporary speed restriction on the line after the possession is given up, this will also be planned at the same time.

If an EPA is only created on one line in the open section of line, and the adjacent line is to remain open to traffic, any temporary speed restriction will be planned at the same time.

### Details to be published



Except when a possession must be taken in an urgent situation, details of the possession must be published in the *Weekly Operating Notice* or *Engineering Notice*.

### Changes to published details

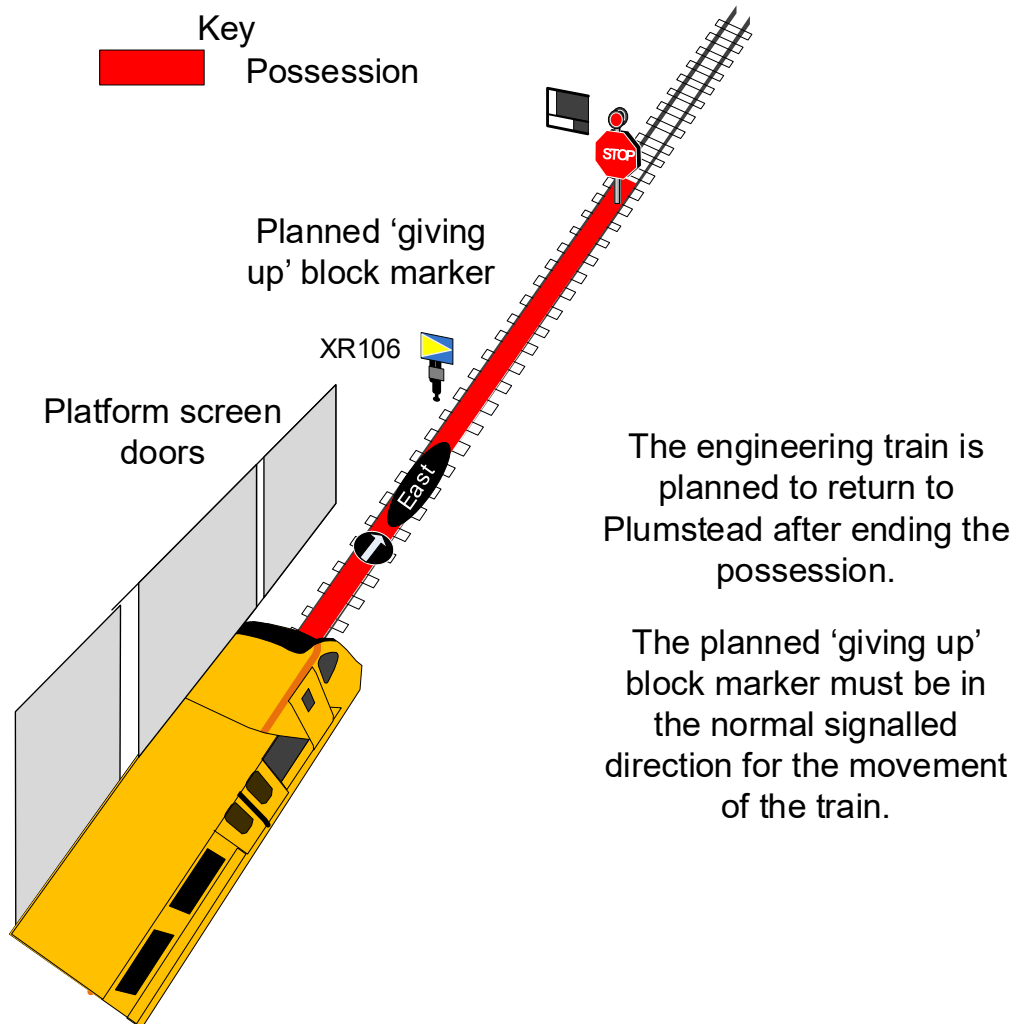


If it is necessary for any of the published details to be changed, this must be agreed between the organisation responsible for the possession and Operations Control.

**Planning for giving up a possession**

When giving up a possession around a train, consider reducing the worksites within the possession so only one worksite contains the engineering train. Any other worksites needed can be placed into a separate possession. The engineering train must have left a worksite before the worksite is handed back.

The block marker that the engineering train is to remain at when the possession is given up should be in the normal signalled direction, with the driver making the initial train movement from the leading end. The block marker should also be at a station so the engineering train driver can easily identify the location.



*Figure 1 showing an engineering train at the planned block marker awaiting the end of the possession.*

## 4 Taking a possession

### 4.1 Types of EPA

signaller

Creation of an EPA is carried out by cooperative action between you and the PICOP.

The granting of an EPA is achieved by electronic communication by the PICOP using the HHT which is electronically recorded.

The EPA will not be created until you have validated the information and granted the possession.

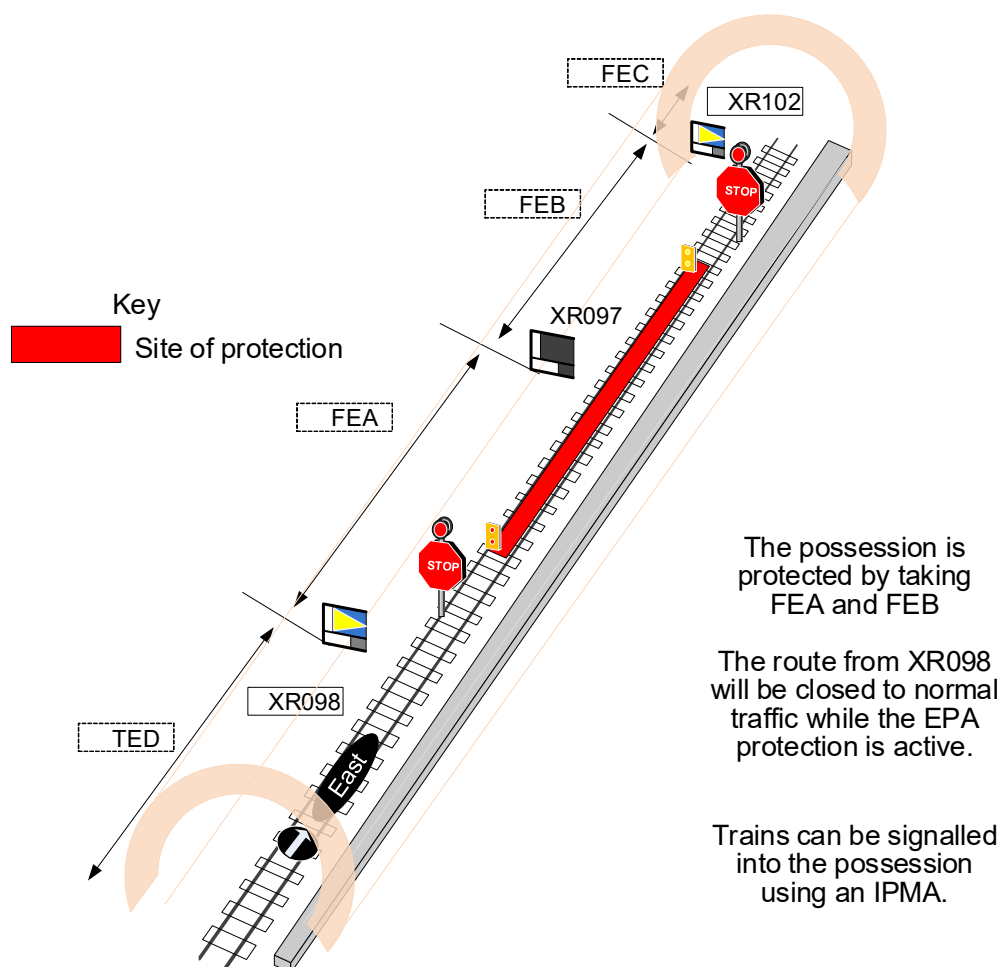


Diagram T3.1

*Simple possession between block marker XR098 and block marker XR102*

A possession can consist of more than one EPA.

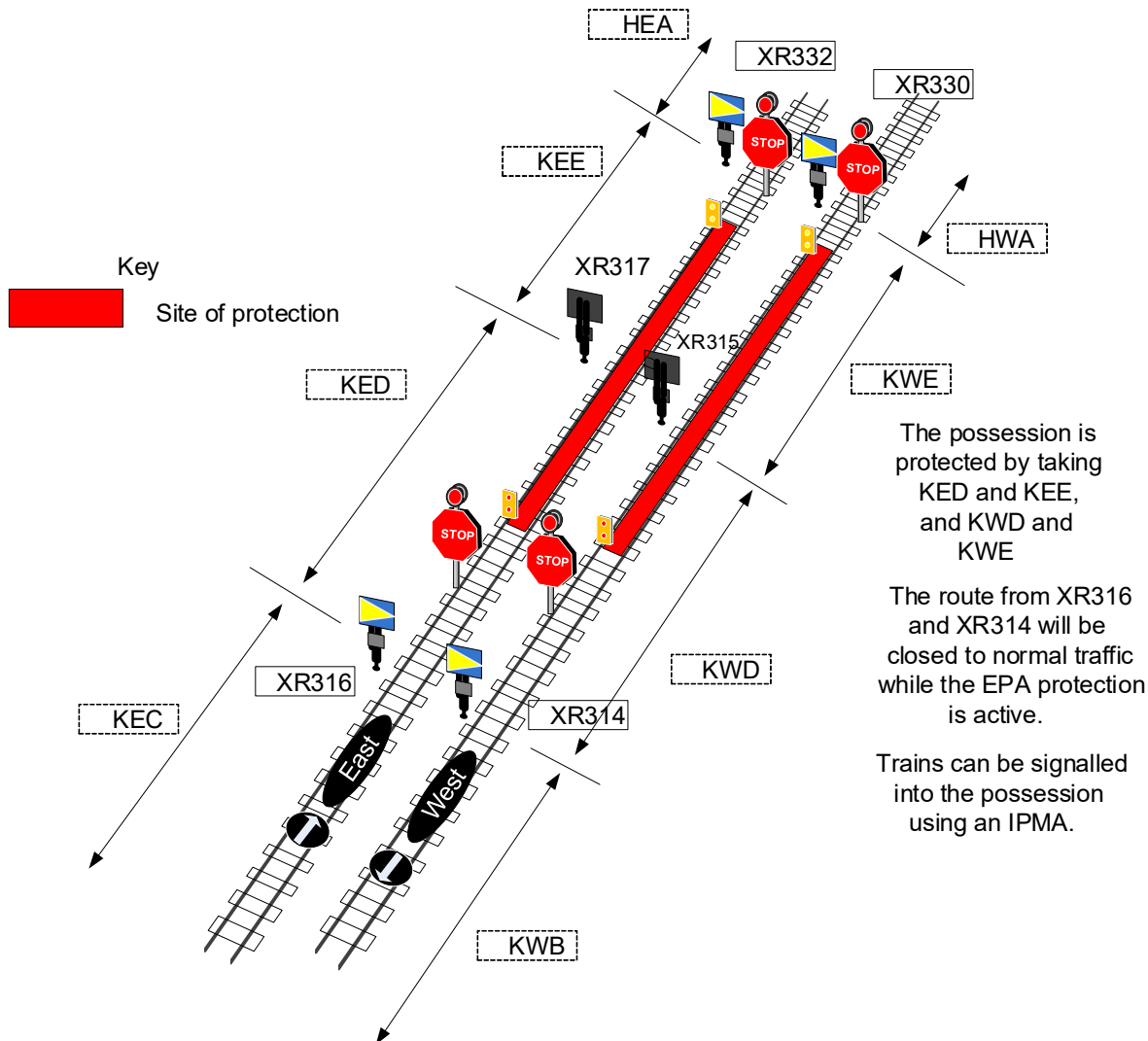


Diagram T3.2

Possession with two EPAs

## 4.2 PICOP requesting an EPA to take a possession

You must check the details against what is shown in the *Weekly Operating Notice* or *Engineering Notice* to make sure that the requested EPA fully covers the area of the work.

signaller

When you and the PICOP are ready to take the EPA, the PICOP will request this by using the HHT.



### 4.3 Approving an EPA request

signaller

You must consider the traffic situation prior to approving the EPA and when the request is made from the PICOP using the HHT you may:

- approve the request, or
- refuse the request, or
- change the request by input to the signalling system.

You must tell the PICOP:

- of any change you make to the planned EPA, or
- the reason if the EPA is refused.

If for any reason the HHT fails during taking of the possession and it is not possible to complete the process, you must:

- get all the necessary details from the PICOP, and
- get permission from Operations Control before using any override controls.

### 4.4 Granting an EPA request

signaller

When the EPA is requested, the PICOP must check the details displayed and any changes on the HHT are correct.

The PICOP will then scan the RFID tag using the HHT to confirm their location.

Before validating the EPA, you must:

- make sure that no route is set towards the EPAs concerned
- no train is inside the EPA unless it is planned to be there
- any additional protection has been implemented.

You must set points within the possession to the normal position unless requested otherwise by the PICOP. Reminder devices must be used, and any points not required in the normal position are locked in their reverse position.

If the conditions are correct you may validate the EPA.

signaller

When you have validated the EPA the PICOP will receive confirmation on the HHT, which the PICOP must acknowledge before allowing work to take place.



**Only when the EPA or EPAs have been validated and the PICOP has completed the Possession arrangements form (CR3198) can you regard the possession as being granted.**

#### 4.5 Taking a possession around an engineering train



**There is no limit to the number of engineering trains or OTM the EPA can be set up or extended around, as long as the details have been published in the *Weekly Operating Notice* or *Engineering Notice*.**

When the possession is to be taken around an engineering train or OTM, you must signal the train concerned normally to the block marker specified in the notices.

signaller

When the engineering train arrives at the specified block marker, you must tell the driver not to move the engineering train again until given instructions by the PICOP or ES after the possession has been granted.

When every engineering train is at its specified block marker you must tell the PICOP.

You must record the details in the Occurrence Log.

#### 4.6 Carrying out signalling work in the possession

You must not allow signalling work to be carried out if it would affect the EPAs protecting the possession.

signaller

# 5 Movement of engineering trains

*The person responsible: signaller*

## 5.1 Entering a possession from a protecting block marker

### Order of trains to be admitted

signaller

If more than one engineering train is to be admitted to the possession the PICOP will tell you the order in which the engineering trains are to be admitted.

### Trains not to enter until authority is given



**After the possession has been granted you must not allow an engineering train into the possession unless the PICOP has given you permission.**

When the PICOP asks you to allow a train into a possession, you must issue an IPMA to the train concerned, and tell the driver to approach the possession limit board (PLB).

If you cannot issue an IPMA, you must carry out the instructions in module S5 *Passing an EoA without an MA*.

### Replacing the PLB

The PICOP must tell you when the PLB has been replaced.

If points are required to be operated for a movement inside a work site, the PICOP or ES will ask you to move them to the required position, if possible.

## 5.2 Entering the possession at an intermediate point – between work sites

Before the PICOP asks you to issue an IPMA for an engineering train to proceed from the protecting block marker towards the PLB, the PICOP will:

signaller

- be at the intermediate point or will make sure a competent person is at the intermediate point to give the instructions to the driver
- make sure a conflicting movement has not been authorised.

The PICOP will tell you:

- when the engineering train has entered the possession
- is clear of the points or crossings
- and the PLB has been replaced.

You must then return the points to the agreed position.

## 5.3 Entering the possession at an intermediate point - directly into a work site

Before the PICOP asks you to issue an IPMA for an engineering train to proceed from the protecting block marker towards the possession, the PICOP will make sure:

signaller

- the ES or a competent person sent by the ES, is positioned at the intermediate point to give the instructions to the driver
- the PICOP or the ES have not authorised a conflicting movement.

The PICOP will tell you:

- when the engineering train has entered the possession
- is clear of the points or crossings
- and the PLB has been replaced.

You must then return the points to the agreed position.

## 5.4 Engineering trains leaving a possession

signaller

You must not allow any engineering train other than a CBTC-fitted engineering train to make a movement between the PLB and the block marker protecting the exit from the possession.

When the PICOP tells you that an engineering train is ready to leave the possession, you must reach a clear understanding with the driver about the movement:

- beyond the PLB and out of the possession, or
- beyond the PLB and through points or crossings that are protecting the possession at an intermediate point.

signaller

You must make sure that the line is clear throughout to the next block marker and safe for the movement to proceed before you authorise the driver to pass beyond the PLB and out of the possession.

To protect the possession, after the movement has left it, you must:

- restore to their original position all points that you have operated for the movement
- close the route protecting the exit from the possession.

The PICOP must tell you when the PLB has been restored.

### **Leaving the possession directly into a siding under possession**

If a movement is to leave your possession directly into an adjacent siding under possession, you must first agree with the PICOP and the PICOS how this is to be done.

## 6 Change of Personnel

*The person responsible: signaller*

### 6.1 Change of PICOP

The PICOP will tell you the name of the new PICOP if there is a change. You must record the details in the Occurrence Log.

signaller

### 6.2 Change of signaller

If you are the new signaller taking duty you must countersign the entries in the Occurrence Log.

signaller

# 7 Giving up a possession

*The person responsible: signaller*

## 7.1 Giving up a possession

### **Giving up the possession - normal arrangements where engineering trains leave the possession**

signaller

When the PICOP is sure the line is safe for the normal passage of trains and is ready to give up the possession, the PICOP will go to a place of safety and input the necessary information into the system using the HHT to do so.

When you are ready to do so, and you are satisfied that the signalling indications are correct, you must accept 'ending the possession'. The signalling system will then confirm the handback to the PICOP.

### **Giving up the possession with restrictions**

If the possession can only be given up with restrictions, the PICOP will ask you to accept the conditions before handing back the possession. You must then make the necessary input to the system to create the restrictions.

If necessary, you must not accept the handing back of the possession until you are satisfied that all appropriate measures have been taken.

You must tell Operations Control of any conditions that have been imposed.

## Revoking an EPA over a faulty track circuit



**You must not revoke an EPA over a faulty track circuit unless you have been authorised by Operations Control to do so, or it is part of a published possession.**

If an EPA cannot be revoked because it is being held by a faulty track circuit, you must get an assurance from the PICOP that the section is safe and clear. Before operating the EPA revoke control, you must tell Operations Control about the restriction, and get authority from Operations Control to operate the EPA revoke control.

signaller

You must record the details in the Occurrence Log.

### 7.2 If the work is not completed

If the work cannot be completed, the PICOP will tell you the reason why.

signaller

If the possession consists of two or more EPAs these can be given up individually to protect work sites that remain.

If necessary, you must agree with the PICOP to impose a new EPA to contain the work which is not finished before giving up the first EPA.

You must only impose the new EPA as shown in section 4.3 of this module.

### 7.3 Giving up the possession when the HHT is not working

If you are told that the HHT is not working when the possession is to be given up, the PICOP will tell you:

signaller

- all work sites have been removed
- the possession limit boards have been removed
- all personnel are clear of the line including them self
- the line is clear and safe to run on
- if any restrictions apply.



**signaller** You must record the details in the Occurrence Log.

You must tell Operations Control what has happened and obtain the necessary authority to use the HHT override controls.

When you have used the HHT override controls and you are satisfied the signalling indications are correct you must:

- record the details in the occurrence log
- tell the PICOP the possession has been given up
- tell operations control.

#### 7.4 If the PICOP fails to give the possession up

**signaller** You must immediately tell Operations Control if at the time the possession is due to be completed, the PICOP does not attempt to use the HHT and you are unable to contact the PICOP by any means at all.



**You must not use any override control until instructed to do so by Operations Control.**

**operations control** You must arrange for the possession to be examined if the signaller tells you that the PICOP cannot be contacted.

You must inform the signaller when the examination has been completed.

**signaller** When you been instructed by Operations Control you must:

- operate the override controls to end the possession
- input any restrictions that may be required
- carry out any other instructions given.

When you have done this and you are satisfied the signalling indications are correct you must:

- record the details in the occurrence log
- tell operations control the possession has ended.

## 7.5 Giving up a possession around an engineering train

You must not give the possession up with an engineering train within an EPA, unless the possession has been published with details telling you which block marker the train is to be left at. The planned block marker must be at station limits. The possession cannot be given up around the train if the planned block marker is not at a station. The engineering train should then leave the possession before it is given up.

signaller

If the possession is to be given up with more than one train remaining, each train must be confirmed at the correct block marker, and there must only be one train in any axle counter section.



**You must not reset any axle counters where a train is occupying the axle counter section until after the possession has been handed back and the train has left.**

If there are any additional restrictions shown on your signalling display within the possession, you must not handback the possession until the PICOP has confirmed to you that the section is clear and safe for trains. If the PICOP cannot confirm that section is clear and safe, you must tell Operations Control that the location must be examined.

You must arrange for the possession to be examined if the signaller tells you that the PICOP cannot be contacted.

operations  
control

You must inform the signaller when the examination has been completed

When you have agreed with the PICOP that the possession can be given up around an engineering train, the PICOP will go to a place of safety and input the necessary information into the system using the HHT to do so.

signaller

When you are ready to do so, and you are satisfied with the signalling indications, you must confirm with the PICOP that any train remaining in the possession is at the block marker published in the Weekly Operating Notice. If possible, confirm that the train is also shown on your display at the correct location.

## Handback of the possession

signaller



**You must not handback the possession around a train unless it is part of a published possession or you have been authorised by Operations Control to do so.**

Before handing back the possession, you must confirm with the driver of each engineering train that they have not isolated CBTC and the train can operate under CBTC supervision.

If the driver cannot confirm this, you must make arrangements for the engineering train to leave the possession as a train with CBTC isolated.

You must tell Operations Control that the possession is to be given up around a train, and get a second competent person to check that the train is at the planned block marker.

You must record the details in the Occurrence Log.

You must accept 'ending the possession'.

The signalling system will then confirm the handback to the PICOP.

## 8 Driver's duties

*The person responsible: driver*

### 8.1 Authority for movement of engineering trains

You must make movements only on the authority of the following personnel.

driver

#### a) Signaller

The signaller must issue an IPMA for you to proceed towards the possession from any point. If it is not possible to issue an MA, the signaller will authorise you to pass an EOA without an MA to:

- proceed from either end towards the PLB
- enter the possession at an intermediate point where your train will be met.

The signaller will give you the necessary instructions to make a movement that must:

- pass through points or crossings that are protecting the possession at an intermediate point when leaving the possession
- proceed beyond the PLB when leaving the possession.

If the possession has been given up around your train, you must make sure that your train is at the block marker shown in the WON or EN, is in the correct CBTC mode for operating on the running line and TPWS is active.

You must confirm your train's location with the signaller before beginning any movements.

The signaller must issue you with a movement authority or authorise you to pass an EOA without an MA.



All movements described in section 8.1 a) are restricted to engineering trains fitted with CBTC.

**b) PICOP****driver**

The PICOP (or competent person on the PICOP's behalf) will authorise you to make a movement that is required to:

- pass through points or crossings that are protecting the possession at an intermediate point when entering the possession but not into a work site
- enter or leave the possession from or to a siding that is also under possession
- pass the WSMB at the exit from a work site; this will be showing two yellow flashing lights
- move between work sites.

The PICOP will wear an armlet on the left arm, or a badge on the upper body, with PICOP in red letters on a yellow background.

**c) Engineering supervisor (ES)**

The ES (or a competent person on the ES's behalf) will authorise you to:

- make a movement past a WSMB into a work site; this will be showing two flashing red lights
- make a movement within a work site
- enter the possession at an intermediate point directly into a work site.

The ES can permit a person to travel in your cab to give you instructions about the working of your train while loading or unloading.

The ES will wear an armlet on the left arm, or a badge on the upper body, with 'ES' shown in blue letters on a yellow background.

## 8.2 Reaching a clear understanding with others

You must reach a clear understanding with the person authorising the movement as to:

driver

- what you must do
- how far the movement is to proceed.

## 8.3 Headlights and tail lamps

If the train is detained between two work sites, you must make sure that:

driver

- a red light is showing at both ends of the train
- the headlights are switched off.

## 8.4 Indicating work sites within the possession

A WSMB will be placed in the 'four-foot' at each end of the work site.

driver

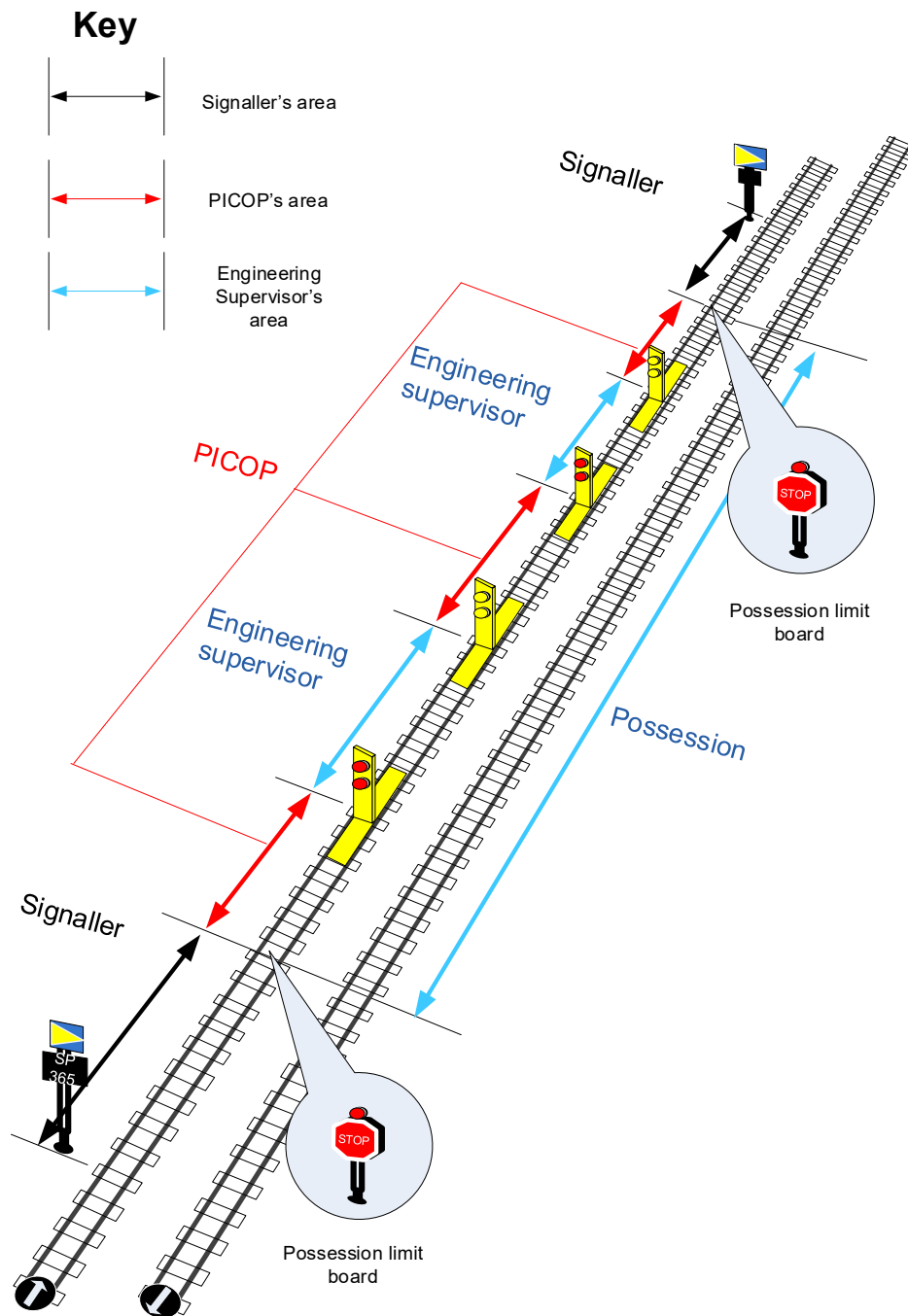


Diagram T3.3

**Positioning of PLBs and work-site marker boards**

driver

The WSMB for one work site will be no closer than 100 metres from the WSMB of another work site.

If a WSMB or a PLB is passed without authority, it is a signal passed at danger.

## 8.5 During the movement

### a) Making the movement

You must make the movement at caution and not exceed 20 mph (30 km/h) at any point in the journey when entering, making a movement within, or leaving the possession.

driver

The PICOP, when authorising the movement between work sites, will tell you the location of any permissible or temporary speed restriction lower than 20 mph (30 km/h) on the portion of line concerned and you must not exceed these speeds.

You must:

- make sure you are given specific instructions by the ES on the maximum speed to be applied
- be prepared to stop before reaching a handsignal that is being displayed.

You can use GSM-R radio to speak at any time about details of the movement being made.

You must also carry out the instructions shown in module S5 *Passing an end of authority (EoA) without a movement authority (MA)*.

When vehicles are being loaded or unloaded, you must also carry out the instructions shown in module SS2 *Shunting*.

### b) Passing a block marker within the possession

You must not pass a block marker within the possession unless you are authorised to do so by the PICOP or ES.



## 8.6 When a possession is to be taken around one or more engineering trains

### a) Conditions

driver

If the arrangements have been published, the signaller can grant a possession to the PICOP when your train is standing at a block marker on the line on which the possession is to be taken.

The block marker this applies to will be shown in the *Weekly Operating Notice* or *Engineering Notice*.

### b) Proceeding to the specified block marker

Your movement to the specified block marker will be signalled under normal arrangements.

### c) Arriving at the specified block marker

When your train arrives at the specified block marker, the signaller will instruct you to make no further movement until you are authorised by the PICOP or ES, as appropriate.

## 9 When the signalling system cannot be used or can no longer be relied on to protect the possession

*The person responsible: signaller*

### 9.1 If the signalling system fails prior to taking a booked possession

signaller

If you are unable use the signalling system to take a possession, you must immediately tell Operations Control about the problem and carry out any further instructions you are given.

You must also tell the PICOP about what has happened.

### 9.2 If the signalling system cannot be relied on to give protection during the possession

If the signalling system can no longer be relied on to protect the possession, you must:

signaller

- immediately tell Operations Control about the extent of the failure
- not allow any movements within the affected area
- tell the PICOP stop all engineering trains or OTP and not allow any further movements within the possession
- carry out any further instructions given to you by Operations Control.


### 9.3 If the signalling system cannot be relied upon to give protection during testing and commissioning


Planned updates to the signalling system may require the S&CS to be taken offline, and normal protection functions will not be available. Under such circumstances, you will be provided with special operating instructions.

signaller

**signaller** Protection may be provided by a combination of possessions on Network Rail infrastructure, signalling restrictions imposed and/or signal protected zone instructions.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/T10

# Duties of a Designated Person (DP) and people working on rail vehicles

## Module T10



Issue 3

Date December 2022

Comes into force 7<sup>th</sup> January 2023

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)




First Issued October 2019  
Issue 3, December 2022

© Copyright 2022  
Rail for London Infrastructure Limited

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module if you carry out the duties of a:

- designated person
- person working on a rail vehicle

Conventions used in the Rule Book	Examples
A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.	
Purple text in the margin indicates who is responsible for carrying out the rule.	<b>Signaller</b>
A white i in a blue circle indicates that information is provided.	
A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.	

## Contents

- 1 Definitions**
- 2 Competence**
- 3 Duties of people working on rail vehicles**
  - 3.1 Working alone
  - 3.2 Before starting work on a rail vehicle
  - 3.3 If vehicle protection is not in place
  - 3.4 If vehicle protection is already in place
  - 3.5 During the work
  - 3.6 When the work is suspended or has been completed
  - 3.7 Walking to or from a failed train on a running line
- 4 General duties of a DP**
  - 4.1 Before allowing work to start
  - 4.2 Moving a vehicle that is being worked on
  - 4.3 Working on a train on a running line including at a station platform
- 5 DP arranging line protection for a siding**
  - 5.1 Before placing line protection a siding
  - 5.2 Line protection for all of a siding
  - 5.3 Line protection for part of a siding
  - 5.4 Withdrawing the line protection
- 6 DP arranging to block an adjacent running line**
  - 6.1 Blocking an adjacent running line
  - 6.2 Agreeing the arrangements
  - 6.3 When the signaller has stopped trains
  - 6.4 During the work
  - 6.5 When the work is suspended or has been completed
- 7 DP walking with a group to or from a failed train on a running line**
  - 7.1 Deciding which line to block
  - 7.2 When trains have been stopped
  - 7.3 Arriving at the failed train
  - 7.4 Returning from the failed train
  - 7.5 Arriving at the access point



**8 Working on a rail vehicle on a running line or siding under possession**

**8.1 Before allowing work to start**

**8.2 When the work is suspended or has been completed**

# 1

## Definitions

The following definitions are used in this module.

### Depot

A depot is a building or buildings in which train maintenance, servicing or repair takes place. This also includes any sidings within the depot boundary.

### Designated person

A designated person (DP) is the person who is responsible for setting up line protection so that people working on rail vehicles will be protected from train movements.

A DP can be in charge of a group of people or can work alone. When working alone, a DP must also carry out the duties of a person working on rail vehicles.

### Local instructions

Local instructions may be published by Network Rail in the *Sectional Appendix*, or by the operator of the depot.

These local instructions may modify the arrangements shown in this module for the protection of staff.

### Working on rail vehicles

The instructions within this module must be applied when people who are working on rail vehicles may be in danger from train movements.

Examples of working on rail vehicles may include:

- maintenance work
- repair work, or
- servicing.

## 2 Competence

*The person responsible: designated person*

To act as a DP you must have with you a valid DP certificate of competence issued by your employer.

DP

## 3 Duties of people working on rail vehicles

*The person responsible: person working on a rail vehicle*

### 3.1 Working alone

person  
working on  
a rail vehicle

You must not work alone on a rail vehicle unless a DP has made the arrangements for your protection.

### 3.2 Before starting work on a rail vehicle

person  
working on  
a rail vehicle

You must get confirmation from the DP that line protection has been provided for the line or siding and that it is safe to start work.

You must not start any work that may foul an adjacent line or siding until you have confirmation from the DP that line protection has been applied to that line or siding.

### 3.3 If vehicle protection is not in place

person  
working on  
a rail vehicle

If you are the first person to start work on a rail vehicle, you must arrange to apply vehicle protection to that vehicle or vehicles.

The vehicle protection must consist of a NOT TO BE MOVED board or a red flag or red light.

You must place this vehicle protection at the end of the last vehicle in the direction from which any other vehicle might approach.

If vehicle protection is to be placed at both ends, you must place it on diagonally opposite corners. However, if there is a running line immediately adjacent to the vehicle, you must place the vehicle protection on the side furthest from the running line.

The instructions in this section 3.3 do not apply on running lines including platform lines where it will be the DP who places the vehicle protection as shown in section 4.3.

person  
working on  
a rail vehicle

After applying the vehicle protection, you must place your personal identification on it.

### 3.4 If vehicle protection is already in place

If you are not the first person to work on the rail vehicle, before you start work, you must place your personal identification on the vehicle protection already in place.

person  
working on  
a rail vehicle

### 3.5 During the work

You must not move the vehicle or allow any other vehicle to make contact with it. If you need the vehicle to be moved, you must tell the DP.

person  
working on  
a rail vehicle

### 3.6 When the work is suspended or has been completed

You must tell the DP when work that may foul an adjacent line or siding has been completed.

person  
working on  
a rail vehicle

When you have suspended or completed your work on the vehicle, you must remove your personal identification from the vehicle protection.

You must not remove anyone else's personal identification.

You must tell the DP that your work is suspended or has been completed.

If you are the last person to remove your personal identification, you must check with the DP that it is safe to remove the vehicle protection.

### 3.7 Walking to or from a failed train on a running line

person  
working on  
a rail vehicle

You may be asked to walk along a running line where there is no safe walking route so you can reach or return from a failed train.

You must not do this unless a DP or a controller of site safety (COSS) is present to take charge of the arrangements for your safety and you have received a briefing from them.

## 4 General duties of a DP

*The person responsible: designated person*

### 4.1 Before allowing work to start

Before allowing work to take place on the outside of a rail vehicle or ladders to be erected within a vehicle, you must have arranged line protection as described in this module.

DP

If the work will foul an adjacent siding, you must also arrange line protection for that siding.

If the work will foul an adjacent running line, you must arrange protection with the signaller for that running line.

You must brief anyone under your control about the arrangements that you will make for their safety.

### 4.2 Moving a vehicle that is being worked on

If it is necessary to move a vehicle that is being worked on, you must first make sure:

DP

- the vehicle is safe to be moved
- everyone who is affected is told
- everyone is in a safe position
- all vehicle protection placed on that vehicle is removed.

### 4.3 Working on a train on a running line including at a station platform

On your arrival, you must report to the driver and if working at a station report to platform staff (if present).

DP

You must reach a clear understanding about the actions to be taken.

DP

You must place vehicle protection, consisting of a NOT TO BE MOVED board or a red flag or red light, on the side of the train at the end from which the train is being driven.

You must place the vehicle protection at both ends of the train if:

- the driver is not present and the train can be driven from either end
- vehicles might be shunted from that end onto those on which work will take place.

When at a station you must place the vehicle protection on the platform side of the train.

You must not remove the vehicle protection until the work is completed.

When the work has been completed, you must tell the driver and platform staff (if present).





# 5 DP arranging line protection for a siding

*The person responsible: designated person*

## 5.1 Before placing line protection a siding

You must get permission from the person in charge of the siding or, where necessary, the signaller, before arranging line protection. DP

If movements can enter the siding from either end, you must arrange the line protection at both ends.

## 5.2 Line protection for all of a siding

You must get confirmation from the signaller that the points will be kept in the position to prevent movements entering the siding. DP

## 5.3 Line protection for part of a siding

If it is not possible to arrange line protection for all of the siding as shown in section 5.2, you must place a red flag or red light or a possession limit board in the four-foot of the siding concerned, so that it can be clearly seen by an approaching movement. DP

## 5.4 Withdrawing the line protection

You must not withdraw the line protection arrangements that have been put in place until you are sure that the work has been suspended or completed. Only you may withdraw the line protection. DP

## 6 DP arranging to block an adjacent running line

*The person responsible: designated person*

### 6.1 Blocking an adjacent running line

DP You must make sure any adjacent running line is blocked to train movements if:

- the distance between the outside rail of the line the vehicle is on and the nearest rail of the adjacent running line is less than 3 metres (approximately 10 feet), and
- work needs to be carried out on the side of the vehicle nearest to the adjacent running line.

### 6.2 Agreeing the arrangements

DP You must agree with the signaller what you want to do. The arrangements must include:

- the exact location
- the line to be blocked
- how long will be needed.

### 6.3 When the signaller has stopped trains

DP When the signaller tells you that the line is blocked, you will also be told which other lines will stay open to traffic.

You must not allow anyone under your control to start work until you have briefed them about:

- the arrangements you have made
- any known hazards
- the tasks.

### 6.4 During the work

You must take care that neither you nor anyone under your control moves out of the safe area. You must tell the signaller if your work will take longer than agreed.

DP

### 6.5 When the work is suspended or has been completed

When the work is suspended or is completed, you must:

DP

- make sure everyone is in a safe position, and then
- tell the signaller that you no longer need the line to be blocked.

# 7

## DP walking with a group to or from a failed train on a running line

*The person responsible: designated person*

### 7.1 Deciding which line to block

DP

If you need to walk as a group along a running line to or from a failed train and there is no safe walking route available, you must arrange for trains to be stopped.

If you can clearly identify your location to the signaller and you are sure of the line the failed train is on, you will only need to block the line that will provide a safe walking route to the failed train.

If you are not sure of your location or that of the failed train, you must arrange for all lines to be blocked. If the signaller is not able to arrange for all lines to be blocked, you must ask for a COSS to attend, who will make alternative arrangements.

### 7.2 When trains have been stopped

DP

When the signaller tells you that the line is blocked, you will also be told which other lines will stay open to traffic.

The signaller will give you an authority number.

You must not allow anyone under your control to start walking until you have briefed them about:

- the arrangements you have made
- the location of the failed train
- where to walk
- any other known hazards.

### 7.3 Arriving at the failed train

When you arrive at the failed train, you must report to the driver and agree what is to happen.

DP

When you and your group are in a safe position, you must tell the signaller that you have arrived and no longer need the line to be blocked.

If you need an adjacent line to be blocked during the work, you must make separate arrangements with the signaller for the line concerned to be blocked, as described in section 6.

### 7.4 Returning from the failed train

You must decide whether the group is to travel on the failed train or will walk to the access point.

DP

If you are to walk to the access point, you must carry out the instructions shown in sections 7.1 and 7.2.

### 7.5 Arriving at the access point

When everyone has reached the access point and all of your group are in a safe position, you must tell the signaller that you no longer need the line to be blocked.

DP

You must tell the signaller the authority number you were given.

## 8

## Working on a rail vehicle on a running line or siding under possession

*The person responsible: designated person*

### 8.1 Before allowing work to start

DP

Before allowing work to take place on the outside of a rail vehicle, you must arrange for the line protection to be provided, as described below.

You must not allow any work to start until you have been told that line protection has been provided.

If it is necessary to work on any item of on-track plant (OTP) on a line or siding that is under possession, you must ask the machine controller (MC) to arrange this.

#### **Line protection on the running line that the vehicle is standing on**

If the line is under possession, but the vehicle is not within a work site, you must ask the person in charge of the possession (PICOP).

If the line is under possession, and the vehicle is within a work site, you must ask the engineering supervisor (ES).

#### **Line protection on a siding that the vehicle is standing on**

If the siding is under possession, you must ask the person in charge of the siding possession (PICOS).

#### **Line protection on an adjacent running line**

You must make sure any adjacent running line or siding is blocked to train movements if:

- The distance between the outside rail of the line the vehicle is on and the nearest rail of the adjacent line is less than 3 metres (approximately 10 feet), and
- Work needs to be carried out on the side of the vehicle nearest to the adjacent running line.

If the adjacent line is under possession, you must ask:

DP

- the PICOP of that possession, if the portion of the adjacent line is not within a work site
- the ES from that possession, if the portion of an adjacent line is within a work site
- the MC, if work is to take place on an item of OTP
- the PICOS, if the vehicle is within a siding possession.

If the adjacent line is not under possession, you must ask:

- the PICP, if the line on which the vehicle is standing is under possession
- the PICOS, if the vehicle is standing on a siding under possession
- the MC, if work is to take place on an item of OTP.

### **Line protection on an adjacent siding**

If an adjacent siding is under possession, you must ask the PICOS.


## **8.2 When the work is suspended or has been completed**


When the work is suspended or is completed, you must:

DP

- make sure everyone is in a safe position, and
- then tell the person who has arranged the line protection that you no longer need the line or siding to be blocked.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS



# General signalling regulations in the central operating section

## Module TS1



Issue 9

Published Friday 6th August 2024

In force from 31st August 2024

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquires on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 8, August 2024

© Copyright 2024  
Rail for London Infrastructure Limited

This module details the general signalling regulations for the Elizabeth Line central operating section.



The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this entire module if you carry out the duties of an RfLI signaller.

You will need sections 1, 2, 3, 7, 9, and 11 of this module if you carry out the duties of RfLI Operations Control.

You will need section 3 of this module if you carry out the following duties.

- An RfLI signaller.
- RfLI Operations Control.
- RfLI track staff, including:
  - Incident Response Managers (IRMs)
  - infrastructure staff

Conventions used in the Rule Book	Examples
Issue 9 of TSI has been thoroughly revised throughout, with changes and updates to almost every section. Therefore, a black line is NOT provided to show updates.	
Green text in the margin indicates who is responsible for carrying out the rule.	Signaller
A white i in a blue circle indicates that information is provided.	
A black exclamation mark in a yellow circle is considered to be critical and is therefore emphasised in this way.	

# Contents

1	Working in the RCC	3
1.1	Principles	3
1.2	Recording the Occurrence log	4
1.3	Change of signaller	5
2	Accidents and incidents: reporting procedures	6
2.1	Telling Operations Control about accidents or incidents	6
2.2	Telling adjacent operational control centres about incidents	6
2.3	Dangerous goods incidents	8
2.4	Irradiated fuel flasks	9
2.5	Making sure the incident does not escalate	10
3	Line blocks and safety of personnel	11
3.1	Line block general provisions	11
3.2	Using the signalling equipment to protect line blocks	17
3.3	Emergency protection	27
3.4	Pre-determined line blocks (PDLBs)	29
3.5	Protection using a train	31
3.6	Taking possession of the maintenance siding at Plumstead	37
3.7	Personnel working on vehicles in sidings	39
4	Working of signalling equipment	41
4.1	General provisions	41
4.2	Checking and testing equipment	43
4.3	Using reminder appliances	44
4.4	Using the service hold function	46
4.5	Bi-directional opposing moves to and from the GEML	48
4.6	Withdrawing a Movement Authority (MA)	49

5	Emergency stops	50
5.1	Emergency stop areas	50
5.2	Emergency stop plungers	51
6	Working of points	53
6.1	Movement of vehicles carrying passengers over points	53
6.2	Trap points	53
7	Train movements	54
7.1	Regulating trains	54
7.2	Additional instructions	55
7.3	Network Rail interfaces	56
7.4	North Kent Line specific instructions	56
8	Out-of-gauge loads and trains affected by route restrictions	59
8.1	Being aware of out-of-gauge loads and trains affected by route restrictions	59
8.2	Dealing with an out-of-gauge load	59
8.3	Blocking an adjacent line	61
8.4	Signalling an out-of-gauge load	61
8.5	Signalling a train that has route restrictions	61
9	Broken rails and bridge strikes	62
9.1	Broken, distorted or damaged rails or broken fishplates	62
9.2	Bridge strikes	64
10	Trespassers, animals or minor obstacles on the line	71
10.1	Reports of trespassers	71
10.2	Confirmation of a trespasser in a tunnel	72
10.3	Animals and minor obstacles	72

# Contents

11	GSM-R calls	74
11.1	Actions following an railway group emergency call (REC)	74
11.2	GSM-R cautioning on the move	74
12	Stop and examine train	77
12.1	When this regulation must be used	77
12.2	Anything unusual or wrong with a train	78
12.3	After the train has stopped	79
12.4	If the train cannot be dealt with	80
12.5	Door open on a passenger train	80
13	Examining the line	81
13.1	When the line is to be examined	81
13.2	Before an examination using a train can start	81
13.3	Dealing with the train that will be used to examine the line	83
13.4	Signalling the train being used to examine the line	83
13.5	Resuming normal working	84
13.6	When an axle counter section or track circuit fails to clear or shows occupied for some other reason	84
14	Train an unusually long time in section	87

## I Working in the RCC

### I.1 Principles

#### I.1.1 Safe operation of the workstation

You are responsible for the safe operation of the workstation that you are working.

Signaller

#### I.1.2 If another signaller is not working correctly

You must immediately tell Operations Control if any other signaller is not correctly carrying out any rules, regulations, or instructions.

Signaller

#### I.1.3 Rules, regulations, and publications

When on duty, you must have with you a copy of or access to the rules, regulations, and instructions that you have been issued with.

All  
concerned

You must sign for any publication or amendment issued to you on a personal basis. You must make sure you receive amendments to your publications and update them as appropriate.

If you lose a publication you must ask your manager to give you another copy.

It is your responsibility to clearly understand the content of the publications issued to you, so that you have a thorough knowledge and understanding of the requirements.

#### I.1.4 Keeping equipment readily available

You must keep equipment that might be needed in an emergency readily available.

All  
concerned

Signaller

## 1.1.5 Using unauthorised equipment

You must not use personal audio or video equipment on the operations floor without the permission of your manager; this includes the use of mobile telephones, laptops, tablets, and game consoles.

All  
concerned

## 1.1.6 Keeping the RCC and equipment clean and tidy

You must keep the RCC and equipment clean and tidy.

## 1.2 Recording the Occurrence log

Signaller

### 1.2.1 General

You must:

- Make an appropriate entry in the Occurrence Log of any unusual incident and other items as shown in the Central Operating Section (COS) Rule Book and Train Signalling Regulations, and
- Sign this entry and record the time.

If you are another signaller in the RCC, you must countersign the entry if it affects you.

You must write, legibly and in pen using blue or black ink.

Signaller

### 1.2.2 Incorrect entries

If you make an incorrect entry, you must draw a line through it lightly and make the correct entry either below or above it so the original entry can be clearly seen.

Signaller

### 1.2.3 Recording tests made

Where rules or instructions require you to test equipment, you must record the details in the Occurrence Log.

Signaller

### 1.2.4 Recording times in the Occurrence Log

When you are making an entry, you only need to record times to the nearest minute.



### 1.2.5 Keeping the occurrence log and operational forms

Completed Occurrence Logs and operating forms must be kept safely in the RCC until withdrawn by the line manager.

Signaller

## 1.3 Change of signaller

### 1.3.1 Taking duty

If you are taking duty, you must:

Signaller

- Make sure you receive all necessary information.
- Sign the occurrence log with the words 'on duty at ..... hours'.

When signed on duty, you are only permitted to operate the workstation you are allocated.

### 1.3.2 Going off duty

When going off duty, you must:

Signaller

- Make sure the signaller taking over is in a fit condition to take duty.
- Tell the signaller taking over whether the equipment is in order, about any unusual incidents, and any other necessary information.
- Sign the occurrence log with the words 'off duty at..... hours' immediately below the last entry.
- Leave the RCC immediately when the new signaller has signed the Occurrence Log and has taken over.

### 1.3.3 If your relief does not arrive

You must tell Operations Control if the signaller due to take over from you has not arrived by the correct changeover time.

Signaller

## **2 Accidents and incidents: reporting procedures**

### **2.1 Telling Operations Control about accidents or incidents**

Signaller

You must report any mishaps, delays, irregularities, and equipment failure likely to affect safety or punctuality to Operations Control.

You must also report any failures of signalling equipment, track, structures, electrical, telecoms and radio equipment to Operations Control, even though local staff may already be aware of that failure.

You must make sure incidents are faulted on the S&CS (Signalling & Control System) (if applicable).

### **2.2 Telling adjacent operational control centres about incidents**

#### **2.2.1 Main provisions**

Signaller,  
Operations  
Control

In areas adjacent to, or on the approach to, railway lines controlled by another operational control centre, you must immediately tell the appropriate signaller or operations control about the following circumstances.

- If you become aware of an incident, accident, or unusual event, which could affect a line under their control.
- If it is necessary for passengers to be detained under supervision, or
- If information is received that passengers are self-evacuating from the train.

Signaller,  
Operations  
Control

You must come to a clear understanding on what action each operational control centre will take, and who you will be contacting.

If a train is detained or is likely to be detained for more than five minutes in areas adjacent to or on the approach to running lines controlled by another operational control centre, you must tell the appropriate signaller or operations control as soon as possible.

Signaller,  
Operations  
Control

## 2.2.2 Where these provisions apply

Areas adjacent to, or on the approach to, railway lines controlled by another operational control centre includes the following locations.

Signaller,  
Operations  
Control

- Between Plumstead and Abbey Wood (adjacent to the North Kent Line) – you must speak to the Ashford IECC signaller and Network Rail Kent Route Control.
- Between Liverpool Street and Puddling Mill Lane (approaching the Great Eastern Main Line) – you must speak to the Liverpool Street IECC signaller, Network Rail Anglia Route Control, and Docklands Light Railway control.
- Between Paddington and Westbourne Park (approaching the Great Western Main Line) – you must speak to the Thames Valley Signalling Centre, Network Rail Western Route Control, and London Underground control.

Signaller

### 2.3 Dangerous goods incidents

If a dangerous goods incident occurs, you must stop the passage of trains on all lines at the location, making sure you do not bring trains to a stand in the immediate area of the dangerous goods vehicles, unless there is no damage to the wagon, tank, container, or flask.

You must pass the information you have received from the traincrew to Operations Control using the message prefix: **'This is a rail dangerous goods emergency.'**

This information must include:

- The train reporting number, if appropriate.
- Where and when the incident happened.
- The wagon types and numbers, if known.
- The position of the wagons on the train or in the siding.
- As many details of the incident as possible.
- Whether any railway personnel or members of the public are involved.
- The six-character 'Emergency Code', made up of four numbers followed by two letters.



The four-figure 'United Nations number' identifies the substances in the vehicle and the two-letter alpha code allows Operations Control to identify which number to use for specialist assistance.

More information about dangerous goods can be found in the Railway Group Standard RS524 List of Dangerous Goods and their United Nations Number.

If there is any doubt whether dangerous goods are involved, you must tell Operations Control immediately. If possible, you must give Operations Control the position in the train of the vehicles concerned.

## 2.4 Irradiated fuel flasks

If an incident involves an irradiated fuel flask, you must make sure that the report from the traincrew includes answers to the following questions in the order shown. Each question must be answered 'Yes' or 'No'.

Signaller

1	Is the flask wagon derailed?	Yes/No
2	Has the flask wagon been involved in a collision?	Yes/No
3	Is there a fire near the flask?	Yes/No
4	Are large quantities of liquified petroleum gas, petroleum or other flammable liquids present?	Yes/No
5	Is there any visible damage to the flask or to the cover (if fitted)?	Yes/No

If the answer to any of the questions is 'Yes', you must stop the passage of trains on all lines at the location. However, you must not stop trains in the immediate area of the irradiated fuel flasks.

You must immediately pass this information to Operations Control in the same order.

## 2.5 Making sure the incident does not escalate

Signaller



Due to the intensity of the train service a train incident within the COS, especially within the single bore tunnels can quickly escalate causing secondary incidents.

You must make every effort to stop any incident from escalating. You must take into consideration what actions are to be taken. This may include for example:

- Applying a station hold at all stations.
- Stopping trains from entering the single bore tunnels.
- Whether it is likely passengers will need to be evacuated.
- How the tunnel ventilations system will react.
- Applying an appropriate line block as shown in the next section.

This is not a definitive list.

## 3 Line blocks and safety of personnel

### 3.1 Line block general provisions

#### 3.1.1 When this regulation must be used

Unplanned line blocks may only be granted for the following reasons.

All  
concerned

- During an emergency.
- For incident management.
- For infrastructure fault management and rectification.
- For infrastructure asset critical compliance, using visual inspection or approved hand tools only, when authorised by Operations Control.
- To carry out a manual tunnel sweep.
- For train incidents and failures, including checking that working equipment on an engineering train or maintenance vehicles is correctly positioned.
- For retrieving items dropped onto the track.
- A driver asks to block a line for their personal safety to walk around their train.
- A designated person (DP) needs to walk with a group to a train stopped on a running line because of failure or another incident.
- A competent platform screen door maintainer requests protection from trains when cycling and inspecting platform screen doors.
- For training, mentoring, and competence retention.

The person asking the signaller for protection by using a line block is referred to as the requestor.

All  
concerned



In an emergency, the signaller must immediately carry out whatever actions are necessary to protect the safety of the line, save lives, and minimise risks.

The requestor and signaller will agree what type of line block they intend to use. The type of line block to be used depends on the circumstances of the incident and who is requesting the line block.

The requestor and signaller must select the safest and most appropriate type of line block for the circumstances, depending on the urgency of the situation.

The requestor and signaller must ensure the safety of the staff obtaining track access as well as minimising wider risks to the safe operation of the railway, such as avoiding unnecessarily stranding and delaying trains.

Unless immediate action is required, the signaller will then get authority from Operations Control to use the proposed line block.

The types of line block are:

- Creating Engineering Possession Area (EPA) protection.
- Emergency protection.
- Pre-determined line blocks.
- Protection using a train.
- Working in sidings.



### 3.1.2 Position of trains inside line blocks

The signaller must not grant a line block if engineering traffic, including on-track plant (OTP), on-track machines (OTM), and engineering trains, are to occupy the line alongside personnel for maintenance and engineering work. The signaller and engineering staff must carry out the instructions in module *T3 Possession of a running line for engineering work* in these circumstances.

All  
concerned

If a train or multiple trains have failed or been involved in an incident or accident, and the signaller has made sure with each driver that their trains will not be moved, the signaller may grant a line block with the trains still occupying the line.

A train can be used to provide protection as shown in section 3.5.

### 3.1.3 Confirmation with other Signallers

If the signaller arranging the line block does not control the signal or block marker protecting the line to be blocked, the signaller must liaise with the controlling signaller and get an assurance from them that trains have been stopped on the line concerned.

Signaller

If granting the line block means that there may be or will be disruption to train running in another signalling centre, the signaller must make sure that the other signalling centre is told of the circumstances.

All  
concerned

### 3.1.4 Reaching a clear understanding

The signaller must ask the requestor for the exact location and lines on which trains are to be stopped or will still be stopped.

If an item is to be retrieved from a platform line at Abbey Wood or Custom House stations by station staff, the signaller must also stop trains on any line adjacent to the platform line under the signaller's control.

If the requestor is not sure which lines they want trains stopped on, the signaller must find out what has happened and the nature of the request. The signaller then must carry out the actions described above in section 3.1.1.

Unless the signaller has already stopped trains on the lines concerned, the signaller and requestor must agree a suitable time for the line block to start.

Other than in an emergency, the signaller must attempt to bring passenger trains to a stand at station platforms.

A EL3180 Line Block form must be filled out by the signaller, and by RfLI track staff when they are the requestor, unless the following applies.

- Emergency protection is being used.
- A Pre-Determined Line Block is being used, requiring a EL4182 PDLB form.

If the site of the work will be less than 40 metres from the protecting signal or block marker, and the work will affect the safety of the line, the requestor must tell the signaller. The signaller must also keep the previous signal at danger, or the route closed at the previous block marker, unless the route can be set for an unaffected line.

If the location of the activity will be beyond any points or crossover, the signaller may run trains over an unaffected route if this has been agreed with the requestor. See diagrams TS1.3, TS1.4, and TS1.5.

### 3.1.5 Granting the line block

Other than when providing emergency protection, when the arrangements are confirmed, protection is in place, and a line block is granted, the signaller must provide an authority number to the requestor. Once the authority number is provided, the requestor may safely access the track.

All  
concerned

Before concluding the communication with the requestor, the signaller must also do the following:

- Confirm to the requestor that the line will stay blocked until the requestor confirms that the protection is no longer needed.
- Confirm the call back time.
- Remind the requestor about any other lines that are still open for normal working.
- Give that person permission for the activity to start.

The signaller must also record the details of the line block, including the authority number, in the occurrence log.

### 3.1.6 Keeping the signaller updated

The requestor must keep the signaller updated as to the progress with the incident or work activity regularly, at agreed times.

All  
concerned

The requestor must tell the signaller as soon as practicable if progress is slower than expected, and if the line block cannot be given up at the agreed time and the reason why.

The signaller must immediately tell Operations Control if the requestor states more time is required. The signaller and requestor must then carry out any instructions from Operations Control.

**3.1.7 If the line block is to be temporarily given up and then resumed**

All concerned

The signaller must give the requestor a new authority number each time the line block is resumed.

The signaller and (when applicable) the requestor must use a new line block form if the line that needs to be blocked, or the protection arrangements, are changed.

**3.1.8 First train over the affected portion of line when the work has affected the safety of the line**

Signaller

The signaller must specifically watch the operation of track circuits or axle counter sections occupation during the passage of the first train over each line that was affected by the line block.

The signaller must not allow a second train to pass over the line that was affected by the line block unless the first train was fully supervised by CBTC or there is a block marker or signal at which the route is closed between the first and second train.

**3.1.9 Giving up the line block with restrictions**

All concerned

If the requestor needs to impose restrictions on the line to be reopened, the requestor will ask the signaller to accept the conditions before giving up the protection.

The signaller must then arrange for the necessary changes to be input into the system to create the restrictions. If necessary, the signaller must not accept the giving up of the protection until the signaller is satisfied that all appropriate measures have been taken.

The signaller must tell Operations Control of any conditions that have been imposed.

### 3.1.10 When the line block is no longer needed

When the requestor confirms signalling protection is no longer needed, the signaller and requestor must:

All  
concerned

- Confirm that all railway staff, other personnel, members of the public, and equipment (as applicable) are in positions of safety,
- Confirm it is now safe to run trains, either normally, or with restrictions.

The requestor must quote the authority number to the signaller. The signaller must record these details on the line block form and in the occurrence log.

## 3.2 Using the signalling equipment to protect line blocks

### 3.2.1 Signaller using EPAs for Line Blocks

EPAs are normally used as part of possession arrangements. They can also be used to provide line blocks as shown in this section of the Rule Book.

Signaller

This method of line block can also be used by a Controller of Site Safety (COSS) using a handheld terminal (HHT), as part of a planned safe system of work, if no engineering trains or maintenance vehicles will occupy the line concerned.

All  
concerned

### 3.2.2 Using a Hand-Held Terminal (HHT)

Using a HHT is required for taking unplanned line blocks, except in the following circumstances.

- Emergency protection is being used, as shown in section 3.3.
- A pre-determined line block is being used, as shown in section 3.4.
- Protection by train is being used, as shown in section 3.5.
- Working in sidings is being used, as shown in sections 3.6 and 3.7.
- The requestor is not a RfLI COSS and therefore does not have an HHT.
- An IRM is going to retrieve an item from the track.
- The HHT and associated electronic equipment is defective or unavailable (Operations Control must be informed this has happened by the requestor).
- Operations Control authorise a line block without an HHT.

### 3.2.3 Agreeing the arrangements and ensuring protection

Signaller

The signaller must agree with the requestor all necessary details as shown in section 3.1, and any relevant other part of section 3.

The signaller must make sure the EPA protection to be used is the correct one for the location the requestor requires access to. See diagram TSI.1 and TSI.2.

Unless protection by train is being used, and the train alone provides sufficient protection, the signaller must carry out the following to protect the line block area:

- Make sure the area to be blocked is clear of all trains that can proceed.
- Withdraw movement authorities for any trains unable to move and get verbal confirmation from the drivers of those trains that they will remain at a stand, until authorised to move by the signaller.
- Remove automatic route setting (ARS).
- Close all routes at the block markers and lineside signals leading to the area requiring protection, in both directions.
- Use reminder appliances on the necessary route setting positions (RSPs).
- Make sure all points are in the position necessary to protect the line block.

When a COSS is taking EPA protection with an HHT, the signaller must tell the COSS when the EPA protection is ready to be requested.

All  
concerned

### **3.2.4 Validating the EPA protection**

When the signaller has validated the EPA protection as being correct and are ready to be activated, the signaller must complete Part A of the line block form EL3180.

When a COSS is using an HHT, the signaller must then tell the COSS the details of the EPA protection that is going to be used. The COSS will complete Part A of the line block form EL3180 and read it to the signaller, who must make sure that the entries are correct.

The COSS will then request the protection using the HHT. The signaller may then activate the EPA protection.

### **3.2.5 Checking EPA protection has been activated using an HHT**

All  
concerned

When the requested EPA protection has been activated, and a COSS is using an HHT, the COSS will check the details displayed and any changes on the HHT are correct.

If the details are correct, the COSS will then scan the Radio Frequency Identification (RFID) tag using the HHT to confirm their location.

The COSS will receive a confirmation on the HHT that the EPA protection has been activated, which the COSS will acknowledge before allowing work to take place. The signaller must then give the COSS an authority number.



### 3.2.6 When EPA protection is no longer required and an HHT is in use

When the COSS no longer requires the EPA protection, the COSS will:

All  
concerned

- go to a place of safety and give up the protection as shown in section 3.1.
- input any necessary information into the system using the HHT to do so.

When the signaller is ready to do so and is satisfied that the signalling indications are correct, the COSS must accept 'ending the possession' on the HHT. The signalling system will then confirm the hand-back to the COSS.

The signaller must then enter the time the line block was given up in the line block form and update the occurrence log.

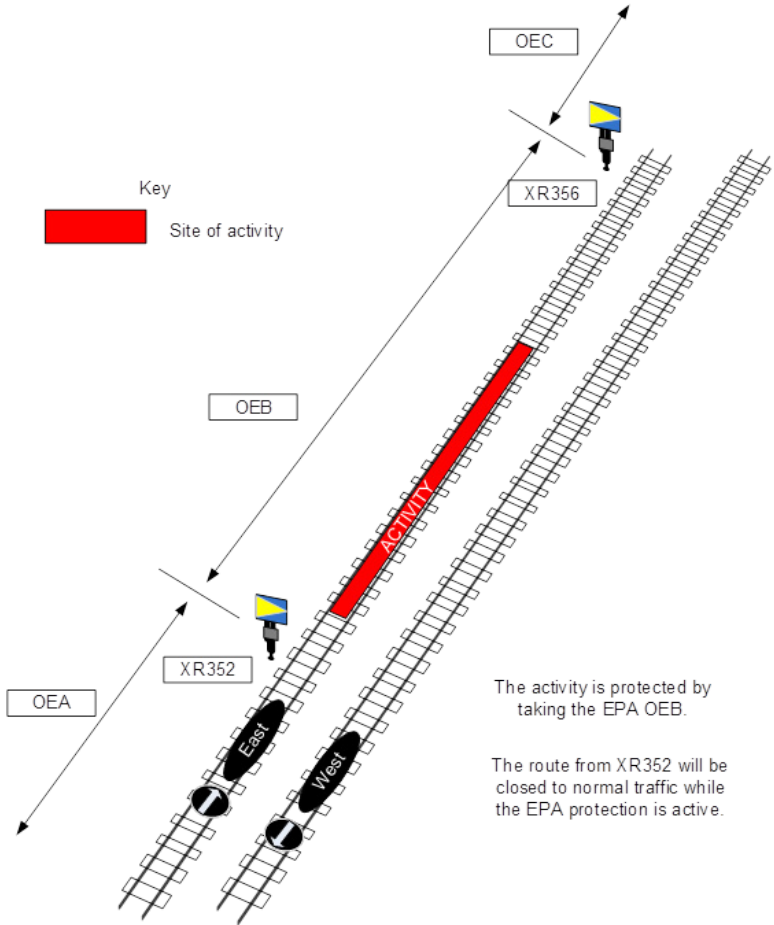
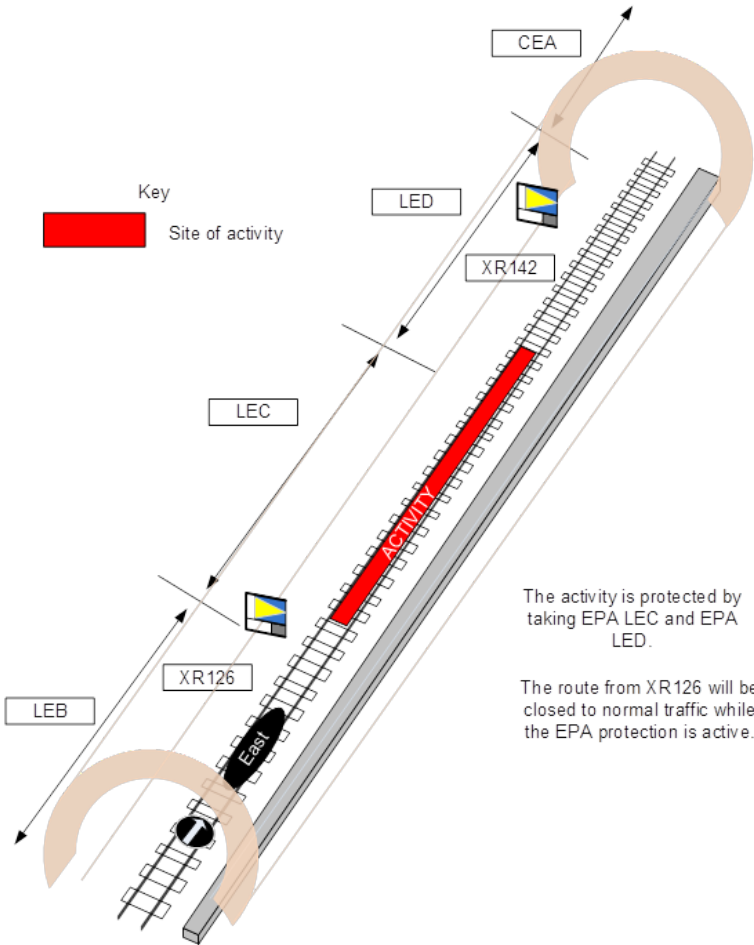


Diagram TS1.1

Using EPA protection to block the line in an open section

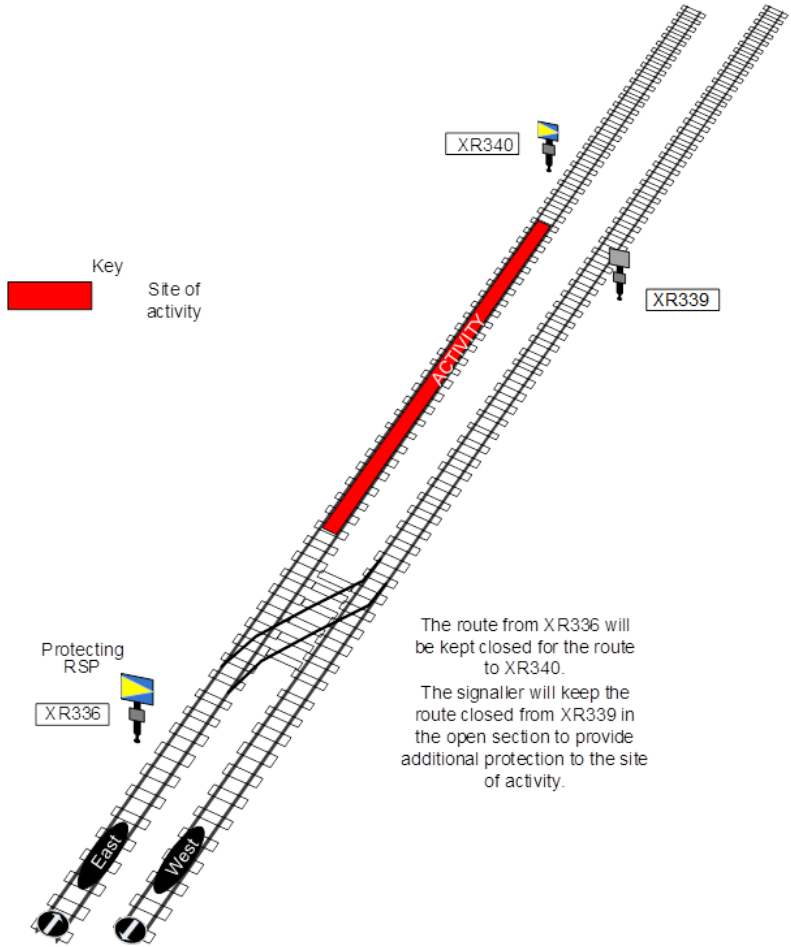


The activity is protected by taking EPA LEC and EPA LED.

The route from XR126 will be closed to normal traffic while the EPA protection is active.

Diagram TS1.2

Using EPA protection to block the line in the single bore tunnel



*Diagram TS1.3*

*Activity taking place close to a block marker in an open section*

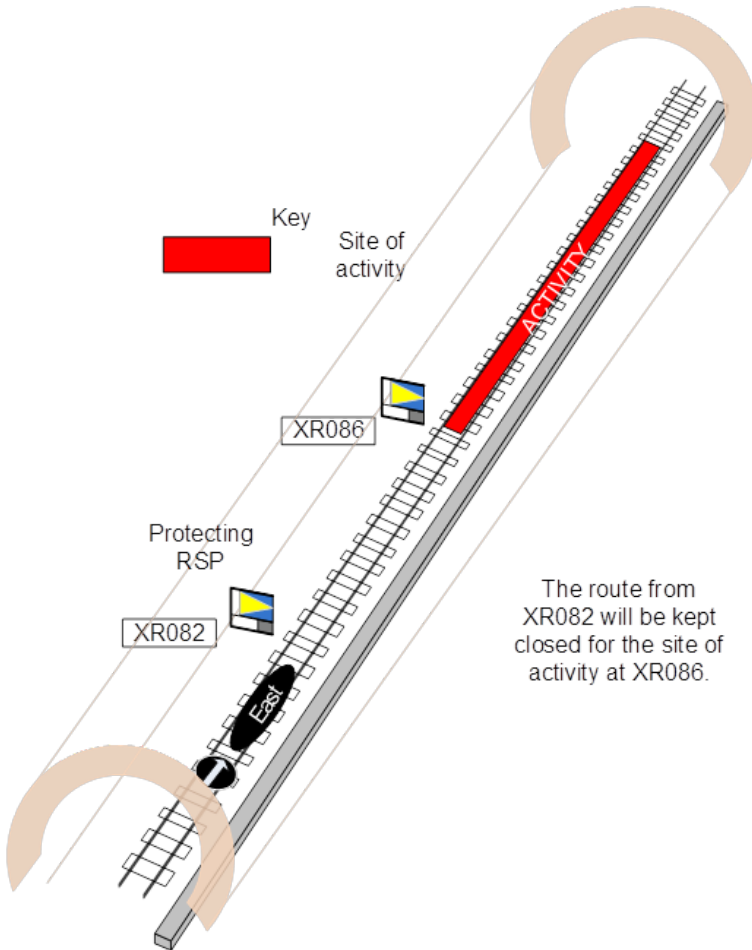
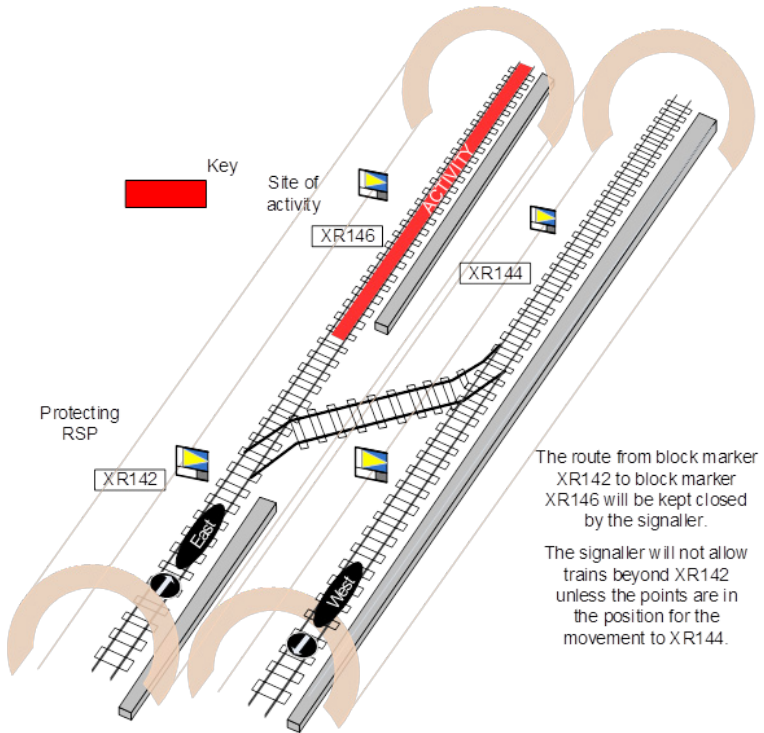


Diagram TS1.4

Activity taking place close to a block marker in a single bore tunnel



*Diagram TS I.5*

*An activity taking place beyond points that will be used in single bore tunnels*

### 3.3 Emergency protection

#### 3.3.1 When emergency protection may be used

Emergency protection may be used to grant track access when there is an emergency, major incident, or critical incident. The following roles may request emergency protection:

All concerned

- A railway incident first responder – these roles include:
  - Rail for London Infrastructure (RfLI) – Incident Response Manager (IRM)
  - London Underground – Network Incident Response Manager / Team (NIRM / NIRT)
  - Network Rail – Mobile Operations Manager (MOM) and Mobile Incident Officer (MIO)
  - Transport for London – Emergency Response Unit (ERU)
  - Train Operating Company – Train Operator Liaison Officer (TOLO)
- Emergency Services
- Train crew
- In the absence of any of the above, other railway staff with appropriate competencies and personal protective equipment



Responding to emergencies is also covered in these modules:

- AC, Electrified Lines
- M1, Dealing with a train accident or train evacuation in the central operating section,
- M3, Managing incidents, floods, and snow in the central operating section
- G1, Personal track safety for non-track workers,
- HBI, General duties and track safety for track workers.

All  
concerned

### 3.3.2 Agreeing the area to be blocked

The signaller and requestor must reach a clear understanding as to what locations emergency protection is to be provided between.

The locations used must be clear and obvious to the requestor.



For railway staff, examples of clear and obvious locations can include stations, junctions, tunnel portals, and Network Rail boundaries (this list is not exhaustive).

For the emergency services, examples of clear and obvious locations will normally be limited to stations.

Signallers and requestors do not need to quote which EPAs and block markers are to be used.

If trains are already in the affected area, the signaller must confirm with the train crew of each impacted train that they must not move until given verbal authority to do so by the signaller.

The signaller must ensure a clear understanding is reached with the appropriate adjacent control centres and operational staff about what is required to protect the emergency at boundaries.



### 3.3.3 Granting authority to access the track

Once the signaller has ensured that either the affected area is clear of trains, or all trains in the affected area are at a stand, and the signaller must also:

- Withdraw all movement authorities and close all routes at the block markers leading to the area requiring protection.
- Use reminder appliances on the necessary RSPs.

If the requestor is a member of railway staff, the signaller must confirm they have carried out these actions with the requestor.

If emergency protection is being provided to the emergency services, you must come to a clear understanding with them as to which areas are blocked, and where they can safely access the track.

They then can grant the requestor authority to access the track. An RfLI IRM must ensure the line block arrangements are formalised with the signaller as soon as practicable. A line block form and authority numbers are not required for emergency protection.

## 3.4 Pre-determined line blocks (PDLBs)

### 3.4.1 When pre-determined line blocks may be used

PDLBs may only be used by a RfLI COSS, and in the following circumstances.

- To formalise arrangements when emergency protection is in use.
- When urgent track access is needed to contain an incident that would otherwise result in stranded trains.
- When track access is needed to respond to an urgent infrastructure fault.

All  
concerned

All  
concerned

All  
concerned

### 3.4.2 Using the EL4182 form

PDLBs are described on form EL4182. Each version of the form has a unique identity number for the locations involved.

The signaller and requestor, upon agreeing that a PDLB will be used, and having obtained authority from Operations Control, need to fill in together the following parts of the form:

- Persons involved,
- Locations involved and lines to be blocked,
- Traffic Manager granting authority for the line block.

The requestor and signaller do not need to discuss the following parts of the form:

- Site safety information for the requestor.
- Site safety arrangements signed off by the requestor.
- EPAs to be used by the Traffic Manager.

If the available PDLB forms aren't suitable for the location and circumstances of the incident, Operations Control can authorise the signaller and requestor to use a blank EL3180 line block form. Operations Control must record this has happened in the control log.

## 3.5 Protection using a train

### 3.5.1 When using a train for protection may be used

A train can be used by a railway incident first responder, train crew, or a COSS to obtain track access for the following purposes.

All  
concerned

- Containing an incident that would otherwise result in stranded trains.
- Facilitating track access for a short duration to remove an item from the track or carry out a quick inspection.

### 3.5.2 Applying the protection

Once authorised by Operations Control, the signaller and RfLI track staff must complete and confirm to each other their entries in the line block form EL3180.

All  
concerned

The requestor will arrange with the signaller which train is to be used and from which station the train will depart.

The signaller must ensure the driver is told about the circumstances of the incident, the requirement to use their train for protection, and the point at which the train is to be stopped.

The signaller, driver, requestor, and Operations Control must reach a clear understanding about the following.

- Whether it is necessary to detrain passengers.
- Where the requestor will be accessing the track from and where the requestor's position of safety will be once they have left the track.

### 3.5.3 Providing additional protection before signalling the train

Signaller

If the train alone does not give complete protection, the signaller must arrange for additional protection to be provided as follows.

- Close all routes at the block markers leading to the area requiring protection.
- Use reminder appliances on the necessary RSPs.

### 3.5.4 Signalling and securing the train

Signaller,  
Driver

The signaller must signal the train to the designated block marker, and once it has arrived, keep the route ahead of this block marker and any other routes that have been agreed with the requestor closed. See diagrams TS1.6 and TS1.7.



When authorised by Operations Control, the signaller may use the regulations in:

- *COS/S5 Passing an end of authority (EoA) without a movement authority (MA) or passing a signal at danger in the central operating section, and*
- *COS/TS10 CBTC Train signalling regulations.*

To authorise the train to pass the protecting block marker, proceed at caution and stop short of the section to be inspected / the item to be retrieved.

The regulations for examining the line apply in these circumstances.

When the train has arrived, the signaller and the driver must confirm that the driver has carried out the following actions.

- For Class 345 stock.
  - Pressed 'ATO Stop' (which places the train in protected manual).
  - Placed the master control switch into the 'secure' position.
  - Removed the driver's control key from the key switch.
- For Robel and Linsinger On-Track Machines.
  - De-selected 'Direction of Travel'.
  - Applied the parking brake.
- For Class 69 locomotives.
  - Applied the locomotive parking brake.
  - Placed the main brake handle into the emergency position (venting the brake pipe).

For all types of train – the driver must confirm with the signaller that the driver will not change the cab controls from the above state until either:

Signaller,  
Driver

- The driver is given verbal authority from the signaller to do so.
- Or the requestor is back in the train.

After this is done, the signaller must:

- Inform the requestor that the driver has carried out the above actions.
- Give the requestor an authority number.
- Tell the requestor it is safe to go on the line.

All  
concerned

### 3.5.5 When the work is complete

When the requestor has either returned to the train, or is in a position of safety and has told the signaller the authority number, and confirmed that protection is no longer required, the signaller and RfLI track staff must then enter the time the line block was given up in the line block form.

If the requestor was:

- Not the driver.
- Not getting back into the train providing protection to reach their position of safety.

Then the signaller must tell the driver involved the person is in a position of safety and it is safe to move the train again. The signaller can signal the train normally.

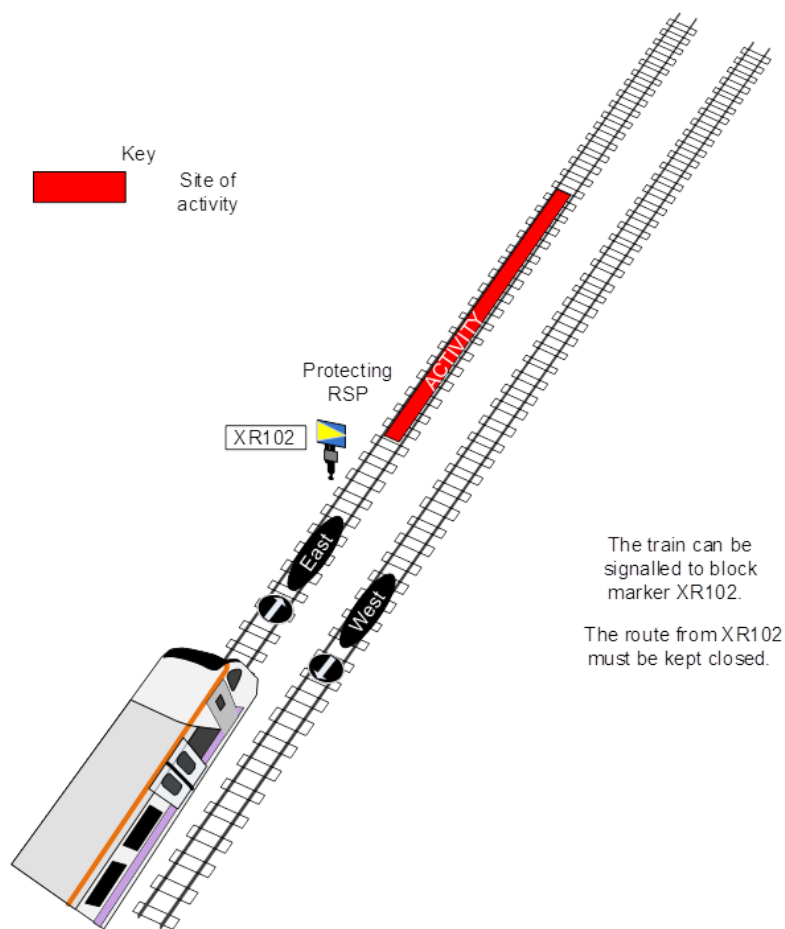


Diagram TS1.6

Providing protection using a train in an open section

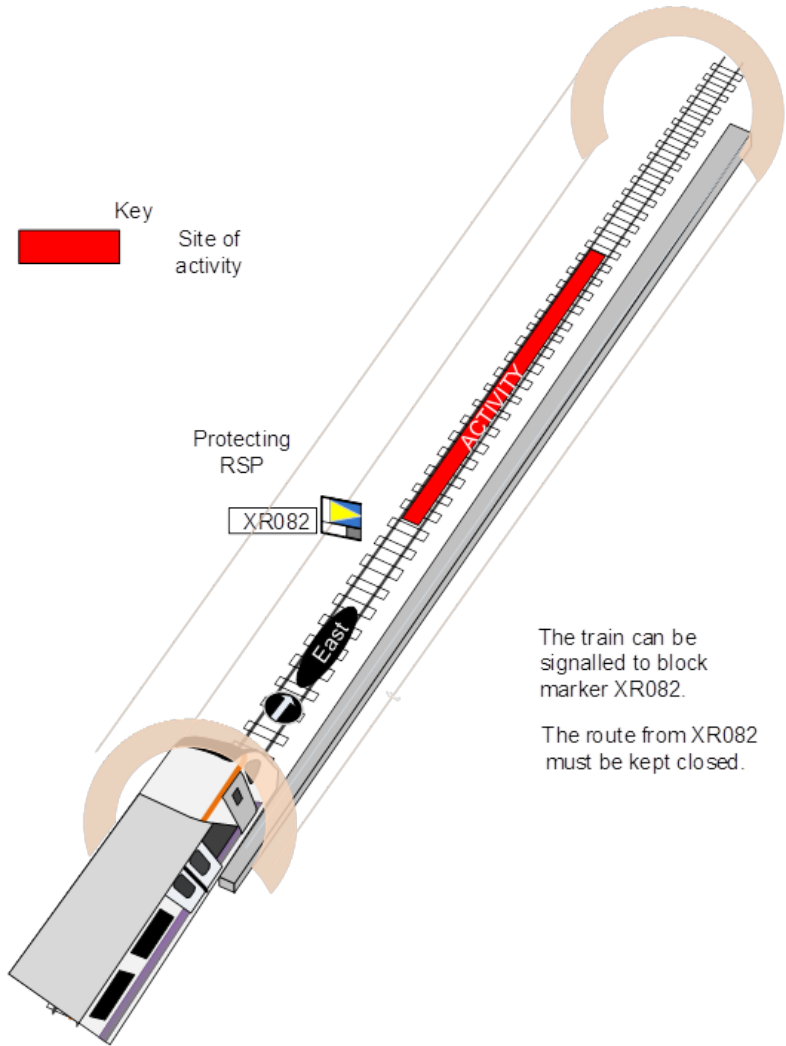


Diagram TS1.7

Providing protection using a train in a single bore tunnel



## 3.6 Taking possession of the maintenance siding at Plumstead

### 3.6.1 When this regulation must be used

A requestor may ask for possession of one or more of the sidings at Plumstead. The requestor is referred to as the person in charge of the siding possession (PICOS).

Signaller,  
PICOS

### 3.6.2 Agreeing the arrangements

The signaller and PICOS must confirm the following.

Signaller,  
PICOS

- The name and contact number of the PICOS.
- Whether it is the whole length of a siding or just part of it that will be taken under possession.
- How line protection will be arranged.
- The date and time possession will be taken and when it will be given up.
- Who will tell the shunter, if involved – this must be done when the possession is taken and given up.

### 3.6.3 Possession of the whole length of the siding

If the signaller has agreed with the PICOS that possession may be taken of the whole siding, the signaller must carry out the following.

Signaller

- Where the signaller controls the points at the entrance to the siding, make sure those points are set to prevent movements from entering it.
- Where the signaller does not control points at the entrance to the siding, make sure those points are set by the PICOS to prevent movements from entering it and give the PICOS permission to apply line protection by clipping and padlocking the points.

### 3.6.4 Possession of part of the siding

Signaller,  
PICOS

If the signaller has agreed with the PICOS that possession may be taken of only part of the siding, the signaller must give the PICOS permission to place line protection on the siding concerned. This consists of the following.

- A sleeper secured across the rails.
- A possession limit board (PLB), red flag or red light placed at the sleeper so that it may be clearly seen by an approaching movement.

### 3.6.5 Protecting the siding possession

Signaller,  
PICOS

The signaller must not allow any movement to enter the siding concerned until the signaller has confirmed with the PICOS that the line protection is in place.

If possession of the siding is to be taken in association with a possession of an adjacent running line, the PICOS does not need to provide line protection unless the following applies.

- The siding is a through siding and the PICOS needs to prevent access at the far end of the siding, or,
- Possession of the siding will be taken before possession of the main running line.

When possession of the siding will be kept after the adjacent running line possession is given up, the PICOS must make sure line protection is provided before the adjacent running line possession is given up.

If the siding possession is being used for movements to enter or leave an adjacent running line possession, and it is necessary for the signaller to be involved, the PICOS or PICOP as appropriate, will come to a clear understanding with the signaller about each movement.

### 3.6.6 Giving up the possession

The PICOS will inform the signaller when the possession is given up. The signaller and PICOS must confirm that any line protection that was provided has been removed.

Signaller,  
PICOS

### 3.6.7 Recording the arrangements

The signaller must record in the occurrence log the following.

Signaller

- The name and contact number of the PICOS.
- The siding or sidings taken under possession.
- Whether possession of the whole or part of the siding is taken.
- The location of any line protection.
- The date and time that possession is taken.
- The date and time that possession is given up.

## 3.7 Personnel working on vehicles in sidings

### 3.7.1 When this regulation must be used

The signaller and requestor must carry out this regulation when personnel are to carry out work on a vehicle in a siding which the signaller controls the entrance to, and the personnel need protection from movements into that siding.

All  
concerned

All  
concerned

### **3.7.2 Agreeing the arrangements**

The signaller and requestor must agree the line block arrangements to be applied for the siding involved.

The signaller must do the following.

- Place the points leading to the siding in the correct position to protect the siding.
- Make an entry in the occurrence log.
- Confirm to the requestor that no movements will be allowed towards that siding.
- Remind that person that all other lines will stay open to traffic.

All  
concerned

### **3.7.3 When the activity is completed**

When the requestor tells the signaller that the work has been completed, the signaller must make an entry in the occurrence log and remove the reminder appliances

## 4 Working of signalling equipment

### 4.1 General provisions

#### 4.1.1 Setting routes

Before you set a route for a train to proceed, you must make sure you have carried out the appropriate rules, regulations, and instructions.

Signaller

#### 4.1.2 Manually closing routes

When you manually close a route, you must make sure the route is clear of trains and the indication is showing correctly.

Signaller



Following the closing of a route or if a train is at a stand at a block marker and the movement authority is withdrawn, there will be a time delay of 60 seconds before another route can be set.

#### 4.1.3 If a train does not have a movement authority

If it is reported that a train does not have a movement authority, you must investigate possible causes and if possible, set the conditions to allow for a movement authority to be sent to the train if it is safe to do so.

Signaller

**4.1.4 Network Rail interlocking failures**

Signaller



In the case of complete interlocking failure on NR, the route will not remain operational because the S&CS requires a clear block section between communicating trains and non-communicating trains.

The interlocking failure on NR would cause track circuit repeat relays to the RCC to drop, thus appearing to the S&CS as if the area was occupied by non-communicating trains.

**4.1.5 Failure of the slot to normalise**

Signaller

If the slot at an interface does not normalise fully following the passage of a train, the route lights and slot route locking triangle will remain lit and cause route locking (trains will be able to travel normally in the direction of travel). In this situation, you must do the following.

- Try to cancel the slot.
- Establish with the NR signaller whether the route has been cancelled or any other reason why the slot has not normalised.
- Make sure the issue is reported as a fault.
- Tell Operations Control.

**4.1.6 If Automatic Route Setting (ARS) is not working**

Signaller

If ARS is not working, and you receive a slot request, you must immediately set the slot request manually (if possible).

You must tell Operations Control and the maintenance competent person of the fault and apply the applicable rules and regulations.

#### 4.1.7 Checking signalling equipment is working properly

After operating a signalling control, you must observe the workstation for the correct equipment indications.

Signaller

You must always check that indications are correct on the S&CS when trains are not working normally.

#### 4.1.8 Using signalling overrides

You must only use override controls when it is safe to do so and as shown in the rules and regulations.

Signaller

#### 4.1.9 When technical assistance is required

Where the rules, regulations, and instructions state a maintenance competent person or other technical staff are required, you must arrange for their attendance through Operations Control.

Signaller

### 4.2 Checking and testing equipment

#### 4.2.1 Recording the details

When you check the clock or test equipment, as described in this regulation, you must record the details in the Occurrence Log, including any telephone calls you make or receive for test purposes.

Signaller

#### 4.2.2 Checking the clock

Unless an automatic clock that self-adjusts is in use, you must check and correct the clock daily between 09:00 and 10:00 hours.

Signaller

#### 4.2.3 Testing emergency equipment with the interface signallers

You must test emergency alarms with the interface signalling centres between 10:00 and 11:00 hours daily.

Signaller

**4.2.4 Testing the SPAD alarm**

Signaller

You must test the SPAD alarm between 10:00 and 11:00 hours daily.

**4.3 Using reminder appliances**

**4.3.1 On a signalling control**

Signaller

You must use a reminder appliance on the appropriate signalling control to prevent the operation of the following.

- The route setting position (RSP) protecting a route over which the normal passage of trains (or certain trains) is stopped including a possession and line block.
- The RSP protecting a route over which trains can pass only after the driver has been told to proceed at caution in connection with an incident, failure, or unusual occurrence.
- Any RSP that is defective.

**4.3.2 On signalling equipment that must not be operated**

Signaller

You must use a reminder appliance when signalling equipment:

- Must not be worked, or
- Is to be kept in a particular position as shown in the rules, regulations, and instructions.

**4.3.3 Interlocking failure**

Signaller

Following an interlocking failure, you must apply all appropriate reminders to the signalling system before the signalling system is restarted.



#### 4.3.4 Reminder appliance at overlay areas

When told of one of the below restrictions by an NR signaller, you must apply applicable reminders to the overlay section (in addition to any required interaction with the Signalling & Control System (S&CS)):

Signaller

- Isolations.
- Possessions.
- Line blocks.
- Speed restrictions.
- Station closures.
- Adhesion issues.
- Any other restrictions.

Once the restriction is removed, you must reach a clear understanding with the NR signaller that it is safe to remove the reminder (in addition to any required interaction with S&CS).

#### 4.3.5 Removing a reminder appliance

You must not remove a reminder appliance until the line is clear or normal working is resumed.

Signaller

However, if you need to signal a train to a route that is not affected, or for a movement to proceed after the driver has been told to proceed at caution, you must do the following.

- Remove the reminder appliance.
- Operate the signalling control.
- Immediately replace the reminder appliance after you have operated the signalling control.

## 4.4 Using the service hold function

Signaller



Service holds can be applied to the whole COS or by station.

If trains cannot be held in a station by the S&CS, preferred stopping locations will be used.

When applied to a station, the functionality will place a service hold on services in the direction it is applied to prevent trains leaving the previous and next stations (preferred stopping locations will be used if physical platforms are not available). This will prevent doors automatically closing within the platform.



If two service holds are applied only the one removed will be cancelled.

If a train in the service hold area cannot be held in a station, it will be stopped at a preferred stopping location.

### 4.4.1 Using the service hold function during an operational incident

Signaller

When told of an operational incident (including an obstruction of the line), you must do the following.

- Keep trains in stations, where possible, using the service hold functionality, and
- Stop trains through the affected area.

You must apply a service hold (to each platform required) to keep trains in platforms when possible.

You must tell the Electrical Control Operator (ECO) of any potential effect to the Tunnel Ventilation System.

#### 4.4.2 If a train is to proceed but the service hold will still be needed

If a train is to proceed but the service hold is required for further trains, you must remove the service hold for the first train and then immediately re-apply it for the following train.

Signaller

You must set the route manually, unless the route was already set before the service hold was applied.

#### 4.4.3 When the service hold is no longer required

When a service hold is no longer required, you must manually turn on the ARS for the area in a staggered approach (if required).

Signaller

#### 4.4.4 Using service hold in the Pudding Mill Lane area (westbound)

When applying a service hold westbound in the Pudding Mill Lane area, you must do the following.

Signaller

- Confirm the arrangements with the Liverpool Street IECC signaller.
- Come to a clear understanding with them over the reason and likely duration of the service hold.

#### 4.4.5 Using service hold at Paddington (eastbound)

When applying a service hold eastbound at Paddington, you must do the following.

Signaller

- Confirm the arrangements with Thames Valley Signalling Control (TVSC) signaller.
- Come to a clear understanding with them over the reason and likely duration of the service hold.

#### 4.4.6 Non-communicating trains

Service hold will not work on a non-communicating train: you must hold a non-communicating train using other methods and make sure the driver understands what is required.

Signaller

**4.5 Bi-directional opposing moves to and from the GEML**

**4.5.1 Directional interlocking**

Signaller



Directional interlocking will be given to prevent the setting of a route for a directly opposing movement.

The directional interlocking should be maintained until the train reaches the exit signal, although neither exit signal should be locked by the occupation of the line between them – with a directional indicator given at the GEML interface. You will have master control of the direction for the interlocking on the COS.

**4.5.2 Not setting a conflicting route**

Signaller

You must not try to set a route which conflicts with the directional indicator for a route set by another signaller.

**4.5.3 If the directional indicator is not working**

Signaller

If the directional indicator is not working correctly, you must reach a clear understanding with the NR signaller for train movements and agree a primary direction for each line.

## 4.6 Withdrawing a Movement Authority (MA)

### 4.6.1 In an emergency

In an emergency, if you have closed a route, you must make sure that the driver is aware that you have done so before you do the following.

Signaller

- Permit any obstruction of the route to which MA applies.
- Move any points in that route.

### 4.6.2 Except in an emergency

If you have issued an MA for a train to proceed, you must not withdraw it unless you are sure the driver will not encounter or need to make a brake application.

Signaller

If you have issued an MA for a train to start, you must not withdraw it before the train starts, until you have made sure that the driver is aware that you are going to do so, or you have made sure the train does not have a driver.

If a train stops at an end of authority (EoA) where you have issued an MA for the train to proceed, you must not withdraw the MA until you have made sure that the driver is aware that you are going to do so.

## 5 Emergency stops

### 5.1 Emergency stop areas



Emergency stop areas will apply the emergency brake to communicating trains within the area when used which prevents ARS.

Emergency stop functionality can be applied to the whole COS, to defined areas or to a single block marker.

All trains on the approach to the track section covered by the emergency stop will be stopped before entering the area either by an emergency brake or by a service brake.

#### 5.1.1 Using the emergency stop function

Signaller

You must use the emergency stop function to stop communicating trains in an emergency, as required and tell any affected stakeholders.

#### 5.1.2 Telling drivers

Signaller

You must tell drivers of the reason for the emergency stop.

#### 5.1.3 When the emergency stop is no longer required

Signaller

Once the emergency has ended, you must tell drivers and manually cancel the emergency stop function. To reissue an MA, you must either:

- Route the train manually, or
- Turn on the relevant ARS sub area (in a staggered approach).



Trains in stations will not close the doors automatically, regardless of the door mode selected by the driver during an emergency stop.

### 5.1.4 Emergency stop for non-communicating trains

To stop a non-communicating train in an emergency, you must use the most appropriate means of communication to the train.

Signaller

### 5.1.5 Emergency stop at an interface

If you apply an emergency stop (for the whole of the COS or a specific area within the overlay area), you must immediately tell the appropriate NR signaller.

Signaller

If a train is in Staff Accountable (SA) or in Recovery Mode (RM), or the train is not using CBTC, you must use the most appropriate means of communication to stop the train.

## 5.2 Emergency stop plungers

### 5.2.1 Stations



Emergency stop plungers are located at Custom House and Abbey Wood stations.

When used the Emergency stop plungers will stop communicating trains within the area via emergency brake application.

Signaller

When you have been alerted to an emergency stop plunger activation, you must issue a PSMA into the emergency stop plunger area for the next train to enable the driver to examine the line in the affected area but only as shown in TS1 section 13.

The routing of trains in PSMA at caution into the affected area will continue until the emergency stop plunger has been reset.

If it is required to route a train from the emergency stop area, you must use the run authorisation zone override.

## 5.2.2 Sidings

Signaller



Emergency stop plungers are located at Plumstead stabling sidings (including the head shunt and sidings access line) and the maintenance sidings.

No routes can be set into or out of the affected area within Plumstead until a successful reset is complete.

When used, the Emergency stop plungers will stop communicating trains within the area by an emergency brake application.

## 5.2.3 Non-communicating trains

Signaller

Non-communicating trains will not be stopped, or prevented from moving, by an emergency stop plunger activation. You must therefore stop the train by using other appropriate methods.

## 5.2.4 Reset

Signaller

You must reset the emergency stop plunger command when the reason for operation is understood and you have been advised that the line is clear and it is safe to do so.



## 6 Working of points

### 6.1 Movement of vehicles carrying passengers over points

You can only allow a vehicle carrying passengers to pass over points in the facing direction if:

Signaller

- The points are locked by the signalling equipment, or
- The points have been secured for the movement.

### 6.2 Trap points

Except when a movement is being made over any of these, you must make sure that:

Signaller

- Trap points are set to prevent vehicles escaping onto or fouling other lines.
- Points leading to a running line are set to protect the running line.

## 7 Train movements

### 7.1 Regulating trains

#### 7.1.1 General provisions

Signaller

You must regulate trains as shown in the published Train Regulation Statement.

You must also use and keep to any agreed Contingency Plan arrangements if these apply.

If required, you must reach a clear understanding with NR signallers regarding variations to the published working timetable.

If necessary, you must find out how trains are running so that you can regulate them correctly.

#### 7.1.2 If a manual intervention is required

Signaller

If manual intervention to a train's booked path is required, you must:

- Amend train working via the Timetable Editor (TTE) function.
- Update the "head code" on the Signallers Overview Display (SOD).
- Tell affected stakeholders.

#### 7.1.3 Changes to the baseline timetable

Operations  
Control,  
Signaller

You must check the timetable has been successfully uploaded each time there are changes to the base timetable. This check should include a sample check against the short-term plan which is proposed. If errors are identified, you must undertake a detailed check to identify any additional potential errors, and then attempt to rectify these and tell stakeholders.

### 7.1.4 Connaught tunnel

Only one train is permitted into Connaught tunnel at any one time (in each direction).

Signaller



The length of only about 300m of this twin bore section relative to the train length of about 200m makes it very unlikely that more than two trains will be in this twin bore section at a time during normal operation.

## 7.2 Additional instructions

### 7.2.1 Additional running lines

When it is shown in the train signalling regulations that trains must be stopped or instructed to proceed at caution, you must make sure that the same action is taken for trains on additional running lines if those trains might be affected.

Signaller

### 7.2.2 Propelling movements

You must not issue an MA for a propelling movement to begin unless the route is set throughout for the movement.

Signaller

### 7.2.3 Movements to running lines already occupied

Except when trains are working in Automatic Train Operation (ATO) or have been issued with MAs, you must not allow a train to enter an occupied portion of line between two block markers unless a movement is to enter a line that is obstructed by an accident, failure, obstruction, or engineering work.

Signaller

### 7.2.4 Routing of non-reporting trains

You must not allow a non-reporting train to approach an EoA without an MA unless the line is clear up to and including the overlap of the next EoA (or the buffer stops on a dead-end line).

Signaller

## **7.3 Network Rail interfaces**

### **7.3.1 Restrictions at interfaces**

Signaller

If you apply a restriction which will affect train routing at the interfaces, you must:

- Reach a clear understanding with the NR signaller regarding the restriction and any trapped trains, and
- Identify if the restriction can be removed for the routing of the trapped train.

### **7.3.2 Dealing with non-communicating trains at interfaces**

Signaller

A non-communicating train should not be routed into the COS.

If a non-communicating train does get into the COS, it should be dealt with in accordance with Rule Book modules COS/RB/S5 and COS/RB/TSI 0 Regulation 3.5.

### **7.3.3 Great Western Main Line**

Signaller

If the Thames Valley Signalling Centre (TVSC) signaller requires to route a train into turnback A, before accepting the slot, you must make sure the route can be set safely and reach a clear understanding on how long the train will be in turnback A.

## **7.4 North Kent Line specific instructions**

### **7.4.1 Stabling on the engineering road**

Signaller

If a train is stabled on the engineering road, you must apply appropriate reminders.

### 7.4.2 Routing to the engineering road from North Kent Lines

Before setting the slot for XR601, you must:

Signaller

- Reach a clear understanding with the Ashford IECC signaller.
- Make sure the whole train will fit within the engineering road and is booked.
- Make sure no conflicting routes are set.
- Place reminders on opposing routes to prevent conflicting movements.
- Set the slot to the Ashford IECC signaller.

You must manually cancel the route for the slot on XR601 if it has been set and a train has not passed through the section.

### 7.4.3 Routing from XR397

If you are required to set a route from XR397, you must:

Signaller

- Reach a clear understanding with the driver, and
- Set the route.

### 7.4.4 Routing to XR397 and XR602 stop board

You must not set an opposing route towards XR602 or XR397 until you are sure the train is at a stand.

Signaller

### 7.4.5 Routing from XR602

To route a train from XR602, you must:

Signaller

- Make sure the train is permitted to be routed onto the engineering road.
- Reach a clear understanding with Ashford IECC signaller for acceptance of the train.
- Use the OIR function.
- Set the route (non-communicating trains must be routed as shown COS/RB/S5).

**7.4.6 XR397 signal**

Signaller



XR397 signal is fitted with a Train Stop Sensor (TSS) to make sure non-communicating trains stop within AWJ track section.

## 8 Out-of-gauge loads and trains affected by route restrictions

### 8.1 Being aware of out-of-gauge loads and trains affected by route restrictions

You must not let a train proceed that is carrying an out-of-gauge load, carrying an exceptional load or which is affected by route restrictions unless you have the details of the restrictions that apply to the movement of the train and how it must be signalled.

Signaller

### 8.2 Dealing with an out-of-gauge load

An out-of-gauge train will have a train identity including the letter 'X'.

Signaller

You must deal with any train described as being out-of-gauge as shown below depending on the restrictions that apply to it in any area under your control.

#### 8.2.1 If a train is shown with the restriction 'adjacent lines or sidings need not be kept clear'

You must deal with the train normally, but take into account any routing restrictions that are shown.

Signaller

## 8.2.2 If a train is shown with the restriction ‘no out-of-gauge train must be allowed on the running lines or sidings on both sides of the load’

Signaller

You must not allow the train to proceed if any of the following applies.

- It will pass or be passed by another train with the same restriction on an adjacent line or siding.
- It will be on a running line or siding which is required to be kept clear for another out-of-gauge train.
- It has been published in the Weekly Operating Notice or a special notice that an engineering train or on-track machine on an adjacent line under possession is out-of-gauge when working.

## 8.2.3 If an adjacent running line is to be kept clear for the passage of the out-of-gauge train

Signaller

You must not allow the out-of-gauge train to proceed if any of the following applies.

- A train or vehicle is standing on the adjacent line concerned within the portion of line where this restriction applies.
- Permission has been given for a train to proceed or approach on the adjacent line concerned.
- The adjacent line concerned is under possession, or a line blockage has been granted on it.

You must speak to any other signaller involved to find out whether any of those situations apply.

Before you allow the out-of-gauge train to proceed, you must block the adjacent line concerned, as shown in regulations 8.3 and 8.4.



## 8.3 Blocking an adjacent line

You must close the route and keep it closed, to prevent any train entering the portion of line that must be kept clear until the out-of-gauge train has passed.

Signaller

If you do not control the signal or route protecting the line to be blocked, you must:

- Tell the controlling signaller.
- Get an assurance from that signaller that trains have been stopped on the line concerned.

If you are that other signaller, you must make an appropriate entry in the Occurrence Log.

## 8.4 Signalling an out-of-gauge load

You must not allow an out-of-gauge train to proceed until you are sure all the necessary conditions are in place.

Signaller

You must carry out these instructions for an out-of-gauge train if it is shown that no other out-of-gauge train is allowed to be on the running lines or sidings on both sides, or an adjacent running line must be kept clear for its passage.

If the train is to travel between two signal boxes, you must both carry out the instructions in TS10 regulation 3.5.

If more than one signaller in the same signal box is involved with the movement of the out-of-gauge train, you must all reach a clear understanding as to the action to be taken.

## 8.5 Signalling a train that has route restrictions

A train that has a train identity including the letter 'Q' has route restrictions and must follow its planned route.

Signaller

You must deal with the train normally, but make sure that it follows the planned route.

## 9 Broken rails and bridge strikes

### 9.1 Broken, distorted or damaged rails or broken fishplates

#### 9.1.1 Signaller's actions

Signaller

If you are told about a broken, distorted, or damaged rail or that both fishplates are broken on the same rail, you must:

- Stop trains from passing over the affected line.
- Tell Operations Control who will arrange for a rail defect examiner (RDE) or rail defect nominee (RDN) to examine the rail or fishplates concerned.

#### 9.1.2 Authority to run trains

Signaller

When the RDN or RDE has examined the defective rail or fishplates and gives permission for trains to proceed at a specified reduced speed, you must apply a temporary speed restriction (TSR) at that location. If any train approaching that location will not automatically adhere to the TSR, you must:

- Stop that train.
- Tell the driver what has happened.
- Tell the driver the location of the defective rail or broken fishplates.
- Instruct the driver not to exceed the specified reduced speed over the defective rail or broken fishplates.

You must not allow a train to pass over any adjacent line when a train is passing over the defective rail or broken fishplates.

You must continue to instruct drivers to proceed at the speed authorised by the RDN or RDE until one of the following applies.

Signaller

- The RDN or RDE advises that the condition of the defect has worsened, and train movements must be stopped.
- An emergency speed restriction is imposed over the line or lines concerned.
- An RDE authorises that normal speed of trains may be resumed.

### 9.1.3 Report of only one broken fishplate

If you are told that one fishplate of a pair is broken, you must tell Operations Control and arrange for a competent engineer to examine the fishplate concerned.

Signaller

Until you are informed that the broken fishplate has been replaced or you have applied a temporary speed restriction, you must:

- Stop each train over the affected line.
- Tell the driver what has happened.
- Tell the driver the location of the broken fishplate.
- Instruct the driver not to exceed 20 mph (30 km/h) over the broken fishplate.

You do not need to stop trains on any adjacent line.

## 9.2 Bridge strikes

### 9.2.1 Immediate actions to take

Signaller

If you become aware that a bridge has been struck by a road vehicle, you must identify exactly which bridge has been struck.

If the report is not from Operations Control, you must get the reporting person's name and contact details.

You must then carry out the following.

- Stop trains passing over the affected bridge, unless otherwise shown in section 9.2.2 below.
- Tell Operations Control.
- If applicable, tell Network Rail signallers to make sure these instructions are carried out.
- Make sure Operations Control have arranged for a competent person – either a bridge strike examiner (BSE), or bridge strike nominee (BSN), or civil engineer representative – to examine the bridge.

### 9.2.2 Classification for bridge strikes

Underline bridges on the Elizabeth Line COS are classified using the following table. Depending on the classification of the bridge that has been struck, you must use the following actions:

Signaller

Line Classification	Action to be taken following a report of a bridge strike
Red	All train movements across the bridge to be stopped until the bridge is examined by a competent person.
Amber	<p>The first train on each line is to be stopped.</p> <p>You must reach a clear understanding with the driver over the requirements of the line examination and exact location of the bridge.</p> <p>First train over each line to be cautioned at 5 mph – to report back if after crossing the bridge as to whether any defects in track alignment or ride were detected whilst crossing the bridge or if any debris on the line was identified.</p> <p>If no defects or debris reported, subsequent trains on the examined line are authorised to cross the bridge at 20 mph until the bridge is examined by a competent person.</p>

Signaller

Line Classification	Action to be taken following a report of a bridge strike
<p><b>Double Amber</b></p>	<p>The first train on each line is to be stopped.</p> <p>You must reach a clear understanding with the driver over the requirements of the line examination and exact location of the bridge.</p> <p>First train over each line to be cautioned at 5 mph – to report back if after crossing the bridge as to whether any defects in track alignment or ride were detected whilst crossing the bridge or any debris on the line was identified.</p> <p>If no defects or debris reported, subsequent trains on the examined line are authorised to cross the bridge at normal speed until the line is examined by a competent person.</p> <p>When the line is being examined, trains travelling over the adjacent line (that has already been examined and reported as safe for the passage of trains) must be cautioned and the driver instructed to not exceed 20 mph.</p>
<p><b>Green</b></p>	<p>No action required.</p>

Operations Control

Operations Control must check the COS Control Manual (COSCM) Unit 9.4 (Bridge Strikes) section 13 (Bridge Strike Appendix) for information pertinent to the bridge that has been struck.

### 9.2.3 Additional checks for all bridge strikes

In all cases, the movements of trains on all lines over the bridge must be stopped when you become aware of:

Signaller

- A suspected track defect (“rough ride”) within ½ mile (805 metres) of the bridge, or track damage, or debris on the line.
- A vehicle or load under the bridge is on fire.
- A vehicle is wedged under the bridge and any of the following is established and confirmed:
  - persons are trapped in the vehicle, until the persons have been removed,
  - the vehicle is carrying, or is for the purpose of carrying, hazardous materials, until the vehicle or load has been removed;
  - a BSN, BSE, or a civil engineering representative reports that the vehicle or load is substantial and examination of the Bridge is not possible until the vehicle or load has been removed,
  - the vehicle or load is being removed, unless the a BSN, BSE, or a civil engineering representative confirms that the wedged part of the vehicle or load is not substantial and removal will not affect the Bridge.
- The damage to the bridge exceeds the damage limits for a BSN, until either:
  - train movements are permitted by a BSE, or
  - it has been established that the damage is within limits assessed for the bridge and train movements are permitted by civil engineering representative

Signaller

### 9.2.4 Light vehicles

Where shown as applicable (Y) in the column headed light vehicle (LV) the COSCM bridge strike appendix, you may authorise the passage of trains at normal speed over the bridge, until the bridge has been examined by a competent person, but only if you can establish the following as applicable:

- The only road vehicle(or vehicles) involved in the bridge strike is one of the following types of vehicles:
  - motorcycle.
  - car.
  - light van such as or smaller than a Ford Transit van.
- The road vehicle involved in the bridge strike is not on fire.

In all other cases, the line classification which applies to each line over the bridge must be determined by reference to the schedule of bridges in the COSCM bridge strike appendix. The actions you must take will be as specified for the line classification.

### 9.2.5 Train drivers examining the line

Signaller

You are permitted to examine the bridge on more than one line at the same time.

When the driver of the first train is examining the line, the passage of trains on the adjacent line (as shown with the relevant bridge classification), may continue at no more than 20 mph.

Examination of any line by a driver must be undertaken independently for each associated line.



### 9.2.6 Competent persons examining the bridge

Where shown as applicable (Y) in the column headed BSE in the COSCM bridge strike appendix, you must authorise the passage of trains only when the bridge has been examined a BSE or the Civil Engineer's representative.

Signaller

After the bridge is examined, you must carry out the instructions of the BSN, BSE or a civil engineering representative. This may be to permit trains to pass over the bridge at normal or a specified reduced speed.

If you are given permission for trains to proceed at a specified reduced speed, you must apply a TSR at that location. If any train will not automatically supervise the TSR, you must:

- Stop that train before it runs over the affected line.
- Tell the driver what has happened and the location of the bridge.
- Instruct the driver not to exceed the specified reduced speed over the bridge.

### 9.2.7 Late reported bridge strike

If you become aware that an underline bridge has been struck some time earlier, and trains have continued to pass since the bridge strike happened, you must try to get details of:

Signaller

- The approximate time the bridge was struck.
- The type of vehicle that hit the bridge.
- Whether any damage to the bridge has been reported.

You must carry out any instructions provided by Operations Control about the speed and type of trains that may pass over the affected bridge. You must also carry out any applicable regulation shown in section 9.2.1 above.

Signaller

### 9.2.8 Boundary wall damage

When you are told that there is damage to a boundary wall, you must:

- Reach a clear understanding on the exact location and effect to train running.
- If applicable, act as shown in COS Rule Book module TS10 section 4.
- Tell Operations Control.
- Make sure a competent person is sent to investigate.

You may continue to run trains normally (unless you are carrying out the instructions in COS/RB/TS10 section 4), unless told by a competent person it is not safe to do so.

## 10 Trespassers, animals or minor obstacles on the line

### 10.1 Reports of trespassers

If you become aware that one or more trespassers are on or near the line, you must arrange for the trespassers to be removed. You must also tell Operations Control.

Signaller

If you believe, or are told, that:

- Trespassers are in danger from passing trains, or,
- Trespassers or others are likely to endanger trains, or,
- There is potentially a trespasser in a tunnel, but this is not yet confirmed (such as you receive an unexplained door alarm).

You must carry out the following actions:

- Stop each train which is to proceed over the affected portion of line.
- Tell the driver of each train involved what is happening and to proceed at caution when approaching the location.
- Arrange for the tunnel lighting to be switched on.
- Tell the driver to report their findings at the end of the section.

You must continue to tell each driver to proceed at caution until you are sure the line is again clear or that trespassers are no longer in danger from passing trains.

If the entrance to the section is controlled by another signaller, you must tell that signaller.

## 10.2 Confirmation of a trespasser in a tunnel

Signaller

If you receive confirmation that a trespasser is in a tunnel, you must:

- Arrange for a competent person to be appointed to check the line is clear and safe for trains to run.
- Once suitable protection is in place, instruct the competent person to walk through the affected tunnel section and report the status of the line.
- If a cross passage door alarm has been activated, instruct the competent person to walk through the cross passage and non-incident tunnel.
- Record details in the Occurrence Log.

It may be necessary for more than one person to be involved in carrying the above activity.

After receiving confirmation from the competent person or driver that the caution has been carried out and that the tunnel section is clear, you must:

- Record the details in the Occurrence Log.
- Caution the first train through the section.
- When safe to do so, resume normal working.

## 10.3 Animals and minor obstacles

### 10.3.1 General instructions

Signaller

You must arrange for the line to be cleared if you become aware that:

- Animals are likely to cause an obstruction.
- Minor obstacles are on the line.
- A large animal is within the boundary fence.

You do not need to examine the line, but you must:

Signaller

- Stop each train which is to proceed over the affected portion of line.
- Tell the driver what is happening, and to proceed at caution.

Except in the single bore tunnels, you must not allow more than one train to be in the tunnel at the same time.

You must continue to stop and tell each driver to proceed at caution until you are sure the line is again clear.

If the entrance to the section is controlled by another signaller, you must tell that signaller about the incident.

### 10.3.2 Swans on the line

If a swan is reported to be in the “four foot” of a line under your control, you must caution trains on the line involved. You can run normally on other lines.

Signaller

### 10.3.3 When you can run normally with animals on the line

You can run trains normally with animals on the line if the animals are:

Signaller

- Domestic (for example, dogs).
- Deer.
- Not more than six sheep.

If you are told of one of the above by a driver, you must tell Operations Control and send a GSM-R general broadcast to trains in the area to advise drivers:

- About the animals.
- There is no need to report it.

## 11 GSM-R calls

### 11.1 Actions following an railway group emergency call (REC)

Operations  
Control

If you are alerted to an incident through the emergency call procedure, you must make sure:

- The emergency services are contacted (if required),
- The signaller is carrying out the appropriate rules and regulations as shown in this rule book module.
- All affected parties are told.

### 11.2 GSM-R cautioning on the move

#### 11.2.1 Berth triggered messages

Signaller

You are authorised to use a berth triggered message using the GSM-R radio system to caution train drivers for the following reasons:

- Poor railhead conditions.
- Animals on the line in open sections of the COS.
- Unusual events (this excludes track or signalling faults).



Unusual events are those where drivers may stop and report something unusual that is not expressly covered in the Rule Book. For example, unusual events and structure faults can include overcrowding on station platforms or a loose canopy on station platforms.

### 11.2.2 Choosing a suitable location

You must choose a suitable protecting block marker, which will allow sufficient time for an acknowledgement to be received and allows you to set the required route, without bringing the train to a stand. The route must remain closed with a reminder applied until drivers have been cautioned.

Signaller

### 11.2.3 Choosing the berth

You must choose a berth far enough back from the protecting block marker so that drivers of trains triggering the message have enough time to listen to it repeated, acknowledge the message, and remain with a valid MA. The trigger berth and protecting block marker must both be in your area of control.

Signaller

### 11.2.4 Only one message at a time

You can only have one berth triggered safety message active, but the same message may be triggered by several berths (for example, in both directions for animals on the line).

Signaller

### 11.2.5 Using the script

You must use the script format as shown in Handbook RS523 to deliver the pre-recorded safety broadcast.

Signaller

You must get another competent person to check the message and the arrangements before implementation.

### 11.2.6 When the 'acknowledged' message is received

When receiving an 'acknowledged' message, you must check which train sent it before setting an MA.

Signaller

### 11.2.7 Reapplying the reminder appliance

Once the train is clear of the protecting block marker and the route closed, you must reapply the reminder appliance.

Signaller

### **11.2.8 If the 'acknowledged' message is not received from a driver**

Signaller

If a driver does not send you an 'acknowledge' message, you must keep the route closed at the block marker and caution the driver once the train is at a stand.

You must also verbally caution the driver if the GSM-R berth triggered message fails or is not sent.

### **11.2.9 If a safety of the line event is taking place at the same time**

Signaller

If a safety of the line event is also taking place including degraded mode working, you must not use the berth triggered broadcast process unless it would reduce your workload.

If a safety of the line event occurs whilst the berth triggered broadcast is in place including degraded mode working, the berth triggered broadcast process can be suspended for the duration of the degraded working unless it would continue to reduce your workload.



## 12 Stop and examine train

### 12.1 When this regulation must be used

You must carry out this regulation if you become aware of anything unusual or wrong such as the following.

Signaller

- Signals of alarm.
- An insecure load.
- A vehicle on fire.
- A hot axle box.
- A train door is incorrectly open.
- A person has fallen from a train.
- Unusual noise coming from a train.
- Other mishaps.

You must also monitor for damage to the infrastructure which might have been caused by the train including:

- Multiple or sequential axle counter failures, or
- Multiple or sequential loss of detection of points.

Signaller

## 12.2 Anything unusual or wrong with a train

If you become aware of anything unusual or wrong with a train, you must immediately:

- Stop the train concerned.
- Stop trains on any adjacent lines from passing the train concerned.
- Stop trains proceeding on the same or any other line over the affected area.
- Tell the signaller who controls the area from which the train approached what has happened.
- If necessary, carry out general signalling regulation TSI 4.6 (withdraw an MA).
- Arrange for the train to be examined and dealt with as necessary.

If you cannot stop the train concerned before it enters an area controlled by another signaller, you must first send the emergency alarm and then immediately tell that signaller what has happened.

### 12.3 After the train has stopped

After the train has been stopped and you have found out whether any line is obstructed, you may allow normal working on unobstructed lines.

Signaller

If after the train has been examined, nothing can be found wrong with the train, you must do the following.

- Stop the first train to travel over the affected area on any line, and
- Tell the driver what has happened.
- You must then instruct the driver to:
  - Proceed at caution through the affected area.
  - Report the state of the line to the next signaller or at a specified point ahead.

Until you receive a report on the state of the line, you must instruct the driver of any other train that is to pass through the affected area to proceed at caution.

If another signaller is involved, you must tell that signaller what has happened.

If the other signaller is an RfLI signaller, they must then carry out this regulation 12.3. If the other signaller is a Network Rail signaller, they must be asked to carry out the applicable regulation.

You must reach a clear understanding with the other signaller as to what is required.

## 12.4 If the train cannot be dealt with

Signaller

If, after the train has been examined, it is not possible for it to be dealt with, but it can proceed safely to a point where it can be dealt with, you must do the following.

- Agree the arrangements with any other signaller who controls the area ahead, if applicable.
- Tell the driver to disengage ATO (if applicable) and then signal the train in the highest level of supervision.

You must not allow the train to pass, or be passed by, a train on an adjacent line unless you have been assured that it can be done safely.

These arrangements must be repeated for each section the train has to pass through.

## 12.5 Door open on a passenger train

### 12.5.1 If a person has fallen from the train

Signaller

If you are told a person has fallen from a train, you must arrange to examine the line.

### 12.5.2 If it is not known whether a person has fallen from the train

Signaller

If you are told that a door is open on a passenger train and you have been told the door has been closed, but it is not known whether any person has fallen from the train, you do not need to examine the line. However, you must:

- stop the first train on each line and tell the driver what has happened
- instruct the driver to proceed at caution over the affected portion of line.

### 12.5.3 When no-one has fallen from the train

Signaller

If it is confirmed that no-one has fallen from the train and the door has been closed, you may resume normal working.

## 13 Examining the line

### 13.1 When the line is to be examined

If the train signalling regulations require a line to be examined, this can be achieved by one of the following.

Signaller

- You can get a competent person to check the line is safe for trains to pass.
- You can get the driver of a train passing over the affected line to check the line is safe for trains to pass.

You must not use a train to examine the line but must instead arrange for a competent engineer to examine the line if any of the following are reported.

- Broken, distorted or damaged rails, or broken fishplates.
- An underline bridge has been struck by a road vehicle, unless otherwise shown in the COS Control Manual.
- Damage to a bridge not caused by a road vehicle.
- Subsidence or other earthworks damage.
- Suspected damage to any other structure below or above the railway.

### 13.2 Before an examination using a train can start

If another signaller is involved, you must both reach a clear understanding about what is to be done.

Signaller

You must be sure that the last train to enter the affected section has passed, complete with tail lamp, beyond the stop signal or block marker ahead of the affected portion of line.

You must not allow a train with a failed headlight to examine the line during darkness, or poor visibility, or if there is a tunnel in the section, unless a portable headlight is fitted to the front of the train. If necessary, you must arrange for tunnel lighting to be lit to help with the examination of the line.

## Signaller

If there is more than one line, you must treat each line as affected unless you have definite information that a line is not affected.

Each affected line must be examined individually but this can be done at the same time.

Where the affected portion of line is in Connaught tunnel, you must not allow another train to enter or pass through the tunnel while a train is being used to examine the affected portion of line.

If the overhead line equipment is to be examined using a train, you must also carry out the instructions shown in module AC electrified lines.

You may allow trains on all other lines not affected to continue to run. However, during the time an affected line is being examined, the driver of each train on lines immediately next to the affected line must be:

- Told what is happening.
- Told the locations between which the adjacent line is affected.
- Instructed to proceed at caution when approaching the affected portion of line.
- Told to report as soon as possible if anything is seen to be wrong.

You must continue to do this until any train being used to examine the affected line has passed over the affected portion of line.

### 13.3 Dealing with the train that will be used to examine the line

Before you allow the train that will be used to examine the line to enter the affected section, you must:

Signaller

- Tell the driver why the line is to be examined.
- Tell the driver to disengage ATO.
- Reach a clear understanding with the driver as to which portion of the line is to be examined.

You must instruct the driver that when an MA is received or if the train is not reporting to pass the EoA without an MA:

- To proceed at caution over the affected portion of line.
- If the line is to be examined because of a reported track defect, not to exceed 20 mph (30 km/h).
- Report the state of the affected line at an agreed location beyond the affected portion of line.

### 13.4 Signalling the train being used to examine the line

Where another signaller is involved, when the train to be used to examine the line is ready to enter the affected section, you must tell the other signaller and get permission for the train to enter the section. The examining train must not be in ATO.

Signaller

When the driver has been given the necessary information, you may issue an MA for the train to proceed or if the train is not reporting tell the driver to pass the EoA without an MA.

After the examining train has gone beyond the block marker protecting the affected portion of line, you must not allow another train to follow until a report is received stating the line is clear and safe for trains to run on.

If the driver tells you the line is obstructed, you must immediately carry out general signalling regulation 4.6 (withdrawing an MA).

Signaller

### 13.5 Resuming normal working

If the driver of the train being used to examine the line reports that the line appears to be safe for the passage of trains, you may resume normal working over that line, except in the following circumstances.

- If the line has been examined for a reported track defect you must:
  - Tell the driver of each train that is to pass over the affected line that a track defect has been reported.
  - To proceed at caution over the affected portion of line not exceeding 20 mph (30 km/h).
  - You must continue to do this until a competent engineer has confirmed that the affected portion of line is safe for normal operation.
- If damage to structures or earthworks above or below the line is reported, you must carry out the instructions shown in COS Rule Book M3 *Managing incidents, floods, and snow in the central operating section*.

### 13.6 When an axle counter section or track circuit fails to clear or shows occupied for some other reason

Signaller



Note: This regulation applies only when axle counters or track circuits are being used as the main means of train detection.



### 13.6.1 Before the passage of the first train

You must carry out this regulation if an axle counter section or track circuit:

Signaller

- Fails to clear after the passage of a train, or
- Shows occupied for some other reason.

You must make sure that no train has been signalled over the affected portion of line and that the last train over the affected portion of line has passed clear of the axle counter section or track circuit concerned and one of the following applies.

- That train has occupied and cleared the overlap of a signal or block marker beyond the affected portion of line.
- You have been told that the train has passed out of the section with tail lamp attached.

Unless you are sure that the line is not obstructed, you must arrange for the line to be examined as well as carrying out the following instructions.

### 13.6.2 First train to pass on an adjacent line

If the first train to pass on a line immediately next to the affected line before the affected line is examined, the driver of this train must be told the following.

Signaller

- What is happening.
- The locations between which the adjacent line is affected by the axle counter or track circuit.
- To pass the affected portion of line at caution.
- To report as soon as possible if anything is wrong.

### 13.6.3 First train to pass over the affected line

Signaller

You must stop the first train to pass over the affected portion of line and ask the driver if the line appears to be clear as far as can be seen.

If the driver confirms that the line appears to be clear as far as can be seen, you must:

- Tell the driver what has happened.
- Reach a clear understanding with the driver as to which portion of the line is to be examined.
- Issue a PSMA or if the train is not communicating, tell the driver to pass the EoA without an MA and to proceed at caution over the affected portion of line.
- Tell the driver to report the state of the affected line at an agreed point ahead of the affected portion of line.

### 13.6.4 When it is known the affected line is not obstructed

Signaller

If it has been confirmed that the line is not obstructed, you must treat the axle counter or track circuit as having failed.

## 14 Train an unusually long time in section

If you become aware that a long time has passed after a train has entered a section, you must try to contact the driver to find out the cause.

Signaller

If you cannot contact the driver, until you have found out what is wrong, you must:

- Stop each train on any adjacent line travelling towards the overdue train.
- Tell the driver of each train the circumstances regarding the overdue train.
- Instruct the driver to proceed at caution when an MA is received.
- Tell the driver to report what has happened with the overdue train.
- Signal each train normally.

If another line is not available, you must get help from a competent person.

If the entrance to the section is controlled by another signaller, you must tell that signaller about the incident.

You must tell Operations Control about the incident.

Please refer to specific modules for issue and in-force status

[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

COS/TS10

# CBTC train signalling regulations

## Module TS10



Issue 4

Date December 2020

Trial running

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 4, December 2020

© Copyright 2020  
Rail for London Infrastructure Limited

This module details the regulations for train signalling by Communications Based Train Control (CBTC) for the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this module if you carry out the duties of a signaller.

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Definitions**
- 2 Principle**
  - 2.1 CBTC ATP**
  - 2.2 Degraded modes**
- 3 Signalling trains manually**
  - 3.1 Issuing MAs**
  - 3.2 Train requiring to stop in section**
  - 3.3 Not used**
  - 3.4 Emergency permissive working**
  - 3.5 Signalling by telephone**
  - 3.6 Not used**
- 4 Obstruction of the line**
  - 4.1 Stopping trains because of an emergency**
  - 4.2 If another signaller is involved**
  - 4.3 Allowing a train into the affected section**
- 5 Train or vehicles proceeding without authority or train divided**
  - 5.1 Immediate actions**
  - 5.2 If another signaller is involved**
  - 5.3 Making sure the line is clear**
- 6 Tail lamp out or missing**
- 7 Allowing an assisting train into an occupied section**
  - 7.1 Before allowing an assisting train into the occupied section**
  - 7.2 Occupying or obstructing the line within the overlap**
  - 7.3 When the line is again clear**
- 8 Failure of train describers**
- 9 Not used**



## **10 Opening and closing the RCC**

**10.1 Opening**

**10.2 Closing**

**10.3 Transferring to and from the Back-up Control Facility (BUCF)**

# 1

## Definitions

The following terms are used in these regulations and apply to signallers in the Central Operating Section (COS).

### **Automatic route setting (ARS)**

ARS allows the signalling system to secure a safe route for trains according to a timetable and allows a movement authority (MA) to be generated for the train movement.

### **Automatic train operation (ATO)**

ATO allows the communication based train control (CBTC) to automatically operate the train's driving controls in accordance with information received from the signalling equipment.

### **Automatic train protection (ATP)**

ATP provides a safe distance between trains and supervision of train speed through the issuing of MAs.

### **Block marker**

A block marker can only be passed by a train with an MA or with your authority as shown in the rules.

### **Block section**

The line between two RSPs.

### **Logical track element (LTE)**

LTE is a part of an axle counter section in the signalling system. An axle counter section could contain one or many LTEs.

### **Overlap**

An overlap, where provided, is the LTE beyond an RSP up to which the line must be clear before an MA can be issued from the previous RSP.

**Route-setting positions (RSPs)**

RSPs which are operated by you when you are required to set routes manually.

An RSP is indicated on the lineside by a block marker.

**Signals**

Signals are provided at the Network Rail interfaces and can be part of CBTC movement authorities.

A signal is provided at the exit of the Plumstead maintenance siding which is also an RSP.

## 2 Principle

### 2.1 CBTC ATP

CBTC ATP permits automatic train operation (ATO) when:

- the portion of line to which the movement authority (MA) issued by the system is clear
- all route proving checks have been carried out and confirmed as being correct
- the train's onboard CBTC system has received the MA
- the signalling system has correctly identified the train and its position and the system is providing a safe distance between trains.

All required information, such as speed and condition of the line ahead, is communicated directly and continuously to a driver via a driver machine interface (DMI) in the driving cab.

#### **ATO**

On trains fitted with Automatic Train Operation (ATO), this is the normal method of operation which permits the ATO system to drive the train.

#### **Protected Manual**

CBTC affords ATP as shown above and permits the driver to control the train within the movement authority provided.

All required information, such as speed and condition of the line ahead, is communicated directly and continuously to a driver via a driver machine interface (DMI) in the driving cab.

### **Proceed On-sight**

The Proceed On-Sight movement authority (PSMA) enables the train to:

- approach the overlap of an LTE which is detected as occupied by another train, or
- an LTE with a detected unsafe state such as an open platform screen door.

The authority to use this mode will come from you. (The driver must acknowledge the mode).

Before an PSMA can be issued, the train must be at a stand.

The DMI will display the train speed to the driver and the MA continues to be supervised, but in addition the signalling system will limit the train's speed to a lower level so that the driver can stop short of any obstruction.

### **In-Possession MA**

An In-Possession Movement Authority (IPMA) is used to allow an engineering train to enter an Engineering Possession Area (EPA) in on-sight Mode.

The authority to use this mode will come from you. (The driver must acknowledge the mode).

Before an IPMA can be issued, the train must be at a stand.

The DMI will display the train speed to the driver and the MA continues to be supervised, but in addition the signalling system will limit the train's speed to a lower level so that the driver can stop short of any obstruction.

## **2.2 Degraded modes**

If for any reason, such as a failure of the signalling equipment or a failure of the on-board CBTC equipment it is not possible to issue a train with a movement authority, the train can be moved forward in Staff Accountable (SA) mode. Any movement in SA must be authorised verbally by you.

**Staff Accountable (SA)**

In SA mode the train speed is supervised by the onboard system to a maximum of 25 mph (40 km/h). ATP is not provided and there is no overrun protection. You must carry out the instructions in section 10 of module TS11 *Failure of, or work on, signalling equipment - signallers' regulations* and module S5 *Passing an End of authority (EoA) without a movement authority (MA)* before allowing a train to proceed.

SA is also used to move a train which does not have a position reference over balises for it to obtain an ATP mode of supervision.

## 3 Signalling trains manually

### 3.1 Issuing MAs

#### 3.1.1 Before issuing MAs

Before you operate a signalling control to allow a train to proceed, you must make sure that:

- no other movement that may conflict is to be made first
- the route is set or is free to be set by the interlocking.

#### 3.1.2 Shortening an MA

Before you allow a movement to occupy an LTE which would shorten an MA for another train, you must first close the route concerned to protect the movement.

If another signaller controls that route, you must not allow the movement to take place until that signaller tells you the route has been closed.

#### 3.1.3 Obstructing or occupying an overlap

You must not allow a non-reporting train to obstruct or occupy an LTE used as the overlap for a route until:

- any other approaching train has been stopped at the protecting EoA, or
- if no train is approaching that EoA, you have closed the route from the previous RSP.

#### 3.1.4 Emergency alarm

If you receive the emergency alarm from an adjacent signal box, you must close the route on the affected lines. You must then find out whether it is necessary to carry out regulation 4, regulation 5 or module TS1 *General signalling regulations* TS1.19.

### 3.2 Train requiring to stop in section

If a train that is to stop in the block section is to enter an area controlled by another signaller, you must tell that signaller:

- the type of train
- where the train is to stop and why
- the approximate time the train will occupy the section.

### 3.3 Not used

### 3.4 Emergency permissive working

In an emergency, you can allow a train conveying passengers to enter an occupied section to reach a station platform, as long as you have been authorised to do so by Operations Control.

You must make sure there is enough room to safely deal with the train at the platform.

Before you allow a train to proceed, you must tell the driver what has happened, and instruct the driver to pass the EoA without an MA and any other conditions that may apply.

You must also tell the driver that when the train has arrived at the station platform, no further movement is to be made without your authority.

### 3.5 Signalling by telephone

#### 3.5.1 When this regulation must be used

You must use this regulation when it is necessary to signal trains by telephone when signalling equipment is being worked on or has failed.

You must also use this regulation when an out-of-gauge train is to travel between two signal boxes.



### 3.5.2 When signalling by telephone

You must record the times at which all descriptions are sent or received in the Occurrence Log.

### 3.5.3 Not used

### 3.5.4 Signalling trains by telephone

You must send all messages on the telephone, for example:

Signaller A 'Is West Main line clear for one alpha two seven'?

Signaller B 'West Main line is clear for one alpha two seven'.

Signaller A 'One alpha two seven train entering section on West Main line'.

Signaller B 'One alpha two seven train out of section on West Main line'.

If for whatever reason you cannot accept a train that is offered, you must state the refusal as follows:

Signaller B 'No, one alpha two seven refused'.

### 3.5.5 When normal working is to resume

Before returning to normal working, you must both agree how this is to be done.

### 3.6 Not used

## 4 Obstruction of the line

### 4.1 Stopping trains because of an emergency

#### 4.1.1 Protection

If you need to stop trains because of an obstruction or other emergency or the operation of an emergency plunger, you must do this in the quickest and most effective way.

This includes:

- operating the emergency stop control
- making a railway emergency call
- withdrawing MAs which have been issued
- disabling ARS for the affected area.
- closing routes to protect the affected line.

If you cannot stop a train proceeding towards the obstruction or other emergency, you must carry out the instructions shown in regulation 5.

#### 4.1.2 Placing a control to normal

You must also place or keep any slot or acceptance switch in the normal position.

#### 4.1.3 Obstruction within the overlap

If the obstruction or other emergency is within the overlap of the protecting the RSP, you must close the route at the previous RSP unless there are facing points that you have set for a route that is clear of the affected section.

#### 4.1.4 Train detained at an RSP on the approach

If a train is detained at an RSP on the approach to the affected block section, you must instruct the driver to stay there until you give permission for the train to proceed even if an MA is received.

## 4.2 If another signaller is involved

If another signaller controls the RSP that will protect the obstruction or other emergency, you must immediately tell that signaller what is happening.

If this signaller is in another signal box, you must first send the emergency alarm.

If you are the signaller receiving this message or emergency alarm, you must carry out the instructions shown in regulations 4.1 and 4.3.

You must then tell the signaller giving you the message or emergency alarm whether you have been able to stop a train proceeding towards the obstruction or other emergency.

## 4.3 Allowing a train into the affected section

You must not allow a train into the affected block section until the line is again clear and safe for the passage of trains unless it is necessary to:

- examine the line
- allow an assisting train into an occupied section
- work to and from the point of obstruction, or serve an intermediate station, but only if this can be done safely
- allow a train to pass through a diverging junction before reaching the obstruction.

If more than one signaller is involved, you must both come to a clear understanding as to what is to be done before allowing a train into the affected block section.

## 5 Train or vehicles proceeding without authority or train divided

### 5.1 Immediate actions

If you become aware, or you suspect, that a train or vehicle is proceeding without authority, or a train is running in two or more portions, you must stop the train.

This includes:

- sending an emergency stop
- making a railway emergency call.

You must protect other trains and do this in the quickest and most effective way by:

- withdrawing MAs which have been issued to the train concerned or any other trains which could be put in danger
- closing routes to protect any line that could be affected
- if possible, altering the position of any points to divert trains and prevent collisions
- if possible, arranging for the line on which the train or vehicle is proceeding without authority to be cleared
- taking any other possible action to reduce the risk of a collision.

### 5.2 If another signaller is involved

If a train or vehicle that is proceeding without authority, or a portion of a divided train, will enter a block section controlled by another signaller, you must immediately tell that signaller what is happening.

If this signaller is in another signal box, you must first send the emergency alarm.

### 5.3 Making sure the line is clear

If it cannot be confirmed that an adjacent line is not obstructed, you must arrange for that line to be examined.

If a train or vehicle that has proceeded without authority, or all of a divided train has stopped intact and it is confirmed that no other line is affected, you may resume normal working on the other lines.

You must not allow any train to pass over the line where a train or vehicle has proceeded without authority, or a portion of a divided train has passed, until you are sure that the line is clear.

You must signal the next train normally.

## 6 Tail lamp out or missing

If you become aware that a train has the tail lamp out or missing, you must find out whether the train is complete. You must also tell the driver of that train that the tail lamp is out or missing.

If the train enters an area controlled by another signaller before you can find out if the train is complete, or before you are told the tail lamp has been replaced or relit, you must tell that signaller.

## 7 Allowing an assisting train into an occupied section

### 7.1 Before allowing an assisting train into the occupied section

You may allow an assisting train to approach the LTE protecting a failed train in either direction to:

- proceed to, and assist, a failed train
- evacuate passengers from a failed train
- remove the rear portion of a divided train
- remove vehicles which have proceeded without authority.

If the affected block section is adjacent to a line that you control, you must instruct the driver of any train proceeding on the adjacent line to proceed at caution.

If another signaller is involved, you must come to a clear understanding with that other signaller as to what is to happen.

You do not need to do this if the affected block section is within a single bore tunnel.

### 7.2 Occupying or obstructing the line within the overlap

If you are told that the train has failed and will not be moved, you may allow the overlap of the RSP immediately beyond the failed train to be occupied, fouled or obstructed. You may continue to do this until:

- the failed train is ready to proceed, or
- the assisting train has entered the section and the failed train is to be assisted forward.

### 7.3 When the line is again clear

When the line is again clear, you must signal the next train normally.



## CBTC signalling regulations

# 7

section

If the assisted train is to enter a block section controlled by another signaller, you must tell that signaller the train is being assisted and how it is being assisted.



## 8 Failure of train describers

If the train describer equipment fails, you must keep a record of the trains within your area of control.

If a train enters an area controlled by another signaller, you must tell that signaller the identity of the train. If that signaller is at another signal box, you must send the train description by telephone.

If it is not possible to pass on a train description, you may allow trains to proceed and issue MAs in the normal way, if possible.

If you become aware of a train within your area of control for which you have not received a train description, you must find out its identity, if necessary by stopping the train.



CBTC signalling regulations

**9** Not used

# 10 Opening and closing the RCC

## 10.1 Opening

When you are to open the RCC, you must find out if the adjacent signal boxes are open and tell the signallers there that the RCC is now open.

## 10.2 Closing


When you are to close the RCC, you must:


- make sure there are no more train movements required
- make sure that all controlled RSPs in your area of control are closed
- tell the signallers in the adjacent signal boxes that the RCC is closed

## 10.3 Transferring to and from the Back-up Control Facility (BUCF)

If it is necessary to transfer to and from the BUCF, you must carry out the instructions given to you from Operations Control.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

COS/TS11

Failure of, or work on,  
signalling equipment –  
signallers' regulations

**Module TS11**



Issue 5

Date December 2021

Comes into force 21<sup>st</sup> December

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 5, December 2021

© Copyright 2021  
Rail for London Infrastructure Limited

This module details regulations for during failure, or work on signalling equipment in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

You will need this module if you carry out the duties of a signaller.

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 General**
  - 1.1 Definitions
  - 1.2 When the regulations in this module apply
  - 1.3 When the regulations in this module do not apply
  - 1.4 Signaller's responsibilities
  - 1.5 Using a Signal Engineering Work form (CR3187)
  - 1.6 Telling the driver at a previous block marker
- 2 Work that will not affect the normal passage of trains**
  - 2.1 When this regulation applies
  - 2.2 Before starting work
  - 2.3 When the work is completed
  - 2.4 If the work cannot be completed
- 3 Work that will affect the normal passage of trains**
  - 3.1 When this regulation applies
  - 3.2 Before starting work
  - 3.3 At the agreed time
  - 3.4 During the work
  - 3.5 When the work is completed
  - 3.6 If all the work cannot be completed
- 4 Releasing signalling controls**
  - 4.1 When this regulation applies
  - 4.2 Procedure for releasing signalling controls
  - 4.3 Change of signaller
  - 4.4 Cancelling a release of signalling controls
- 5 Failure of signalling equipment**
  - 5.1 Immediate actions
  - 5.2 Indications failure on the workstation
  - 5.3 Before starting work
  - 5.4 If the work requires signalling equipment to be restricted or taken out of use
  - 5.5 During the work
  - 5.6 When the work is completed



- 5.7 If all the work cannot be completed
- 5.8 Failure of an electronic link
- 6 Failure of, or work on, signalling equipment when the line is under possession
  - 6.1 When this regulation applies
  - 6.2 Work on signalling equipment
  - 6.3 Failure of signalling equipment
  - 6.4 Operating signalling equipment for tests
- 7 Train approaching a defective main aspect or approaching an EoA without an MA or a missing block marker
  - 7.1 Allowing a train to approach
  - 7.2 Train approaching an EoA without an MA
  - 7.3 Not used
  - 7.4 Train approaching a missing block marker
- 8 Not used
- 9 Not used
- 10 Allowing a train to pass an EoA when it is not possible to signal the movement
  - 10.1 Unable to issue a Protected Manual (PM) MA to the train
  - 10.2 Unable to issue any MA's to the train
  - 10.3 Unable to issue an MA but all axle counters or track circuits are showing clear
- 11 Not used
- 12 Not used
- 13 Not used
- 14 Defective points
  - 14.1 If you suspect that points have been run through
  - 14.2 Not used
  - 14.3 Defective power-operated points
  - 14.4 Passing an EoA without an MA during a failure of power-operated points

- 14.5 Leaving points secured and unattended**
- 14.6 Change of route-setting agent or points operator**
- 14.7 Returning power-operated points to normal operation**
  
- 15 When a train or vehicle fails to operate track circuits**
  - 15.1 Immediate actions**
  - 15.2 Allowing trains to pass over the track circuit concerned**
  - 15.3 Line not used for a considerable time or first train following a possession or line blockage**
  
- 16 Axle counter or track circuit section showing occupied when clear**
  
- 17 Not used**
  
- 18 Not used**
  
- 19 Not used**
  
- 20 Not used**
  
- 21 Resetting and restoring axle counters**

# 1 General

## 1.1 Definitions

### **Another signaller**

This includes signallers at adjacent signal boxes and signallers at other workstations in the RCC.

### **Complex failure**

A failure of power-operated points which needs more point ends to be set or secured (or both) than a simple failure.

### **Equipment out of use**

Equipment that the signaller must not operate.

### **Defective signal**

A signal which is not operating or displaying correctly, or where the light is out when it should be illuminated.

### **Equipment restricted**

Equipment that has had its functions limited but may continue to be operated by the signaller. This includes:

- a route setting position (RSP) restricted to prevent the signaller from issuing a movement authority (MA) beyond it
- points that have been restricted so they can only be used in the normal (or reverse) position.

### **Logical track element (LTE)**

LTE is a part of an axle counter section in the signalling system. An axle counter section could contain one or many LTEs.

### **Overlap (non-reporting train movement)**

An overlap, is the axle counter or track circuit section beyond an RSP up to which the line must be clear before a verbal authorisation can be given from the previous RSP.

**Points operator**

A competent person who is provided during a simple failure to set and secure power-operated points as directed by the signaller.

**Route-setting agent**

A competent person who is provided during a complex failure to set and secure power-operated points as directed by the signaller.

**Signalling equipment**

This includes:

- axle counters
- track circuits
- points
- CBTC equipment
- interlockings
- data transmission equipment.

**Simple failure**

A failure of power-operated points that needs one of the following to be set or secured, or both.

- A single point end.
- A single point end and co-acting trap point.
- Both ends of a crossover.

**Work which affects the normal operation of signalling equipment**

Any work which will interfere with signalling equipment and needs the signaller's permission before it is carried out but which can be completed in a suitable interval between trains.

**Work which affects the normal passage of trains**

Any work which will interfere with signalling equipment and would prevent trains passing or would allow trains to pass only by diversion or degraded-mode working.

## 1.2 When the regulations in this module apply

The regulations in this module apply:

- during a failure of signalling equipment
- during work on signalling equipment
- when a release of signalling controls is needed.

## 1.3 When the regulations in this module do not apply

The regulations in this module do not apply to work on signalling equipment when all the following are met. The work:

- will not affect the normal passage of trains
- does not need the signaller's co-operation
- will not affect the normal operation of the signalling equipment.

When testing or commissioning of S&CS is planned to take place, the instructions in this module may not apply, and will be supplemented by special operating instructions.

Protection may be provided by a combination of possessions on Network Rail infrastructure, signalling restrictions imposed and/or signal protected zone instructions.

## 1.4 Signaller's responsibilities

You must never interfere with signalling equipment.

You are responsible for the safe working of trains when the regulations in this module are to be applied.

You must not operate any signalling equipment that is affected by the work unless the signalling technician has given you permission to do so.

When you are relieved, you must make sure that the new signaller fully understands the arrangements that apply. If a Signal Engineering Work form (CR3187) is being used, you must make sure that the new signaller signs part 3 in your presence.

## 1.5 Using a Signal Engineering Work form (CR3187)

You must use form CR3187 when:

- signalling equipment will be taken out of use or restricted to allow work as shown in regulation 3 of this module, and
- trains, other than engineering trains in a possession, have to pass through the affected area.

You do not need to use form CR3187 if all the signalling equipment affected is within the area of a line blockage or a possession and it is planned to restore the equipment to normal use before the line blockage or possession is given up. You must record the details of all affected equipment in the Occurrence Log.

However, if the line blockage or possession will be given up and signalling equipment will stay restricted, you and the signalling technician must fill in form CR3187 before the line blockage or possession is given up.

You do not need to use form CR3187 during a failure of signalling equipment unless equipment will be taken out of use or restricted and it will not be possible to complete the work before trains have to pass.

## 1.6 Telling the driver at a previous block marker

If in these regulations you must tell the driver at a previous block marker about a defective signal ahead, and if that defective signal is operated by another signaller, you must:

- tell the other signaller about the defect
- reach a clear understanding about what is to be done.

If you must tell the driver at a previous block marker about the inability to issue an MA at the block marker ahead and that block marker is operated by another signaller, you must:

- tell the other signaller about the defect
- reach a clear understanding about what is to be done.

If you are that other signaller, you must stop each affected train and give the driver the necessary instructions as shown in these regulations.

## 2 Work that will not affect the normal passage of trains

### 2.1 When this regulation applies

You must apply this regulation to work on signalling equipment which will not affect the normal passage of trains, but which will affect the normal operation of signalling equipment.

### 2.2 Before starting work

You must come to a clear understanding with the signalling technician about:

- what work needs to be done
- how the signalling equipment will be affected
- any other equipment that will be affected
- how long the work will take
- the time that permission will be given for the work to start
- the time by which the work must be completed.

You must only give permission for the work to start when there is a suitable interval between trains.

You must make an entry in the Occurrence Log.

### 2.3 When the work is completed

When the signalling technician tells you the work is completed, you must make a suitable entry in the Occurrence Log.

### 2.4 If the work cannot be completed

If the signalling technician tells you that the work cannot be completed on time and you cannot agree more time to complete the work, you must treat the equipment as failed and carry out regulation 5 of this module.



## 3 Work that will affect the normal passage of trains

### 3.1 When this regulation applies

You must apply this regulation to work on signalling equipment which will affect the normal passage of trains.

### 3.2 Before starting work

You must come to a clear understanding with the signalling technician about:

- what work is to be done
- the details of equipment that will need to be restricted, or taken out of use
- any other equipment that will be affected
- how long the work will take
- how the work will affect train working
- the time that permission will be given for the work to start
- the time by which the work must be finished.

You must enter the details in part 2 of your copy of form CR3187 at the same time as the signalling technician.

### 3.3 At the agreed time

At the agreed time and when it is safe to do so, you must:

- place or keep the affected equipment in the agreed position
- tell any other signallers who are affected by the work
- give the signalling technician permission to start the work.

You must enter the details in part 2 of your copy of form CR3187 at the same time as the signalling technician.

If you are another signaller involved, you must make an entry in the Occurrence Log.

Once you have given the signalling technician permission to restrict or take out of use the agreed signalling equipment, you must not allow trains to pass until the signalling technician tells you the restrictions have been made.

When the signalling technician tells you the restrictions have been made or the equipment has been taken out of use, you must enter the details in part 2 of your copy of form CR3187 at the same time as the signalling technician.

### 3.4 During the work

No alteration to the work must be made unless the signalling technician has first agreed the changes with you.

If it is necessary to agree changes, you must again carry out regulation 3.2 of this module.

You must use a new form CR3187 and cancel the previous form.

### 3.5 When the work is completed

When the signalling technician tells you the work is completed and the equipment is in working order, you must enter the details in part 4 of your copy of form CR3187 at the same time as the signalling technician.

You must tell any other signaller involved.

If you are another signaller involved, you must make an entry in the Occurrence Log.

### 3.6 If all the work cannot be completed

If the signalling technician tells you that all the work cannot be completed, you must find out the details of:

- the work that has been completed
- equipment that is in working order
- work that has not been completed
- any equipment that will stay restricted
- any equipment that will be taken out of use
- what arrangements will be made to complete the work, if known.

You must:

- fill in part 4 of form CR3187 for the equipment that is back in order at the same time as the signalling technician
- use a new form CR3187 giving details of all equipment that will stay restricted or will be taken out of use
- make a suitable entry in the Occurrence Log
- tell Operations Control
- tell any other signaller involved.

If you are another signaller involved, you must make an entry in the Occurrence Log.

## 4 Releasing signalling controls

### 4.1 When this regulation applies

You may release the signalling controls when one of the following applies.

- a) An axle counter section or track circuit has failed holding points and it is necessary to move those points to the opposite position.
- b) An axle counter section, track circuit or other equipment has failed holding a route and it is necessary to release that route so that an MA can be issued for movements that are clear of the failure.
- c) An obstruction of the line, derailment or engineering work is keeping an axle counter or track circuit occupied and it is necessary to issue an MA for movements that will be clear of the obstruction.
- d) In exceptional circumstances where a signalling control may need to be released, you must get authority from operations control.

You must release a control which will allow an MA to be issued beyond an EoA when a track circuit or axle counter failure is preventing it on that route.

### 4.2 Procedure for releasing signalling controls

Before you release a signalling control, you must

- make sure the portion of line affected is clear of trains and that the intended movement can be made safely.
- make sure there are no trains moving or signalled in the affected interlocking area
- not operate any control switch within the affected interlocking area.

If possible you must ask another signaller to check that it is safe to release the signalling control.

You must record the details of which signalling control has been released in the Occurrence Log.

If the release given is the type shown in regulation 4.1 b), c) or d), before you allow each train to proceed, you must make sure that any points which are normally locked by the released axle counters or track circuits are secured.

### 4.3 Change of signaller

You must tell any signaller taking over from you which signalling controls have been released.

If you are the new signaller, you must make sure you fully understand which controls have been released.

### 4.4 Cancelling a release of signalling controls

If a release has been given for the reason shown in section 4.1 b) or 4.1 c), you must cancel the release as soon as it is no longer needed.

# 5 Failure of signalling equipment

## 5.1 Immediate actions

When signalling equipment fails, you must:

- make the operational railway safe
- tell any other signallers affected
- tell Operations Control
- make sure trains pass safely
- enter the details in the Occurrence Log.

## 5.2 Indications failure on the workstation

If you can confirm that an apparent failure of an indication or set of points is an indications failure, you may allow trains to run normally if it is possible to issue an MA.

### **Axle counter indication or track circuit failure when trains are communicating and running in ATO**

If there is an indication failure for an axle counter section or track circuit, you may allow communicating trains to run normally. You must not assume this to be an indication failure until you have carried out an axle counter re-set.

## 5.3 Before starting work

You must come to a clear understanding with the signalling technician about:

- what equipment has failed
- what other equipment will be affected by the work to repair the failure
- whether any equipment needs to be restricted or taken out of use
- whether form CR3187 has to be used.

You must agree with the signalling technician the time that work can start.

You must enter in the Occurrence Log all details agreed with the signalling technician.

If you are another signaller involved, you must make an entry in the Occurrence Log.

#### **5.4 If the work requires signalling equipment to be restricted or taken out of use**

Before work is allowed to start that requires signalling equipment to be restricted or taken out of use, you must:

- place or maintain the equipment in the agreed position
- if no train will pass before the work is completed, make an entry in the Occurrence Log
- if trains will pass before the work is completed, enter the details in part 2 of your copy of form CR3187 at the same time as the signalling technician
- tell any other signaller who is affected by the work
- when it is safe to do so, give the signalling technician permission to start the work.

If you are another signaller involved, you must make an entry in the Occurrence Log.

Once you have given the signalling technician permission to restrict the agreed signalling equipment, you must not allow trains to pass until the signalling technician tells you the restrictions have been made.

#### **5.5 During the work**

No alteration to the work must be made unless the signalling technician has first agreed the changes with you.

You must enter in the Occurrence Log the details of any agreed alterations.

If form CR3187 has been used, you must cancel it and enter the details of the agreed alterations on part 2 of a new form CR3187 at the same time as the signalling technician.

## 5.6 When the work is completed

When the signalling technician tells you that the work is completed and the equipment is in working order, you must:

- make an entry in the Occurrence Log, or if form CR3187 has been used, fill in part 4 of your copy at the same time as the signalling technician
- tell any other signaller involved
- tell Operations Control.

## 5.7 If all the work cannot be completed

If the signalling technician tells you that all the work cannot be completed, you must find out the details of:

- work that has been completed
- equipment that is in working order
- work that has not been completed
- any equipment that will stay restricted
- any equipment that will be taken out of use
- what arrangements will be made to complete the work, if known.

You must:

- use form CR3187, giving details of all equipment that will stay restricted or will be taken out of use
- make a suitable entry in the Occurrence Log
- tell Operations Control and give details of the equipment still affected by the failure.

## 5.8 Failure of an electronic link

During the failure of an electronic link between the signal box and an interlocking, you must not rely on the indications in the signal box for the equipment in the interlocking area concerned.

This does not apply if the signalling technician confirms that the failure only exists in the fault indication circuit and the operating indications can be relied on.



## 6 Failure of, or work on, signalling equipment when the line is under possession

### 6.1 When this regulation applies

You must apply this regulation as well as the relevant parts of regulations 2, 3, 4 and 5 when a failure of, or work on, signalling equipment takes place within a possession.

### 6.2 Work on signalling equipment

If work which requires signalling equipment to be taken out of use, or restricted will affect the movement of engineering trains or OTP, before you give the signalling technician permission to do so, you must arrange a suitable time with the PICOP.

### 6.3 Failure of signalling equipment

#### 6.3.1 Becoming aware of a failure

If you become aware that signalling equipment within a possession has failed, you must immediately tell the PICOP or PICOS.

Until the signalling equipment has been repaired, you must, if necessary, carry out regulations 6.3.3 to 6.3.5.

#### 6.3.2 Not used

#### 6.3.3 Points failures

If there is a points failure, you must tell the PICOP that no more movements must take place over the points until:

- the correct detection is obtained, or
- you receive confirmation that the points are in the correct position for the movement and, if they are facing to the movement, they have been secured.

### **6.3.4 Failure of trains to operate axle counters or track circuits**

If a train or vehicle fails to operate axle counters or track circuits, you do not need to carry out regulation 15 of this module.

### **6.3.5 Restricting signalling equipment**

If the failure requires restricting any signalling equipment within the possession, before you give the signalling technician permission to do so, you must arrange a suitable time with the PICOP.

## **6.4 Operating signalling equipment for tests**

If any signalling equipment needs to be operated for testing purposes, you must agree with the PICOP the time at which this can be done.

# 7 Train approaching a defective main aspect or approaching an EoA without an MA or a missing block marker

## 7.1 Allowing a train to approach

You may allow a train to approach a signal at the interface boundary with a defective main aspect if you are sure that signal is showing a danger aspect and the signal is kept at danger, or you are sure it is showing the correct aspect and will not cause the driver to see an incorrect sequence, or if it will cause a sudden shortening of the movement authority.

If this cannot be done, you must not allow a train to approach the defective signal until the driver has been told about the defect and the line is clear up to and including the overlap of the next stop signal that is displaying the correct aspect, beyond the defective stop signal.

## 7.2 Train approaching an EoA without an MA

You must not allow a train to approach an end of authority (EoA) without a movement authority (MA) unless the line is clear up to and including the overlap of the next EoA (or the buffer stops on a dead-end line).

## 7.3 Not used

## 7.4 Train approaching a missing block marker

When a train is not operating ATO, you must not allow the train to approach a missing block marker unless the line is clear up to and including the overlap of the next EoA (or the buffer stops on a dead-end line).

**8** Not used

**9** Not used

# 10 Allowing a train to pass an EoA when it is not possible to signal the movement

## 10.1 Unable to issue a Protected Manual (PM) MA to the train

If the system will not issue a PM MA to a train, it will automatically offer a Proceed on Sight Movement Authority (PSMA) to the train.

## 10.2 Unable to issue any MA's to the train

If the system cannot issue any MA to the train the driver will attempt to force the train into SA mode.

In either case you must carry out the instructions in module S5 *Passing an end of authority (EoA) without a movement authority (MA)*.

## 10.3 Unable to issue an MA but all axle counters or track circuits are showing clear

If you cannot issue an MA but all axle counters or track circuits for the route are showing clear, you may authorise a driver to pass an EoA without an MA. However, this only applies if all the following conditions are met.

- The last train authorised to proceed has passed clear of the overlap of the EoA.
- No conflicting movement has been authorised.
- You have told the driver that all axle counters or track circuits are working correctly and are showing clear.

If another signaller is involved, you must come to a clear understanding with that signaller as to what is to be done.



**11** Not used

**12** Not used





**13** Not used

# 14 Defective points

## 14.1 If you suspect that points have been run through

If you suspect points have been run through, you must not allow any movement to pass over the points in the facing direction until the signalling technician has examined them and tells you:

- the points have not been damaged, or
- they are damaged but can be used when secured.

If the points are found to be damaged, you must not allow any movement to pass over the points in the facing direction until:

- the points have been secured
- the movement can be made safely.

You must also close the route at the protecting block marker and keep it closed until the signalling technician tells you that you may clear it.

You must carry out this regulation even if you have the correct detection.

## 14.2 Not used

## 14.3 Defective power-operated points

### 14.3.1 Checking the points

You must arrange for power-operated points to be checked and if necessary, operated by hand if any of the following applies.

- They cannot be operated from the RCC.
- You cannot get 'normal' or 'reverse' indications.

You must arrange for a points operator to attend in the case of a simple failure or a route-setting agent in the case of a complex failure.

When the points operator or route-setting agent arrives on site, you must record their name, employer and the time in the Occurrence Log.

You must tell the points operator or route-setting agent:

- which points have failed
- when trains have been stopped on the line or lines involved
- if any other lines are still open.

You must tell the points operator or route-setting agent to check the points, and tell you whether:

- the points are in the normal or reverse position
- the points are damaged or obstructed
- the point motor is still running.

If you are told the point motor is still running, you must return the points to their previous position.

#### **14.3.2 Procedure for a simple failure**

If the points have to be operated by hand, you must use the route list, if there is one and tell the points operator which point ends need to be set and in what position.

When the points operator has told you that the points have been set you must:

- if you can, operate the control to correspond with the position the points have been set in
- if you have detection issue an MA.

If you cannot get detection, you must instruct the points operator to:

- secure these points with a clip and scotch if facing to the movement
- secure these points with a scotch if trailing to the movement
- tell you when this has been done.

### 14.3.3 Procedure for a complex failure

During a complex failure, the location affected may be split into two or more areas. In this case:

- there must be a route-setting agent for each area
- you and the route-setting agents must clearly understand which points each route-setting agent will be responsible for.

If the points have to be operated by hand, you must use the route list, if there is one and tell the route-setting agent:

- which point ends need to be set
- in what position they must be set
- the route that is to be set, for example Eastbound to Westbound.

The route-setting agent must record this information on a point-setting form.

When you are sure that the route-setting agent has filled in the point-setting form correctly you must:

- tell the route-setting agent to operate the points by hand
- get the route-setting agent's assurance that this has been done.

When the route-setting agent has told you that the route has been set you must:

- if you can, operate the control to correspond with the position the points have been set in
- if you have detection, clear the protecting signal or issue an MA

If you cannot get detection on any points, you must instruct the route-setting agent to:

- secure only these points with a clip and scotch if facing to the movement
- secure only these points with a scotch if trailing to the movement
- tell you when this has been done.

### 14.4 Passing an EoA without an MA during a failure of power-operated points

Before authorising the first train to pass a signal at danger or an EoA without an MA that protects the defective points, you must first stop any train on a line which could become obstructed.

### 14.5 Leaving points secured and unattended

When trains can continue to operate with some or all of the defective points set in one position and left unattended, you must instruct the points operator, or route setting agent in the case of a complex failure, to:

- clip, padlock and scotch both facing and trailing points in the required position
- leave the point controls set for manual operation
- tell you when this has been done.

You must record the details in the Occurrence Log.

### 14.6 Change of route-setting agent or points operator

If someone takes over from the points operator or route-setting agent, you must record the name and employer of the new points operator or route-setting agent and the time in the Occurrence Log.

### 14.7 Returning power-operated points to normal operation

When the signalling technician tells you that the points are now in working order, you must, as soon as trains have passed clear, tell the points operator, or route-setting agent in the case of a complex failure, to:

- remove the clips and scotches
- return the point machines to power operation
- tell you when this has been done.

If the points have been left unattended, you must tell the signalling technician to do this.

When you are told this has been done, you must:

- operate the points
- ask the points operator, route-setting agent or signalling technician to check the points are working correctly.

If the points are working correctly, you must tell the points operator, route-setting agent or signalling technician that normal working is being resumed.

You must record in the in the Occurrence Log the time that normal operation has resumed.

# 15

## When a train or vehicle fails to operate track circuits

Note: these regulations do not apply to vehicles that cannot be relied upon to operate track circuits when you are not relying on the track circuit because of rail-head conditions.

### 15.1 Immediate actions

#### Communicating trains

You must immediately tell Operations Control if a communicating train fails to operate a track circuit section.

#### Non-communicating trains

If a train non-communicating train or vehicle fails to operate a track circuit, you must immediately:

- close the route and keep it closed to protect the train or vehicle
- close the route to protect the track circuit concerned
- tell Operations Control (including the details of when the previous train passed over the track circuit concerned).

You must also arrange for the train to be stopped at the first available location so that the train can be examined.

### 15.2 Allowing trains to pass over the track circuit concerned

Until the signalling technician tells you that the track circuit section that failed to operate can be relied upon to indicate the presence of trains correctly, before allowing a train to pass over the track circuit section concerned, you must:

- make sure the previous train has passed beyond the overlap of the next stop signal or EoA beyond the track circuit concerned
- keep points in the correct position for the train movement using individual point controls
- close any other route which would conflict with the movement.

You must not allow another train to pass beyond a signal or block marker on the approach to the signal or block marker protecting the track circuit concerned until the train has passed beyond the or track circuit concerned.

### **15.3 Line not used for a considerable time or first train following a possession or line blockage**

You do not need to carry out regulations 15.1 and 15.2 when a train or vehicle fails to operate track circuits, but has operated track circuits elsewhere, when the line has not been used for a considerable time, or when the train was the first to pass over a portion of line that was affected by a possession or line blockage.

However, you must:

- report the failure to Operations Control
- before allowing a train to pass, make sure the previous train has passed beyond the overlap of the next stop signal or EoA beyond the track circuit section concerned
- carefully watch the track circuit indications concerned as each train passes over it
- close the route to protect trains as they pass over it
- keep points in the correct position for each train passing over it using individual point controls
- not rely on the track circuit until a train has correctly operated it.



## 16 Axle counter or track circuit section showing occupied when clear

If a train is not communicating and an axle counter or track circuit section fails to clear after the passage of a train or shows occupied for some other reason, you must arrange for the line to be examined.

You must also arrange for the line to be examined if you observe a track circuit failing to clear or showing occupied following the passage of a communicating train, or before the arrival of the next communicating train.

If it is reported that the line is not obstructed, you may authorise the driver of each train to pass over the affected axle counter or track circuit, as long as one of the following applies.

- You can make sure the portion of line concerned is clear after the passage of each train.
- You have seen the previous train occupy and clear the axle counters or track circuit section ahead of the signal or EoA beyond the affected portion of line.

Where the axle counter or track circuit concerned is between two signal boxes, you must introduce working as shown in regulation 3.5 of module TS10 *CBTC train signalling regulations*.

**17** Not used



**18** Not used

**19** Not used



**20** Not used


## 21 **Resetting and restoring axle counters**


You must be sure that the affected section of line is clear and the route closed and kept closed before starting the resetting and restoration procedure as shown in the *COSOI*.

You must arrange to examine the affected section of line before the resetting and restoration procedure is completed.

If the equipment requires a train to pass through the affected section as part of the resetting process, the train being used to examine the line can do this.

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

EVERY JOURNEY MATTERS

# Preparation and movement of trains in the central operating section

## Module TW1



Issue 8

Published 6th August 2024

In force from 31st August 2024



Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquires on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017

Issue 8, August 2024

© Copyright 2024  
Rail for London Infrastructure Limited

This module details the rules for the preparation and movement of trains in the central operating section.

The central operating section is from Westbourne Park to Pudding Mill Lane junction and from Stepney Green junction to Abbey Wood.

The following will need this module

- driver
- signaller
- train preparer.

#### Conventions used in the Rule Book

#### Examples

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.



Green text in the margin indicates who is responsible for carrying out the rule.

Signaller

A white i in a blue circle indicates that information is provided.



A black exclamation mark in a yellow circle is considered to be critical and is therefore emphasised in this way.



# Contents

1	Abnormal brake applications	5
2	Assisting failed locomotive hauled trains in the rear	6
2.1	General	6
2.2	Failed air-braked train	7
3	Attending for and leaving duty	8
4	Brake system requirements	9
4.1	Making sure brakes are working correctly	9
4.2	Carrying out a brake continuity test on locomotive-hauled trains	9
4.3	Carrying out a brake continuity test on multiple-unit passenger trains	9
4.4	Coaching stock vehicles with isolated brakes	10
4.5	Isolated vehicle brakes	10
4.6	Carrying out a running brake test	11
5	Broken rails, bridge strikes and track defects	12
5.1	Broken, distorted or damaged rails and broken fishplates	12
5.2	Bridge strikes	12
5.3	Track defects	13
6	Classification of trains	15
7	Doors on trains	16
7.1	Door open or not completely closed	16
7.2	Treating and reporting doors as defective	16
7.3	Passenger falling from the train during the journey	17
8	Driver's reminder appliance (DRA)	18
8.1	Using the DRA	18
9	Driving-cab equipment	19

10	Examining the line	20
10.1	How to carry out an examination of the line	20
10.2	If the headlight has failed	20
10.3	Being accompanied by a competent person	20
11	Lights on trains	21
11.1	Headlights and marker lights	21
11.2	Tail lamps	21
12	Locking doors on passenger trains	22
13	Passenger communication apparatus (PCA)	23
14	Personal equipment	24
15	Poor visibility	25
16	Preparing a train	26
17	Proceeding after being stopped because of an accident or other exceptional cause	27
18	Proceeding at caution	28
19	Propelling	29
19.1	Authority for propelling	29
19.2	Controlling the movement	29
19.3	Before the movement starts	29
19.4	During the movement	30
20	Public address system	31

# Contents

21	Rail adhesion	32
21.1	Levels of rail adhesion	32
21.2	When to report rail adhesion levels	32
21.3	Changing adhesion rates	33
21.4	Arranging a controlled test stop	34
21.5	Resuming normal working	35
21.6	Serious wheel slip	35
22	Route and traction knowledge requirements	36
23	Sidings	37
24	Snow conditions	38
25	Starting a train	39
25.1	Starting a train from a siding, depot or yard	39
25.2	Starting a train assisted in the rear	39
26	Stopping a train at a station where the train is booked to stop	40
26.1	At a station where a train is booked to stop	40
27	Stopping or stabling a train	41
27.1	Traction unit left unattended	41
27.2	Standing foul of any other line	41
28	Stopping short of, or overrunning a platform	42
28.1	If the train is stopped short of a station platform	42
28.2	If the train overruns a platform	42
29	Train in distress	44

30	Train radio equipment	45
30.1	Using the train radio safely	45
30.2	Communicating with the signaller	46
30.3	Signaller unable to call the driver	46
30.4	Making an emergency call	46
30.5	Railway emergency group call (REC)	47
31	Train stopped out of course or unable to make normal progress	48
31.1	Driver's instructions	48
31.2	Signaller's instructions	48
32	Traincrew being relieved	49
33	Trains put in danger	50
33.1	When other trains are put in danger	50
33.2	When a following train is put in danger	50
33.3	When your train is put in danger	51
33.4	When trains will not be put in immediate danger	51
34	Trespassers	52
34.1	Reporting trespassers	52
34.2	Instructions from the signaller	52
34.3	Reporting back to the signaller	53
35	Vehicles labelled for repair or with a NOT TO BE MOVED board attached	54
35.1	Trains or vehicles with a NOT TO BE MOVED board attached	54
35.2	Vehicles labelled for repair	54
36	Warning horn	57
36.1	General	57
36.2	Warning tones to use	57
36.3	Sounding the horn as a warning	58

# Contents

37	Working on the outside of a train	59
38	Auto reverse	61
38.1	Unplanned auto reverse (Key in operation)	62
39	Manual driving modes	63
40	Using a train for line block protection	64
40.1	Selecting the train and confirming the arrangements	64
40.2	Before proceeding	65
40.3	Arriving at the location and securing the train	66
40.4	When the work is completed	67
40.5	If the work cannot be completed	67
40.6	Moving the train when protection is no longer required	67
41	Sweeping the line	68
41.1	How to carry out a sweep of the line	68

## I Abnormal brake applications

If your train has been brought to a stand by a brake application which you did not make, you must immediately check the in cab equipment indications.

driver

If CBTC, ETCS, TPWS or AWS has applied the brake, you must immediately contact the signaller.

If CBTC, ETCS, TPWS or AWS did not cause the brake application, you must find out if the brake was applied by the passenger communication apparatus.

If none of these caused the brake application, you must check if the train is complete with tail lamp.

You must agree with the signaller what actions will be taken to find out whether the train has become divided and whether any other line is affected.

You must assume that your train has become divided if:

- the tail lamp is missing or
- the brake pipe is open at the rear.



## **2** Assisting failed locomotive hauled trains in the rear

The person responsible: driver

### **2.1** General

driver failed  
train

If your train has failed, it may be assisted in the rear if you can apply the automatic brake in an emergency.

You must only allow the movement to proceed to the next place where the train can be moved clear of the running line, or a locomotive can be attached to the front.

You must make sure that you can fully control the train throughout the movement.

You must reach a clear understanding with the driver of the assisting locomotive about how the movement is to be started, stopped and controlled.

You can use GSM-R radio for this purpose at any time during the movement.

driver  
assisting  
train

If you are the driver of an assisting train on which CBTC is in operation, you must make sure that CBTC is in the correct mode both before the movement starts, and immediately after your train is detached from the failed train.

You must not make any further movement without the signaller's authority.

## 2.2 Failed air-braked train

An air-braked train can only be assisted in the rear by:

driver failed train

- a light locomotive
- an air-braked train
- a vacuum-braked train hauled by a dual-braked locomotive.

You must not exceed 25 mph (40 km/h).

However, if the brake pipe is operative throughout the train, a light locomotive may assist:

driver failed train

- a passenger train (loaded or empty)
- a postal or parcels train
- any other train running with passenger brake timings.

You must not exceed 40 mph (65 km/h).

A single-piped air-braked train can be assisted in the rear if the failed locomotive is:

- capable of maintaining its own main reservoir pressure, or
- fitted with an assistance to failed train (AFT) cock.

A two-pipe air-braked train can be assisted in the rear if the main reservoir pipe is:

- coupled and operative throughout the failed train
- coupled to the assisting locomotive.

### **3 Attending for and leaving duty**

The person responsible: driver

driver

When attending for duty, you must read the notices that apply to you.

Before leaving duty, you must hand in a full written report of the circumstances of any irregularity or exceptional incident.

## 4 Brake system requirements

The people responsible: driver, train preparer

### 4.1 Making sure brakes are working correctly

The automatic brake must normally be in use on every vehicle. You must make sure that the brakes are working correctly before allowing a train to start a journey.

driver, train preparer

### 4.2 Carrying out a brake continuity test on locomotive-hauled trains

You must carry out a brake continuity test:

driver, train preparer

- when a locomotive is coupled to the train
- after a brake defect has been repaired
- after a train has been left unattended and the traction unit shut down (except where authorised in local instructions)
- when a vehicle is uncoupled from the train, unless it is uncoupled from the extreme rear
- when a vehicle is coupled to the train.

You must carry out a brake continuity test only after all coupling, including brake and electrical connections, have been completed.

driver

If the train is assisted by a locomotive coupled in the rear, you must ask the driver of the assisting locomotive to carry out the brake continuity test.

### 4.3 Carrying out a brake continuity test on multiple-unit passenger trains

You must make sure a brake continuity test is carried out as shown in train operating company instructions.

driver, train preparer

driver, train  
preparer

#### **4.4 Coaching stock vehicles with isolated brakes**

You may allow a train with one vehicle that the automatic brake has been isolated on to start a journey from somewhere other than a maintenance depot if the following are met:

- The train is formed of at least five coaching stock vehicles.
- The automatic brake is working on the last vehicle.
- On multiple-unit trains the automatic brake is operative on the first and last vehicle (except when the vehicle is fitted with a rigid bar coupling).
- The speed of the train is restricted to 10mph (15 km/h) below the permitted speed for that train over the line concerned. However, the speed need not be reduced below 35 mph (55 km/h).

Some types of multiple-unit train have braking equipment which provides the full brake power even though the brakes are isolated on a vehicle. When this is the case, you do not have to reduce speed as shown in this section. Your train operating company instructions will show which classes of train this applies to.

The train must not be driven in ATO and must be driven in a manual driving mode.

#### **4.5 Isolated vehicle brakes**

driver, train  
preparer

You must treat a vehicle with two air-brake distributors, one of which is isolated, as having isolated brakes.

If it is necessary to isolate the automatic brake on any vehicle, you must:

- carry out any necessary instructions for the type of vehicles concerned
- tell the driver
- make sure the train document is amended
- make sure the train meets the requirements of section 4.4.

## 4.6 Carrying out a running brake test

You must test that the automatic brake is working properly at the start of a journey by carrying out a running brake test if the train is driven in a manual driving mode. If you are leaving the COS after only driving in ATO, a running brake test is required.

driver, train  
preparer

When you carry out a running brake test, you must do so from a speed that is high enough for you to be sure that:

- the brake is operating effectively
- the speed of the train is being reduced.

### Locomotive-hauled trains

You must carry out the running brake test at the first opportunity after starting the journey.

You must, if possible, also carry out a running brake test in good time before approaching:

- the first stopping place
- a steep falling gradient
- a terminus or dead-end platform line.

### Multiple-unit trains

When working multiple-unit trains you must carry out the running brake test as shown in your train operating company instructions.

## **5 Broken rails, bridge strikes and track defects**

The person responsible: driver, signaller

### **5.1 Broken, distorted or damaged rails and broken fishplates**

driver,  
signaller

If there is a broken or defective rail or broken fishplates on the line on which your train is to travel, the signaller will tell you what is happening and the location of the rail defect.

When you are told to proceed, you must do so at no more than the speed the signaller tells you.

### **5.2 Bridge strikes**

If a bridge is reported as having been struck by a road vehicle on the line on which your train is to travel, the signaller will tell you what has happened and the location of the bridge.

driver

When you are told to proceed, you must do so at no greater speed than the signaller tells you. You must not increase speed until the whole of your train has passed beyond the bridge concerned.

If it is an overline bridge that has been struck, the signaller may ask you to check the bridge before passing under it. In this case you must:

- stop your train before passing under the bridge
- check for any obvious damage, including debris on the line
- tell the signaller whether the line appears to be safe for the passage of trains.

If there is no obvious damage or debris, you may pass under the bridge at a speed not exceeding 5 mph (10 km/h).

### 5.3 Track defects

If you believe there is a track defect, you must tell the signaller, as soon as possible:

driver

- the location of the defect
- the type of defect, using terms in the table below
- whether there is a bridge or viaduct at/or close to the location of the defect
- as much information as you can about the defect.

If a driver tells you about a possible track defect, you must:

signaller,

- get the location of the defect from the driver
- get as much information as possible from the driver, using the terms in the table below
- carry out the actions shown in the table below
- tell Operations Control.

Type of defect	Driver's report	Signaller's action
A track defect that is seen	You can definitely see that there is: <ul style="list-style-type: none"> <li>• a broken rail</li> <li>• a defective rail</li> <li>• broken fishplates</li> </ul>	You must stop trains from passing over the affected line as shown in module TS1 <i>General signalling regulation 9.1.1</i>



Type of defect	Driver's report	Signaller's action
A track defect that is felt	<p>There is unusual movement of the train – either sideways or vertical – which may be because of a track defect.</p> <p>This may be:</p> <ul style="list-style-type: none"> <li>• a lurch or dip</li> <li>• shaking or vibrating</li> <li>• pitch</li> </ul>	<p>You must arrange for the line to be examined, as shown in module TS1 <i>General signalling regulations 13.1, 13.3 and 13.5</i></p>
A track defect that is heard	<p>You hear an unusual noise that may be because of a track defect.</p> <p>This may be:</p> <ul style="list-style-type: none"> <li>• a bang</li> <li>• a rattle</li> <li>• grinding</li> </ul>	<p>You must arrange for the line to be examined, as shown in module TS1 <i>General signalling regulations 13.1, 13.3 and 13.5</i></p>
Deterioration of ride quality	<p>You consider that the ride quality has deteriorated from that experienced previously at a particular location. In this case.</p> <ul style="list-style-type: none"> <li>• You do not need to tell the signaller about this.</li> <li>• You must report this to your Train Operator's Control at the earliest opportunity</li> </ul>	<p>If a driver reports this type of defect, you must tell Operations Control.</p>

## 6 Classification of trains

The following table shows the classification used to identify the types of train.

You must tell the signaller if the classification of the train is different, or has been changed, from that published.

driver, train  
preparer

<b>Description</b>	<b>Class</b>
Light locomotive or locomotives	0
Express passenger train Breakdown or overhead line equipment train going to clear the line (IZ99) Traction unit going to assist a failed train (IZ99)	1
Ordinary passenger train	2
Autumn-railhead treatment train Empty coaching stock train if specially authorised	3
Empty coaching stock train	5
Freight or engineering trains	6
Other passenger train if specially authorised	9

## **7 Doors on trains**

The people responsible: driver, signaller

### **7.1 Door open or not completely closed**

driver

If a door comes open or is not completely closed while the train is moving, you must immediately stop the train.

### **7.2 Treating and reporting doors as defective**

driver

You must treat a door as defective and carry out the instructions in module TW5 Preparation and movement of trains: Defective or isolated vehicles and on-train equipment in the central operating section if any of the following applies.

- A power-operated door closes other than through normal operation.
- The train starts with someone or something trapped in a door.
- A power-operated door remains open when it should be shut.
- A door comes open during the journey.
- Someone is injured when opening or closing the door and it is possible that the condition of the door may have contributed to the accident.
- Someone falls from the door during the journey.
- The power-operated door controls become inoperative.
- The internal passenger 'door open' buttons become lit when the train is moving.

If it is necessary to stop the train, you must do so immediately.

You must tell the signaller what has happened and give details of:

driver

- the vehicle number
- the location of the door
- the position of all door controls
- the position of the traction interlock switch at the time of the incident.

You must not move your train until instructed to do so by the signaller.

You must instruct the driver not to make any further movement until you have been given specific instructions from Operations Control.

signaller

### 7.3 **Passenger falling from the train during the journey**

You must tell the signaller if:

driver

- someone has fallen from the train
- you cannot be certain whether anyone has fallen from the train.

You must also tell the signaller if it is known or suspected that someone has fallen from the train, but it is not known which door was involved.

You must, if possible, transfer passengers to another vehicle and place the vehicle out of use.

You must not move your train until instructed to do so by the signaller.

You must instruct the driver not to make any further movement until you have been given specific instructions from Operations Control.

signaller

## 8 Driver's reminder appliance (DRA)

The person responsible: driver

### 8.1 Using the DRA

driver

You must use the DRA as shown in train operating company instructions.

## 9 Driving-cab equipment

The people responsible: driver, train preparer

When preparing a train for service, you must check that the following equipment is available in each driving cab or other location, as shown in train operating company instructions for the type of rolling stock concerned:

driver,  
train preparer

- at least 10 detonators
- two track-circuit operating clips
- two red flags
- any other equipment shown in the instructions for the type of train concerned.

On a multiple-unit train, one red flag must be available in each cab.

If any equipment is not available, you must not allow the train to start a journey.

## 10 Examining the line

The person responsible: driver

### 10.1 How to carry out an examination of the line

driver

If instructed by the signaller to examine the line, you must:

- reach a clear understanding with the signaller as to which portion of line is to be examined
- proceed over the affected portion of the line at caution
- carry out any other instructions.

If the signaller has told you that the examination of the line is because of a suspected track defect, you must not exceed 20 mph (30 km/h) over the affected portion of line.

You must report the state of the affected line from an agreed location beyond the affected portion of line.

signaller

Where fitted, the tunnel lights should be turned on to assist the driver with the examination of the line.

### 10.2 If the headlight has failed

driver

During darkness, poor visibility or within a tunnel in the section, you must not use a train to examine the line if the headlight has failed completely, unless a portable headlight is fitted.

### 10.3 Being accompanied by a competent person

driver

During darkness, poor visibility, or if the affected portion of line is within an unlit tunnel, while examining the line, you must be accompanied by a competent person (if one is immediately available).

## 11 Lights on trains

The people responsible: driver, train preparer

### 11.1 Headlights and marker lights

You must make sure that any marker lights at the front of your train are switched on when the train is:

driver

- on a running line
- moving on any line or in a depot, yard or siding
- being propelled in the right direction.

You must make sure that the headlight (fixed or portable) at the front of your train is:

- switched on when the train is moving on a running line
- displaying the correct day or night beam.

You must make sure that the headlight (fixed or portable) is switched off:

- in a depot, yard or siding
- when stabled on a running line.

### 11.2 Tail lamps

You must make sure there is a tail lamp that is lit at the rear of the train when it is:

driver

- on a running line
- on a through or reception siding
- being propelled in the right direction.

When two built-in electric tail lights are provided, you must make sure both are lit where possible.

You must make sure that no other tail lamp is displayed at any other position.



## 12 Locking doors on passenger trains

The person responsible: train preparer

train preparer

Before any train starts a journey, you must make sure that the following doors are locked.

- Gangway doors at each side of any gangway connection which cannot be made.
- A door leading to any accommodation or vehicle which is not for public use.

You must make sure that all other doors (internal and external) are kept unlocked at all times.

## 13 Passenger communication apparatus (PCA)

The person responsible: driver

If the PCA is operated, you must, if possible, avoid stopping the train at an unsuitable location.

driver

If an emergency brake application is not automatically made when the warning alarm sounds on a train fitted with a PCA, you must:

- if possible, contact the person who has operated the apparatus
- ask the person why the PCA has been used
- take the necessary action
- if necessary, bring the train to a stand as soon as possible at a suitable location.

However, you must stop the train immediately if PCA apparatus is operated as the train is leaving a station.

You must reset the PCA before the train restarts.

## 14 Personal equipment

driver

The person responsible: driver

When on duty, you must have with you:

- a handlamp
- high-visibility clothing
- a means of telling the accurate time
- up-to-date notices for all lines over which you are required to work
- any other equipment as shown in your train operating company instructions.

You must also have with you a supply of:

- Form CR3185 CBTC Reporting a CBTC Failure or irregularity.
- Form CR3190 Point to Point working.

## 15 Poor visibility

The person responsible: driver

If not operating under Automatic Train Operation, you must reduce the speed of your train as you consider necessary, if you cannot see signals, block markers or lineside indicators soon enough to react to them during poor visibility.

driver

## 16 Preparing a train

train preparer

The person responsible: train preparer

Before a train starts a journey, you must check all of the following.

- All vehicles are properly coupled, including the brake-pipe and electrical connections.
- The necessary lamps are provided on the trains.
- The load and formation of the train meet the relevant rules and instructions.
- Before moving any vehicle in the train that is not registered with Network Rail or Rail for London Infrastructure, that special authorisation has been received from the infrastructure manager.
- All vehicles appear safe to travel.
- All handbrakes are released (unless it is the driver's responsibility on multiple units).
- All the doors are properly closed on a passenger or empty coaching stock train.
- Two track-circuit operating clips are available for use in or next to each brake compartment on a train of coaching stock.

You must make sure the driver is aware of any items of defective or isolated on-train equipment.

You must give the driver any necessary instructions to do with the safe working of the train.

You must test power-operated doors as shown in your train operating company instructions. You must carry out this test before a train starts a journey, unless your train operating company instructions allow the test to be done before entering passenger service.

## 17 Proceeding after being stopped because of an accident or other exceptional cause

The person responsible: driver

When your train has been stopped because of an accident or other exceptional cause, you must not restart until you have made sure it is safe to do so.

driver

## 18 Proceeding at caution

The person responsible: driver

driver

If instructed to proceed at caution, you must, as well as not exceeding any specified speed, proceed at a speed which takes account of conditions such as the distance you can see to be clear, that will allow you to stop the train short of any train, vehicle or other obstruction, or the end of your movement authority.

## 19 Propelling

The people responsible: driver, shunter, signaller

### 19.1 Authority for propelling

You may allow a propelling movement to take place as follows.

driver,  
shunter,  
signaller

- A shunting movement on a CBTC line that is not required to proceed beyond more than one block marker.
- A movement of an engineering or breakdown train.

You must tell the driver before authorising the movement:

signaller

- what is required
- how far the movement can go
- to check, where possible, that points and crossings are set correctly for the movement.

### 19.2 Controlling the movement

You must not make a propelling movement unless it is controlled by a person acting as a shunter as shown in COS Rule Book module SS2 Shunting.

driver

### 19.3 Before the movement starts

Before the movement starts, you must both reach a clear understanding about:

driver,  
shunter

- the movement
- the limits of the movement
- how it will be controlled.

You can use GSM-R radio to speak at any time during the journey about how the movement is to be started, stopped and controlled.

shunter



driver

If the movement is to be made along a running line, you must:

- make sure the automatic brake is in use
- tell the signaller that the movement will be propelled.

You must make sure that CBTC is in the correct mode before the propelling movement starts.

### 19.4 During the movement

driver

If you are making a propelling movement, you must drive from the leading cab unless either of the following applies.

- You have to look out for signals, block markers or handsignals and you will have a better view from another cab.
- A shunter is controlling the movement by radio and you do not have to look out for signals, block markers or handsignals during the movement.

Throughout the movement you must:

- observe all signals
- not pass any block marker or stop board without authority
- not exceed 20 mph (30 km/h).

## 20 Public address system

The person responsible: driver

If your train operating company's instructions tell you to make announcements using the public address system, you must not do so when the train is moving if you may become distracted and put the safe operation of the train in danger.

driver

## 21 Rail adhesion

The people responsible: driver, signaller

### 21.1 Levels of rail adhesion

driver

There are three levels of rail adhesion conditions:

Level	Definition
Good	Rail adhesion conditions are good.
Expected	Rail adhesion is no worse than would be expected for the location and environmental conditions.
Reportable	Rail adhesion is worse than would be expected for the location and environmental conditions.

If sanding occurs during braking or is requested on acceleration, you must report this to the signaller, saying the location where sanding occurred or was requested.

### 21.2 When to report rail adhesion levels

driver

You must follow your train operator's driving policy for low adhesion at locations where you expect to experience 'expected' adhesion levels. You do not need to report 'expected' adhesion levels to the signaller.

You must tell the signaller immediately if you experience 'reportable' rail adhesion levels.

If you are told about ‘reportable’ rail adhesion levels, you must tell Operations Control and take the following action.

signaller

Locations where conditions apply	Action to be taken
Approach to a stop signal or an End of Authority (EoA)	Arrange for the driver of each train to be told about the circumstances unless the signal is showing a proceed aspect or an MA has been issued beyond the EoA
Approach to a platform	Arrange for the driver of each train booked to call to be told about the circumstances
Dead-end platform	Arrange, if possible, for the platform to be taken out of use.

When it is necessary for you to tell a driver about ‘reportable’ rail adhesion levels, you can do this by using the ‘Acknowledged (safety) broadcast calls’ arrangement.

If you have been told about ‘reportable’ rail adhesion levels, you must approach the location using the method shown in your train operator’s driving policy.

driver

### 21.3 Changing adhesion rates

Brake or acceleration rate can be requested or recommended by any of the following:

all concerned

- the vehicle maintainer
- the signaller
- operations control.

Operations control will decide if the brake or acceleration rate needs to be changed and agree how and when it will be changed.

signaller

You must change the brake rate when told by operations control. You must make sure the change in brake rate does not affect trains braking to a platform or other operational stopping point.

### 21.4 Arranging a controlled test stop

signaller

You must arrange for a train to make a controlled test stop at the location concerned, if one of the following applies.

- Operations Control tell you that the rail head has been inspected and nothing unusual has been found.
- Operations Control tell you that the rail head has been inspected, and improvement treatment carried out.
- At least 30 minutes have passed since you were told about the 'reportable' rail adhesion level.
- You are told by Operations Control to change the braking rate to BRI.

In the case of a dead-end platform, you must not arrange for a test stop to be made unless you have been told that the rail head has been treated.

If possible, you must arrange for the test stop to be performed by a similar type of train to that which reported the conditions.

Before a controlled test stop is made, you must arrange for the signal, where provided, to be cleared.

driver

When the signaller tells you to make a controlled test stop, you must observe the train braking in the way that would normally happen for the environmental and rail adhesion conditions at the location, rather than the way that you would for 'reportable' rail adhesion levels.

Immediately after the controlled test stop, you must tell the signaller:

driver

- the results of the test
- whether the rail adhesion level should still be considered as 'reportable'
- if sanding has been applied by the train.

If the driver who made the controlled test stop reports that the rail adhesion level is still 'reportable' or the train has applied sand, you must tell Operations Control, who will tell you when to arrange a further controlled test stop.

signaller

## 21.5 Resuming normal working

Until you are told that drivers are being notified by other means, you must continue to advise drivers.

signaller

You must continue to take any other action shown in section 13.

You must not resume normal working until a controlled test stop has been carried out and the rail adhesion level is no longer considered as 'reportable'.

## 21.6 Serious wheel slip

You must tell the signaller the location where serious or prolonged wheel slip is experienced. However, if you suspect the rail to be damaged, you must stop the train specially and tell the signaller immediately.

driver

You must arrange for the affected portion of line to be inspected.

signaller

## 22 Route and traction knowledge requirements

The people responsible: driver, conductor driver

driver

When working a train, you must have the necessary knowledge for the entire route over which you are to work, or be accompanied by a competent conductor driver.

If the conductor driver is not familiar with the type of traction concerned, you must explain before starting the journey:

- how to stop the train in an emergency
- where the emergency equipment is kept
- how to shut down the traction unit in an emergency.

If you are being conducted over a portion of line you are not familiar with, you must take note of signals, speed restrictions and other features about the line.

conductor driver

If you are the conductor driver, you must:

- take responsibility for the safe working of the train
- drive the train if authorised and competent to do so.

If you are not driving the train, you must give the driver the necessary instructions concerning all features of the line the driver needs to know.

## 23 Sidings

The people responsible: driver, signaller

You must not allow a passenger train to enter a siding unless: driver

- the arrangements have been published, or
- in an emergency, when authorised by the signaller.

You must not signal a passenger train into a siding unless: signaller

- the arrangements have been published, or
- in an emergency, when authorised by the operations control.



## 24 Snow conditions

The person responsible: driver

driver

When snow is falling, or fallen snow is being disturbed by the passage of trains, if not operating in ATO, you must carry out running brake tests as frequently as necessary to make sure that the automatic brake is operating effectively.

You must also carry out any other train operating company instructions.

## 25 Starting a train

The people responsible: driver, person in charge

### 25.1 Starting a train from a siding, depot or yard

Before you give permission to the driver of a train leaving a siding, depot or yard to start the train, you must make sure it is safe to do so.

person in charge

Before you start a train from a siding, depot or yard, you must make sure it is safe to do so, and get permission from the person in charge, if there is one.

driver

### 25.2 Starting a train assisted in the rear

If a train is assisted in the rear, you must also give permission to the driver of the assisting vehicle for the train to start.

person in charge



Person in charge in this section means the person in charge of movements at the location concerned.

## 26 Stopping a train at a station where the train is booked to stop

The person responsible: driver

### 26.1 At a station where a train is booked to stop

driver

You must make sure that your train has stopped at the platform as indicated by the car stop markers or platform screen door alignment markers, where provided.

Unless you are authorised to do otherwise, you must stop your train so that all doors used by passengers are at the platform.

If your train is to stop at a station where it is longer than the platform, you must, if possible, tell passengers leaving the train at that station to move along the train before reaching the station, or wait for the train to be drawn forward.

You must make sure you do not release the doors until the train has stopped and is at the correct position at the platform.

You must make sure that you release the doors at the correct side of the train.

If the whole of the train will not be at a platform, you must make sure that you only release those doors that will be alongside the platform.

## 27 Stopping or stabling a train

The person responsible: driver

### 27.1 Traction unit left unattended

You must only leave your traction unit unattended when you are:

driver

- handing it over to another competent person who is to take charge of it
- stabling the traction unit in either a depot, siding or other authorised place
- required to leave your traction unit unattended as instructed in the rules.

Each time you leave your traction unit unattended, you must make sure it is properly secured and not in ATO or auto reverse.

### 27.2 Standing foul of any other line

When stopping your train on a reception line or siding, you must make sure that the train does not stand foul of any other line.

driver

## **28** Stopping short of, or overrunning a platform

The person responsible: driver

### **28.1** If the train is stopped short of a station platform

driver

You must immediately tell passengers not to get out of the train until it has been moved to the correct stopping position.

If the doors have been released by mistake, you must check that no one has fallen from the train before moving the train.

You must tell the signaller if someone has fallen from the train, or you cannot be certain whether anyone has fallen from the train.

You must make arrangements, including where necessary with the platform staff for the train to be moved so that those passengers who want to get off can do so safely.

If the train is to draw forward, you must only do this when all doors are closed and are no longer released.

Before you make the movement, you must make sure you can do this without endangering anyone who has got off the train.

Where PSDs are fitted, the train must align with the PSDs before doors are released.

### **28.2** If the train overruns a platform

driver

You must immediately tell passengers not to get out of the train until it has been moved. You must then tell the signaller that the train has overrun the platform.

If the doors have been opened by passengers, you must check that no one has fallen from the train before moving the train.

You must tell the signaller if someone has fallen from the train, or you cannot be certain whether anyone has fallen from the train.

driver

If the signaller tells you the train is to be moved to the next station, you must:

- inform the passengers that the train is to proceed to the next station
- check platform screen doors are closed where applicable
- check that the doors are closed
- check the train has a movement authority.

If the signaller tells you the train is to return to the platform, you must make arrangements with the person in charge of the platform, for the train to be moved so that those passengers who want to get off can do so safely.

You must only do this when all doors are closed and are no longer released.

If the platform is fitted with platform screen doors (PSDs) you must tell the signaller and carry out the instructions given.

Where PSDs are fitted, the train must align with the PSDs before doors are released.

If the driver tells you that the train has overrun the platform, you must make arrangements for the train to return to the correct position within the platform or continue to the next platform.

signaller

## 29 Train in distress

The person responsible: driver

driver

If you cannot control the speed of your train or you need to alert anyone about some other emergency, you must:

- sound the 'train in distress' warning (a continuous series of long blasts on the high/loud tone of the horn)
- switch on the hazard warning indication if provided
- display a red light.

## 30 Train radio equipment

The people responsible: driver, signaller

### 30.1 Using the train radio safely

Except in an emergency, you must only use the train radio when a train is moving if one of the following applies.

driver

- You need to pass a message relating to the immediate movement of the train and it is necessary to do so before your next stopping point.
- You are responding to a 'contact signaller' or a 'contact train operator's control' message.
- You are allowed to elsewhere in the Rule Book.

Before you use the train radio when a train is moving, you must decide whether it is necessary and whether it can be done safely, taking into consideration whether it is being controlled by ATO or if driven manually, whether:

- your train is running under caution
- your train is approaching a location where it is necessary for you to reduce speed or you are controlling the train over a speed restriction
- you have reduced the speed of your train sufficiently before making the call to keep full control of the train throughout the call.

If a conversation cannot be completed quickly, you must end the call or stop the train.

If you need clarification, advice or information from a signaller, you must bring the train to a standstill before making a call.

If you receive a text message, you must only read that message when it is safe to do so.



signaller

Except in an emergency, you must not use the train radio to speak to the driver unless you are sure that the train concerned is at a standstill.

You can use the train radio at any time to send a 'contact signaller' message to get the driver to call you.

### 30.2 Communicating with the signaller

driver

You must use the train radio (if available) as the normal method of communicating with the signaller.

### 30.3 Signaller unable to call the driver

signaller

If you cannot contact the driver on the train radio, you must not send messages to the driver through anyone else. Instead, you must arrange for the driver to contact you direct.

### 30.4 Making an emergency call

driver

You must only use the emergency call facility when it is necessary to give immediate advice for trains to be stopped or cautioned, or to call the emergency services, in connection with an accident, obstruction or other exceptional incident.

signaller

You must only use the emergency call facility when it is necessary to do so to stop the movement of trains, as shown in the train signalling regulations.

## 30.5 Railway emergency group call (REC)

### a) Receiving a REC

If you receive a REC, you must:

driver

- bring your train to a stand immediately
- listen to the message.

### b) During the REC

During the REC, you must:

signaller

- identify all trains that must remain at a stand
- instruct the drivers of those trains to remain at a stand
- get confirmation from the driver of each train that must remain at a stand that the message has been received and understood.

### c) Ending the REC

When you are sure the emergency has been protected, you must end the REC with the phrase 'End of railway emergency group call'.

signaller

You must not consider the REC to be ended until the signaller has said this.

driver

### d) Restarting trains

After the REC has been ended, you may restart your train as long as:

driver

- you are sure your train is not affected by the emergency
- the signaller has not instructed you to remain at a stand.

You must proceed as far as the next stop signal or proceed at caution as indicated by the movement authority displayed.

In all other situations, you must get authority from the signaller before you restart your train.

## 31 Train stopped out of course or unable to make normal progress

The person responsible: driver

### 31.1 Driver's instructions

driver

If your train stops out of course for any reason, you must tell the signaller as soon as possible, including the reason for your train stopping.

If your train is only making slow progress and may be brought to a standstill, if you can, you must tell the signaller what is happening as soon as possible. The signaller may advise you about problems occurring which are affecting your train.

Examples of reasons a train cannot make normal progress would include:

- rail-head adhesion
- insufficient traction power
- timetable adjustments.

Whether you told the signaller because your train had stopped or was only making slow progress, you must carry out any instructions you are given by the signaller.

### 31.2 Signaller's instructions

signaller

If a driver tells you that a train has stopped out of course for any reason, or is only making slow progress and may be brought to a standstill, you must take any action that will prevent other trains from being stopped as a result, and tell any other signaller who may be able to take similar action.

You must tell Operations Control.

## 32 Traincrew being relieved

The person responsible: driver

You must give the new driver all necessary instructions and information about the safe operation of the train.

driver

This must include:

- any operational requirements affecting the safe working of the train
- any defects with the train which the new driver needs to know about
- any instructions given by the signaller.

## 33 Trains put in danger

The person responsible: driver

### 33.1 When other trains are put in danger

driver

You must carry out the instructions in this section if you see:

- an obstruction on the line which could cause danger to other trains
- damage to structures or earthworks which could cause danger to other trains
- a cow, a bull or other large animal within the boundary fence, even if it is not an immediate danger to trains
- any other animal on or near the line which might be a danger to trains
- something wrong with another train.

You must tell the signaller by making a railway emergency call (REC) on the train radio equipment.

You must warn the driver of any approaching train, if possible, by:

- sounding the horn
- showing a red light to the driver of the other train
- switching on the hazard warning indication, if provided.

You must tell the signaller in the quickest way possible.

### 33.2 When a following train is put in danger

driver

If you see an obstruction or something wrong which could put a following train in danger, you must immediately report this to the signaller.

### 33.3 When your train is put in danger

If you become aware of something which could put the safety of your train in danger, you must stop your train as soon as possible.

driver

You must, if possible, avoid stopping the train in any unsuitable location.

### 33.4 When trains will not be put in immediate danger

If you see something wrong which will not put trains in immediate danger, you must tell the signaller at the first available opportunity.

driver

## 34 Trespassers

The person responsible: driver

### 34.1 Reporting trespassers

driver

If you see any trespasser, you must report this to the signaller immediately using the train radio.

You must give the signaller as much information as possible including:

- train reporting number
- the location of the trespassers
- whether trespassers are on the lineside or on or near the line
- if the trespassers are moving, which direction they are moving in
- whether trespassers appear likely to endanger trains
- a brief description of the trespassers. If possible, include distinguishing features such as age and what they are wearing.

### 34.2 Instructions from the signaller

driver

If a signaller has been told about trespassers on or near the line, the signaller will:

- stop your train if it would proceed over the affected portion of the line
- tell you what is happening and to proceed at caution past the location where trespassers have been reported

If a signaller has been told, or has reason to believe, that trespassers are likely to endanger trains, the signaller will stop your train, tell you what is happening and tell you:

- not to run in ATO
- to proceed at caution past the affected location.

### 34.3 Reporting back to the signaller

In all occurrences of reported trespassers, the signaller will instruct you to report back your findings to them once you have cleared the section of line concerned.

driver

After you've been cautioned following an report of trespassers, you must always tell the signaller whether you have seen any trespassers or not.



### 35 Vehicles labelled for repair or with a NOT TO BE MOVED board attached

The people responsible: driver, train preparer

#### 35.1 Trains or vehicles with a NOT TO BE MOVED board attached

driver,  
train preparer

If a train or vehicle has a NOT TO BE MOVED board attached, you must not allow:


- it to start a journey
- it to be moved
- another vehicle to make contact with it
- the controls on a traction unit to be interfered with.




#### 35.2 Vehicles labelled for repair




driver,  
train preparer

If a train or vehicle has a repair label attached, you must make sure the movement restrictions on the label are carried out.

The meaning of each type of label is shown in the following table.

Label	Meaning	Example
NOT TO GO	<p>Must not:</p> <ul style="list-style-type: none"> <li>• be worked away from the station, depot, yard or siding, or</li> <li>• be moved within the station, depot, yard or siding unless authorised by a rolling stock technician</li> </ul>	

Label	Meaning	Example
<p>YARD TO YARD FOR REPAIRS</p>	<p>Must only make the journey to a maintenance depot shown on the label</p>	
<p>FOR REPAIRS</p>	<p>May complete the journey and then be dealt with as shown in train operating company instructions</p>	
<p>AUTOMATIC BRAKE DEFECIVE (PIPE OPERATIVE)</p>	<p>Must be treated as a piped-only vehicle</p>	

Label	Meaning	Example
<p>AUTOMATIC AND HAND BRAKE DEFECTIVE</p>	<p>Must be treated as a piped-only vehicle and must be coupled to another vehicle unless suitably secured</p>	
<p>HAND BRAKE DEFECTIVE</p>	<p>Must be coupled to another vehicle unless suitably secured</p>	
<p>FOR URGENT REPAIRS/ RESTRICTED MOVEMENT</p>	<p>Vehicle must be worked to a maintenance depot and must not exceed 35 mph (55km/h)</p>	

## 36 Warning horn

The person responsible: driver

### 36.1 General

You must only use the horn as much as is necessary to give an effective warning or to make sure safe working takes place.

driver

### 36.2 Warning tones to use

If two tones are provided, you must use the horn as shown below. If the horn has no soft/loud setting, you must use the setting provided.

driver

Circumstances	Tones you must use
To give a warning to anyone on or near a running line	High and low tones – use the loud setting
To give an urgent warning to anyone on or dangerously near to the line	High tone - use the loud setting
To give a warning when in a depot or siding	Low tone - use the loud setting or depot whistle (if fitted)
To sound a local or special code	High tone - use the loud setting

### 36.3 Sounding the horn as a warning

#### a) Anyone on or near the line

driver

You must sound the horn to warn anyone who is on or near the line on which you are travelling.

Give a series of short, urgent danger warnings to anyone who is on or dangerously near the line who does not:

- acknowledge your warning by raising one arm above the head, or
- appear to move clear out of the way of the train.

#### b) Train movements

You must sound the horn at any other time you consider necessary.

## 37 Working on the outside of a train

The person responsible: driver

### Limits of protection your train provides on the line your train is standing on

You must not go beyond 40 metres (43 yards) in front or behind your train.

driver

### Stopping trains on the adjacent line

You must ask the signaller to stop trains on any adjacent line which could put you, another member of traincrew, or anyone else whose duties mean that person has to be with you, in danger and the train is secured if one of the following applies.

driver

- You or the other person needs to work on the outside of your train after it has stopped because of a failure or other exceptional incident.
- You or the other person has to walk alongside your train.
- You or the other person needs to check that the working equipment on an on-track machine (OTM) is correctly positioned.

You must do this before you or the other person starts working or walking.

To arrange for trains to be stopped, you must:

- ask the signaller to stop the passage of trains on the lines concerned
- get an assurance from the signaller that this has been done
- reach a clear understanding about which lines have been blocked
- reach a clear understanding about which lines will stay open to traffic
- ask the signaller to read back to you the details that have been recorded.

## driver

If you are satisfied that the details recorded by the signaller are correct, you must confirm you understand the arrangements.

The signaller will then give you an authority number. Until you are given this authority number, you must not consider the adjacent line as being blocked.

If you have arranged to stop the passage of trains for another driver or person to work on the outside of your train or walk alongside it, you must explain the arrangements to that person.

When the work on the outside of the train has finished or you, or the other person have finished walking, you must tell the signaller that the normal passage of trains can be resumed.

You must give the signaller the authority number that you were given.



Work includes checks or examinations for defects or damage which must be carried out to meet the rules, and minor repairs to your train that your employer has authorised you to carry out.

## 38 Auto reverse

The people responsible: driver, signaller



Auto reverse mode can be used with the key in the driving desk, or with the key out. When performing key in auto reverse, the driver will remain in the active cab.

When performing key out auto reverse, the driver could be walking through the train to enter another cab.

### Planned auto reverse

You must only accept an auto-reverse movement if you have GSM-R operational in the train (except in an emergency where another method of communication has been agreed with the signaller).

driver

When auto reverse is authorised, and the next movement is to be carried out from the other end of the train, you must first check that the train is not carrying passengers before accepting auto reverse.

When you are sure that the train is empty of passengers, you may:

- accept auto reverse,
- remove the key (key out operation),
- leave and secure the cab, and
- walk through to the other cab.

When you reach the other cab, you must only enter the driving key when the movement is complete.

If you require to stop the train before the movement is complete, you must use the train controls to apply the brake.



### 38.1 **Unplanned auto reverse (Key in operation)**

driver

You must only request or accept unplanned auto reverse in an emergency or when told by the signaller that it is necessary. You must have communication with the signaller during the movement.

You must remain in the driving cab from which auto reverse is initiated until the movement is complete.

If you require to stop the train before the movement is complete, you must use the train controls to apply the brake.

#### **Communication during auto-reverse movements**

signaller

When you need to contact the driver of a train in planned auto reverse, you must make an announcement to the train PA system asking the driver to contact the signaller, unless the train is identified as having the driving cab active for GSM-R.

When you need to contact the driver of a train in unplanned auto reverse, you must contact the driver using the GSM-R.

If the train has a defective GSM-R and the driver is in possession of a GSM-R hand portable device, you must contact the driver using the hand portable device.

driver

If the GSM-R is defective and you have been given a GSM-R hand portable, you must carry this with you during any auto reverse movement.

## 39 Manual driving modes

The people responsible: driver, signaller

If you need a train to proceed in a mode other than ATO, you must tell the driver why manual driving is required and any other instructions that are to be followed.

signaller

You must not allow your train to exceed the ceiling speed. Additionally, in OSMA and SA, you must make sure that you can stop short of any obstruction ahead, making proper allowance for darkness or poor visibility conditions.

driver

You must follow any additional instructions given to you by the signaller.

## 40 Using a train for line block protection

The person responsible: driver, signaller

### 40.1 Selecting the train and confirming the arrangements

signaller,  
driver

Protection by train as a type of line block can be used in the following circumstances:

- Containing an incident that would otherwise result in stranded trains.
- Facilitating track access for a short duration to remove an item from the track or carry out a quick inspection.

If a train is to be used for protecting personnel on the line, the signaller must confirm with the driver:

- The circumstances of the incident, and that their train is required to provide protection for a line block.
- The point at which their train will be stopped.
- From which station the person requiring protection will board the train.
- Whether it is necessary to detrain passengers from the train.
- Whether the person requiring protection will be returning to the train, or using a different location, for their position of safety.
- Whether it will be necessary, once the train has reached the protecting block marker, to provide the driver an additional verbal movement authority to pass the protecting block marker, to examine the line for an obstruction.



When authorised by Operations Control, the signaller may use the regulations in:

- *COS/S5 Passing an end of authority (EoA) without a movement authority (MA) or passing a signal at danger in the central operating section, and*
- *COS/TS10 CBTC Train signalling regulations.*

To authorise the train to pass the protecting block marker, proceed at caution and stop short of the section to be inspected/the item to be retrieved.

The regulations for examining the line apply in these circumstances

signaller,  
driver

## 40.2 Before proceeding

Whenever required, you must make sure all passengers are safely detrained before the train proceeds.

driver

The person requiring protection will tell you the block marker at which you must stop the train.

The signaller will signal the train to the designated block marker in the normal manner.

The signaller may then give you a new verbal movement authority to pass the protecting block marker.

You must proceed at caution being prepared to stop short of any obstruction.

When the train is ready to leave the station, you must signal the train normally to the agreed block marker.

signaller

You may then issue the driver with a new verbal movement authority as per the regulations in EL COS Rule Book Modules S5 and TS10, if it is necessary to examine the line for an obstruction.

driver

### 40.3 Arriving at the location and securing the train

When you have arrived at the designated location, you must not move the train until instructed to do so.

Depending on the type of train you are driving, you must carry out the following actions to secure the train.

- For Class 345 stock.
  - Press 'ATO Stop' (which places the train in protected manual).
  - Place the master control switch into the 'secure' position.
  - Remove the driver's control key from the key switch.
- For Robel and Linsinger On-Track Machines.
  - De-select 'Direction of Travel'.
  - Apply the parking brake.
- For Class 69 locomotives.
  - Apply the locomotive parking brake.
  - Place the main brake handle into the emergency position (venting the brake pipe).

The signaller will ask you to confirm you have carried out all these actions.



You must not change the cab controls from the above state until one of the following applies:

- The signaller gives you verbal authority to do so, or
- You know that the person taking the line block is safely back in your train.

The signaller will ask you to confirm you will carry out this instruction before they grant the line block.

#### 40.4 When the work is completed

After the work has been completed, the person requiring protection will either:

driver

- return to the train and tell you that it is safe for the train to be moved
- go to a different position of safety and confirm with the signaller they are clear of the line, the signaller will tell you it is safe to move your train again.

#### 40.5 If the work cannot be completed

If the work cannot be completed, the person requiring the protection will tell the signaller.

driver

You must carry out the instructions you are given by the signaller.

#### 40.6 Moving the train when protection is no longer required

You must only request a movement authority after the person requiring protection has told you that it is safe to continue, or the signaller has confirmed it is safe to do so.

driver

When the signaller authorises you, you must drive the train to the indications shown on the DMI.

## 41 Sweeping the line

The people responsible: driver, signaller

### 41.1 How to carry out a sweep of the line



Sweeping the line is only to be used following a possession using the Line Clear Verification (LCV) process and not for examination of the line.

signaller

When the PICOP tells you that following a LCV possession, the line is clear and safe for trains to run, but axle counter sections are showing disturbed on your display, you must carry out the process for sweeping the line for the axle counter sections that are disturbed.

You must tell the driver:

- that a sweep of the line is required,
- the start and end locations where the line is to be swept.

You must use the signalling controls to remove the axle counter restrictions and signal the train over the portion of line to be swept.

driver

If instructed by the signaller that a sweep of the line is required, you must:

- reach a clear understanding with the signaller as to where the sweep of the line starts and finishes,
- proceed over the affected portion of the line in OS mode
- carry out any other instructions.

When the train has left the portion of line to be swept, drive according to the information provided by the DMI.









Please refer to specific modules for issue and in-force status

[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

COS/TW5

Preparation and movement of trains: Defective or isolated vehicles and on-train equipment in the central operating section

**Module TW5**



Issue 5

Date December 2021

Comes into force 21<sup>st</sup> December

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available  
at:

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents approved by Rail for London (Infrastructure)

Enquiries on this document can be forwarded to:  
[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

First Issued December 2017  
Issue 5, December 2021

© Copyright 2021  
Rail for London Infrastructure Limited

This module details the rules regarding the preparation and movement of trains: Defective or isolated vehicles and on-train equipment in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

The following will need this module:

- driver
- signaller
- train preparer

#### Conventions used in the Rule Book

A black line in the margin indicates a change to that rule and is shown when published in the module for the first time.

Purple text in the margin indicates who is responsible for carrying out the rule.

A white i in a blue circle indicates that information is provided.

A white exclamation mark in a red circle is considered to be critical and is therefore emphasised in this way.

#### Examples



Signaller



## Contents

- 1 Reporting defective or isolated on-train equipment**
  - 1.1 Driver reporting a defect
  - 1.2 Not used
  - 1.3 Signaller receiving a report from a driver
  - 1.4 Signaller receiving instructions from Operations Control
  - 1.5 Giving instructions to the driver
  
- 2 Competent person travelling with driver**
  - 2.1 General instructions
  - 2.2 Not used
  - 2.3 Broken or obscured windscreen
  - 2.4 Defective or isolated DSD or driver's vigilance equipment
  
- 3 Air suspension**
  - 3.1 Not used
  - 3.2 Starting a journey from somewhere other than a maintenance depot
  - 3.3 During a journey
  
- 4 Automatic warning system (AWS)**
  - 4.1 Not used
  - 4.2 Starting a journey from somewhere other than a maintenance depot
  - 4.3 If the AWS becomes defective during a journey
  - 4.4 Isolating the AWS during a journey
  - 4.5 Not used
  
- 5 Brake defects**
  - 5.1 Brake not working correctly
  - 5.2 Brake pipe parting on an engineering train
  - 5.3 Not used
  - 5.4 Brake no longer operating on the leading vehicle of a passenger train
  - 5.5 Brake no longer operating on the last vehicle
  
- 6 Door defects on passenger vehicles**
  - 6.1 Vehicles which must be locked out of use
  - 6.2 Locking and labelling defective doors
  - 6.3 If the doors on one or both sides cannot be released
  - 6.4 If the train has to be worked forward with a door open
  
- 7 Driver's reminder appliance (DRA)**

- 7.1 Not used
- 7.2 Starting a journey from somewhere other than a maintenance depot
- 7.3 During a journey
- 8 Driver's safety device (DSD) and driver's vigilance equipment**
  - 8.1 Not used
  - 8.2 Starting a journey from somewhere other than a maintenance depot
  - 8.3 Isolating the driver's vigilance equipment
  - 8.4 During a journey
- 9 Driving cab windows - broken or obscured**
  - 9.1 Not used
  - 9.2 Starting a journey from somewhere other than a maintenance depot or during a journey
- 10 Driving controls defective**
  - 10.1 During a journey
  - 10.2 Duties of the competent person
- 11 Brake continuity isolation switch (BCIS)**
  - 11.1 Starting a journey from a maintenance depot
  - 11.2 Starting a journey from somewhere other than a maintenance depot
  - 11.3 Operating the BCIS during a journey
- 12 CBTC on-train equipment**
  - 12.1 Not used
  - 12.2 Starting a journey from somewhere other than a maintenance depot
  - 12.3 During a journey
  - 12.4 If CBTC is not in operation when it should be
  - 12.5 Not used
- 13 External orange hazard lights**
  - 13.1 Signaller becoming aware of an illuminated orange hazard light
  - 13.2 Not used
  - 13.3 Train starting or continuing a journey
- 14 Headlights, marker lights and tail lamps**
  - 14.1 Not used
  - 14.2 Starting a journey from somewhere other than maintenance depot
  - 14.3 During a journey
- 15 Hot axle boxes and activation of in built hot axle box detectors**



- 15.1 Starting a journey**
- 15.2 Vehicle developing a hot axle box**
- 15.3 Receiving a report of a hot axle box**
- 15.4 Checking for evidence of overheating**
- 15.5 No evidence of overheating**
- 15.6 If there is evidence of overheating**
- 15.7 Activation of a built-in hot axle box detector**
  
- 16 Lifeguards**
  - 16.1 Starting a journey**
  - 16.2 During a journey**
  
- 17 On-train data recorder (OTDR)**
  - 17.1 Starting a journey**
  - 17.2 During a journey**
  
- 18 Public address system**
  - 18.1 Starting a journey**
  - 18.2 During a journey**
  
- 19 Sanding equipment to assist train braking**
  - 19.1 Not used**
  - 19.2 Starting a journey from somewhere other than a maintenance depot or during a journey**
  
- 20 Selective door-opening**
  
- 21 Speedometer and DMI**
  - 21.1 Starting a journey**
  - 21.2 During a journey**
  
- 22 Not used**
  - 22.1 Not used**
  - 22.2 Not used**
  - 22.3 Not used**
  
- 23 Traction interlock switch (TIS)**
  - 23.1 Not used**
  - 23.2 Starting a journey from somewhere other than a maintenance depot**
  - 23.3 Operating the TIS**
  - 23.4 Before the movement begins**
  - 23.5 When the journey is over**

## **24 Train protection and warning system (TPWS)**

**24.1 Not used**

**24.2 Starting a journey from somewhere other than a maintenance depot**

**24.3 During a journey**

**24.4 Failure to activate**

**24.5 Not used**

## **25 Train radio equipment**

**25.1 Not used**

**25.2 Starting a journey from somewhere other than a maintenance depot**

**25.3 During a journey**

## **26 Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes**

**26.1 Starting a journey**

**26.2 During a journey**

**26.3 Detaching the defective vehicle**

**26.4 Moving vehicles with wheelskates**

## **27 Warning horn**

**27.1 Not used**

**27.2 Starting a journey from somewhere other than a maintenance depot**

**27.3 During a journey**

## **28 Wheel slide protection (WSP) equipment**

**28.1 Not used**

**28.2 Starting a journey from somewhere other than a maintenance depot or during a journey**

## **29 ATO on-board failure**

**29.1 Reaction to an on-board ATO failure on a train**

## 1

## Reporting defective or isolated on-train equipment

*The persons responsible: driver, signaller*

### 1.1 Driver reporting a defect

#### a) Stopping the train immediately

driver

You must stop your train and tell the signaller as soon as you become aware of a defect with the:

- air suspension
- axle boxes
- brakes
- doors if they cannot be closed
- driver's safety device (DSD)
- driver's vigilance equipment
- driving cab window - broken or obscured
- driving controls
- brake continuity isolation switch (BCIS) or brake continuity circuit
- CBTC on-train equipment other than the DMI showing the incorrect units of speed
- external orange hazard lights
- headlights or tail lights
- lifeguards
- sanding equipment - if you believe you may have difficulty stopping the train if it continues on a journey
- selective door-opening - if you consider this may be due to defective lineside equipment
- traction interlock switch (TIS)
- warning horn - complete failure
- wheel slide protection - if you believe you may have difficulty stopping the train if it continues on a journey.

If possible, you must avoid stopping the train:

driver

- at the entrance to a station
- between stations within the tunnel sections
- on or near points until the last vehicle of the train is clear
- at any other place where it might be difficult to deal with the situation.

### **b) Stopping the train at the first convenient opportunity**

You must tell the signaller at the first convenient opportunity, stopping the train specially if necessary, when you become aware of a defect with the train radio equipment.

You must stop your train at the first convenient opportunity and tell the train operators control when you become aware of a defect with the:

- automatic warning system (AWS) - if not in operation on the train
- doors unless they cannot be closed
- driver's reminder appliance
- ERTMS on-train equipment
- on-train data recorder
- public address system on DO trains
- sanding equipment - unless you believe you may have difficulty stopping the train if it continues on a journey.
- DMI if it is displaying the incorrect units of speed
- train protection and warning system (TPWS) - if not in operation on the train

### **c) General**

If you isolate an item of defective on-train equipment that will affect the movement of the train, you must tell the signaller immediately.

If the train stops out of course or might not be able to depart on time, you must tell the signaller immediately.

After reporting the defect you must make sure you receive instructions on how the defect is to be dealt with and the arrangements for further movement.

If reporting the defect to the train operator's control will cause delay, you must tell the signaller the reason for the delay.

signaller

If the train has stopped in a position which prevents the movement of other trains, you may, if the circumstances allow, authorise the driver to move the train to clear points or junctions.

## 1.2 Not used

## 1.3 Signaller receiving a report from a driver

signaller

If a driver tells you about defective or isolated on-train equipment, you must:

- if necessary take action to stop trains and protect any line affected
- tell Operations Control
- make a suitable entry on the occurrence log.

## 1.4 Signaller receiving instructions from Operations Control

signaller

When you receive instructions from Operations Control about the action to be taken with the train, you must:

- pass the instructions to the driver immediately
- make sure the driver understands clearly what action to take
- make a suitable entry on the occurrence log.

## 1.5 Giving instructions to the driver

You must give directly to the driver any instructions from Operations Control relating to the movement of the train.

signaller

Any instruction relating to the movement of the train will be given to you directly by the signaller.

driver

If you are required to drive your train at a restricted speed, and this speed is not supervised by CBTC, you must control the train in a manual mode and not accept ATO.

In exceptional circumstances, instructions may be given to vary the conditions shown in this module. The conditions shown in this module cannot be varied for AWS, CBTC, ERTMS or TPWS equipment.

driver,  
signaller



In this module, the term 'normal movement of the train' means that the train can accelerate, travel and stop in the normal way without speed restriction or special travel conditions

## 2 Competent person travelling with driver

*The persons responsible: competent person, driver*

### 2.1 General instructions

driver

If the driver's safety device (DSD) or driver's vigilance equipment fails, or if the windscreen becomes broken or obscured, a competent person may be provided to travel with you.

When you are accompanied by a competent person, you must tell the competent person which equipment is defective and what to do.

### 2.2 Not used

### 2.3 Broken or obscured windscreen

competent  
person

You must help and advise the driver with sighting signals, lineside signs, stations and anything else on the line which the driver needs to be aware of.

### 2.4 Defective or isolated DSD or driver's vigilance equipment

driver

If necessary, you must point out and explain to the competent person the relevant equipment needed for stopping the train in an emergency and how to contact the signaller.

competent  
person

You must confirm to the driver that you understand how to stop the train in an emergency and contact the signaller.

If the driver becomes unable to drive, you must stop the train immediately, and tell the signaller, by using the train radio if possible.

# 3

## Air suspension

*The persons responsible: driver, train preparer*

### 3.1 Not used

### 3.2 Starting a journey from somewhere other than a maintenance depot

If the air suspension is deflated on any bogie, you must tell the train operator's control.

driver, train preparer

If the train operator's control gives authority to start a journey, you must comply with any speed or route restrictions given. You must make sure that the signaller is aware of these restrictions.

### 3.3 During a journey

If the air suspension becomes deflated on any bogie, you must:

driver

- stop your train immediately
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.



## 4 Automatic warning system (AWS)

*The persons responsible: driver, train preparer, signaller*

### 4.1 Not used

### 4.2 Starting a journey from somewhere other than a maintenance depot

driver, train  
preparer

You can allow a train to start a journey with the AWS defective or isolated in the cab to be driven from, as long as AWS will not be required to be in operation during the journey.

You must:

- tell the train operator's control at the first convenient opportunity
- carry out any instructions given.

You can allow a train or traction unit to start a journey (but not carrying passengers) with AWS defective or isolated in the cab which is required to be driven from with the AWS in operation, to travel to a maintenance depot for repair as long as you:

- tell the signaller
- get permission for the train to start a journey in this condition.

### 4.3 If the AWS becomes defective during a journey

driver

If you become aware that the AWS has become defective when it is not required to be in operation, you must:

- tell the signaller immediately
- carry out any instructions given.

signaller

You must make arrangements with operations control as to how the train will proceed once it exits the COS.

#### 4.4 Isolating the AWS during a journey

You may isolate the AWS when it is required to be in operation only when:

driver

- cancelling the AWS warning indication does not stop the horn sounding or the brakes applying
- successive or intermittent failures suggest that the AWS equipment is defective
- the train stops directly over the track equipment.

If the AWS has been isolated because the train stopped with the receiver directly over the track equipment, you must if possible, make sure the AWS is made operative again immediately when restarting the train.

If it becomes necessary to isolate the AWS, you must:

- stop your train immediately
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

You must make arrangements with operations control as to how the train will proceed once it exits the COS.

signaller

#### 4.5 Not used

# 5

## Brake defects

*The people responsible: driver*

### 5.1 Brake not working correctly

driver

If you suspect that the automatic brake is not working correctly, you must:

- if necessary, stop the train
- report the circumstances to the signaller immediately
- carry out the instructions given
- if permission is given to proceed, travel at reduced speed.

### 5.2 Brake pipe parting on an engineering train

driver

If the train comes to a stand because the brake-pipe coupling heads separate, you must try to recouple them if they are undamaged.

If this can be done, you may continue normally as long as you:

- tell the signaller
- carry out a brake continuity test.

### 5.3 Not used

### 5.4 Brake no longer operating on the leading vehicle of a passenger train

driver

If the brake is no longer operating on the leading vehicle, you must tell the signaller immediately and carry out the instructions given.

The train must be assisted from the front unless one of the following applies.

driver

- The line ahead is rising.
- The leading vehicle is fitted with a parking brake which can be applied in an emergency, in which case the movement must not exceed 5 mph (10 km/h).
- The leading vehicle is coupled by a bar coupling to the next vehicle on which the brake is operating.

You must transfer passengers to a vehicle on which the brake is operating unless:

- this is not possible, or
- the vehicle is coupled by a bar coupling to the next vehicle on which the brake is operating.

A competent person must be provided to travel in a vehicle other than the leading vehicle to secure the train in an emergency unless:

- the train is being assisted from the front
- the leading vehicle is coupled by a bar coupling to the next vehicle on which the brake is operating.

### **Loss of brake continuity**

If control of the automatic brake is no longer continuous throughout the train, you must drive the train from a cab where you have control of the automatic brake. You must apply the instructions shown in section 10 of this module, making sure that:

- the leading cab, in which a competent person must ride, has a hand or parking brake operating on the first vehicle
- the train does not exceed 5 mph (10 km/h).

## **5.5 Brake no longer operating on the last vehicle**

If the brake is no longer operating on the last vehicle, you must tell the signaller immediately and carry out the instructions given.

driver

driver

The train must be assisted in rear unless one of the following applies.

- The line ahead is level or falling.
- The last vehicle, is provided with a hand or parking brake operating on that vehicle.
- The last vehicle is coupled by a bar coupling to the next vehicle on which the brake is operative.

You must transfer passengers to a vehicle on which the brake is operating unless:

- this is not possible, or
- the vehicle is coupled by a bar coupling to the next vehicle on which the brake is operating.

driver

A competent person must be provided to travel in the rear vehicle to secure the train in an emergency unless:

- the train is being assisted from the rear
- the rear vehicle is coupled by a bar coupling to the next vehicle on which the brake is operating.

### **Loss of brake continuity**

If control of the automatic brake is no longer continuous throughout the train, you must not exceed 5 mph (10 km/h).

You must make sure, as often as possible, that the train is still complete.

## 6

**Door defects on passenger vehicles**

*The person responsible: driver, signaller, train preparer*

**6.1 Vehicles which must be locked out of use**

You must place the vehicle out of public use and arrange to transfer passengers to another vehicle, if:

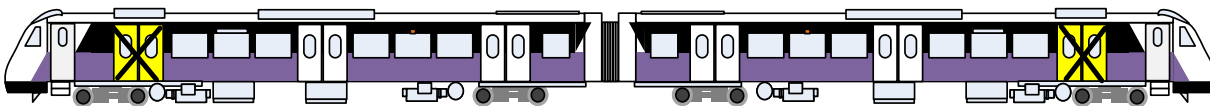
*driver, train preparer*

- all doors including those only available to the public for use as an emergency exit are defective on one or both sides of the vehicle and the nearest door on the next vehicle is also defective
- a door at the leading end of the first passenger-carrying vehicle is defective, unless the emergency passenger egress control is of a type which still allows the door to be opened
- a trailing-end door of the last passenger-carrying vehicle is defective, unless the emergency passenger egress control is of a type which still allows the door to be opened.

The following colours denote:

Yellow door - Door out of use.

The following is an example of the possible arrangements.



*Diagram TW5.1*

*Doors out of use*

## 6.2 Locking and labelling defective doors

driver, train  
preparer

You must make sure that any door which is defective is locked and labelled 'OUT OF USE'.

Any door which is not being locked or released by the central door locking must be locked and labelled 'OUT OF USE'.

## 6.3 If the doors on one or both sides cannot be released

driver

If all the doors on one or both sides cannot be released, you must:

- report the circumstances to the signaller immediately
- carry out the instructions given.

## 6.4 If the train has to be worked forward with a door open

driver

If the train has to be worked forward with a door open, it must be taken out of passenger service.

If the train is not at a station, you must:

- transfer passengers to another vehicle
- close and lock the vestibule doors on the affected vehicle.

If you are not able to do both of these, passengers must be kept as far away from the open door as possible. If a competent person is available, they must travel in the affected vehicle. The train must be taken out of passenger service at the next station. Exceptionally if the next station cannot deal with the detained passengers, or during severe weather, the train operator can give permission for the train to continue to a more suitable station

You must tell the signaller that the door cannot be closed and get permission to make a movement with the door open. If the open door increases the width of the train, you must tell the signaller.

signaller

If the open door increases the width of the train, you must make sure that you do not allow the train to pass, or be passed by, any moving train on a line adjacent to the open door.

You must confirm with the driver that the train door will not affect the gauge of the train.

signaller

When you have authority to proceed, you must proceed at caution and take special care when passing any structure or vehicle where clearance with the open door is limited.

driver



# 7

## Driver's reminder appliance (DRA)

*The people responsible: driver*

### 7.1 Not used

### 7.2 Starting a journey from somewhere other than a maintenance depot

driver

If you are aware that the DRA is defective in any cab that will be driven from with the DRA required to be in use, you must tell the train operator's control.

If the train operator's control gives authority to start a journey, you must carry out any instructions given.

### 7.3 During a journey

driver

If the DRA becomes defective on a train during a journey, you must:

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

# 8

## Driver's safety device (DSD) and driver's vigilance equipment

*The people responsible: driver, train preparer*

### 8.1 Not used

### 8.2 Starting a journey from somewhere other than a maintenance depot

A train can start a journey (but not carrying passengers) with DSD or vigilance equipment defective or isolated in the cab to be driven from, to travel to a maintenance depot for repair as long as you:

driver, train preparer

- tell the signaller
- get permission for the train to start a journey in this condition.

If permission is given for the train to start a journey, you must apply the conditions for travel shown in section 8.4.

### 8.3 Isolating the driver's vigilance equipment

You must only isolate the driver's vigilance equipment if the equipment cannot be reset.

driver

### 8.4 During a journey

If the DSD becomes defective, or you need to isolate the vigilance equipment, you must:

driver

- if not already at a stand, stop the train at the next station
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

**a) If CBTC is working correctly and the train is operating in ATO or PM mode**

driver

If the DSD becomes defective, or you need to isolate the vigilance equipment, you must:

- stop the train at the next station
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

If permission is given for the train to proceed, you must proceed at the normal permissible speed to the location where the train can be dealt with.

**b) If the train is being driven manually and is not in ATO or PM mode**

If the DSD becomes defective or you need to isolate the vigilance equipment, you must:

- stop the train immediately
- tell the signaller
- not move the train until a competent person is provided
- carry out the train instructions given.

When the competent person has been provided, you must proceed at a speed not exceeding the ceiling speed to the location where the train can be dealt with.

# 9

## Driving cab windows - broken or obscured

*The people responsible: driver*

### 9.1 Not used

### 9.2 Starting a journey from somewhere other than a maintenance depot or during a journey

If you have not got a clear view of the line ahead because the windscreen is broken or obscured, you must take appropriate action. This may include reducing speed and using the warning horn more frequently to make sure that the train, or anyone on or near the line, is not placed in any danger.

driver

If the train cannot proceed safely, you must:

- stop the train immediately
- tell the signaller
- if necessary, ask for a competent person to assist you
- not move the train until instructed to do so
- carry out the instructions given.

# 10 Driving controls defective

*The people responsible: competent person, driver*

## 10.1 During a journey

driver

If the driving controls become defective in the leading cab, you must:

- stop the train immediately
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

A competent person must be provided to ride in the leading cab, if permission is given for the train to proceed, driven from another cab, which must be forward-facing if one is available.

If the automatic brake cannot be applied by the competent person because only a hand or parking brake is available in the leading cab, the train must not exceed 5 mph (10 km/h).

## 10.2 Duties of the competent person

competent person

If you are to travel in the leading driving cab in which the driving controls are defective and the train is being driven from another cab you must:

- have the required knowledge for the entire route over which you have to travel
- keep a good lookout
- use the warning horn as necessary
- observe all lineside indications.

You must give instructions to the driver as necessary by:

- cab-to-cab telephone
- radio
- bell or buzzer
- handsignal.

You must be prepared to stop the movement in an emergency.

# 11 Brake continuity isolation switch (BCIS)

*The people responsible: competent person, driver*

## 11.1 Starting a journey from a maintenance depot

You must not allow a train to start a journey if the BCIS has been operated in any driving cab.

driver

## 11.2 Starting a journey from somewhere other than a maintenance depot

A train can start a journey (but not carrying passengers) with the BCIS operated in any driving cab to travel to a maintenance depot for repair as long as you:

driver

- tell the signaller
  - get permission for the train to start a journey in this condition
- If the train is formed of more than one unit, a competent person must be provided.

You must travel in the rear unit and, if necessary, carry out the instructions in M1 *Dealing with a train accident or train evacuation*.

competent person

## 11.3 Operating the BCIS during a journey

If you need to operate the BCIS, you must:

driver

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

If the train is formed of more than one multiple unit you must:

- transfer all passengers to the leading unit, if it is possible
- lock the remaining units out of use.

If possible you must arrange for a competent person to travel in the rear unit.

competent  
person

You must travel in the rear unit and, if necessary, carry out the instructions in module M1 *Dealing with a train accident or train evacuation*.

signaller

If a track circuit remains occupied after the passage of a train on which the BCIS has been operated, you must immediately contact the driver to find out if the train is complete.

# 12 CBTC on-train equipment

*The person responsible: driver, signaller*

## 12.1 Not used

## 12.2 Starting a journey from somewhere other than a maintenance depot

You can allow a train to start a journey with CBTC not working in the cab to be driven from when CBTC is required to be in operation to travel (not in passenger service) to a maintenance depot for repair.

driver

You must:

- tell the signaller
- get permission for the train to start a journey in this condition.

## 12.3 During a journey

If CBTC becomes defective when it should be in operation you must:

driver

- stop your train immediately
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

## 12.4 If CBTC is not in operation when it should be

If permission is given for a train or traction unit to proceed, you must be authorised to proceed by the signaller who will authorise you to pass each end of authority without a movement authority, as shown in module S5 *Passing an end of authority (EoA) without a movement authority (MA)*.

driver

You must make sure that the train with defective CBTC does not proceed beyond the EoA, as shown in module S5 *Passing an end of authority (EoA) without a movement authority (MA)*.

signaller



signaller

You must tell the next signaller who is to signal the train about the defective CBTC.

**12.5** Not used

# 13 External orange hazard lights

*The person responsible: driver, signaller*

## 13.1 Signaller becoming aware of an illuminated orange hazard light

You must arrange for the driver to be told if you become aware of a train with an illuminated orange hazard light and you have not been told the reason.

signaller

You must not stop the train specially unless you notice anything else unusual affecting the train.

## 13.2 Not used

## 13.3 Train starting or continuing a journey

If the train is to start or continue a journey with an orange hazard light illuminated, you must tell the signaller immediately.

driver

On receiving advice from the driver about the circumstances, you must tell Operations Control immediately and arrange for any other signaller concerned to be told.

signaller

# 14 Headlights, marker lights and tail lamps

*The people responsible: driver, signaller, train preparer*

## 14.1 Not used

## 14.2 Starting a journey from somewhere other than maintenance depot

*driver, train preparer*

You must not allow a traction unit to start a journey without a working headlight or tail lamp on any vehicle that is required to be at the front or rear of a train.

If the headlight has failed and there is no other headlight, the train can start a journey if a portable headlight is provided.

A train can start a journey with a defective tail lamp if the train is fitted with two built-in tail lamps, one of which is working, or a portable tail lamp is provided.

## 14.3 During a journey

*signaller*

If you become aware that a train is proceeding without a headlight illuminated on the front, you must arrange for the driver to be told in the quickest way possible.

If the train has to be stopped specially to tell the driver, but you cannot do this without stopping it suddenly, you must tell the next signaller.

*driver*

You must deal with any headlight or tail lamp failure as shown in the following table.

Type of failure	Action the driver must take
A failure of one headlight beam	<p>Report the circumstances to the train operator's control at the first convenient opportunity</p> <p>The train may proceed normally</p>
The headlight has completely failed	<ul style="list-style-type: none"> <li>• Stop the train immediately</li> <li>• Arrange for a white light to be displayed at the front of the train</li> <li>• Tell the signaller</li> <li>• Not move the train until instructed to do so</li> <li>• Carry out the instructions given</li> <li>• Not allow the speed of the train to exceed 20 mph (30 km/h)</li> <li>• Sound the warning horn frequently so as to warn anyone on or near the line</li> </ul> <p>If a portable headlight is provided, you must not allow the speed of the train to exceed 75 mph (120 km/h)</p>
Complete failure of tail lamp	<ul style="list-style-type: none"> <li>• Report the circumstances to the signaller immediately</li> <li>• Arrange for a handlamp with a red aspect to be displayed at the rear of the train</li> <li>• Report the circumstances to the train operator's control at the first convenient opportunity</li> </ul>
Failure of one tail lamp where two built-in lamps are provided	<p>Report the circumstances to the train operator's control at the first convenient opportunity</p> <p>The train may proceed normally</p>

# 15 Hot axle boxes and activation of in built hot axle box detectors

*The people responsible: driver, signaller*

## 15.1 Starting a journey

driver

You must not allow a train, traction unit or vehicle to start a journey with a hot axle box.

## 15.2 Vehicle developing a hot axle box

driver

If you become aware that a vehicle on your train has developed a hot axle box, you must:

- stop the train immediately
- tell the signaller
- if your train is carrying dangerous goods, tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

You must if possible, arrange for passengers to be transferred from the affected vehicle.

If you have any doubt about whether the movement can be made safely, you must get the authority of a rolling stock technician.

During the movement, you must not allow the speed of the train to exceed:

- 10 mph (15 km/h)
- 5 mph (10 km/h) over any points and crossings.

signaller

You must stop all trains on the adjacent line or lines before giving the driver authority for the movement to be made.

### 15.3 Receiving a report of a hot axle box

#### a) When the alarm operates

When the alarm operates in the signal box, or you receive a report of a hot axle box from another source, you must:

signaller

- stop the train concerned immediately
- in an open section stop any trains on the adjacent line
- advise Operations Control.

#### b) After the train has been stopped

When the train has been stopped, you must tell the driver:

- which axle box is affected by identifying the axle number (counting from the front of the train)
- on which side of the train (in the direction of travel) the affected axle box is
- to examine the vehicle concerned.

If you do not know which axle box is affected, you must:

- give the driver as much information as possible
- tell the driver the approximate location of the defective vehicle
- tell the driver to examine the whole train if necessary.

You must ask the driver if the adjacent line or lines need to stay blocked while the examination is carried out.

You must also ask the driver to tell you if the adjacent line or lines are obstructed.

If the driver tells you that the adjacent line or lines are clear, you can allow any other train which has been stopped to proceed.

#### c) Delay in carrying out an examination

If you are unable to carry out the examination within 10 minutes of stopping, you must:

driver

- tell the signaller
- carry out the instructions given
- if the train is to be moved, proceed at no more than 20 mph (30 km/h).

## 15.4 Checking for evidence of overheating

driver

If one is available, a rolling stock technician must carry out the examination.

However, if one is not available, you must immediately examine the vehicle concerned for evidence of overheating.

After examining the axle box concerned, if there is no evidence of overheating, you must continue to check the other axle boxes to see if they are at similar temperatures, as follows.

- All axle boxes on both sides of the vehicle concerned.
- All the axle boxes on the vehicles on either side of the vehicle concerned.

driver

When you have examined the affected vehicle, you must tell the signaller if you have found any defects.

## 15.5 No evidence of overheating

driver

If the examination reveals no evidence of overheating to any axle box and all the vehicles examined have roller bearings, the train must proceed normally.

If the train is stopped because of another hot axle box detector activation within 50 miles (80 kilometres), or any of the vehicles examined have other than roller bearings you must:

- not move the train until instructed to do so
- carry out the instructions given
- if the train is to be moved, proceed at no more than 20 mph (30 km/h).

If the train has not passed over another hot axle box detector within 50 miles (80 kilometres), arrangements will be made for it to be stopped and you must then carry out another examination.

### 15.6 If there is evidence of overheating

If an axle box is obviously hot, or hotter than those on the same vehicle or on a vehicle on either side, you can move the train to the next location where it can be dealt with.

driver

If you have any doubt about whether the movement can be made safely, you must get the authority of a rolling stock technician.

If the train is to be moved, you must get authority from the signaller for the movement to be made.

You must if possible, arrange for passengers to be transferred from the affected vehicle.

During the movement, you must not allow the speed of the train to exceed:

- 10 mph (15 km/h)
- 5 mph (10 km/h) over any points and crossings.

You must stop all trains on the adjacent lines before giving the driver authority for the movement to be made.

signaller

### 15.7 Activation of a built-in hot axle box detector

When a built-in hot axle box detector is activated, you must:

driver

- stop the train and tell the signaller at the first convenient opportunity
- unless a rolling stock technician is immediately available, examine the axle box concerned to check whether it is overheated.

If the train is to be moved, you must get authority from the signaller.

If you have any doubt about whether the movement can be made safely, you must get the authority of a rolling stock technician.

You must if possible, arrange for passengers to be transferred from the affected vehicle.



**driver**

During the movement, you must not allow the speed of the train to exceed:

- 10 mph (15 km/h)
- 5 mph (10 km/h) over any points and crossings.

**signaller**

You must stop all trains on the adjacent lines within open sections before giving the driver authority for the movement to be made.

# 16 Lifeguards

*The person responsible: driver, train preparer*

## 16.1 Starting a journey

You must not allow a train or traction unit to start a journey with a loose or damaged lifeguard.

driver, train preparer

A train or traction unit must not start a journey with a missing lifeguard at any cab which requires to be used.

## 16.2 During a journey

If you become aware that a lifeguard is missing, loose or damaged, you must:

driver, train preparer

- tell the signaller immediately
- not move until instructed to do so
- carry out the instructions given.

If you have any doubts about whether the movement can be made safely, you must get the authority of a rolling stock technician.

# 17 On-train data recorder (OTDR)

*The people responsible: driver, train preparer*



OTDR includes the juridical recorder on trains on which CBTC is in operation when operating on CBTC lines.

## 17.1 Starting a journey

*driver, train preparer*

You must not allow a train or traction unit to start a journey if you are aware that the OTDR that records activity in the leading cab is defective. This applies unless a working OTDR is provided elsewhere on the train.

You must tell the train operator's control at the first convenient opportunity.

## 17.2 During a journey

*driver*

If you become aware of an OTDR becoming defective on a train during a journey, you must:

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

# 18 Public address system

*The people responsible driver, train preparer*

## 18.1 Starting a journey

If there is a complete failure of the public address system, the train must not start a journey with passengers on the train.

driver, train preparer

## 18.2 During a journey

If you become aware that the public address system is not working on a vehicle, you must:

driver

- tell the train operators' control at the first convenient opportunity
- carry out the instructions given.

# 19 Sanding equipment to assist train braking

*The people responsible: driver*

## 19.1 Not used

## 19.2 Starting a journey from somewhere other than a maintenance depot or during a journey

driver

If the sanding equipment is defective or becomes defective on a train or there is no sand in the sand box, you must:

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

However, if you believe you may have difficulty in stopping the train, you must:

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

## 20 Selective door-opening

*The people responsible: driver, signaller*

If selective door operation does not operate correctly and you consider that this may be due to defective lineside equipment, you must tell the signaller immediately.

driver

If you become aware of the failure of lineside equipment provided for selective door operation, you must:

signaller

- tell Operations Control
- tell the driver of any following train which would use the equipment, about the circumstances.

# 21 Speedometer and DMI

*The people responsible: driver, train preparer*

## 21.1 Starting a journey

driver, train  
preparer

You must not allow a train or traction unit to start a journey unless there is a working speedometer in any driving cab which is required to be driven from.

## 21.2 During a journey

driver

If a speedometer fails or cannot be read and there is no other working speedometer in the driving cab, you must:

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

If the train is to be moved, you must proceed at a speed that will make sure you are keeping to all speed restrictions.

If the DMI fails to operate the correct units of speed, you do not need to stop the train immediately, but you must inform the signaller at the first convenient opportunity.

When operating in any other mode than ATO, you must proceed at a speed that will make sure you are keeping to all speed restrictions.

## 22 Not used

22.1 Not used

22.2 Not used

22.3 Not used



## 23 Traction interlock switch (TIS)

*The people responsible: Driver, train preparer*

### 23.1 Not used

### 23.2 Starting a journey from somewhere other than a maintenance depot

driver, train  
preparer

You must not allow a train to start a journey carrying passengers if the TIS has been operated.

### 23.3 Operating the TIS

driver

If it becomes necessary to operate the TIS, you must only do this:

- when the train is at a stand
- when you cannot get traction power
- after you have checked that all the doors on both sides of the train are securely closed.

When you have operated the TIS, you must:

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

### 23.4 Before the movement begins

driver

Before the movement begins, you must check all doors on both sides of the train to make sure they are securely closed.

On each occasion that the doors are released, you must check all doors on that side of the train to make sure they are securely closed.

### 23.5 When the journey is over

You must restore the TIS to the normal position before shutting down the driving controls when the train is:

driver

- stabled
- reversed
- coupled to another train and you are driving the train from another cab.

You must not leave a switch in the isolate position in any driving cab other than the cab from which the train is being driven.

driver

This does not apply to a TIS which can only be restored by a rolling stock technician.

## 24 Train protection and warning system (TPWS)

*The people responsible: driver, signaller, train preparer*

### 24.1 Not used

### 24.2 Starting a journey from somewhere other than a maintenance depot

driver, train preparer

You can allow a train or traction unit to start a journey with the TPWS defective in the cab to be driven from, as long as TPWS will not be required to be in operation during the journey.

You must:

- tell the train operator's control at the first convenient opportunity
- carry out any instructions given.

You can allow a passenger train to start a journey (but not carrying passengers) with TPWS defective in the cab to be driven from with the TPWS in operation to travel to a maintenance depot for repair as long as you:

- tell the signaller
- get permission for the train to start a journey in this condition.

You must not allow an engineering train to start a journey with TPWS defective in the cab to be driven from

### 24.3 During a journey

driver

If you become aware that the TPWS has become defective when it is not required to be in operation you must:

- tell the signaller
- carry out any instructions given.

signaller

You must tell Operations Control about the defect.

If you become aware that the TPWS has become defective on an engineering train you must:

driver

- tell the signaller
- carry out the instructions given.

signaller

You must tell Operations Control about the defect.

### 24.4 Failure to activate

If you become aware that TPWS has failed to activate when it should have done, you must:

driver

- stop your train immediately
- tell the signaller
- not move the train until instructed to do so
- carry out the instructions given.

### 24.5 Not used

# 25 Train radio equipment

*The person responsible: driver, signaller, train preparer*

## 25.1 Not used

## 25.2 Starting a journey from somewhere other than a maintenance depot

driver, train  
preparer

You must not allow a train or traction unit to start a journey with a defective radio in any cab which is required to be driven from unless one of the following applies.

- Operative transportable or portable GSM-R radio equipment has been provided in the cab to be driven from.
- You have been given permission to start a journey and proceed to a location where operative transportable or portable GSM-R radio equipment will be provided in the cab to be driven from.
- You have been given permission to start a journey and complete the journey without an operative radio in the cab to be driven from.
- The defective radio is not in the cab from which the train is to be driven from during the current journey.
- You have been told that there is a radio network failure.

If you are told that there is a radio network failure, you may be told not to allow the speed of your train to exceed 100 mph (160 km/h) or 60 mph (100 km/h) while passing through the area affected by the failure. You must control the speed of your train to no more than the speed that you have been told.

### 25.3 During a journey

If the radio in the cab which the train is being driven from becomes defective on a train during a journey, you must:

driver

- tell the signaller as soon as possible, stopping the train specially if necessary
- not move the train until instructed to do so
- carry out the instructions given.

The train can continue the journey as long as one of the following applies.

driver,  
signaller

- Operative transportable or portable GSM-R radio equipment has been provided in the cab to be driven from.
- Operative transportable or portable GSM-R radio equipment is carried by the driver if an auto-reverse movement is to take place.
- You have been given permission to proceed as far as a location where operative transportable or portable GSM-R radio equipment will be provided in the cab to be driven from.
- You have been given permission to complete the journey without an operative radio in the cab the train is being driven from.
- You have been told that there is a radio network failure.

If you are told that there is a radio network failure, you may be told not to allow the speed of your train to exceed 100 mph (160 km/h) or 60 mph (100 km/h) while passing through the area affected by the failure. You must control the speed of your train to no more than speed that you have been told.

driver

# 26 Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes

*The people responsible: driver, signaller, train preparer*

## 26.1 Starting a journey

driver, train preparer

You must not allow a train or vehicle to start a journey with:

- locked wheels
- shifted tyres
- dragging brakes
- serious wheel flats.

## 26.2 During a journey

### a) Dragging brakes

driver

If you believe that the brakes on a vehicle may be dragging, you must:

- attempt to release the brakes on the vehicle locally
- examine the brakes, tyres and wheels for evidence of damage or overheating.

If the brakes cannot be fully released, they must be isolated.

You must check to see that the wheels rotate freely before you proceed.

If there is evidence of damage to the wheels, you must carry out the instructions shown in section 26.2 c) of this module.

If the brakes are still not fully released, you must not allow the speed of the train to exceed:

- 10 mph (15 km/h)
- 5 mph (10 km/h) over points and crossings.

### b) Checking for wheel rotation

After freeing locked wheels, you must make sure that the wheels will rotate freely before you proceed.

**c) Following an examination**

If the train has been examined for locked or hot wheels, it must only continue as shown in the following table.

driver

Can wheels be freed?	Condition of wheels	Action to be taken
Yes	Slight flats or no evidence of damage	The train can proceed normally
Yes	More serious flats but no other obvious damage	<ul style="list-style-type: none"> <li>• Report the circumstances to the signaller immediately</li> <li>• Not move the train until instructed to do so</li> <li>• Carry out the instructions given</li> <li>• If the train is to be moved, proceed at no more than 20 mph (30 km/h)</li> </ul>
Yes	Serious damage such as: <ul style="list-style-type: none"> <li>• a flat greater than 60 mm (2½ inches) in length</li> <li>• a flat which has formed a flange on the outside of the wheel</li> <li>• evidence that a tyre may have shifted</li> </ul>	<ul style="list-style-type: none"> <li>• Report the circumstances to the signaller immediately</li> <li>• Not move the train until it has been examined by a rolling stock technician</li> <li>• Carry out the instructions given</li> </ul>
No	Any condition	<ul style="list-style-type: none"> <li>• Report the circumstances to the signaller immediately</li> <li>• Not move the train until it has been examined by a rolling stock technician</li> <li>• Carry out the instructions given</li> </ul>



**d) If there is doubt the train can proceed safely**

driver

You must:

- tell the signaller immediately
- not move the train until it has been examined by a rolling stock technician.

**e) If the damage to the vehicle is serious**

You must tell the signaller immediately.

operations  
control

If you have been informed that the damage to the vehicle is serious, you must arrange for an engineer to examine the line.

signaller

If Operations Control tells you that the portion of line needs to be examined by an engineer, you must instruct the driver of each subsequent train to proceed at caution until it is safe to resume normal working.

**26.3 Detaching the defective vehicle**

driver

If the damage to the wheels or brake gear is such that the brakes may not adequately secure the vehicle, you must:

- not detach the vehicle from the train until the vehicle has been properly secured
- let the signaller or person in charge of that location know the condition of the vehicle and where the vehicle is located.

**26.4 Moving vehicles with wheelskates**driver,  
signaller

Before the movement starts, you must find out the conditions of travel.

driver

If fitting the wheelskate results in 50% or more of the brake force of the vehicle being unavailable, you must treat the vehicle as being piped only.

A traction unit fitted with a wheelskate can only be moved under its own power as long as at least 50% of the brake force of the traction unit is available and the parking brake is fully operative.

## 27 Warning horn

*The person responsible: driver, train preparer*

### 27.1 Not used

### 27.2 Starting a journey from somewhere other than a maintenance depot

A train can start a journey if the warning horn is partially defective (for example, one tone not working) in a cab which is required to be driven from, as long as you:

*driver, train preparer*

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

### 27.3 During a journey

#### a) Complete failure

If the warning horn becomes completely defective on a train, you must:

*driver*

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

If permission is given to proceed, you must make sure the train does not exceed 20 mph (30 km/h).

#### b) Partial failure

If the warning horn becomes partially defective (for example, one tone not working) on a train, you must:

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

## 28 Wheel slide protection (WSP) equipment

*The people responsible: driver, signaller*

### 28.1 Not used

### 28.2 Starting a journey from somewhere other than a maintenance depot or during a journey

driver

If the WSP equipment is defective or becomes defective on a train, you must:

- tell the train operator's control at the first convenient opportunity
- carry out the instructions given.

However, if you believe you may have difficulty in stopping the train, you must:

- tell the signaller immediately
- not move the train until instructed to do so
- carry out the instructions given.

## 29 ATO on-board failure

*The persons responsible: driver, signaller, operations control*

### 29.1 Reaction to an on-board ATO failure on a train

If you become aware of an ATO on-board failure you must tell the signaller immediately.

driver

When you are alerted to an on board ATO failure, you must:


signaller


- reach a clear understanding with the driver
- tell Operations Control immediately
- route the train as told by Operations Control.

If you are told that a train has a failure of the on-board ATO equipment, you must arrange for the train to be dealt with according to the TOC company instructions.

operations  
control

Please refer to specific modules for issue and in-force status

 [rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)

 <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**  
EVERY JOURNEY MATTERS



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB1

## Handbook 1

# General duties and track safety for track workers

Handbook 1

If you go on electrified lines, you will also need the relevant electrified lines instructions.

Issue 5

Date December 2021

Comes into force 21<sup>st</sup> Dec

This handbook is for those personnel who need to go on the operational railway to carry out their duties, with the exception of a:

Train driver

Shunter

Signaller

Designated person (DP).

The personnel listed above will not receive this handbook but will get Rule Book module G1 General safety responsibilities and personal track safety for non-track workers.

All personnel, other than those listed above, who go on the operational railway are defined as track workers for the purpose of the Rule Book.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 **Definitions**
- 2 **General instructions**
- 3 **Going on the lineside**
- 4 **Going on or near the line alone**
- 5 **Going on or near the line with others**
- 6 **Reporting an accident**
- 7 **Preventing hazards**
- 8 **Stopping trains in an emergency**
- 9 **Communications procedure**
- 10 **Limited clearance signs**
- 11 **Telephones with limited clearance**



# 1 Definitions

## **A position of safety**

You are in a position of safety if you are at least 1.25 metres (4 feet) from the nearest line on which a train can approach and there is a safe method of protection is being used.

## **Lineside**

You are on the lineside (shown green in diagrams HB1.1 and HB1.2) if:

- you are between the railway boundary fence and the area called on or near the line, and
- you can be seen by the driver of an approaching train.

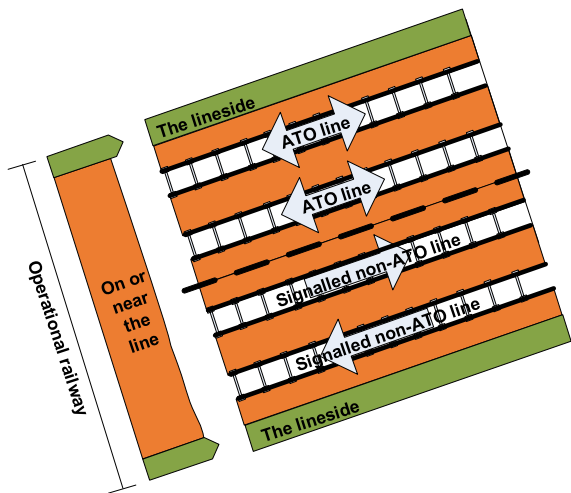
You are not on the lineside if you are on a station platform.

## **On or near the line**

You are on or near the line (shown orange in diagram HB1.1, HB1.2, HB1.3 and HB1.4) if you are:

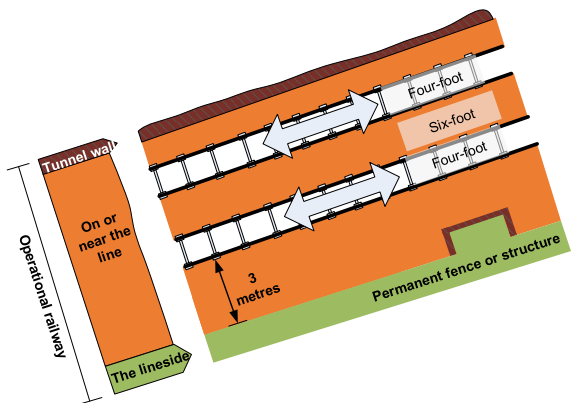
- within 3 metres (10 feet) of a line and there is no permanent fence or structure between you and the line
- on the line itself.

You are not on or near the line if you are on a station platform unless you are carrying out engineering or technical work within 1.25 metres (4 feet) of the platform edge including where platform screen doors are provided and a door or doors are open.



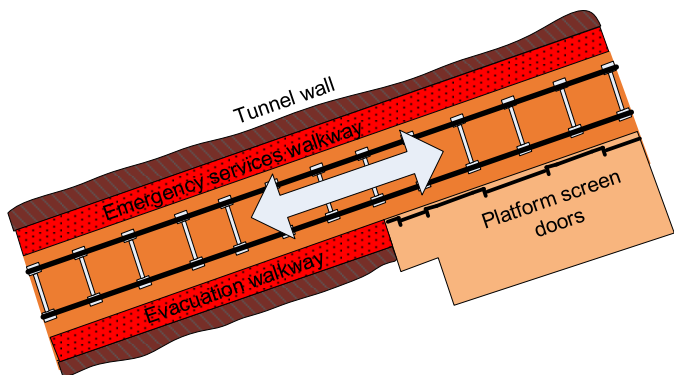
*Diagram HB1.1*

*On or near the line or lineside in open sections*



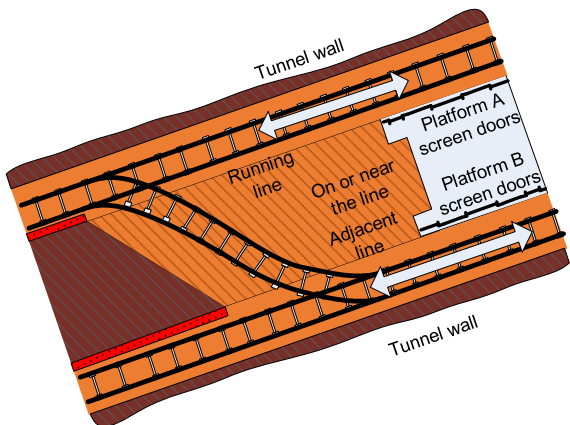
*Diagram HB1.2*

*On or near the line or lineside in Connaught tunnel or in open sections of the COS*



**Diagram HB1.3**

***On or near the line or lineside in a single bore tunnel***



*Diagram HB1.4*

*On or near the line where there is a cavern in the COS*

### **Maximum speed**

The maximum speed is the highest speed at which trains are allowed to travel over a line. The maximum speed for each line is shown in the *Sectional Appendix*.

### **Operational railway**

The term operational railway includes the area called on the lineside and the area called on or near the line.

### **Safety barrier**

A safety barrier can be a permanent fence or barrier or a temporary fence made of rigid or tensioned material, plastic netting or barricade tape.

## **2 General instructions**

### **2.1 Rules, regulations and instructions**

Rules, regulations and instructions apply to the task being carried out and to those carrying out the task, no matter what grade or job title they have.

Unless you are under instruction from a competent person, you must be competent to correctly apply the rules, regulations and instructions to the tasks you are authorised to carry out.

Safety must always be your first concern. If there is no rule that allows or prevents you doing something you believe must be done, you must do it in the safest way you know taking into account your training and experience.

## 2.2 Mechanical and electrical plant or other equipment

You must not operate mechanical or electrical plant or any other equipment unless you have been trained and are authorised to do so. If necessary, you must also hold a certificate of competency in operating the plant or equipment.

## 2.3 Getting on and off moving rail vehicles

You must not get on or off a moving rail vehicle.

You must not ride on the steps of a locomotive or vehicle or ride on a hand trolley or any other vehicle not designed for this purpose.

## 2.4 Travelling in driving cabs

You must only travel in the driving cab of a train if it is in connection with your duties and you have authority to do so.

If you are in possession of a cab pass, you must:

- show your cab pass to the driver before entering the cab
- show the driver any necessary permission issued by the train operator when asking for

access to the cab of a train carrying high consequence dangerous goods

- tell the driver the reason for travelling in the cab and where you plan to travel to
- arrange for the train to be stopped specially if necessary
- check you have any personal protective equipment your company policy requires if you plan to leave the train somewhere other than a station platform
- check with the driver if any mobile electronic devices are to be switched off before entering the cab.

When travelling in the driving cab you must not distract the driver.

## 3 Going on the lineside

### 3.1 General

You must get the authority of the signaller before going on or near the line, and have a method of protection in place.

You must wear the correct high-visibility clothing issued to you by your employer.



You must use an authorised access point, if provided, to get onto the operational railway.

You must use authorised walking routes if they are provided.

You must raise one arm above your head to acknowledge the driver of any approaching train who sounds the warning horn.

## 3.2 Working on the lineside

Any work done on the lineside must not affect or go within the area called on or near the line unless a controller of site safety (COSS) or a person in charge of possession (PICOP) is present and has given permission for the work to take place.

## 3.3 Using a road vehicle on the lineside

If you are using a road vehicle, you must not allow it to enter the area called on or near the line unless:

- you are the driver of the vehicle and you are an ES, or
- an ES is present and has given you permission.

# 4 Going on or near the line alone

## 4.1 General

You must get the authority of the signaller before going on or near the line, and have a method of protection in place.

You must have with you a valid certificate of competence in personal track safety issued by your employer.

You must wear the correct high-visibility clothing issued to you by your employer.

You must never work alone unless you are a COSS or PICOP.

You must make sure you have a suitable lamp with you if you will be on or near the line during darkness, poor visibility or if you are to enter the tunnel section.

## 4.2 Local knowledge

Before you go on or near the line alone, you must know about all of the following for each line:

- the maximum speed
- the direction from which trains normally approach
- the location of any area where you must not go while trains are running
- any location with limited clearances.

## 4.3 When a train approaches

When a train approaches you must immediately move to a position of safety or, if already in a position of safety, stay there.

If the driver sounds the warning horn, raise one arm above your head to show you have heard the warning.

You must stay in your position of safety until the train has passed clear or you are certain you will not be put in danger by that train or any other train.

# 5 Going on or near the line with others

## 5.1 General

You must have with you a valid certificate of competence in personal track safety issued by your employer.

You must wear the correct high-visibility clothing issued to you by your employer.

## 5.2 COSS must be present

You must not go into the area called on or near the line with another person unless you are with a COSS or ES. The COSS or ES must then stay with you while you are there.

You can identify the COSS or ES by the armband on the left arm or the badge worn on the chest.

The COSS or ES must have given you a briefing about the safe system of work that has been set up so that you will not be put in danger from passing trains.

If you do not understand the briefing, ask the COSS or ES to explain it.

You must sign the safe-work briefing form (CR3180) for line blockages and (CR3198) for possessions to show you understand the safe system of work that is to be used.

You must follow all instructions given by the COSS or ES.

## **5.3 Using a safety barrier**

If a safety barrier is being used as part of the safe system of work, you must not lean against it or rest tools or equipment against it.

## **5.4 Using lookouts within a worksite**

When working in a work site within a T3 possession, you must stop any work, acknowledge the warning and move to the position of safety immediately the lookout gives the warning.

If someone does not acknowledge or move to the position of safety when the lookout gives the

warning, the lookout will give an urgent warning. This urgent warning is a series of short sharp blasts on the whistle or horn.

You must not leave the position of safety until the ES gives you permission.

You must never distract a lookout.

## **5.5 Using site wardens within a worksite**

If the site warden gives a warning, you must check you are in the safe area. If you have moved into the danger area, you must immediately step back into the safe area.

The site warden will give a series of sharp short blasts on the whistle or horn as an urgent warning if the person does not immediately move back into the safe area.

You must never distract a site warden.

# **6 Reporting an accident**

You must report an accident as quickly as possible to the person in charge or to the signaller or Operations Control.

When reporting an accident, you must first say 'This is an emergency call'. This is important, as you will get the immediate attention of the person you are speaking to.

You must give your name, the exact location and details of the accident including whether any lines are or may be obstructed.

You must also say which emergency services are needed.

You must report all accidents and near misses to your supervisor or manager.

## 7 Preventing hazards

### 7.1 Tools and equipment

Tools and equipment must not be placed any closer than 2 metres (6 feet 6 inches) from a line on which a train could pass, unless you are absolutely sure that they will not be hit by a passing train or be moved by the slipstream of passing trains.

## 7.2 Gates and lineside fences

You must keep gates at access points to the railway closed and locked to prevent people from trespassing and causing vandalism.

If you come across a damaged fence you must secure it if you can, and report any defects to the signaller or Operation Control.

## 7.3 Trespassers

You must report anyone you believe to be trespassing to the person in charge, the signaller or Operations Control.

## 7.4 Reporting lineside fires

You must immediately report a lineside fire to the person in charge, the signaller or Operations Control.



## 7.5 Flowing or pooling water that might affect structures or earthworks

You must immediately report any flowing or pooling water that might affect structures or earthworks to the signaller or Operations Control. Examples of this include:

- Water rising up from the track or the cess
- Unusual amounts of water pooling next to the track or in the cess
- Water flowing down or pouring out of the sides of embankments or cuttings.

You must tell the signaller or Operations Control if the water is displacing any material.

## 7.6 If you see something wrong with a train

You must report to the person in charge, the signaller or Operations Control, anything that looks unsafe on a train, such as:

- a door not closed properly or an insecure load
- a vehicle on fire or a hot-axle box
- the headlight not lit or the tail lamp missing or not lit
- the driver sounding the train in distress warning (which is a continuous series of long blasts on the high/loud tone of the horn)
- the driver displaying a red handsignal
- the hazard warning indicator (flashing headlights).

## 7.7 Overhead power lines

If an overhead electric power line belonging to an electricity company falls onto or near the railway line, you must, if necessary, carry out the instructions shown in section 8 of this handbook.

You must not go closer than 5 metres (approximately 5 yards) to the fallen power line or anything in contact with it, until it has been confirmed by the electricity company that it is safe to do so.

## 8 Stopping trains in an emergency

### 8.1 Hazards that may put trains in danger

The following hazards might put approaching trains in danger.

- A track defect.
- A flood or fire.
- An obstruction.
- Damage to structures or earthworks above or below the line.
- Any light which is out at an emergency indicator.
- A large animal within the boundary fence (even if it is not an immediate danger to trains).
- Any other animals on or near the line.

## 8.2 Reporting the hazard and stopping trains

If you become aware of any of these or other dangers, you must immediately tell the person in charge, the signaller or Operations Control.

As well as reporting the hazard, you must take any necessary action, such as stopping trains yourself. If you have to stop a train in an emergency, you must use an emergency stop plunger if one is provided or show a hand danger signal clearly to the driver from a position of safety as follows.

### **During daylight**

You must show a red flag. If you do not have a red flag, raise both arms above your head. If you are riding on a vehicle, raise one arm held out horizontally.

### **During darkness or in poor visibility**

You must show a red light to the driver or wave any light violently.

## Auto Reverse Operation

In locations where auto reverse is permitted, a driver may not be present in the leading end of the train. If the train is to be stopped in an emergency or other exceptional cause, you must:

- immediately tell the signaller or person in charge of the movement, or
- use the emergency stop plunger (if one is provided) and then tell the signaller.

# 9 Communications procedure

## 9.1 Communicating clearly

You must make sure you properly understand the meaning of all messages whether they are communicated by phone, radio or face-to-face.

You must:

- make sure you are talking to the right person
- give your location, if using a phone or radio
- give your name and the name of your employer
- state what task you are performing
- if necessary, let the person know how you can be contacted
- use the phonetic alphabet to make sure names and locations that are difficult to pronounce are fully understood
- never use the words 'not clear' to describe a line that is obstructed, always use 'line blocked'.

You must say numbers one at a time. You should say 8107 as 'eight, one, zero, seven'. There are exceptions to this such as when giving the time or when referring to a rule book module or handbook.

If you are receiving a message, make sure you fully understand it. You must repeat the message back so that the other person knows you correctly understand it.

To help make sure your message is fully understood when using a telephone or radio:

- speak with the mouthpiece close to your mouth and speak directly into the mouthpiece
- talk slightly slower than normal using a natural rhythm
- use your normal level of volume when speaking
- avoid using hesitation sounds for example 'um' and 'er'
- use clear sentences
- get the person to repeat your message back to you.

## 9.2 Lead responsibility

During any conversation, one person must always take lead responsibility.

The person who must take lead responsibility depends on the task being carried out. Examples are shown below.

<b>Lead responsibility</b>	<b>When communicating with</b>
Electrical control operator (ECO)	anyone
Signaller	anyone except the ECO
Person in charge of a possession (PICOP)	anyone except the ECO or signaller
Route-setting agent	points operator
COSS	members of the work group

If it is not clear who has lead responsibility, or if two people carrying out the same task are communicating with each other, the person who begins the conversation must always take lead responsibility.



## 9.3 Phrases to use when using a radio or telephone

<b>Phrase</b>	<b>Meaning</b>
This is an emergency call	This message provides emergency information which needs immediate action to prevent death, serious injury or damage.
Repeat back	Repeat all of the message back to me
Correction	I have made a mistake and will now correct the word or phrase just said.

## 9.4 Other phrases to use when using a radio and only one person can be heard at a time

<b>Phrase</b>	<b>Meaning</b>
Over	I have finished my message and am expecting a reply.
Out	I have finished my message and no reply is expected.

## 9.5 Using the phonetic alphabet

You must use the phonetic alphabet:

- to identify letters of the alphabet
- to spell words and place names that are difficult to say, or may be misunderstood
- if there is interference on the radio or phone
- when quoting the identity of signals or points
- when quoting train descriptions.

This is the phonetic alphabet.

A - alpha	N – november
B – bravo	O – oscar
C – charlie	P – papa
D – delta	Q – quebec
E – echo	R – romeo
F – foxtrot	S – sierra
G – golf	T – tango
H - hotel	U – uniform
I – india	V – victor
J – juliet	W – whiskey
K – kilo	X – x-ray
L – lima	Y – yankee
M - mike	Z - zulu

## 9.6 Using communications equipment

You must not use communications equipment if it may cause a distraction or affect safety.

Make sure you are in a position of safety before using mobile communications equipment.

Unless it is an emergency, you must not use the group call, general call or conference-call facility for passing instructions to do with:

- passing signals at danger or an end of authority (EoA) without a movement authority (MA)
- protecting trains
- wrong-direction movements
- unsignalled movements.

# 10 Limited clearance signs

## Limited clearance warning sign



There is no position of safety on this side of the railway for the length of the structure. You must not enter or stand at that location when a train is approaching.

## No refuge warning sign



There is no position of safety on this side of the railway for the length of the structure. However, there are positions of safety, or refuges, on the opposite side of the railway line.

## Prohibition sign



You must not pass beyond this sign while trains are running. This is because you would not be able to reach a position of safety or refuge safely.

# 11 Telephones with limited clearance

Some telephones are positioned where there is limited clearance between the telephone and the adjacent lines.

These telephones are identified by one of the following signs shown on or near to the telephone or on the signal post or gantry.

You may use these telephones only in an emergency and then only if no other form of communication is available.



## Core operational aim

The core aim of the fundamental operational principles is to enable the safe and timely delivery of people and goods to their destination.

### Fundamental operational principles

- 1 The method of signalling must maintain a space interval between trains that is safe.
- 2 Before a train is allowed to start or continue moving, it must have an authority to move that clearly indicates the limit of that authority.
- 3 Trains proceeding over any portion of line must not be obstructed in a way that threatens their safety.
- 4 Trains must be prevented from proceeding onto a portion of line if it is known or suspected that it would not be safe for them to pass.
- 5 Trains must not be allowed to begin or continue their journeys until it is clear that it is safe for them to do so.
- 6 Trains must only be allowed to operate over any portion of line as long as the rolling stock is compatible with the infrastructure on that portion of line.
- 7 Trains must not continue to operate after they have been found to be unsafe in any respect, until measures have been taken to allow them to continue safely.
- 8 People must be kept a safe distance from moving trains.
- 9 The workforce must be protected from the particular hazards associated with electrified railways.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)




**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**





ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB3

## Handbook 3

# Duties of the lookout and site warden

Handbook 3

Issue 4

Date December 2020

Trial running

This handbook details the rules for lookouts and site wardens working in the central operating section under possession and within a work site.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:  
Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 **Competence**
- 2 **Identification**
- 3 **Site-warden duties**
- 4 **Lookout duties - general**
- 5 **Site-lookout duties**

# 1 Competence

To act as a lookout or a site warden you must have with you a valid lookout certificate of competence issued by your employer.

# 2 Identification

When you are acting as a lookout, you must wear a white armband or badge with the word 'LOOKOUT' in red letters.

When you are acting as a site warden, you must wear a white armband or badge with the words 'SITE WARDEN' in blue letters.

You must wear the armband on your left arm or if it is a badge, wear it on the upper chest.

You must not wear these armbands or badges at any other time.

# 3

## Site-warden duties

The engineering supervisor (ES) will tell you who to watch and the boundary of the safe area within the work site as well as where you must stand.

You must not leave your post until the ES tells you that you are no longer needed to act as site warden or you are relieved by another site warden.

The ES will make sure you understand the limits of the safe area within the work site.

You must watch the group and make sure that no one moves beyond the safe limits laid down by the ES.

You must warn anyone who attempts to move beyond the safe limits by shouting 'get back'. If they do not immediately move back into the safe area, you must give a series of short sharp blasts on the whistle or horn until they do move back into the safe area.

While you are acting as a site warden you must:

- make sure your mobile phone is switched off
- stay alert and carefully watch the group.

You must not:

- take part in the actual work
- carry out any other duties
- allow yourself to be distracted.

You must immediately let the ES know if you do not believe you can continue to give an adequate warning or you cannot continue your duties as a site warden.

## 4 Lookout duties - general

If you are to be a site lookout, the ES will tell you:

- where to stand
- from which direction trains will approach
- on which lines trains will approach
- who you are to give the warning to
- how you are to give the warning
- where the position of safety is.

You must stay at your post until the ES tells you that you are no longer needed to act as lookout or you are relieved by another lookout.

You must not act as a lookout if you cannot stay alert.

While you are acting as a lookout you must:

- make sure your mobile phone is switched off
- stay alert and carefully watch for approaching trains
- give the warning and then tell the ES if you can no longer give an adequate warning or your view becomes blocked.

You must not:

- take part in the actual work
- carry out any other duties
- allow yourself to be distracted.

## 5 Site-lookout duties

When you see a train approaching on the lines concerned, you must immediately give the warning.

You must give the warning using one of the following methods as instructed by the ES:

- whistle
- horn
- touch.

If necessary, you must also shout.

If anyone does not immediately acknowledge your warning and move to the position of safety, you must give a series of short sharp blasts on the whistle or horn or repeat the touch warning until they do move to the position of safety.



Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB4

## Handbook 4

Duties of a points operator and  
route-setting agent – moving and  
securing points by hand

Handbook 4

Issue 4

Date December 2020

Trial running

This handbook details the rules for points operators and route setting agents moving points by hand when working in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 Competence**
- 3 Points operator dealing with a simple failure**
- 4 Points operator dealing with a complex failure**
- 5 Duties of a route-setting agent**
- 6 Moving power-operated points by hand within a T3 possession**
- 7 How to secure points**
- 8 Other requirements for points to be considered 'out of use'**
- 9 Points run through**

# 1 Definitions

## Simple failure

Simple failures are limited to a failure or disconnection of:

- a single point end, or
- a single point end and a co-acting trap point, or
- both ends of a crossover.

If any more than this has failed or is disconnected, it must be dealt with as a complex failure.

## Complex failure

A complex failure involves more point ends than a simple failure

A route-setting agent will be appointed to be in charge of a complex failure.

You can split a complex failure into two or more areas with a route-setting agent appointed to each area. Each route-setting agent must agree with the signaller which points they are responsible for.

## 2 Competence

The points operator must have with them a valid points operator certificate of competence issued by their employer.

The route-setting agent must have with them a valid route-setting-agent certificate of competence issued by their employer and must also be competent as a points operator.

## 3 Points operator dealing with a simple failure

### 3.1 Arriving on-site

On arrival, the points operator must:

- speak with the signaller and get instructions
- make sure trains have been stopped on the line involved
- find out if any other lines are still open
- reach a clear understanding with the signaller about what is to be done.

## 3.2 Before moving points

Before moving the points, the points operator must:

- check that it is not an obstruction that is stopping the points operating correctly
- make sure the power is cut off.

## 3.3 After moving points

Unless the signaller tells the points operator otherwise, the points must be secured.

When the points are correctly set, the points operator must move to a safe position and then tell the signaller.

The signaller will give the points operator instructions when it is necessary for the points to be unclipped and moved or for the power to be restored to the points when the fault is rectified.

When the points have been rectified, the points operator must check with the signaller that the points operate correctly.

## 3.4 Leaving secured points unattended

If the points are going to be left secured and unattended, the points operator must padlock each point clip before leaving.



## 4 Points operator dealing with a complex failure

The procedure for a complex failure is similar to a simple failure with the following differences.

- A route-setting agent will be appointed to be in charge.
- If a points operator is appointed, they will take instructions from the route-setting agent and not the signaller.
- The points operator must tell the route-setting agent, not the signaller, when the points are correctly set.
- The route-setting agent will give instructions to the points operator, not the signaller, if it is necessary for the points to be unclipped and moved.
- The route-setting agent will give instructions to the points operator for the power to be restored to the points when the fault is rectified.

## 5 Duties of a route-setting agent

The route-setting agent must be familiar with the track layout at the location concerned.

The route-setting agent must record the signaller's instructions on the route-setting form (CR3183).

If necessary, the route-setting agent will also carry out the duties of the points operator.

If a points operator is also appointed, they must take their instructions from the route-setting agent and not the signaller.

When the points have been correctly set, the points operator must report this to the route-setting agent.

The route-setting agent must walk through the route that has been set and check it has been done correctly and is set as shown on the route-setting form (CR3183).

The route-setting agent must make sure everyone is clear of the line concerned before a train is allowed to pass over the portion of line.

The route-setting agent will give instructions when it is necessary for the points to be unclipped and moved, or for the power to be restored to the points when the fault is rectified.

Before leaving the site, the route-setting agent must check with the signaller that all of the affected points operate correctly.

If the route-setting agent is relieved, before leaving the site, the route-setting agent who is leaving must tell the signaller and any points operators who the new route-setting agent is.

## 6 Moving power-operated points by hand within a T3 possession

A route-setting agent is not needed when points within a possession need to be moved by hand.

Before moving points by hand in a possession, the points operator must first make sure the signaller agrees to the points being moved by hand.

The points operator must carry out the instructions given by the PICOP or ES to do with the position the points need to be moved to.

The points operator must tell the PICOP or ES when the points have been correctly set and are secured for any movement that is to be made over them.

When the PICOP or ES no longer needs the points to be moved, the points operator must restore the points to the original position.

The points operator must tell the signaller when the points have been returned to the original position and power has been restored.

## 7 How to secure points

### 7.1 Not used

### 7.2 Using clips and scotches

Use a clip and a scotch for movements over the points in the facing direction. You only need to use the scotch for movements over the points in the trailing direction.

## 7.3 How to apply a points clip and scotch

The clip must be placed under the rail as near to the tip of the tongue as possible. Always try to get it in the first or second bed.

The scotch must be placed between the open blade and the stock rail. It must be well below the top of the running rail.

## 8 Other requirements for points to be considered 'out of use'

If points are taken out of use, they must be secured by approved devices that are padlocked.

## 9 Points run through

If the points operator or route setting-agent suspects that points have been run through, they must immediately tell the signaller and then carry out the signaller's instructions.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)




[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB7

Handbook 7

General duties of a  
Controller of Site Safety  
(COSS)

Handbook 7

Issue 5

Date December 2021

Comes into force 21<sup>st</sup> Dec

This handbook details the general rules for a Controller of Site Safety (COSS) when working in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI



# Contents

- 1 Competence and identification**
- 2 Work you can do without the line being blocked**
- 3 Work that that can only be carried out under a possession or line blockage**
- 4 Working with a group**
- 5 COSS briefing**
- 6 Track Visitor permits**

# 1 Competence and identification

To act as a Controller of Site Safety (COSS), you must have with you a valid COSS certificate of competence issued by your employer.

You must wear a COSS armband on the left arm or a COSS badge on the upper chest when you are carrying out the duties of a COSS.

You must not wear the COSS armband or badge at any other time.

The COSS armband or badge must have COSS in white letters on a blue background.

## 1.1 Responsibilities

You must only control the activities of one workgroup within a Line Blockage. If more than one workgroup is required, then another COSS must be appointed for each separate workgroup, or the work must be undertaken using a T3 Possession.

## 2 Work you can do without the line being blocked

### 2.1 Work that does not affect the safety of the line on the open sections

If the work will not affect the safety of the line and nobody will come within 3 metres (10 feet) of the nearest running rail of an open line, or 1.25 metres (4 feet) if a rigid or tensioned barrier or permanent fence is used, you may carry out the work without blocking that line.

## 3 Work that that can only be carried out under a possession or line blockage

### 3.1 Work group at risk from trains

If the work group will be at risk from trains, the line concerned must be under a T3 possession, or all lines which affect the work must be blocked to traffic.

### 3.2 Work affecting the safety of the line

You must consider the following as types of work that will affect the safety of the line and must be carried out under a possession:



Placing of electrical earths onto the overhead line within the protection of a possession or a line blockage is not considered work affecting the safety of the line.

- Carrying heavy or awkward equipment or materials across or along the line.
- Work that will affect the condition of the track.
- Digging a hole or stacking material or equipment close to the line or near the edge of a platform.
- Placing a hand trolley on the line.
- Using plant within 3 metres (10 feet) of the line.
- Using a road vehicle within 3 metres (10 feet) of the line.
- Using on-track plant (OTP) that will foul the line.
- Using a crane or other lifting equipment that will foul the line.
- Attaching anything to a railway structure, such as a bridge, a station roof or building, a signal post or gantry, or electrical equipment.
- Using a ladder, unless secured so that it cannot fall towards the line.
- Using scaffolding or a climbing tower, unless secured so that it cannot fall or move towards the line.
- Felling or trimming trees if the debris would fall towards the line.

### 3.3 Before starting work

You must not start any work that will affect the safety of the line unless the line concerned is blocked by one of the following methods.

- The line is under a T3 possession as shown in handbooks 11 and 12.
- The protection is provided by a line blockage and the work does not affect the safety of the line.
- Your site of work is within a siding and you have agreed a safe system of work with the person in charge of the siding possession (PICOS) as shown in handbook 13.

## 4 Working with a group

### 4.1 Remaining with your group

You must stay with your group so that you are able to personally observe and advise everyone until:

- work is completed and your group is no longer on or near the line,
- work is to be carried out under a T3 possession,
- you are replaced by another COSS.

## 4.2 Safe systems of work

The following are the safe systems of work available.

### **Safeguarded**

Where every line at the site of work has been blocked to normal train movements.

### **Fenced**

Where there is a suitable barrier between the site of work and any line open to the normal movement of trains.

### **Separated**

Where there is a distance of at least 2 metres (6 feet 6 inches) between the nearest running rail of an open line and the site of work, and a site warden has been appointed.

There must be an identifiable limit to the site of work.

If it is only you and one other person in the group, you do not need to appoint a site warden. However, you must make sure neither of you go any closer than 2 metres (6 feet 6 inches) to the nearest running rail of the open line.

## 4.3 Setting up the safe system of work

There must be at least 3 metres (10 feet) between any open line and any member of your group.

Where this is not possible, the instructions shown in section 4.4, 4.5 or 4.6 of this module, must be applied.

Before allowing your group to walk to the site of work or to start work, you must have:

- set up the safe system of work so that nobody in the group will be put in danger by a passing train
- tested the safe system of work to make sure it is adequate
- briefed everyone in the group about the safe system of work.

## 4.4 Blocking the line

You may use a blocked line as part of the safe system of work.

You must only consider a line to be blocked if at least one of the following applies.



- You have blocked the line or lines concerned as shown in handbook 8.
- Your site of work is within a siding and you have agreed the safe system of work with the PICOS, as shown in handbook 13.

When all lines are blocked, you may consider your safe system of work as safeguarded.

## 4.5 Safe system of work using a safety barrier (fenced)

If there is a safety barrier that is approved by the infrastructure manager between you and any open line, you may work as follows.

### **Rigid or tensioned barrier or permanent fence**

As long as the barrier or fence is at least 1.25 metres (4 feet) from the nearest running rail of the open line, you may allow work to start on the safe side of the fence.

### **Fence made of barricade tape or plastic netting**

If the fence is placed at 1.25 metres (4 feet) from the nearest running rail of the open line and the maximum speed on the open line is no greater than 40 mph (65 km/h), you may work on the safe side of the fence.

If the fence is at least 3 metres (10 feet) from the nearest running rail of the open line, you may work on the safe side of the fence. There is no restriction on the speed of trains on the open line.

## 4.6 Safe system of work using site wardens (site-warden warning)

You may set up a safe system of work using one or more site wardens as long as all of the following conditions apply.

- There will be at least 2 metres (6 feet 6 inches) between the site of work (the safe area) and the nearest running rail of an open line.
- You appoint one or more site wardens to watch all members of the group to make sure no one is allowed to go outside the safe area.
- You and each site warden can clearly identify the limits of the safe area.
- If you act as a site warden, you must take no part in the actual work.

## **Before starting work**

You must check that each site warden is competent and is correctly wearing a site warden armband or badge.

You must point out the limits of the safe area and who will be the site wardens to each member of the group.

You must agree with each site warden and each member of the group what warning the site warden is to give if anyone attempts to move out of the safe area.

You must position each site warden so that the limits of the safe area and everyone in the group can clearly be seen and the warning will be heard by everyone in the group.

You must make sure nobody distracts the site warden.

Note: If it is only you and one other person in the group, you do not need to appoint a site warden, but you must make sure neither of you go any closer than 3 metres (10 feet) to the nearest running rail of the open line.

# 5

## COSS briefing

Before the group goes on or near the line, you must make sure each member fully understands the safe system of work.

You will need to tell the group:

- the nature of the work
- the location of the work
- which lines have been blocked and which are still open
- if they are using a safety barrier, not to pass beyond the barrier and not to lean or place tools on it
- if they are using site wardens, who the site wardens are and the limits of the safe area
- if using site lookouts, who the site lookouts are, the method of warning and the position of safety.

You must make sure each member of the group confirms they understand the safe system of work by signing your safe-work briefing form (CR3180).

## 6 Track Visitor permits

If a person is issued with a track visitor permit as shown in your company instructions, you may allow that person to take part in the work even though they do not hold the required track safety competence.

The person must be fit for work and wearing the correct personal protective equipment including a blue safety helmet.

The person concerned must give you a document or show you their authorisation, telling you that their visit onto the operational railway has been approved.

You must:

- brief the person on the safe system of work and any special arrangements for accessing or egressing the work site, including if breaks are required during the work
- make the necessary entries to the visitor permit before the person leaves site
- stay with the person until they leave the operational railway.

If the person will not be visiting any more sites or has already visited 3 sites previously with this visitor permit, you must keep the visitor permit and return it to the works planner with your safe work pack.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB8

Handbook 8

COSS blocking a line


Handbook 8

Issue 5

Date June 2022

Comes into force July 2022





ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

This handbook details the rules for a Controller of site safety (COSS) when a line needs to be blocked and personnel have to gain access in the central operating section.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive)

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 Arranging to block a line**
- 3 Methods of protection**
- 4 Not to go on the line until protection is in place**
- 5 Creating an EPA and using an HHT for protection**
- 6 Using a train for protection**
- 7 Blocking the line using the signalling equipment**
- 8 Handing over to another COSS**

# 1 Definitions

## Engineering possession areas (EPAs)

An EPA is a section of line where normal signalling controls are inhibited. An EPA when activated within the signalling system prohibits the normal movement of trains.

EPAs are marked on the line side, they look like this:



*Engineering possession area marker*

## Hand held terminal

A wireless device which connects to the signalling system allowing pre-programmed possessions and protection to be taken and given up.

## 2 Arranging to block a line

When a line must be blocked



You must use the instructions in this handbook to block the line in an emergency or to establish the reason for a failure or other unusual occurrence.

You must make sure the line blockage arrangements are safe to carry out an activity or work which does not affect the safety of the line.

A possession must be taken as shown in module T3 if work affecting the safety of the line is to be carried out following an emergency, failure or other occurrence.

## 2.1 Agreeing the arrangements

You must agree all of the following with the signaller.

- The line or lines to be blocked.
- The method to be used for blocking the line.
- The locations between which protection must be applied.
- The amount of time needed for the line blockage.
- The time after which permission can be given for the line blockage to start.

# 3 Methods of protection

There are three ways of blocking the line:

1. Creating an Emergency Possession Area (EPA) and using a Handheld Terminal (HHT) for protection at the location where staff are to go on or near the line,
2. Using a train.
3. Using the signalling equipment and route barring.



**Creating an Engineering Possession Area (EPA) using the HHT must always be used except when one of the other methods described in this module provides better protection and has been agreed by Operations Control.**

# 4 Not to go on the line until protection is in place



If because of an emergency or other exceptional circumstance, you must not go on or near the line or allow any other person to go on or near the line until the protection has been authorised and granted.

# 5 Creating an EPA and using an HHT for protection

## 5.1 When an HHT can be used for protection



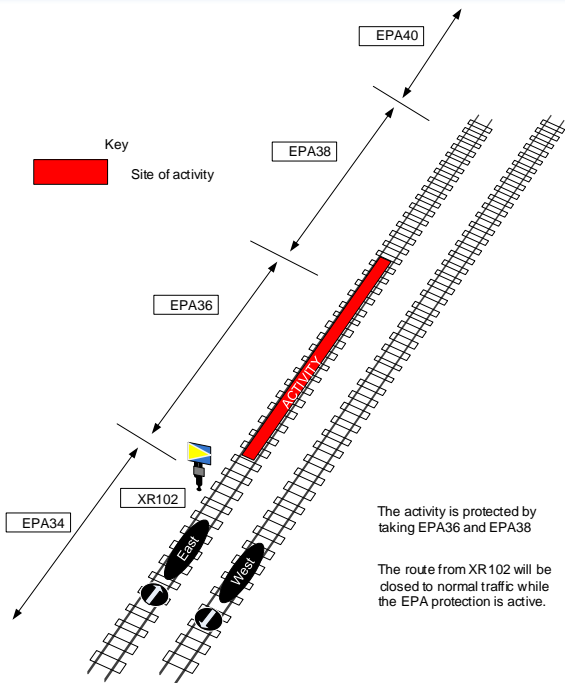
EPAs are normally used as part of possession arrangements. They can also be used as a means of preventing train movements for a short period of time when trains are operating normally. The EPAs are made active by a cooperative process between the HHT and the signalling and control system.

The signaller will ask Operations Control for authority to use an EPA for protection.

## 5.2 Competence

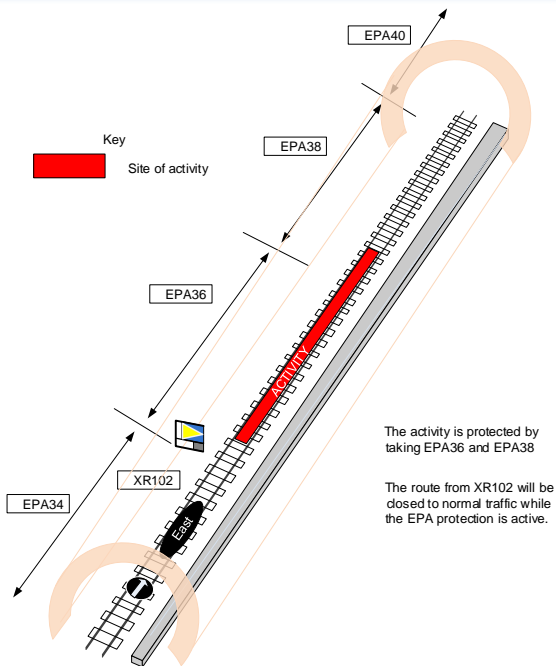
You must be competent to carry out the instructions within this section.





**Diagram HB8.1**

***EPAs being used for protection in open section***



**Diagram HB8.2**

***EPAs being used for protection in single bore tunnel***

## 5.3 Requesting an EPA for protection



The granting of an EPA is achieved by electronic communication by you using the handheld terminal and the signalling and control system which is electronically recorded.

The EPA will not be created until the signaller has validated the information and granted the protection.



**You must not go on or near the line or allow any other person to go on or near the line until the protection has been granted.**

The signaller will tell you when the EPA can be requested. When you are ready to take the EPA, you must request this by using the HHT.

If for some reason you do not have an HHT, you must:

- verbally ask the signaller to create the EPA, and
- tell the signaller your exact location.

When the requested EPA is validated, you must check the details displayed and any changes on the HHT are correct.

If you do not have an HHT, you must:

- check the details of the EPA with the signaller, and
- confirm your exact location with the signaller.

You must then complete Line Blockage Form (CR3180) and read it back to the signaller.

Using the HHT if one is available, you must then scan the RFId tag using the HHT to confirm you are at the correct location.



**Confirming your position using the HHT or verbally with the signaller does not mean the EPA has been granted. You must treat the line as open to traffic until the EPA has been granted.**

When the signaller has validated the EPA you will receive a confirmation on the HHT, or verbally from the signaller, which you must acknowledge before going onto the line.

The signaller will give you an authority number which you must record on your Line Blockage Form (CR3180).



**Only when the EPA has been validated and the form CR3180 has been completed can you regard it as safe to go on the line.**

## 5.4 Going on the line

You do not need to erect a possession limit board (PLB) or work-site marker boards (WSMB).

You must brief any staff that may accompany you of the details of the EPA(s) being used to give protection.

You must make sure all staff thoroughly understand the limits of the EPA(s).

You must make sure staff do not stray outside the limits of the EPA(s).

## 5.5 Keeping the signaller informed

You must keep the signaller advised as to the progress of the activity and if you expect the activity to finish within the agreed time.

You must immediately tell the signaller if you think this timescale will not be met.

## 5.6 If the line blockage cannot be given up or suspended at the planned time

As soon as you become aware that it will not be possible to give up or suspend the line blockage at the planned time, you must tell the signaller:

- the reason why
- what time you expect to give up or suspend the line blockage.

## 5.7 When the EPA is no longer required

When you are sure the line is safe for the normal passage of trains and you no longer need the EPA or EPA(s) for protection, you must go to a place of safety and:

- tell the signaller you no longer need the EPA or EPA(s) and your authority number
- input the necessary information into the system using the HHT to do so.

When the signaller is ready to do so and is satisfied that the signalling indications are correct, the signaller will then accept 'ending the possession'.

The signalling system will then confirm the handback to you on the HHT.

You must then complete Line Blockage Form (CR3180) with the details.

### **Giving up the protection with restrictions**

If the line blockage can only be given up with restrictions, you must ask the signaller to accept the conditions before giving up the protection.

The signaller will then make the necessary input to the system to create the restrictions.

The signaller will not accept the giving up of the line blockage until satisfied that all appropriate measures have been taken.

## **6 Using a train for protection**

### **6.1 Getting authority**



**You can use a train for protection but only when it provides better protection than an EPA and the signaller has given you authority to do so.**

## 6.2 Competence

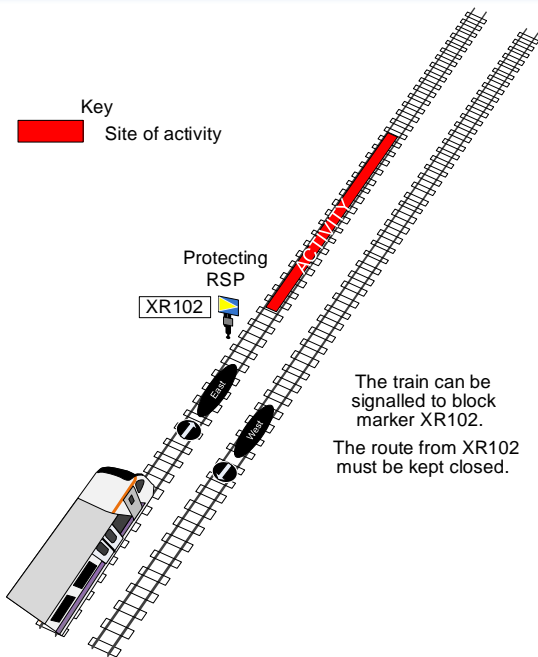
You must be competent to carry out the instructions within the section.

## 6.3 Selecting the train to travel to the location

You must arrange with the signaller which train is to be used and from which station you will depart.

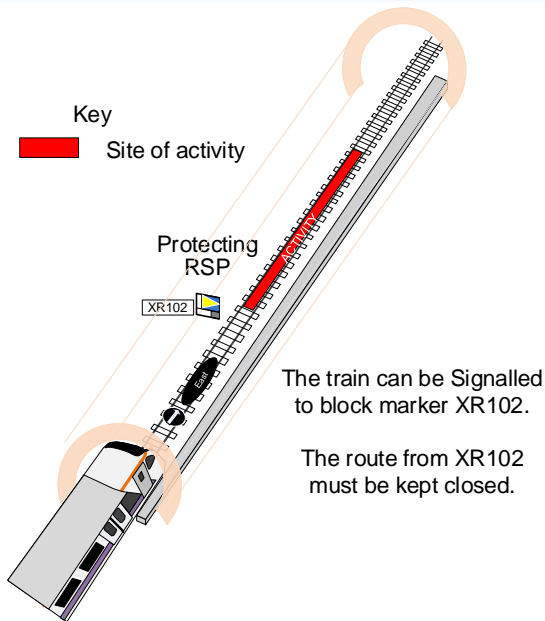
When the train arrives at the designated station you must arrange for all passengers to be detrained before a train is used to get to the required location. You must tell the driver the point at which the train is to be stopped. (See diagram HB8.3 and HB8.4).





**Diagram HB8.3**

**Providing protection using a train in the open section**



**Diagram HB8.4**

***Providing protection using a train in a single bore tunnel***

## Completing the forms

You must complete all the details on your Line Blockage Form (CR3180) and repeat the details back to the signaller.

## 6.4 Arriving at the location



**You must not go on or near the line unless the signaller has given you an assurance that protection is in place.**

When you have arrived at this location, you must tell the driver to secure the train and not to move it until instructed to do so.

The signaller will tell you when the necessary protection arrangements are in place and will then give you an authority number which you must record on your CR3180 form.

## 6.5 Keeping the signaller informed

You must keep the signaller advised as to the progress of the activity and if you expect the activity to finish within the agreed time.

You must immediately tell the signaller if you think this timescale will not be met.

## 6.6 If the line blockage cannot be given up or suspended at the planned time

As soon as you become aware that it will not be possible to give up or suspend the line blockage at the planned time, you must tell the signaller:

- the reason why
- what time you expect to give up or suspend the line blockage.

## 6.7 When the line blockage is no longer needed

When the line blockage is no longer needed, you must return to the train and tell the signaller:

- your name and authority number
- that all work has been completed

The signaller will tell the driver how to proceed.

# 7 Blocking the line using the signalling equipment

## 7.1 Getting authority



You can block the line using the signalling system for protection but only when it provides better protection than an EPA and the signaller has given you authority to do so.

## 7.2 Competence

You must be competent to carry out the instructions within this section.

## 7.3 Recording the details

You must complete the details on a Line Blockage Form (CR3180).

You must read your entry to the signaller to confirm that it is correct.

The signaller will tell you when the route has been closed and the route barring applied, and will confirm it will be kept closed.

## 7.4 What the signaller will do



The signaller will keep signals at danger, or the route closed and kept closed to protect the line blockage.

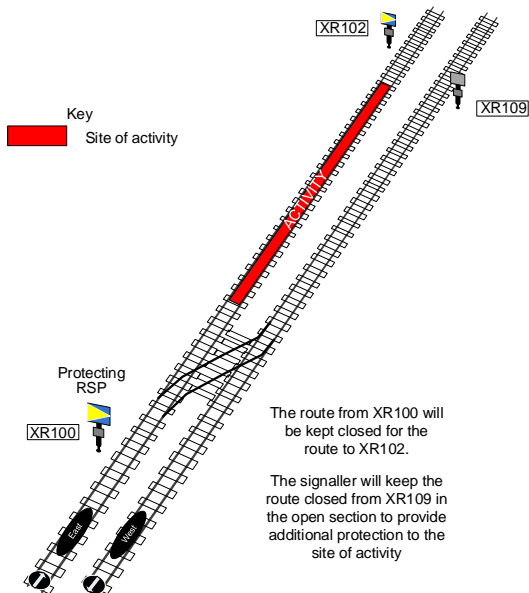
The signaller will:

- protect the line blockage in both directions
- make sure all points are in the position necessary to protect the line blockage
- apply route barring.

The signaller will tell any other signaller who controls a signal or block marker protecting the line to be blocked about the arrangements and get their confirmation that they have protected the line blockage.

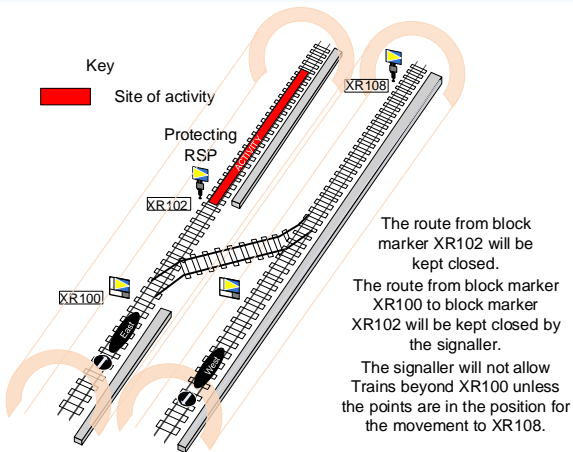
The signaller will make sure that the line to be blocked is clear of all trains unless you and the signaller are sure that all trains have passed the location where the activity is to take place.

If the location to be protected is beyond any points or crossovers, the signaller may set the route for an unaffected line as long as the signaller has agreed this with you. See diagram HB8.5 and HB8.6.



**Diagram HB8.5**

***Work taking place beyond points that will be used.***

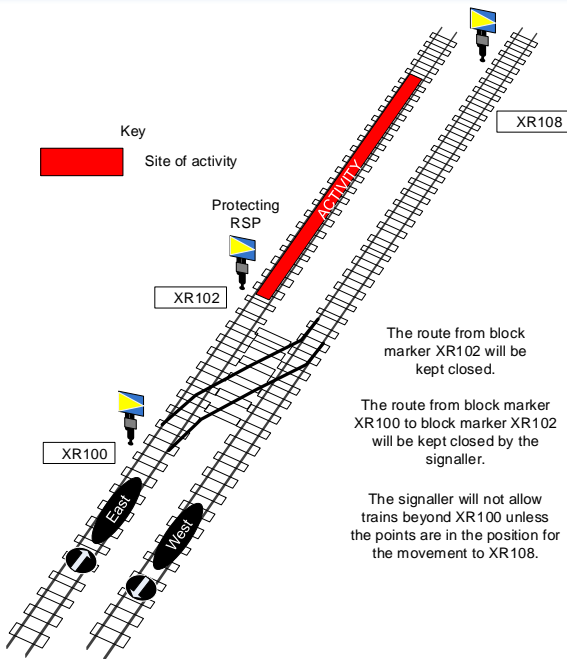


**Diagram HB8.6**

***Work taking place close to a block marker in a single bore tunnel.***

If the line blockage will be less than 40 metres from the protecting signal or block marker, you must tell the signaller. The signaller will keep the previous signal at danger or the route closed at the previous block marker unless the route can be set for an unaffected line. (See diagram HB8.4).





**Diagram HB8.7**

**Work taking place close to a block marker**

## 7.5 Barring the route

The signaller will arrange for the necessary routes to be barred. You must record the details on your Line Blockage Form (CR3180) and read the details back to the signaller.

## 7.6 Granting the line blockage



**You must not go on or near the line unless the signaller has given you an assurance that all protection is in place.**

The signaller will not grant the line blockage to you until the portion of line concerned is clear of all trains, or when you and the signaller can be sure that all trains have passed beyond the area to be protected.

When you and the signaller are sure that the details on your Line Blockage Form (CR3180) are correct and all the arrangements have been carried out, the signaller will give you an authority number.

You must record the authority number on your Line Blockage Form (CR3180).

You may now consider the line blockage to be granted.

## 7.7 Giving up or suspending the line blockage

When the line blockage is to be given up or is to be suspended, you must make sure that any activity that is to continue does not need a line blockage.

You must then tell the signaller your name, the authority number and that the line blockage is no longer needed or is suspended.

You must then complete your Line Blockage Form (CR3180) with the details.

The signaller will arrange for the route barring to be removed if the line blockage is no longer required.

## 7.8 If the line blockage cannot be given up or suspended at the planned time

As soon as you become aware that it will not be possible to give up or suspend the line blockage at the planned time, you must tell the signaller:

- the reason why
- what time you expect to give up or suspend the line blockage.

## 7.9 When the line blockage is to resume

When the line blockage is to resume after being suspended, you must again carry out the instructions shown in this section.

The signaller will give you a new authority number, but you may continue to use the same Line Blockage Form (CR3180).

However, you must complete a new Line Blockage Form (CR3180) if the line to be blocked or the protection arrangements are different.

## 8 Handing over to another COSS

When handing over to another COSS, you must explain the details of the line blockage to the new COSS and give them the Line Blockage Form (CR3180).

The new COSS must sign the Line Blockage Form (CR3180).

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across the center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB9

Handbook 9

Engineering supervisor (ES)  
setting up safe systems of work in  
a work site within a possession

Handbook 9

Issue 5.1

Date 09/11/22

Comes into force 7th Jan 2023

You will need this handbook if you are an engineering supervisor or a competent person and are required to set up a safe system of work within a work site when a possession of the line has been taken on the central operating section (COS)

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at

<https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 General**
- 3 Working within a work site**
- 4 Working with a group**
- 5 ES briefing**
- 6 Track Visitor permits**



## 1

## Definitions

### Competent Person

Within this handbook, a competent person is someone who holds ES competence and is appointed by the Engineering Supervisor to manage a site of work within a work site.

### Possession

A running line is under possession when arrangements have been made to block the line and engineering trains or on-track plant (OTP) may be used.

A possession on a running line will be under the control of a person in charge of the possession (PICOP).

The PICOP is responsible for authorising the movement of engineering trains or OTP anywhere within the possession other than a work site.

### Work site

A work site is the portion of line within a possession of a running line where work will take place and will be marked by a work site marker board (WSMB) at each end.

Each work site is under the control of an engineering supervisor (ES). A competent person can be authorised by the ES to manage a site of work within a worksite.

The ES is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The site of work cannot be given to a competent person if engineering trains or OTP are planned to enter or move within the work site.

### **Competence and identification**

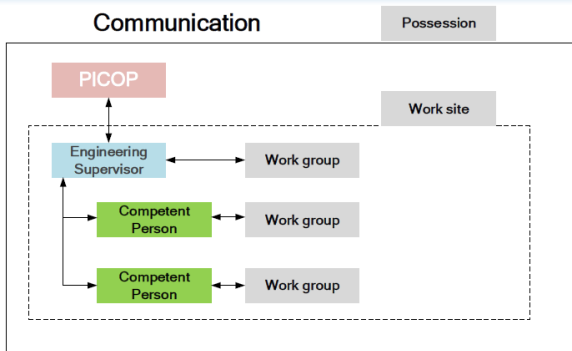
To act as the ES you must have with you a valid certificate of competence issued by your employer.

When you are carrying out the duties of the ES, you must wear an armlet on the left arm or a badge on the upper chest.

If you are the ES, the armlet or badge must have ENGINEERING SUPERVISOR in blue letters on a yellow background.

## **2 General**

Before you allow any work to be carried out within a work site you must first set up a safe system of work as shown in this handbook. You must brief any competent person about the safe system of work before authorising them to set up their site of work. You must agree the method of communication to be used between you and the competent person.



*Figure 1 – Hierarchy of communication*

## 3 Working within a work site

### 3.1 Agreeing the site of work with the work group

Before allowing work to start in a work site, you must tell the work group:

- who is responsible for managing the site of work
- the limits of your work site
- the nature of the work
- the safe system of work you will use.

You must brief the work group and then sign the Work-site Certificate (CR3199).

## **3.2 Agreeing the arrangements before the work site is granted**

You may reach the agreement with the work group, give the work-site briefing and sign the CR3199, as shown in section 3.1 before the work site is granted.

You must not allow work to start until you have told the work group that the work site has been granted and you have been given an authority number.

You must record the authority number on your Work-site Certificate (CR3199).

## **3.3 Safe system of work where all lines are blocked (safeguarded)**

Before you can treat your safe system of work as safeguarded, you must agree with the work group that:

- there will be no train or OTP movements at your site of work, or
- if there are train or OTP movements at your site of work, they will be made at extreme caution and no greater than 5 mph (10 km/h).

## 3.4 Safe system of work using a safety barrier (fenced)

Before you can treat your safe system of work as fenced, there must be a safety barrier as described below between your site of work and any open line.

### **Rigid or tensioned barrier or permanent fence**

As long as the barrier or fence is at least 1.25 metres (4 feet) from the nearest running rail of the open line, you may allow work to take place on the safe side of the fence.

### **Fence made of barricade tape or plastic netting**

If the fence is placed at 1.25 metres (4 feet) from the nearest running rail of the open line and the maximum speed on the open line is no greater than 40 mph (65 km/h), you may allow work to take place on the safe side of the fence.

If the fence is at least 2 metres (6 feet 6 inches) from the nearest running rail of the open line, you may allow work to take place on the safe side of the fence. There is no restriction on the speed of trains on the open line.

You must also:

- reach a clear understanding with the work group that there will be no train or OTP movements at your site of work or,
- if there are train or OTP movements at your site of work, they will be made at extreme caution and at no greater than 5 mph (10 km/h).

### **3.5 Separated safe system of work**

Before you can treat your safe system of work as separated, the instructions shown in section 4.6 of handbook 7 must be carried out for any adjacent open line.

You must also:

- reach a clear understanding with the work group
- there will be no train or OTP movements at your site of work, or
- if there are train or OTP movements at your site of work, they will be made at extreme caution and at no greater than 5 mph (10 km/h).

## 3.6 Not used

## 3.7 Safe system of work using lookouts (lookout warning)

You may use lookout warning as below for any line within the work site.

During daylight, you may use a maximum speed of 25mph (40 km/h) for the lines within the work site.

However, you must provide lookout protection in all directions.

During darkness, poor visibility, or when in or near a tunnel, you may only use lookout warning if all the following conditions apply.

- You have told the work group that all movements made at no more than 20 mph (30 km/h).
- The maximum speed of trains on any open line is no greater than 20 mph (30 km/h).
- Only site lookouts are needed to achieve the sighting distance.

## 3.8 When your safe system of work includes movements at no greater than 5 mph (10 km/h)

If you have agreed with the work group that movements will be made at no greater than 5 mph (10 km/h), you must make sure you, and your group are in a safe position before any movement passes through your site of work.

# 4 Working with a group

## 4.1 Remaining with your group

As ES, or competent person, you must stay with your group so that you are able to personally observe and advise everyone until:

- work is completed and your group is no longer on or near the line, or
- you are replaced by another ES or competent person.



## 4.2 Safe systems of work

The following are the safe systems of work available.

### **Safeguarded**

Where every line at the site of work has been blocked to normal train movements.

### **Fenced**

Where there is a suitable barrier between the site of work and any line open to the normal movement of trains.

### **Separated**

Where there is a distance of at least 2 metres (6 feet 6 inches) between the nearest running rail of an open line and the site of work, and a site warden has been appointed.

There must be an identifiable limit to the site of work.

If it is only you and one other person in the group, you do not need to appoint a site warden. However, you must make sure neither of you go any closer than 2 metres (6 feet 6 inches) to the nearest running rail of the open line.

## 4.3 Setting up safe systems of work

There must be at least 3 metres (10 feet) between any open line and any member of your group.

Where this is not possible, the instructions shown in section 4.5 or 4.6 of this module must be adopted.

Before allowing your group to walk to the site of work or to start work, you must have:

- set up the safe system of work so that nobody in the group will be put in danger by a passing train,
- tested the safe system of work to make sure it is adequate,
- briefed everyone in the group about the safe system of work.

## 4.4 Not used

## 4.5 Safe systems of work using a safety barrier (fenced)

If there is a safety barrier that is approved by the infrastructure manager between you and any open line, you may work as follows.

### **Rigid or tensioned barrier or permanent fence**

As long as the barrier or fence is at least 1.25 metres (4 feet) from the nearest running rail of the open line, you may allow work to start on the safe side of the fence.

### **Fence made of barricade tape or plastic netting**

If the fence is placed at 1.25 metres (4 feet) from the nearest running rail of the open line and the maximum speed on the open line is no greater than 40 mph (65 km/h), you may work on the safe side of the fence.

If the fence is at least 3 metres (10 feet) from the nearest running rail of the open line, you may work on the safe side of the fence. There is no restriction on the speed of trains on the open line.

## **4.6 Safe systems of work using site wardens (site-warden warning)**

You may set up a safe system of work using one or more site wardens as long as all of the following conditions apply.

- There will be at least 2 metres (6 feet 6 inches) between the site of work (the safe area) and the nearest running rail of an open line.
- You appoint one or more site wardens to watch all members of the group to make sure no one is allowed to go outside the safe area.
- You and each site warden can clearly identify the limits of the safe area.
- If you act as a site warden, you must take no part in the actual work.

### **Before starting work**

You must check that each site warden is competent and is correctly wearing a site warden armband or badge.

You must point out the limits of the safe area and who will be the site wardens to each member of the group.

You must agree with each site warden and each member of the group what warning the site warden is to give if anyone attempts to move out of the safe area.

You must position each site warden so that the limits of the safe area and everyone in the group can clearly be seen and the warning will be heard by everyone on the group.

You must make sure nobody distracts the site warden.

Note: if it is only you and one other person in the group, you do not need to appoint a site warden, but you must make sure neither of you go any closer than 3 metres (10 feet) to the nearest running rail of the open line.

## 5 ES briefing

Before the group goes on or near the line, you must make sure each member fully understands the safe system of work.

You will need to tell the group:

- the nature of the work
- the location of the work
- if a competent person has been assigned and who the competent person is
- which lines have been blocked and which are still open
- if they are using a safety barrier, not to pass beyond
- if they are using site wardens, who the site wardens are and the limits of the safe area
- if using site lookouts, who the site lookouts are, the method of warning and the position of safety.

You must make sure each member of the group confirms they understand the safe system of work by signing your safe work briefing form (CR3199).

## 6 Track Visitor permits

If a person is issued with a track visitor permit as shown in your company instructions, you may allow that person to

take part in the work even though they do not hold the required track safety competence.

The person must be fit for work and wearing the correct personal protective equipment including a blue safety helmet.

The person concerned must give you a document or show you their authorisation, telling you that their visit onto the operational railway has been approved.

You must:

- brief the person on the safe system of work and any special arrangements for accessing or egressing the work site, including if breaks are required during the work
- make the necessary entries to the visitor permit before the person leaves site
- stay with the person until they leave the operational railway, or appoint a safe task leader to be responsible for their safety
- the person must report to you if they have finished their work and want to leave before the work site is given up.

If the person will not be visiting any more sites or has already visited 3 sites previously with this visitor permit, you must keep the visitor permit and return it to the works planner with your safe work pack.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB10

## Handbook 10

Duties of the ES and person in charge when using a hand trolley

Handbook 10

Issue 4.1

Date June 2021

Comes into force July 2021



The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 General**
- 2 Duties of the ES**
- 3 Duties of the competent person in charge of the trolley**

# 1 General

The instructions in this handbook apply when using manually propelled equipment mounted on two or more rail wheels or runners. All these items are referred to as trolleys in this handbook.

A competent person must always be appointed to be in control of the trolley while it is in use. Additional staff may be required to assist with safely propelling the trolley, they must carry out the instructions given to them by the person in charge of the trolley.

An Engineering Supervisor (ES) must make sure the line is blocked before the trolley is placed on the line. The ES can be the person in control of the trolley if:

- they are competent to control a trolley,
- it has been agreed in the work plan,
- they are also able to maintain the safety of the worksite.

If the ES cannot achieve the above conditions, the ES should appoint a competent person to control the trolley or not place the trolley onto the line.

Each trolley must be fitted with an operational fail-safe braking system. A two-stage brake test must be performed by the person in charge of the trolley prior to loading and moving the trolley.

When a trolley is to be controlled by a person appointed by the ES, a method of communication between the ES and the person in charge of the trolley must be agreed and tested before placing the trolley onto the line.

## 2 Duties of the ES

### 2.1 Verifying the Safe System of Work Pack (SSOW)

When verifying a SSOW pack and checking arrangements, you must make sure that:

- a trolley must not pass over an axle counter head unless reset arrangements have been agreed and are in place,
- the potential for the runaway of trolleys within the worksite, outside the worksite and outside of the possession has been identified and the necessary control arrangements have been put in place,
- any gradients greater than 1:50 within or outside of the worksite are identified (another means of transporting materials is used if gradients exceed 1:50),
- there are no rail cants or curvatures that might endanger the safe movement of loads,
- arrangements are in place to secure points for movements or make sure movements cannot be made that will foul any adjacent open line.

If any of the conditions above cannot be met, you must reject the work pack. You must then:

- tell the responsible manager the reason why the work pack has been rejected,
- if you can, suggest an alternative to the method of working.

You must not allow any alternative methods to be used unless authorised by the responsible manager.

## 2.2 Making sure the line is blocked

You must make sure the line is under possession as shown in module T3 *Possession for engineering work in the Central Operating Section* and that the necessary arrangements for the trolley have been made before you allow the trolley to be placed on the line.

You must make sure that trolleys are not moved outside or between worksites or move outside the area where movements have been agreed to take place.

## 2.3 ES managing the movements of trolleys

You must:

- make sure site conditions have been assessed to make sure the movement can be made safely and there is a clear walking route for pushing the trolley
- make sure the track has been assessed to make sure there is no water, ice or grease on the rails which could affect braking
- come to a clear understanding with the person in charge of the trolley about where movements are to take place,
- make sure that the person in charge of the trolley requires your authority to make each movement,
- make sure there are sufficient staff to conduct the movement safely and where there are many trolley movements or heavy loads, fatigue issues are considered, and relief staff are available
- make sure that the person in charge of the trolley is fully aware that no movements outside the agreed area can be made without your permission.

Only when you are fully satisfied that all checks have been made can you authorise the movement.

You must record all activities with trolleys on your Vehicle Management Form (VMF) and check with the responsible person when all movements are complete, if applicable.

### 3 Duties of the competent person in charge of the trolley

You must make sure that there is an agreed means of communication in place with the ES.

The ES must confirm with you that either there is no gradient within or next to the worksite which is greater than 1:50, or that an alternative method of moving the materials is being used.



Before getting authority to place the trolley on the line, you must:

- check the trolley's braking system has been tested and is in good order,
- a red flag or red light is displayed on the trolley (the flag or light must be visible in both directions),
- check the trolley is correctly loaded and secured if necessary, and the load cannot foul any other line,
- check that the trolley is not overloaded (load not exceeding 1 tonne).

You must check that the trolley has the correct brake lever, push bars and side bars fitted (if required).

When the ES has told you that the trolley can be placed on the track, you must make sure:

- no-one rides on the trolley,
- arrangements are in place to secure points for each movement and they have been checked,
- the trolley has at least two people with it when moving and one of them must be in charge of the brake,
- sufficient and competent support staff are available to facilitate each movement.

You must not attempt to move materials without the correct number of assisting staff being present.

You must make sure that when the trolley is not being used, the trolley is placed at least 2 metres from the nearest open line.

If the trolley is to be left unattended, you must make sure the trolley is secured to a fixed structure with a chain and padlock so that it cannot foul the line.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB11

Handbook 11

Duties of the person in charge  
of possession (PICOP)

Handbook 11

Issue 5

Date October 2023

The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

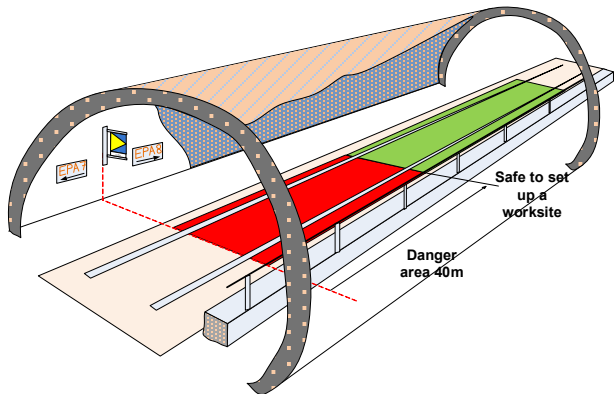
# Contents

- 1 Definitions**
- 2 Responsibilities**
- 3 Planning a possession**
- 4 Taking a possession**
- 5 Work sites**
- 6 Movement of engineering trains**
- 7 Change of PICOP or ES**
- 8 Giving up the possession**
- 9 When the signalling system cannot be used or relied on to protect the possession**

# 1 Definitions

## Danger area

The danger area is 40 metres from the block marker protecting the Engineering Possession Area (EPA).



## *Engineering possession area*

## Driver

This includes an operator of an on-track machine.

## Engineering possession areas (EPAs)

An EPA is a section of line where normal signalling controls are inhibited. An EPA when activated within the signalling system prohibits the normal movement of trains.

EPAs are marked on the line side, they look like this:



*Engineering possession area marker*

## Engineering supervisor (ES)

The person responsible for:

- the safety of staff working inside a work site
- authorising the movements of engineering trains in a work site
- authorising movements into a work site at an intermediate point
- authorising the movements of engineering trains and OTP inside a work site
- authorising OTP to be placed on/removed from the track within a work site.



## **Engineering train**

This includes on-track machines but does not include on-track plant.

## **Hand held terminal**

A wireless device which connects to the signalling system allowing pre-programmed possessions and protection to be taken and given up.

## **In-possession movement authority (IPMA)**

An IPMA is an On-Sight Driving Mode and is a sub mode of Protected Manual Mode with a maximum speed limited to 25 mph (40 km/h).

An IPMA is issued by the signaller where an EPA is active.

An indication is displayed on the DMI to enable the driver to recognise when the IPMA has been applied by the signaller.

The driver is required to confirm the mode change to On-Sight Driving when indicated on the DMI.

## **On-track plant (OTP)**

Also known as 'in-possession only rail vehicles' and includes road-rail vehicles (RRV), rail-mounted maintenance machines (RMMM) and their trailers and attachments with guidance wheels.

OTP can only be on and off tracked within a possession of a siding or in a work-site on a running line that is under possession.

## **Person in charge of the possession (PICOP)**

The person on the ground who is responsible for:

- on site management of the possession area
- movements of all engineering trains and OTMs inside a possession area and out of a work site (but not within a work site)
- giving authority to create work sites
- authorising movements into and out of the possession
- authorising movements into and out of the possession at an intermediate point but not into or within a work site
- liaising with the signaller about movements into and out of the possession area.

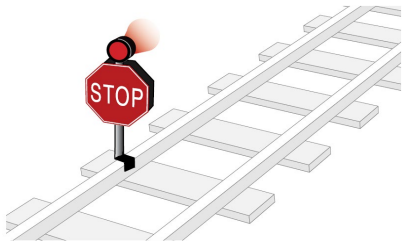
A possession can consist of many work sites but only one PICOP can be responsible for a particular possession.

### **Possession limit board**

Possession limit boards mark the extremities of the possession.

The board is red, double-sided and is visible along the line in both directions.

It will also have a steady or flashing red light visible along the line in both directions. If a PLB is passed without authority, it is a signal passed at danger.



*Possession limit board*

### **Radio frequency identification (RFId) tag**

A radio frequency identification (RFId) tag is a wireless data tag fixed to infrastructure to give a location reference.

### **Temporary speed restriction (TSR)**

A speed restriction which is lower than the permissible speed, and has been imposed by means of Communication-based train control (CBTC) supervision.

### **Work site**

A work site is a section of line within a possession where the work or activity is carried out and is marked by work-site marker boards.

### **Work-site marker boards**

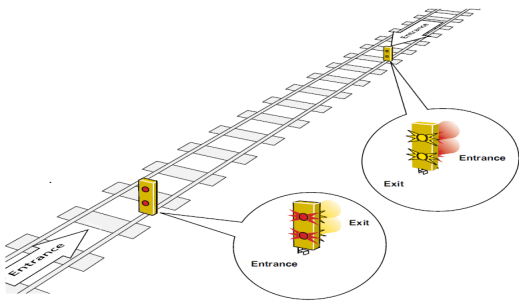
Work site marker boards (WSMB) mark the extent of work sites within the possession. Each work-site marker board is yellow, double-sided and is visible along the line in both directions.

It has two red flashing lights which indicate an entrance to a work site. The authority of the ES is needed to pass it.

It has two yellow flashing lights which indicate an exit from a work site. Your authority is needed to pass it.

Both indications must be treated as a stop signal.

If a work-site marker board is passed without authority, it is a signal passed at danger.



***Work-site marker boards***

## 2 Responsibilities

### 2.1 Person in charge of possession (PICOP)

#### Competence

To act as a PICOP, you must have with you a valid PICOP certificate of competence issued by your employer.

You must wear an armlet on the left arm or a badge on the upper chest when you are carrying out the duties of the PICOP. The armlet or badge must have PERSON I.C. POSSESSION in red letters on a yellow background.

You must be:

- familiar with the line and location where the work will take place and the associated EPA will be located, and
- familiar with the arrangements for the work to be carried out.

You are responsible for:

- arranging, taking and giving up the possession
- protecting work sites within the possession
- authorising movements into and out of the possession
- authorising movements into and out of the possession at an intermediate point but not in a work site
- controlling movements of engineering trains within the possession
- authorising the movements of engineering trains outside a work site
- authorising the movement of engineering trains to exit a work site
- agreeing the arrangements for unplanned works with operations control and the signaller.

You must not take part in any work activity. The only exception to this is when the work is to be carried is not pre-planned because of an emergency or other exceptional circumstances.

## 2.2 Engineering supervisor (ES)

The ES must have with them a valid certificate of competence issued by their employer.

The ES must wear an armlet on the left arm or a badge on the upper chest when you are carrying out the duties of the ES. The armlet or badge must have 'ENGINEERING SUPERVISOR' in blue letters on a yellow background.

The ES must be:

- competent to carry out the duties of an ES
- familiar with the line and location where the work site will be located
- competent to supervise the arrangements for the planned work to be undertaken.
- competent to determine the work has been completed to allow trains to operate.



The ES is responsible for:

- creating a work site and managing site safety
- authorising the movements of engineering trains and OTMs into the work site
- authorising the movements of engineering trains, OTMs and On Track Plant (OTP) inside a work site
- authorising the OTP to be placed or removed from the track within a work site
- setting up safe systems of work within the work site as shown in HB12 *Duties of the Engineering Supervisor (ES) setting up safe systems of work in a work site within a possession.*
- giving up a work site with the line safe and fit to run on.

## 2.3 Machine Controllers (MCs)

The MC must have with them a valid machine controller certificate of competence issued by their employer.

MC's must wear an armband on the left arm or badge on the upper body with MACHINE CONTROLLER or MC in black letters on a white background.

If the OTP will be carrying out any lifting operations, the MC must also be competent as a crane controller and wear an armband on the left arm or badge on the upper body with CRANE CONTROLLER or CC in black letters on a white background.

MC's are responsible for:

- controlling the movement and operation of OTP inside a work site under the authority of the ES
- controlling the movement of OTP between work sites under your authority.

## 2.4 Signallers

Are responsible for:

- granting the possession
- liaising with you and drivers in connection with movements into and out of the possession
- accepting the infrastructure back after the possession has been given up.

## 2.5 Drivers

Are responsible for properly controlling their trains when acting in accordance with instructions given by you or the ES.

## 2.6 Operations control

Are responsible for agreeing and authorising the arrangements for unplanned works with you and the signaller.

## 2.7 OTP operator

OTP operators are responsible for operating the OTP safely.

They must be competent in the rules for the operator as shown in HB15 *Duties of the machine controller (MC) and on-track plant operator*.

If an operator is also acting as the machine controller, they must carry out the instructions for the machine controller shown in HB15 *Duties of the machine controller (MC) and on-track plant operator*.

# 3 Planning a possession

## 3.1 Work to be planned



When it is necessary to carry out engineering work within the COS, the work, including the associated EPA(s) will always be planned in advance and entered into the signalling system.



The plan will identify:

- the extent of the work
- the EPA(s) needed to be created and their unique reference number
- the movement of any engineering trains or OTP associated with the work
- the name of the PICOP



- the name or names of the ES
- the time the possession is to be taken,
- the last train to pass before the possession area is granted
- if the possession area is to be imposed around a stationary engineering train
- if the possession is to be given up around a stationary engineering train
- the time the possession is to be given up
- and the identity and time the first train to pass after the possession is given up.
- If the work extends across more than one running line, sufficient EPAs will be created.
- If an isolation of overhead line equipment is necessary, the appropriate arrangements will be planned at the same time.

- If the work involves the use of tunnel vent modes and the arrangements that will apply.



If the work will result in the application of a temporary speed restriction on the line after the possession is given up, this will also be planned at the same time

If an EPA is only created on one line in the open section of line, and the adjacent line is to remain open to traffic, any temporary speed restriction will be planned at the same time.

## 3.2 Details to be published



Except when a possession must be taken in an urgent situation, details of the possession must be published in the Weekly Operating Notice or Engineering Notice.

## 3.3 Changes to be published



If it is necessary for any of the published details to be changed, this must be agreed between the organisation responsible for the possession and Operations Control.

# 4 Taking a possession

## 4.1 Types of EPA

Creation of an EPA is carried out by cooperative action between you and the signaller.

The granting of an EPA is achieved by electronic communication by you using the HHT and the signalling and control system which is electronically recorded.

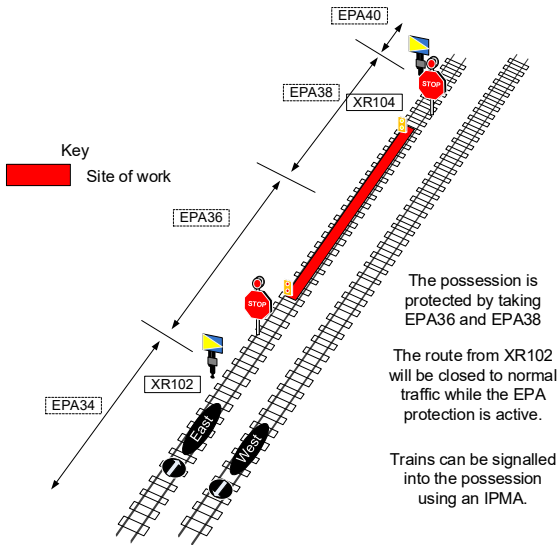


**If it is necessary for any of the published details to be changed, this must be agreed between the organisation responsible for the possession and Operations Control.**

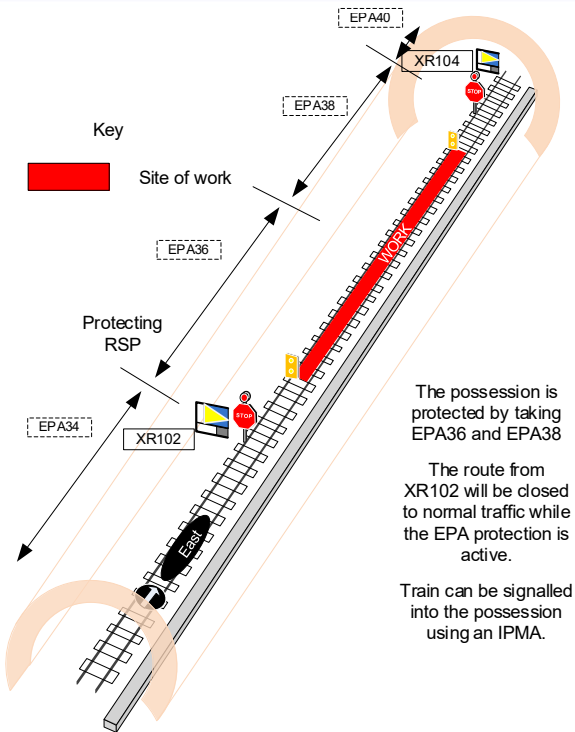
The EPA will not be created until the signaller has validated the information and granted the possession.

If the EPA is not available on your handheld terminal, or there are other details needed to be confirmed with the signaller, you may contact the signaller to confirm these.



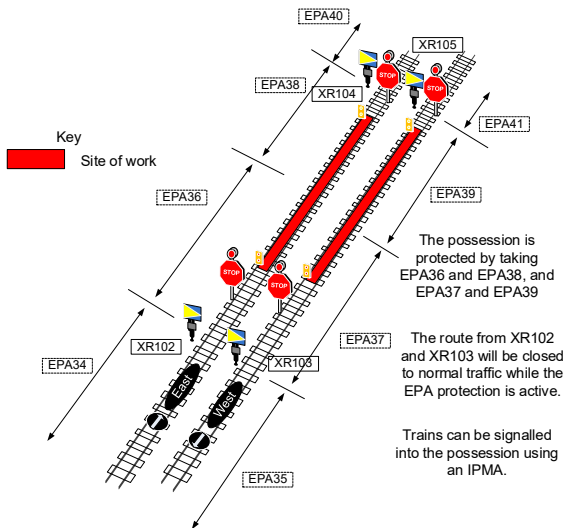


***Simple possession between block marker XR102 and block marker XR104***

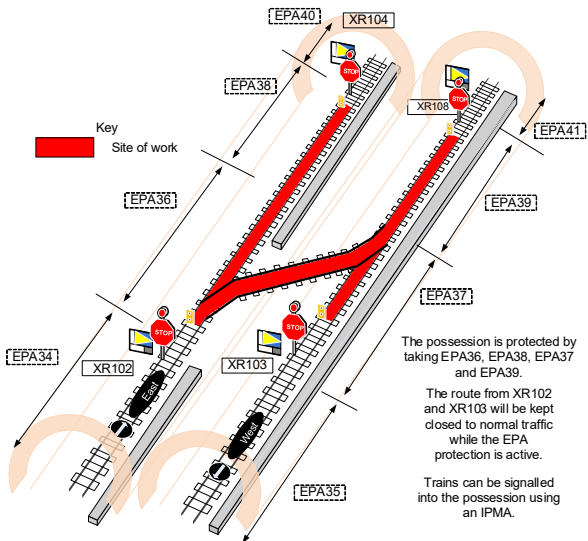


**Simple possession between block marker XR102 and block marker XR104**

A possession can consist of more than one EPA.



### Possession with two EPAs



### Possession with EPAs over two lines

## 4.2 Requesting an EPA to take a possession



**You must not go on or near the line or allow any other person to go on or near the line until the possession has been granted.**

Before requesting the EPA using the HHT, you must check the details against what is shown in the *Weekly Operating Notice* or *Engineering Notice* to make sure that the requested EPA fully covers the area of the work.

When you are ready to take the EPA, you must request this by using the HHT.

## 4.3 Approving an EPA request

The signaller will tell you of any change which has been made to the planned EPA or if the EPA has been refused.

If for any reason the HHT fails during taking of the possession and it is not possible to complete the

process, you must give the signaller all the necessary details.

## 4.4 Granting an EPA request

When the requested EPA is validated, you must check the details displayed and any changes on the HHT are correct.

You must then scan the RFID tag using the HHT to confirm you are at the correct location.



**Confirming your position using the HHT does not mean the EPA has been granted. You must treat the line as open to traffic until the EPA has been granted.**

When the signaller has validated the EPA you will receive a confirmation on the HHT which you must acknowledge before allowing work to take place.



**Only when the EPA or EPAs have been validated can you regard the possession as being granted.**

You must then arrange for possession limit boards to be placed. The PLB must not be placed closer than 40m from the protecting block marker or points.

You may then authorise each ES to set up each work site and place WSMB's as shown in section 5 of this handbook.

## 4.5 Taking a possession around an engineering train

There is no limit to the number of engineering trains or OTM the EPA can be set up or extended around, as long as the details have been published in the *Weekly Operating Notice* or *Engineering Notice*.

When the possession is to be taken around an engineering train, before you can proceed any further with the possession arrangements, the signaller must tell you when every train concerned is at a stand at its specified block marker.

You must not allow any of these trains to move again until the possession has been granted and all the necessary arrangements have been made.

If a work site is to be taken or extended around an engineering train, before you allow the ES to proceed any further with setting up or extending the work site, you must tell the ES when:

- every engineering train concerned is at a stand at its specified block marker
- the possession has been granted.

You must tell the ES not to allow any of these trains to move again until the work-site marker boards are in place and all the necessary arrangements for the work site have been made.

## **4.6 Carrying out signalling work in the possession**

You must not allow signalling work to be carried out if it will affect the EPAs protecting the possession.



# 5 Work sites

## 5.1 Principles



A work site is a portion of line inside a possession where work or activity is carried out.

When more than one work site is created within the same possession, the area of each work site must not overlap the area of any other work site.

The area selected must be identifiable by work-site marker boards.



The extremities of work sites must be protected by work-site marker boards when:

- people are working within the work site
- there are engineering trains or OTMs operating inside the possession area, or
- there are engineering trains or OTP operating inside any of the work sites.

## 5.2 Setting up a work site

You must arrange to provide work-site marker boards (WSMBs) if there are engineering trains or OTP within the possession. However, whether or not WSMBs are provided, you must still make sure the possession limits are marked with possession limit boards (PLBs).



**You must not allow the ES or any other person to go on the line to set up a work site until the possession has been granted and you have told the ES it is safe to do so.**

The ES will contact you and state the published possession reference if there is one and then confirm:

- the line on which the ES will be setting up the work site
- the exact mileage or kilometres and metres of each work-site marker board (WSMB)
- whether the work site is to be taken around one or more trains.

When it is safe to do so, you must dictate the necessary details to the ES who will record the details on their Work-Site Certificate (CR3199) and arrange for the work-site marker boards to be positioned.

The ES will read back the details to you.

You must complete the details on your form CR3198.

## 5.3 Indicating the work site

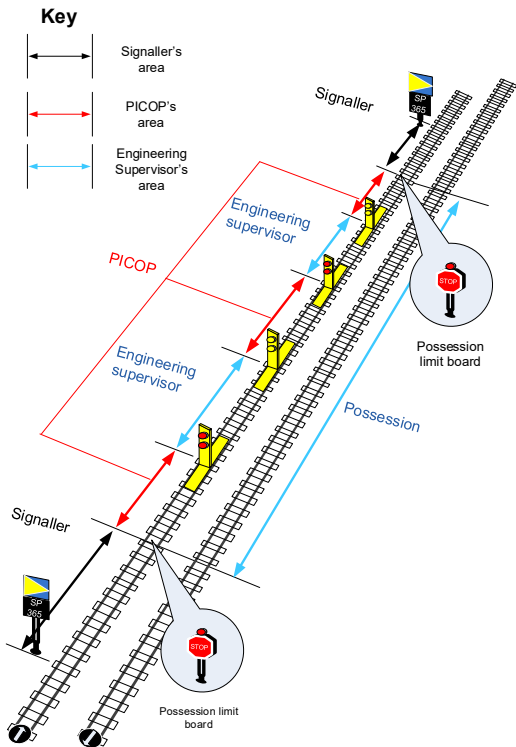
The ES will place a WSMB in the 'four-foot' at each end of the work site at the agreed location.



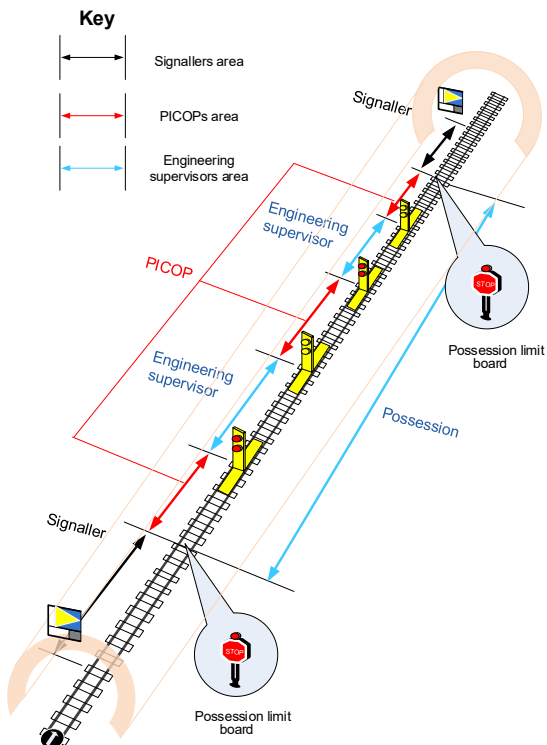
**WSMBs must be positioned so that the red lights will be visible to the driver of a train approaching the work site and the yellow lights will be visible to the driver of a train leaving the work site.**

**The first and last work site marker boards within the EPA must be positioned at least 40 metres from the protecting block markers.**

**A WSMB for one work site must not be closer than 100 metres from the WSMB of another work site on the same line.**



**Positioning of PLBs and work-site marker boards**



**Positioning of PLBs and work-site marker boards in single bore tunnels**

## 5.4 Allowing work to start

When the ES tells you the WSMBs at each end of the work site are in position, you must dictate the details to the ES who will fill in a Work-Site Certificate (CR3199).

The ES will read back the details to you.

When you are satisfied that all details are in order for the work to start, you must give the ES your full initials and authorise the work to start.

You must record the details on your CR3198 form.

## 5.5 Entering a work site



The ES must not allow the WSMB or PLB (at an intermediate point) to be removed until the movement has stopped at it.

When the movement has entered the work site, the ES must make sure the WSMB or PLB (at an intermediate point) is immediately replaced.

The ES must tell you when the WSMB or PLB (at an intermediate point) has been replaced.

## 5.6 Working within the work site



The ES must make sure staff working within their work site do not go or place equipment outside these limits.

## 5.7 If the work is suspended

The ES will tell you if the work has been suspended.

## 5.8 Giving up a work site

When the work site can be given back the ES will tell you:

- all work has been finished
- all OTP and OTM have been removed
- all materials are clear
- all personnel are clear
- all work site marker boards have been removed
- the line is safe and fit to run on.



You must record the details and the name of each ES and the time on your CR3198 form.

If the work site is being handed back with restrictions the ES will tell you if arrangements for applying the restrictions are in place.

If the work cannot be finished by the planned giving up time, the ES will tell you.

If it is possible to alter the limits of the work site to allow part of the possession to be given up, the ES will agree the arrangements with you.

# 6 Movement of engineering trains

## 6.1 Entering a possession from a protecting block marker

### **Order of trains to be admitted**

If more than one engineering train is to be admitted to a possession from different locations, you must tell the signaller the order in which the engineering trains are to be admitted.

### **Trains not to enter until authority is given**

After the possession has been granted the signaller will not allow an engineering train into the possession unless you have given permission to do so.

## **Making sure it is safe for a train to enter the possession**

When the train has arrived at the protecting block marker and you are ready for the train to enter the possession, you must:

- make sure it is safe for the train to enter the possession
- tell the driver when authority is received for the movement to proceed to the location the train must stop at.

## **Allowing the train to enter the possession**

Before you request the signaller to let an engineering train proceed towards the PLB, you must make sure:

- the PLB is in place
- you have not authorised a conflicting movement.

You must not allow the PLB to be removed until the engineering train has stopped at it.

You must make sure that the PLB is replaced immediately after the engineering train has entered the possession.

When the PLB has been replaced you must tell the signaller.

## 6.2 Entering the possession at an intermediate point – between work sites

Before you give the signaller permission for an engineering train to proceed from the protecting block marker towards the PLB, you must make sure:

- you or a competent person sent by you is at the intermediate point to give instructions to the driver
- you have not authorised a conflicting movement to take place.

Once the engineering train has entered the possession and is clear of the points or crossings and the PLB has been replaced, you must tell the signaller.

The signaller will then return the points to the agreed position.

## 6.3 Entering the possession at an intermediate point - directly into a work site

Before you give the signaller permission for an engineering train to proceed from the protecting block marker towards the possession, you must make sure:

- the ES or a competent person sent by the ES, is positioned at the intermediate point to give the instructions to the driver
- you or the ES have not authorised a conflicting movement to take place.

Once the engineering train has entered the possession and is clear of the points or crossings and the PLB has been replaced, you must tell the signaller.

The signaller will then return the points to the agreed position.

## 6.4 Movements of engineering trains and OTP between work sites

### Authorising the movement

Only you can authorise an engineering train or OTP to leave a work site.

You must not allow the WSMB to be removed for an engineering train or OTP to leave a work site until the movement has stopped at it.

Before you allow an engineering train or OTP to proceed from a WSMB to the next work site you must make sure:

- any previous movement authorised over that section of line has passed clear or is at a stand at the next WSMB or the agreed block marker or PLB
- you, or a competent person tells the driver or MC the exact location of the next WSMB or the exact location of the agreed block marker or PLB or the exact location of any train waiting at the PLB.

You must make sure the ES replaces the work-site marker board as soon as the movement has passed clear of the work site.

## **Assisting a failed train, failed OTP or removing a portion of a divided train**

You may allow a train or OTP to enter an occupied area under your control to assist an OTP or a train that has failed or divided.

Before doing this, you must:

- Tell the driver of the failed train or MC of the failed OTP not to move the train or OTP until the assisting train or OTP arrives
- Give the driver of the assisting train or MC of the assisting OTP the exact location of the failed train or OTP.

## **Speed of movements**

You must tell the driver or the MC to make any movement at not more than 20 mph (30 km/h).

## **Points within the possession**

Before you authorise any movement, you must make sure any points in the route are in the correct position.

## **Instructions to drivers and machine controllers**

You must instruct the driver of each engineering train, or the MC of each item of OTP, to make each rail movement at caution.

You must check that the driver or MC clearly understands the location the movement is to proceed to.

### **Competent person passing on your instructions**

If you use someone else to give your instructions to the driver or MC, you must make sure the person:

- is competent to do so
- fully understands the instructions to pass on
- does not travel in the driving cab with the driver.



**When told to move the engineering train or OTP, the driver or operator will:**

- sound the warning horn or whistle,
- keep a good lookout for any personnel who may be on or near the track
- keep a good lookout for and stop before any other engineering train or OTP
- stop before any work-site marker board.



## Passing a block marker between work sites

Drivers and MCs will not pass a block marker without verbal authority, you are responsible for giving this authority.

## 6.5 Engineering trains leaving a possession

### Leaving the possession

You may allow an engineering train to proceed to the PLB to wait for the signaller to give permission for the engineering train to leave the possession.

You must make sure PLB is not removed until:

- the engineering train is at a stand at the PLB
- the signaller has given the necessary instructions to the driver
- the signaller has given the driver permission for the engineering train to leave the possession.

When the engineering train has left the possession, you must:

- make sure the PLB is immediately replaced.
- tell the signaller when you have done so.



The signaller will not allow any engineering train other than a CBTC-fitted engineering train to make a movement between the PLB and the block marker protecting the exit from the possession.

### **Leaving the possession at an intermediate point**

If the engineering train is to leave the possession at an intermediate point, the signaller will give the driver the necessary instructions.

You must tell the signaller when the engineering train has passed clear of the points or crossings, and the PLB has been replaced.

The signaller will then return the points to the agreed position.

### **Leaving the possession directly into a siding under possession**

If a movement is to leave your possession directly into an adjacent siding under possession, you must first agree with the signaller and the PICOS how this is to be done.

# 7 Change of PICOP or ES

## 7.1 Change of PICOP

If you are going off duty, you must:

- carry out the possession handover process, or give the HHT to the new PICOP
- tell the new PICOP about the possession arrangements
- hand the CR3198 form to the new PICOP
- tell the signaller the name of the new PICOP.

If you are the new PICOP, you must record the details on the CR3198 form.

## 7.2 Change of ES

The ES must tell you the name of the new ES.

You must record the details on the CR3198 form.

# 8 Giving up the possession

## 8.1 Giving up the possession

When the work within the work site has been completed and the work site is no longer required the ES will tell you:

- when all work has been finished, that the line within the work site is safe and fit to run on
- if any restrictions apply.

You must tell the ES to remove the work-site marker boards.

Before you give up the possession, you must:

- make sure all work sites have been given up
- make sure there are no trains within any EPA
- all the work-site marker boards have been removed
- the possession limit boards have been removed
- all personnel are clear of the line.

## Giving up the possession

You must then go to a position of safety and input the information to the signalling system by using your HHT.



**When the signaller is ready to do so and is satisfied that the signalling indications are correct, the signaller will accept 'ending the possession'.**

If the signalling system confirms the hand back, you will then receive a notification that the signaller has accepted that the possession has ended and you can regard the possession as being given up.

## Giving up the possession with restrictions

If the possession can only be given up with restrictions, you must:

- tell the signaller what the restrictions are
- make sure that the appropriate arrangements have been made and are in place before giving up the possession.

The signaller will then make the necessary input to the system to create the restrictions.



If necessary, the signaller will not accept the giving up of the possession until satisfied that all appropriate measures have been taken.

## 8.2 If the work is not completed



If the work is not completed, and a possession consists of two or more EPAs these can be given up individually to protect work sites that remain.

You must tell the signaller which EPAs are to remain and the reason why.

If necessary, you must agree with the signaller to impose a new EPA to contain the work which is not finished before giving up the first EPA.

You must only impose the new EPA as shown in section 4.3 of this handbook.

## 8.3 Giving up the possession when the HHT is not working

If at the time you come to give the possession up, but all the necessary requirements have been met to safely give the possession up, you find the HHT is not working, you must immediately tell the signaller that the HHT is not working.

You must also tell the signaller:

- all work sites have been removed
- the possession limit boards have been removed
- all personnel are clear of the line including yourself
- the line is clear and safe to run on
- if any restrictions apply.

Only when the signaller tells you the override controls have been used and the possession has ended can you regard the possession as being given up.



**You must not presume the possession has been given up until the signaller confirms that the necessary arrangements have been completed.**

## 8.4 Giving up a possession around an engineering train



**You must not give up a possession with a train within an EPA unless it has been published in the WON and is at a standstill at the published block marker.**

In addition to the checks for giving up a possession in section 8.1 of this handbook, you must make sure that the driver of the engineering train is at a standstill at the block marker identified in the *Weekly Operating Notice* or *Engineering Notice*.

The block marker that the engineering train is to remain at when the possession is given up should be in the normal signalled direction, with the driver making the initial train movement from the leading end. The block marker should also be at a station so the engineering train driver can easily identify the location.



If signalling sections are showing disturbed or occupied, the signaller or operations control may ask you to arrange for someone to examine the section in question before the possession is ended.

## 9 When the signalling system cannot be used or relied on to protect the possession

### 9.1 If the signalling system fails prior to taking a booked possession

The signaller will tell you if the signalling system cannot be used to take the possession.

You must carry out any instructions given to you by the signaller.



**You must not go on or near the line or allow any other person to go on or near the line until such time as the signaller tells you it is safe to do so.**

## **9.2 If the signalling system cannot be relied on to give protection during the possession**

If the signaller tells you that the signalling system can no longer be relied on to protect the possession, you must:

- stop all movements of engineering trains and OTP within your area of control if it is safe to do so and not allow any further movements
- tell any ES under your control to stop all movements of engineering trains and OTP within a work site (if it is safe to do so) and not allow any further movements
- carry out any further instructions given to you by the signaller.

Please refer to specific modules for issue  
and in-force status



ELIZABETH LINE

## TRANSPORT FOR LONDON

---

EVERY JOURNEY MATTERS

Email  
Tel  
Twitter  
Web

[enquiries@crossrail.co.uk](mailto:enquiries@crossrail.co.uk)  
+44(0)  
[www.crossrail.co.uk](http://www.crossrail.co.uk)



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB12

Handbook 12

Duties of the engineering  
supervisor (ES)

Handbook 12

Issue 4

Date December 2020

Trial running

The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

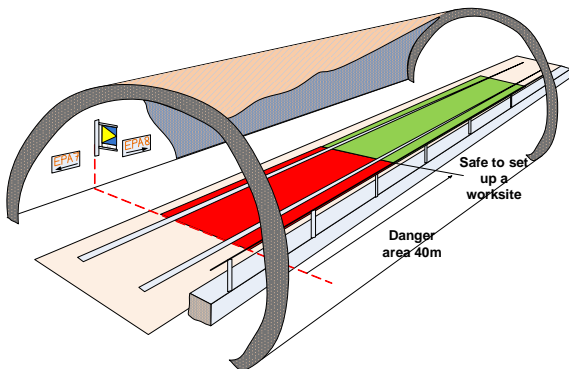
# Contents

- 1 Definitions**
- 2 Responsibilities**
- 3 How possessions are planned**
- 4 How a possession is taken**
- 5 Work sites**
- 6 Moving an engineering train**
- 7 Change of ES**
- 8 Giving up the work site**
- 9 If the signalling system cannot be relied on to give protection during the possession**

# 1 Definitions

## Danger area

The danger area is 40 metres from the block marker protecting the Engineering Possession Area (EPA).



## *Engineering possession area*

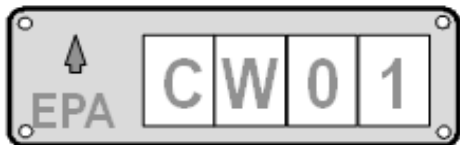
## Driver

This includes an operator of an on-track machine.

## Engineering possession areas (EPAs)

An EPA is a section of line where normal signalling controls are inhibited. An EPA when activated within the signalling system prohibits the normal movement of trains.

EPAs are marked on the line side, they look like this:



*Engineering possession area marker*

## Engineering train

A train used in the transportation of staff, equipment or materials intended to carry out engineering works. The term 'engineering train' also includes on-track machines (OTM) but not on-track plant (OTP).

Unfitted engineering trains (no CBTC) can only enter the COS:

- if the possession starts at the NR boundary, or
- are hauled in by a fitted traction unit.



## **Hand held terminal**

A wireless device which connects to the signalling system allowing pre-programmed possessions and protection to be taken and given up.

## **In-possession movement authority (IPMA)**

An IPMA is an On-Sight Driving Mode and is a sub mode of Protected Manual Mode with a maximum speed limited to 25 mph (40 km/h).

An IPMA is issued by the signaller where an EPA is active.

An indication is displayed on the DMI to enable the driver to recognise when the IPMA has been applied by the signaller.

The driver is required to confirm the mode change to On-Sight mode when indicated on the DMI.

## **On-track plant (OTP)**

Also known as 'in possession only rail vehicles' and includes road-rail vehicles (RVV), rail-mounted maintenance machines (RMMM) and their trailers and attachments with guidance wheels.

OTP can only be on and off tracked within a possession of a siding or in a work-site on a running line that is under possession.

## **Person in charge of the possession (PICOP)**

The person on the ground who is responsible for:

- on site management of the possession area
- movements of all engineering trains and OTMs inside a possession area but not in a work site
- giving authority to create work sites
- authorising movements in to and out of the possession
- authorising movements in to and out of the possession at an intermediate point but not in a work site
- liaising with the signaller about movements into and out of the possession area.

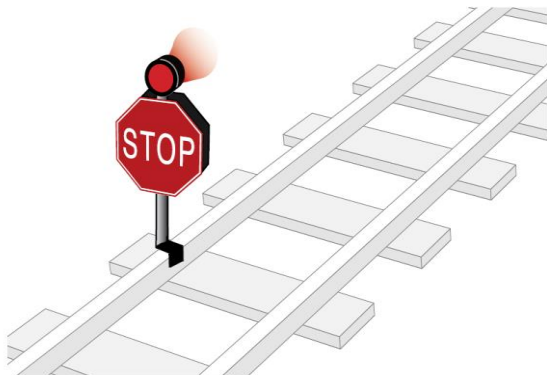
A possession can consist of many work sites but only one PICOP can be responsible for a particular possession.

## Possession limit board (PLB)

Possession limit boards mark the extremities of the possession.

The board is red, double-sided and is visible along the line in both directions.

It will also have a steady or flashing red light visible along the line in both directions. If a PLB is passed without authority, it is a signal passed at danger.



*Possession limit board*

A possession can consist of many work sites but only one PICOP can be responsible for a particular possession.

### **Protection arrangements**

The arrangements that must be put in place to protect staff from moving trains when it is necessary to go on the operational railway in an emergency or other exceptional circumstances.

### **Temporary speed restriction (TSR)**

A speed restriction which is lower than the permissible speed, and has been imposed by means of Communication-based train control (CBTC) supervision.

### **Radio frequency identification (RFID) tag**

An RFID tag is a wireless data tag fixed to infrastructure to give a location reference.

### **Work site**

A work site is a section of line within a possession where the work or activity is carried out and is marked by work-site marker boards.

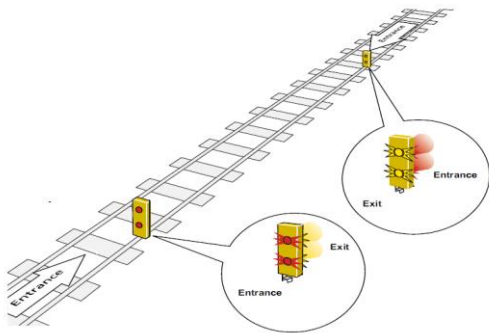
## Work-site marker boards

Work-site marker boards (WSMB) mark the extent of work sites within the possession. Each work-site marker board is yellow, double-sided and is visible along the line in both directions.

It has two red flashing lights which indicate an entrance to a work site. Your authority is needed to pass it.

It has two yellow flashing lights which indicate an exit from a work site. The authority of the PICOP is needed to pass it.

Both indications must be treated as a stop signal.



*Work-site marker boards*

If a work-site marker board is passed without authority, it is a signal passed at danger.

## 2 Responsibilities

### 2.1 Person in charge of the possession (PICOP)

The PICOP must have a valid PICOP certificate of competence when acting as a PICOP.

The PICOP must wear an armband on the left arm or a badge on the upper chest when carrying out the duties of the PICOP. The armband or badge must have PERSON I.C. POSSESSION in red letters on a yellow background.

The PICOP must be:

- familiar with the line and location where the work will take place and the associated EPA will be located, and
- familiar with the arrangements for the work to be carried out.

The PICOP is responsible for:

- arranging, taking and giving up the possession
- protecting work sites within the possession
- authorising movements into and out of the possession
- authorising movements into and out of the possession at an intermediate point but not in a work site
- controlling movements of engineering trains within the possession
- authorising the movements of engineering trains outside a work site
- authorising the movements of engineering trains to exit a work site
- agreeing the arrangements for unplanned works with operations control and the signaller.

The PICOP must not take part in any work activity.

The only exception to this is when the work to be carried out is not pre-planned because of an emergency or other exceptional circumstances.

## 2.2 Engineering supervisor (ES)

To act as an ES, you must have with you a valid certificate of competence issued by your employer.

You must wear an armlet on the left arm or a badge on the upper chest when you are carrying out the duties of the ES. The armlet or badge must have 'ENGINEERING SUPERVISOR' shown in blue letters on a yellow background.

You must be:

- competent to carry out the duties of an ES
- familiar with the line and location where the work site will be located
- competent to supervise the arrangements for the planned work to be undertaken.
- competent to determine the work has been completed to allow trains to operate.



You are responsible for:

- creating a work site and managing site safety
- authorising the movements of engineering trains and OTMs into the work site
- authorising the movements of engineering trains, OTMs and On Track Plant (OTP) inside a work site
- authorising the OTP to be placed or removed from the track within a work site
- setting up safe systems of work within the work site as shown in this handbook
- giving up a work site with the line safe and fit to run on.

## 2.3 Machine controller (MC)

Machine controllers must have with them a valid machine controller certificate when acting as an MC.

An MC must wear an armlet on the left arm or badge on the upper body with MACHINE CONTROLLER or MC in black letters on a white background.

If the OTP will be carrying out any lifting operations, the MC must also be competent as a crane controller and wear an armband on the left arm or badge on the upper body with CRANE CONTROLLER or CC in black letters on a white background.

MC's are responsible for:

- controlling the movement of OTP in accordance with PICOP's instructions
- for controlling the movement and operation of OTP inside a work site.

## 2.4 Signallers

Signallers are responsible for:

- granting the possession
- liaising with PICOP and drivers in connection with movements into and out of the possession
- accepting the infrastructure back after the possession has been given up.

## 2.5 Drivers

Drivers are responsible for properly controlling their train when acting in accordance with instructions given by the PICOP or you.

## 2.6 Operations control

Operations Control are responsible for agreeing and authorising the arrangements for unplanned works with the PICOP and signaller.

## 2.7 OTP operator

OTP operators are responsible for operating the OTP safely.

They must be competent in the rules for the operator as shown HB15 *Duties of the machine controller (MC) and on-track plant operator*.

If an operator is acting as the machine controller, they must carry out the instructions for the machine controller shown in HB15 *Duties of the machine controller (MC) and on-track plant operator*.

# 3 How possessions are planned

## 3.1 Contents of plan



When it is necessary to carry out engineering work within the COS, the work, including the associated EPA(s) will always be planned in advance and entered into the signalling system.



The plan will identify:

- the extent of the work
- the EPA(s) needed to be created and their unique reference number
- the movement of any engineering trains or OTP associated with the work
- the name of the PICOP
- the name or names of the ES
- the time the possession is to be taken



- the last train to pass before the possession area is granted
- if the possession area is to be imposed around a stationary engineering train
- the time the possession is to be given up
- and the identity and time the first train to pass after the possession is given up.
- if the work extends across more than one running line, sufficient EPAs will be created.
- if an isolation of overhead line equipment is necessary, the appropriate arrangements will be planned at the same time.
- if the work involves the use of tunnel vent modes and the arrangements that will apply.



If the work will result in the application of a temporary speed restriction on the line after the possession is given up, this will also be planned at the same time

If an EPA is only created on one line in the open section of line, and the adjacent line is to remain open to traffic, any temporary speed restriction will be planned at the same time.

### 3.2 Possession details to be published



Except where a possession must be taken in an urgent situation, details of the possession must be published in the Weekly Operating Notice or Engineering Notice.

### 3.3 Changes to published details



If it is necessary for any of the published details to be changed, this must be agreed between the organisation responsible for the possession and Operations Control

## 4 How a possession is taken

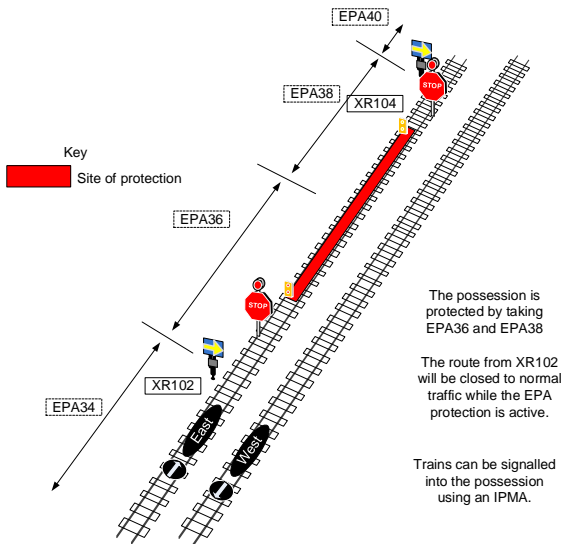
### 4.1 Engineers possession area (EPA)



Creation of an EPA is carried out by cooperative action between the signaller and the PICOP

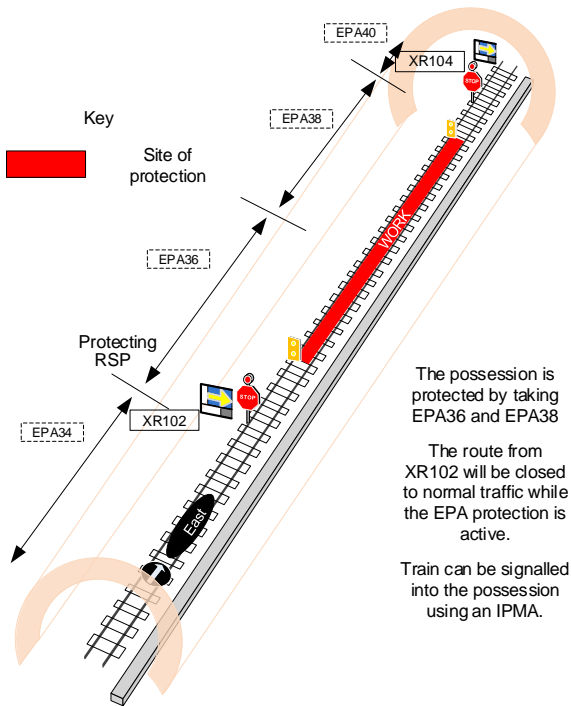
The granting of an EPA is achieved by electronic communication by the PICOP using the handheld terminal and the signalling and control system which is electronically recorded

The EPA will not be created until the signaller has validated the information and granted the possession.



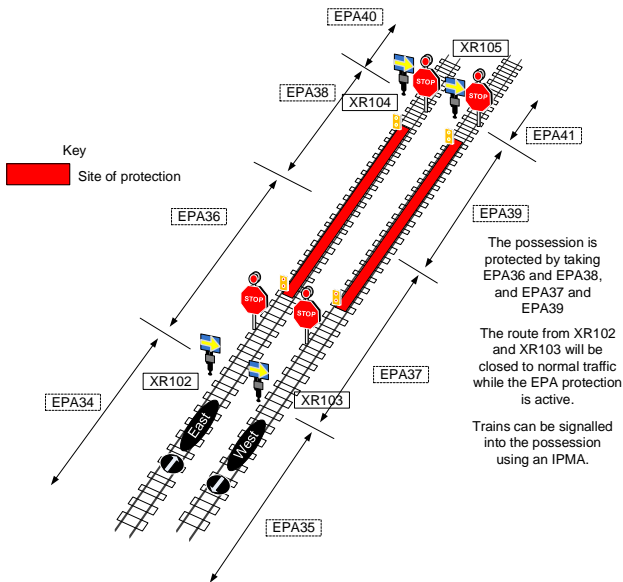
***Simple possession between block marker XR102 and block marker XR104***



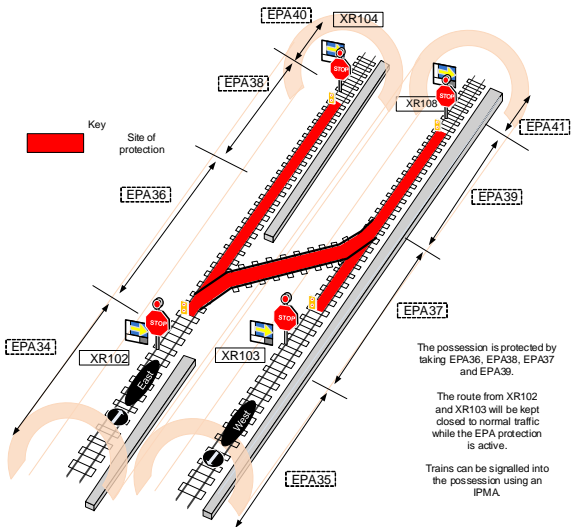


*Simple possession in the single bore tunnel*

A possession can consist of more than one EPA.



### Possession with two EPAs



### Possession across two single bore tunnels

## 4.2 Going on the line



**You must not go on or near the line or allow any other person to go on or near the line until the possession has been granted and the PICOP has told you it is safe to do so.**

## 4.3 When a possession is taken around an engineering train



There is no limit to the number of engineering trains or OTM the EPA can be set up or extended around, as long as the details have been published in the Weekly Operating Notice or Engineering Notice.

When the possession is to be taken around an engineering train or OTM, the signaller will signal the train concerned normally to the block marker specified in the notices.

When the engineering train arrives at the specified block marker, the signaller will tell the driver not to move the engineering train again until given instructions by the PICOP or you after the possession has been granted.

When the work site is to be taken or extended around an engineering train, before you can proceed any further with setting up or extending the work site, the PICOP must tell you when:

- every engineering train concerned is at a stand at its specified block marker
- the possession has been granted.

You must not allow any of these trains to move again until the work-site marker boards are in place and all the necessary arrangements for the work site have been made.

# 5 Work sites

## 5.1 Principles



A work site is a portion of line inside an EPA where work or activity is carried out.

When more than one work site is created within the same EPA, the area of each work site must not overlap the area of any other work site.

The area selected must be identifiable by work-site marker boards.

The extremities of work sites must be protected by work-site marker boards when:

- people are working within the work site
- there are engineering trains or OTMs operating inside the possession area, or
- there are engineering trains or OTP operating inside any of the work sites.

## 5.2 Setting up a work site



**You must not go on the line to set up a work site until the possession has been granted and the PICOP has told you it is safe to do so.**

You must contact the PICOP and state the published possession reference if there is one and then confirm:

- the line on which you will be setting up your work site
- the exact mileage or kilometres and metres of each (WSMB)
- whether the work site is to be taken around one or more trains.

You must not allow a WSMB for one work site to be closer than 100 metres from the WSMB of another work site on the same line.

The PICOP will dictate to you the exact location of each WSMB which you must record on the Work-Site Certificate (CR3199).



## 5.3 Indicating the work site

You must place a WSMB in the 'four-foot' at each end of the work site at the agreed location.

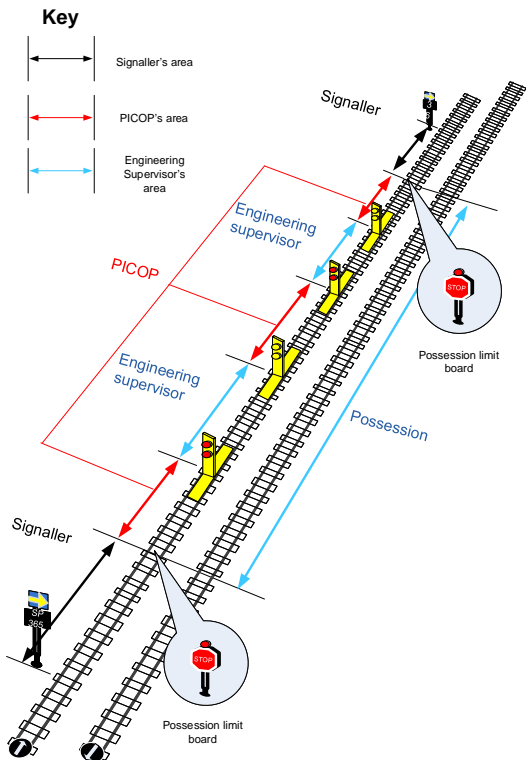
WSMBs must be positioned so that the red lights will be visible to the driver of a train approaching the work site and the yellow lights will be visible to the driver of a train leaving the work site.

You must tell the PICOP when the WSMBs at each end of your work site are in position.

The PICOP will dictate the necessary details to you. You must record these details on your CR3199 certificate.

When the PICOP is satisfied that all details are in order for the work to start, the PICOP will give you the PICOP's full initials and will authorise the work to start.

You must record the details on your CR3199 certificate.



**Positioning of PLBs and work-site marker boards**

## 5.4 Entering a work site

You must not allow the WSMB (or PLB at an intermediate point within the work site) to be removed until the movement has stopped at it.

When the movement has entered the work site, you must make sure the WSMB or PLB is immediately replaced.

When the WSMB or PLB has been replaced you must tell the PICOP.

## 5.5 Working within a work site

You must make sure staff working within your work site do not go on or place equipment outside these limits.

## 5.6 If the work is suspended

You must tell the PICOP if the work has been suspended.

You must not allow a movement to enter a work site where the work has been suspended.

You must record the details on your CR3199 certificate.

## 5.7 Giving a work site up

When you are ready to give up the work site you must make sure that:

- all work has been finished
- all OTP has been removed
- all materials are clear
- all personnel are clear
- all work site marker boards have been removed
- the line is safe and fit to run on.

You must record the details on your CR3199 certificate.

You must tell the PICOP if you cannot give up your work site without restrictions.

If the work will not be finished by the planned giving up time, you must tell the PICOP.

If it is possible to alter the limits of the work site to allow part of the possession to be given up, you must agree the arrangements with the PICOP.

# 6 Moving an engineering train

## 6.1 Where trains can enter a possession



Engineering trains can enter the possession at:

- the PLBs marking the extremities of the possession
- an intermediate point between work sites
- at a PLB at an intermediate point directly into a work site

## When an engineering train is entering the possession



### The driver must:

- drive the train to the location advised by the PICOP and at a speed that the driver can stop short of any obstruction
- keep a good lookout for any personnel who may be on or near the track
- keep a good lookout for and stop before any other engineering train or OTP
- stop before any PLB or WSMB.

## 6.2 Making sure it is safe for an engineering train to enter the work site

When the PICOP requires a train to enter the work site, the PICOP must get your permission for it to enter.

Before you give the PICOP permission for an engineering train to proceed, you must make sure you and the PICOP have not authorised a conflicting movement to take place.

Additionally, if an engineering train is to enter the work site from an intermediate point you must make sure you or a competent person sent by you, is positioned at the intermediate point to give the instructions to the driver.

## **6.3 Controlling the movement of engineering trains and OTP within a work site**

### **Authority to make a movement**

You are the only person who can authorise a driver or MC to make a movement in a work site.

### **Instructions to drivers and machine controllers**

You must instruct the driver of each engineering train, or the MC of each item of OTP to make each rail movement.

You must give the exact location the movement is to proceed to.

You must check that the driver or MC clearly understands the location the movement is to proceed to.

### **Competent person passing on your instructions**

If you use someone else to give your instructions to the driver or MC, you must make sure the person:

- is competent to do so
- fully understands the instructions to pass on
- does not travel in the driving cab with the driver.

### **Before authorising any movement**

Before you authorise any of the following, you must make sure any movement can be made safely and all personnel are told about the intended movement, and are in a position of safety:

- An engineering train to enter your work site.
- An engineering train or OTP to move within your work site.
- An engineering train to leave your work site.

### **Control of movements within the work site**

You must control movements inside a work site by use of verbal/radio messages or handsignals.



Before you authorise the movement of an engineering train, you must check that any points which the movement is required to pass over are in the correct position by examining the points on the ground. If you find the points are not in the correct position you must:

- ask the signaller to move them to the correct position, or
- if the signaller cannot move the points, arrange to have them operated by hand.

You must ask the signaller to operate any points for a movement inside a work site, and tell the signaller what position the points are required to be in.

### **Propelling movements**

You must only propel an engineering train inside a work site.

### **Speed of movements**

You must authorise the driver or the MC to make any movement at not more than 5 mph (10 km/h). unless you give specific instructions on the maximum speed to be applied.

You can however, allow an engineering train or OTP to proceed up to a maximum speed of 20 mph (30 km/h) but you must make sure that:

- the engineering train or OTP is not carrying out any work activities
- there are no other work activities being carried out in the work site
- all personnel are in a position of safety
- it is safe to do so.

### **Passing a block marker within the work site**

Drivers and MCs will not pass a block marker without your verbal authority.

### **On-tracking and off-tracking OTP**

Before you authorise the MC to allow on-tracking or off-tracking of OTP, you must make sure it can be made safely and all personnel are told about it, and are in a position of safety.

The MC must only instruct the OTP operator to place the machine on the track when they have received authority from you to do so.

The MC will tell you when to place your machine on the track or to make any movements.

## 6.4 Engineering trains leaving a work site

Only the PICOP can authorise a movement to leave a work site into the possession or leave the possession at an intermediate point directly from a work site.

## 6.5 Engineering train leaving the work site at an intermediate point

If an engineering train is to leave the work site at an intermediate point, the signaller will give the driver the necessary instructions.

You must tell the PICOP when the movement has passed clear of the points or crossings.

The signaller will then return the points to the position agreed with the PICOP.

## 6.6 Leaving the work site directly into a siding under possession

If a movement is to leave your work site directly into an adjacent siding under possession, you must first agree with the PICOP and the PICOS how this is to be done.

# 7 Change of ES

## 7.1 Change of ES

If you are going off duty, you must:

- tell the new ES about the work-site arrangements
- hand your CR3199 certificate to the new ES
- tell the PICOP the name of the new ES.

If you are the new ES, you must sign the CR3199 certificate.

# 8 Giving up the work site

## 8.1 When the work has been completed

When the work within the work site has been completed and the work site is no longer required you must make sure:

- the work site is clear of all tools and other equipment
- all OTP has been off-railed and removed from the work-site.

## 8.2 Removing the work-site marker boards

You must only remove the work-site marker boards when the PICOP tells you to do so.

## 8.3 Telling the PICOP when all activities are complete

You must then tell the PICOP that as far as you are concerned the line is safe and clear for trains to run on and if any restrictions apply.

You must then make sure all personnel for whom you are responsible leave.

You must record the details on your CR3199 certificate.

## 9 If the signalling system cannot be relied on to give protection during the possession

If you are told by the PICOP that the signalling system can no longer be relied on to protect the possession, you must:

- stop all movements of engineering trains and OTP within your work site if this can be done safely and not allow any further movements
- carry out any further instructions given to you by the PICOP.

Please refer to specific modules for  
issue and in-force status



rulesenquiries@tfl.gov.uk



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across the center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**





ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB13

## Handbook 13

Duties of the person in charge of  
the siding possession (PICOS) at  
Plumstead maintenance sidings

Handbook 13

Issue 4

Date December 2020

Trial running

The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 General**
- 3 Competence**
- 4 Agreeing the arrangements**
- 5 Protecting the possession**
- 6 Siding next to the running line under possession**
- 7 Allowing work to start**
- 8 Change of PICOS**
- 9 Giving up the possession**

# 1 Definitions

## **Designated person**

A designated person (DP) is responsible for setting up protection so that people carrying out work related to maintaining and repairing rail vehicles will be protected from train movements.

## **Engineering train**

This includes on-track machines but does not include on-track plant (OTP).

## **On-track plant (OTP)**

Also known as 'in possession only rail vehicles' and includes road-rail vehicles (RRV), rail-mounted maintenance machines (RMMM) and RRV/RMMM trailers and attachments with guidance wheels.

## **Train**

This includes a light locomotive, self-propelled rail vehicle, on-track machine, an RRV in rail mode and an RMMM.

## 2 General

Before allowing engineering work or on-tracking of OTP to take place, you will be appointed to take possession of the sidings as shown in this handbook.

Wherever possible you should arrange to take possession of the whole of each affected siding.

If a possession of a siding will be taken in association with a possession of an adjacent running line, you may, if competent, also be the person in charge of possession (PICOP) of that possession or the engineering supervisor (ES) of an adjacent work site.

Local instructions may be published by Rail for London Infrastructure Manager (RFLI) in the *Sectional Appendix* or by the operator of a depot.

Those local instructions may modify the arrangements shown in this handbook. You must be aware of and apply these instructions where necessary.

## 3 Competence

To act as a person in charge of a siding possession (PICOS), you must have been passed as competent in the rules shown in this handbook and have with you a valid certificate of competence issued by your employer for a COSS.

# 4 Agreeing the arrangements

## 4.1 Agreement with the person responsible

You must agree the following details with the person who is responsible for the operation of the siding.

- Your name and contact details.
- The location of the siding or sidings involved.
- Whether you will take possession of the whole length of a siding or just part of it.
- Whether you will need to take possession of more than one siding.
- How you will arrange line protection.
- The date and time you will take possession and by when it will be given up.

## 4.2 Telling the shunter

If involved, you must make sure the shunter is told about the possession arrangements. You do not need to do this yourself if the person responsible for the operation of the siding tells you that they will.

## 4.3 Recording the arrangements

You must record in writing on the document provided by your employer:

- which siding is affected
- the siding-protection arrangements
- the date and time the possession is taken.

# 5 Protecting the possession

## 5.1 Possession of the whole length of a siding

Before you allow any work to start or OTP to be placed on the track in the siding, you must arrange the line protection as follows.



Make sure the points leading to the siding are set to prevent movements from entering the siding.

- Clip and padlock the points.
- Keep the key to the padlock until the possession is given up.

## 5.2 Possession of part of one siding

If it is not necessary to block the whole of the siding, you must make sure that no movement approaches the affected part of the siding by placing line protection in the siding concerned.

The line protection is:

- a sleeper secured across the rails, and
- a possession limit board (PLB), red flag or red light placed at the sleeper so that it may clearly be seen by an approaching movement.

## 5.3 Points worked from a signal box

You must get confirmation from the signaller that the points will be kept in the position to prevent movements from entering the siding.

## 6 Siding next to the running line under possession

### 6.1 Line protection arrangements

If the possession of the siding is taken in association with a possession of the adjacent running line, you do not need to provide line protection to the siding as shown in section 5 of this handbook.

When possession of the siding will be kept after the adjacent running line possession is given up, you must make sure line protection is provided before the adjacent running line possession is given up.

### 6.2 Movements to or from the running line under possession

If the siding is to be used to allow movements to enter or leave an adjacent possession, you must agree with the PICOP or ES, as appropriate, and the signaller, how this will be done.

You must make suitable arrangements for the safety of your group and any other group or individual who is working under the protection of your possession while movements take place.

If points have been secured to protect the possession, you must make sure the points are again secured once the movement has been completed.

## 7

### **Allowing work to start**

When you have completed the arrangements for taking possession of the siding, you may allow your group, or another group or individual, to start work in the siding, or allow OTP to be on-tracked.

You must record the name and contact number of any other COSS to whom you give permission to share your protection.

You must brief anyone who is permitted to share your protection about the limits and any known hazards.

## 8 Change of PICOS

When going off duty, you must give the new PICOS the details about:

- the limits of your possession
- the line-protection arrangements
- any movement that you have authorised which has not been completed
- any other groups or individuals working under your protection.

If you are the new PICOS, you must tell the signaller, if involved.

# 9 Giving up the possession

## 9.1 Work suspended or completed

Before you make arrangements to give up the possession, you must make sure that:

- the siding is safe for movements
- each COSS, you have allowed to share your protection has assured you that your protection arrangements are no longer needed
- any OTP have been removed from the siding.

You must then remove any line protection you placed in the siding.

## 9.2 Telling others

You must tell the following that you have removed the line protection and the possession has been given up.

- The signaller.
- The person who is responsible for the operation of the siding.
- The shunter.

You do not need to do this yourself if the person responsible for the operation of the siding or the signaller tells you that they will.

## 9.3 Recording the arrangements

You must record in writing:

- the date and time at which each COSS confirms to you that they no longer need to share your protection
- the date and time the possession is given up.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a purple circle with a white horizontal bar across its center containing the text "ELIZABETH LINE" in white capital letters.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB14

Handbook 14

Duties of the person in charge of loading and unloading rail vehicles during engineering work within a possession

Handbook 14

Issue 5

Date December 2021

Comes into force 21<sup>st</sup> Dec



The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 When these instructions apply**
- 3 Responsibilities of the person in charge of loading and unloading**
- 4 Agreeing the arrangements**
- 5 Before moving vehicles**
- 6 During the movement**
- 7 Propelling movements**
- 8 Loading or unloading during a movement**
- 9 Controlling movements**
- 10 Preparing vehicles for movement from engineering work sites**

# 1 Definitions

## **Driver**

This includes an operator of an on-track machine.

## **Engineering train**

This includes on-track machines but does not include on-track plant (OTP).

# 2 When these instructions apply

These instructions apply to engineering trains when loading and unloading rail vehicles.

### 3 Responsibilities of the person in charge of loading and unloading

You are responsible for:

- the safe loading or unloading of engineering trains, whether stationary or moving
- controlling the movement of engineering trains while they are being loaded or unloaded
- warning everyone who needs to know when vehicles are about to be moved.

### 4 Agreeing the arrangements

You must come to a clear understanding with the driver, and the shunter, if there is one:

- when you will take over control of movements
- how you will control the movement
- when control of movements will be returned to the driver or shunter.

## 5 Before moving vehicles

When you have taken control of movements, you must:

- make sure that it is safe for the movement to be made
- warn anyone working near the vehicles to move to a safe position.

## 6 During the movement

You must control train movements as shown in section 9 of this handbook.

You must make sure everyone who may be in danger from the movement is warned, and if necessary you must stop the movement.

# 7 Propelling movements

Propelling can only be carried out within a work site.

If the train needs to be propelled, if possible, you must control it from the leading end. If this is not possible, you must arrange for a competent person to:

- ride on the leading vehicle, or
- walk alongside the leading vehicle.

If you are at the leading end of the movement, you must warn everyone on or about the line if they might be put in danger by the movement and, if necessary, stop the movement.

If you have arranged for a competent person to be at the leading end of the movement, you must tell them to do this.

## 8 Loading or unloading during a movement

Items can only be loaded on to or unloaded from a moving train if the vehicles concerned have been designed or equipped for this purpose.

# 9 Controlling movements

## By handsignals

You must use the handsignals shown in diagram HB14.1 or diagram HB14.2 to control the movement.

You must make sure that no other driver acts on your handsignals.

## By radio

You must:

- clearly identify the correct train and driver
- keep in constant communication with the driver throughout each movement
- speak continuously or transmit a continuous bleep signal
- instruct the driver to stop immediately if you notice the transmission is failing.





**Move away from  
the shunter**



**Move towards  
the shunter**



**Slow down**



**Stop immediately**

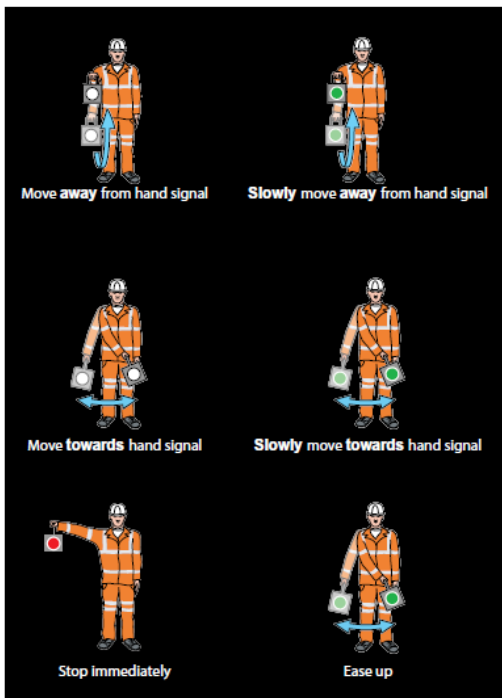


**Ease up**



**Stop immediately  
when on a vehicle**

**Diagram HB14.1  
Hand signals during daylight**



**Diagram HB14.2**  
**Hand signals during darkness or poor visibility**

# 10

## Preparing vehicles for movement from engineering work sites

You must carry out these instructions whenever any loaded or empty vehicle is formed in a train intended to be moved from an engineering work site.

When work has been completed, you must record the status of each wagon, on a certificate of readiness, as heavy (H), medium (M), light (L) or empty (E).

If, during loading or unloading, the wagon was reported as defective or damaged on the certificate of readiness, you must show the wagon as 'carded' (C) and tell the train preparer.

You must complete the certificate in duplicate, sign it, and hand one copy to the train preparer. The certificate confirms whether the wagons can be safely handed over for traffic as the following apply.

- Doors are fully closed and secured.
- Fixed and loose equipment is properly stowed and secured.
- Traffic is loaded and secured as shown in any requirements.
- Loose material and debris has been cleared from the load, vehicle frames and body sides.

If any on-track machines or power-driven rail crane is to be hauled as part of the train, you must make sure that the machine or rail crane carries a 'Ready for haulage' label which would be valid for the current movement, to show that the machine or rail crane has been prepared for travel as shown in company instructions.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB15

Handbook 15

Duties of the machine controller  
(MC) and on-track plant  
operator

Handbook 15

Issue 4

Date December 2020

Trial running

The arrangements in this handbook apply in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 Where these instructions apply**
- 3 Competence and identification**
- 4 Testing OTP**
- 5 Briefing the OTP operator**
- 6 On and off-tracking**
- 7 Making rail movements**
- 8 Propelling movements**
- 9 Controlling OTP rail movements**
- 10 When working**
- 11 Leaving OTP unattended**
- 12 Movements without a MC**
- 13 Movement of multiple OTP**



# 1 Definitions

## **On-track plant (OTP)**

Also known as 'in possession only rail vehicles' and includes road-rail vehicles (RRV), rail-mounted maintenance machines (RMMM) and their trailers and attachments with guidance wheels.

## **Propelling**

This means any movement where vehicles are being pushed by the OTP.

## **Possession**

A running line is under possession when arrangements have been made to block the line and engineering trains or OTP may be used.

A possession on a running line will be under the control of a person in charge of the possession (PICOP).

The PICOP is responsible for authorising the movement of engineering trains or OTP anywhere within the possession, other than entering a work site or within a work site.

The PICOP will wear an armlet on the left arm or a badge on the upper chest. The armlet or badge will have person in charge of the possession in red letters on a yellow background.

A possession may also be arranged for a siding or group of sidings. This type of possession will be under the control of a person in charge of the siding possession (PICOS).

### **Travelling**

This means a movement of the OTP in rail mode along a running line or siding. The OTP must be in travel mode with all equipment safely stowed away. This includes anything attached to or being carried on the OTP.

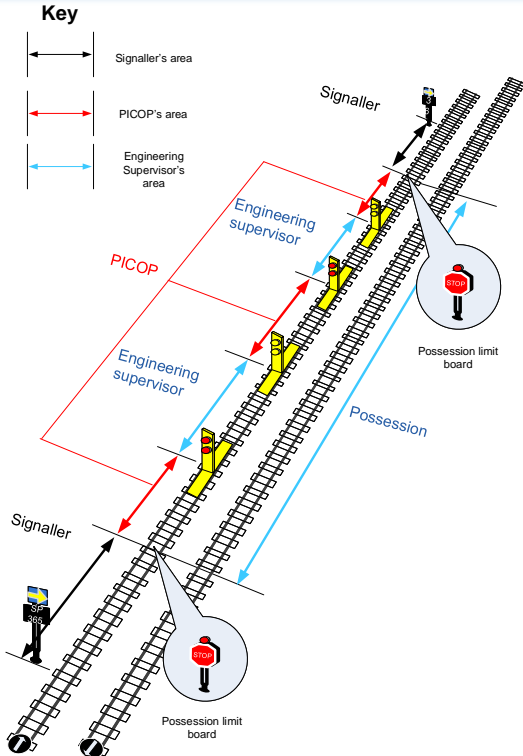
### **Working**

This includes on and off-tracking and when the OTP is being used in rail mode for any purpose other than travelling.

### **Work site**

A work site is the portion of line within a possession of a running line where work will take place and will have a work-site marker board (WSMB) at each end.

The first and last work site will have a possession limit board at the ends nearest the protecting block markers.



*Indication of a work site*

Each work site is under the control of engineering supervisor (ES). The ES is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The ES will wear an armband on the left arm or a badge on the upper chest. The armband or badge will have ES in blue letters on a yellow background.

## 2 Where these instructions apply

The instructions in this handbook only apply to OTP within a possession of a running line or siding.

OTP cannot be used or travel outside a possession.

A machine controller (MC) must be appointed when OTP will be on-tracked, off-tracked or will be used in rail mode.

It is not necessary for an MC to be appointed for each item of OTP as long as the method of work is shown in the method statement.

# 3 Competence and identification

## 3.1 Machine controller

You must have with you a valid machine controller certificate of competence issued by your employer.

You must wear an armlet on your left arm or badge on your upper body with MACHINE CONTROLLER or MC in black letters on a white background.

If the OTP will be carrying out any lifting operations, you must also be competent as a crane controller and wear an armlet on your left arm or badge on your upper body with CRANE CONTROLLER or CC in black letters on a white background. You do not need to wear the machine controller armlet or badge if you are wearing the crane controller armlet or badge.

## 3.2 OTP operator

You must have with you a valid OTP operator certificate of competence issued by your employer.

You may also act as the MC as long as you also hold an MC certificate of competence and this method of work is shown in the method statement.

# 4 Testing OTP

The OTP operator must carry out all the tests as shown in the specific instructions for the OTP concerned.

Except for those tests that can only be carried out after OTP has been on-tracked, tests must be carried out before on-tracking.

If tests are carried out after on-tracking, the OTP must immediately be taken off the line if it fails the test.

The MC must make sure the OTP operator carries out the tests.

# 5 Briefing the OTP operator

The MC must tell the OTP operator:

- the speed restrictions that apply
- the location of any signal or block marker the OTP must stop at
- the location of the work-site marker boards and possession limit boards
- the location of any points or crossovers
- about any known poor rail-head conditions.

The MC must also tell the OTP operator of any hazards that the OTP operator must be aware of such as:

- gradients
- tunnels
- platform edges
- overhead obstructions
- other site activities.

## 6 On and off-tracking

### 6.1 General

An MC must be with the OTP when it is:

- being on or off-tracked
- being set up
- working in rail mode.

These activities must only be carried out within a possession of a siding or in a work site on a running line that is under possession.

The MC must get permission from the PICOS or ES before these activities are carried out.



When the OTP has finished working and has been off-tracked and is clear of the line, the MC must tell the PICOS or ES.

If another line will be fouled when the OTP will be on or off-tracked, the MC must:

- if the line is a running line under possession, make sure that the affected portion of line is within a work site and the ES has given permission
- if the line affected is a siding, make sure the affected portion of line is under possession, and the PICOS has given permission
- if the line affected is a running line not under possession, make sure that a COSS has arranged a blockage of the affected portion of line.

## **6.2 On or off-tracking on lines with overhead line equipment (OLE)**

OTP must not be on or off-tracked or cross a line that has OLE until there is an isolation and:

- an overhead line permit has been issued to the ES
- the ES has given permission to start work.

An isolation is not required if a written safe system of work has been provided for this purpose, and the engineering acceptance certificate (EAC) or engineering conformance certificate (ECC) for the OTP allows this.

## 7 Making rail movements

### 7.1 Getting authority for movements

Movements can only enter or take place within a work site when the ES gives permission. Only after the ES has given permission to the MC can the MC authorise the OTP movement.

Movements can only leave or take place outside a work site when the PICOP gives permission. Only after the PICOP has given permission to the MC can the MC authorise the OTP movement.

Movements can only enter or take place in a siding when the PICOS gives permission. Only after the PICOS has given permission to the MC, can the MC authorise the OTP movement.

OTP is not allowed outside the protection for any possession.

## 7.2 Sounding a warning

Before making any rail movement, the OTP operator must give one short blast on the horn as a warning that the OTP is about to move.

## 7.3 Head and tail lights on OTP

OTP must display two white lights at the leading end and at least one red light at the rear.

OTP must have a headlight at the leading end if it is to travel at a speed of 20 mph (30 km/h) or more.

Any vehicle that the OTP is hauling must display at least one red light at the rear.

Any vehicle that the OTP is propelling must display two white lights at the leading end.

## 7.4 Speed of movements

The following movements are restricted to a maximum of 5 mph (10 km/h):

- over points
- anywhere within sidings
- controlled from the ground
- where speed has not been given by the PICOP or ES.

However, the OTP operator must always be able to stop the OTP within the distance that can be seen to be clear of any obstruction, or before reaching a handsignal that is being displayed.

When CCTV equipment is being used as shown in section 7.9, speed must not exceed 10 mph (15 km/h).

## 7.5 Points

Before any movement is made over points, the MC must check them to make sure they are in the correct position for the movement.

## 7.6 **Protecting an adjacent line in an emergency**

If an adjacent line becomes obstructed during the movement, emergency protection must immediately be carried out. The MC and OTP operator must decide how this is to be done.

## 7.7 **Pulling or pushing a vehicle not coupled to the OTP**

Except as shown in the brake-testing procedure for trailers, a vehicle must not be moved using a chain or rope or by pushing the vehicle with the OTP in road mode.

Only tow bars and couplings specially designed for the purpose of coupling vehicles can be used.

Vehicles must never be moved using a prop or pole against the OTP or any rail or road vehicle.

Loose shunting must never be carried out.

## 7.8 Riding on OTP

No one must ride on OTP or any vehicle attached to it unless the OTP has purpose-made seating or a riding platform and its use is shown in the EAC or ECC.

## 7.9 Having a clear view ahead

The OTP operator must always have a clear view of the line ahead. Mirrors cannot be used for this purpose.

If for any reason the OTP operator cannot get a clear view of the line ahead, the OTP operator and the MC must arrange to turn the OTP.

If the OTP cannot be turned, all movements must be controlled by the MC using radio or handsignals.

The MC must do this from a safe position on the ground or riding on the leading end of the OTP if it is authorised in the EAC or ECC.

Some OTP have an approved on-board CCTV colour display. This may be used as long as:

- it gives a clear view of the line ahead
- the EAC or ECC allows its use
- its use is shown in the method statement.

## 7.10 Block markers

The MC must authorise the OTP to pass a block marker only when permission has been given by either the PICOP or ES as appropriate.

## 7.11 Work-site marker boards

The MC must authorise the OTP to pass a WSMB displaying two flashing red lights only when permission has been given by the ES.

The MC must authorise the OTP to pass a WSMB displaying two flashing yellow lights only when permission has been given by the PICOP.

# 8 Propelling movements

All movements must be controlled by the MC from a safe position on the ground, where the OTP operator and MC can see each other, or stay in contact with each other.

If the EAC or ECC allows the use of purpose-built accommodation on the OTP, the MC may travel in the leading vehicle if it has been established that using handsignals or radio can properly control the movement.

The MC must use the horn or whistle to warn others when the propelling movement is taking place.

OTP must only be propelled within a work site.

## 9 Controlling OTP rail movements

### 9.1 General

Authority for movements can be given face-to-face, by using a radio or by giving handsignals.

The MC and the OTP operator must agree how the movement will be controlled and exactly what needs to be done.



## 9.2 Using radio

When a radio is being used to control movements from the ground, the MC must:

- clearly identify the correct OTP and OTP operator
- speak continuously throughout the movement or transmit a continuous bleep signal
- instruct the operator to stop immediately if the radio transmission is failing.

The OTP operator must stop the movement immediately if the MC stops speaking or the continuous bleep signal cannot be heard.

The OTP operator should only restart the movement when the MC gives authority.

## 9.3 Using handsignals

When handsignals are being used to control movements from the ground, the MC must use the handsignals shown in diagram HB15.2 or diagram HB15.3.

The OTP operator must stop the movement immediately if sight of the MC handsignal is lost.

The OTP operator must only restart the movement when the MC gives permission.

If the OTP operator does not understand the handsignal given or is unsure if it applies, the movement must not start or continue.



**Move away from the machine controller**



**Move towards the machine controller**



**Slow down**



**Stop immediately**



***Handsignals during daylight***



Slowly move away from  
the machine controller



Slowly move towards the  
machine controller



Ease up



Stop immediately

*Handsignals during darkness or poor visibility*

# 10

## When working

### 10.1 General

Except as shown in section 10.3, there must always be enough clearance between the OTP, including any load, and any adjacent open line. An open line must not be fouled at any time.

This also applies to the line adjacent to vehicles being loaded by OTP with jibs, booms, conveyor belts or other extendible equipment.

If there is not enough clearance, the MC must arrange to protect the adjacent line before work starts.

### 10.2 Protecting other lines

When the affected line is in a running line possession, the MC must make sure that it is within ES's work site and the ES has given permission to foul that line.

When the affected line is in a siding possession, the MC must make sure that permission of the PICOS has been given.

When the affected line is not under possession, the MC must make sure that the line has been blocked by a COSS has given permission for the line to be fouled.

## 10.3 Approved alternative method of working

Any approved alternative method published in the infrastructure manager's company instructions may be used instead of the instructions shown in section 10.2, as long as this is shown in the method statement.

# 11 Leaving OTP unattended

OTP may be left unattended in rail mode only when the MC has the permission of the:

- ES, if the line is within a work site
- PICOP, if it is outside a work site within a running line possession
- PICOS, if it is in a siding possession.

The OTP operator must make sure that any parking brake is correctly applied before the OTP is left unattended.

The OTP operator must also make sure a red light is showing on the OTP so that it can be seen by the driver of any movement that could approach.

## 12 Movements without a MC

Movements can be made without a MC but only when it is being done as shown in the infrastructure manager's company instructions.

When working to these instructions the MC must make sure all the hazards within the route have been identified and are briefed to the OTP operator.

The MC and OTP operator must make sure they both know the exact location of where the unaccompanied movement can proceed to.

The OTP operator must not go beyond this point until authorised by an MC.

# 13 Movement of multiple OTP

## 13.1 General

The PICOP is only allowed to authorise one movement at a time within the area controlled unless it is shown in the method statement.

Under these arrangements, more than one OTP may travel together without being coupled.

The PICOP will not allow the multiple movement to leave the work site until permission has been given to each MC and each OTP operator has been given the necessary instructions by the MC.

## 13.2 During the movement

The OTP operator must make sure that a distance of at least 100 metres (approximately 100 yards) is kept between the OTP and the OTP ahead.

The speed must not exceed 20 mph (30 km/h) or any lower speed restriction that applies.

When the movement arrives at the destination, no further movement must take place until authorised by the MC.



Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB16

Handbook 16

AC electrified lines on the  
central operating section

Handbook 16

Issue 4

Date December 2020

Trial running

This handbook is for those personnel who need to go on the operational railway in an AC electrified area to carry out their duties, with the exception of a:

- train driver
- shunter
- signaller
- designated person (DP).

The personnel listed above will not receive this handbook but will get Rule Book module AC *AC electrified lines*.

All personnel, other than those listed above, who go on to the operational railway are defined as track workers for the purpose of the Rule book.

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 Competence**
- 3 Dangers of the system**
- 4 Personal safety**
- 5 Communicating with the ECO**
- 6 Emergency switch-off**
- 7 Rescuing a person from the OLE**
- 8 Isolation of the OLE**
- 9 Overhead line permits**
- 10 Arranging coasting under the OLE**

# 1 Definitions

## Emergency switch-off

An emergency switch-off is carried out by the Electrical Control Operator (ECO).



The neutral sections are at Westbourne sidings on the west and Pudding Mill Lane junction on the east. The engineering road at Abbey Wood is where the OLE terminates (end of wire).

## Overhead line permit

A permit signed and issued by the nominated person (NP) and given to an engineering supervisor (ES) who is to carry out work on or near to the OLE.

This permit states exactly what electrical equipment is isolated and earthed and on which, or near to which it is safe for the specified work to begin.

If an overhead line permit has been issued, it does not mean train movements have been stopped.

## 2 Competence

You must not go on or near the line in an area with OLE unless your certificate of competence in personal track safety states that it is valid on lines electrified by the overhead system.



**The whole of the central operating section is electrified by the AC overhead system.**

If new OLE is being installed, or an electrified area is being extended, the instructions in this handbook will not apply until the equipment has been declared live.

You will be told about this in an energisation warning notice.

If you are not sure whether the OLE is live, you must treat it as live and dangerous to life.

# 3 Dangers of the system

## 3.1 Treating the OLE as being live



**OLE, pantographs and all roof-mounted electrical equipment on trains are extremely dangerous. It may be fatal if you touch or go near any of them, or if you allow anything to touch or go near them.**

You must treat these items (except for the mast or structures) shown in diagram HB16.1 and HB16.2 as being live at all times unless they have been made safe as shown in the instructions in this section.

If you have been told that the ECO has given an assurance that the electricity has been switched off, you must treat any OLE equipment as dangerous and not touch any of those parts.

You do not have to treat the OLE as being live and dangerous to life if either:

- An overhead line permit has been issued to the ES.
- The OLE has been isolated and earthed and an assurance has been received as shown in local isolation instructions.

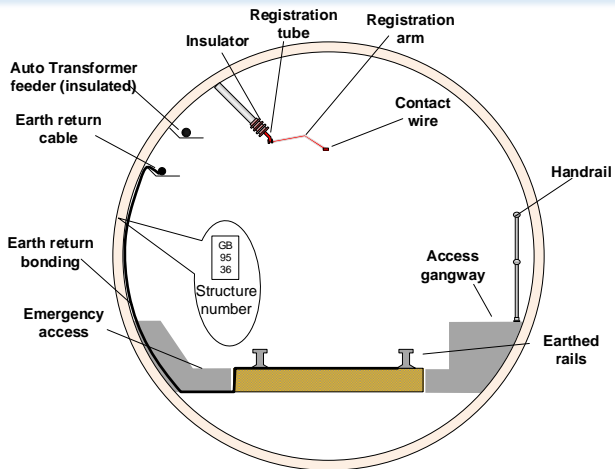
## **3.2 OLE defects and objects on or near to the OLE**

You must treat broken or displaced wires and anything attached to, or near to, the OLE as live and dangerous to life.

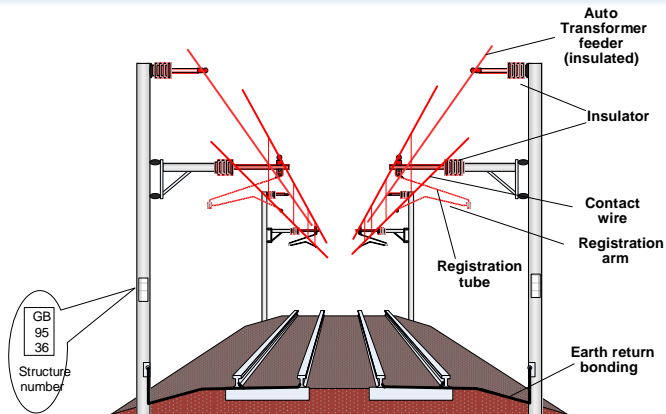
You must not remove or approach anything attached to, or near to, the live OLE.

You must not try to remove or approach an object hanging from, in contact with or close to the OLE, unless you have been specially trained and authorised to do so.





*Typical electrical layout in single bore tunnel*



*Typical OLE construction on the open sections*

## 3.3 Reporting objects and defects to the ECO

You must immediately make sure the following are reported to the ECO.

- Objects that have been thrown onto, are hanging from, or are otherwise touching the OLE.
- Damage to the OLE.
- OLE that is smoking, excessively flashing or fusing.
- Broken or displaced along-track conductors.
- Broken or displaced wires connected to the OLE.
- Damaged or loose automatic power control (APC) track inductors.
- A broken or parted rail.
- A broken or defective bond, in which case you must tell the ECO the colour of the bond.

You must not touch the rails if they are broken or parted, neither must you touch a broken or defective bond if it is marked red, nor any equipment connected to the bond.

If the damage or defect will affect the safe operation of trains, you must first report this to the signaller.

## 3.4 Reporting defects to the signaller

You must immediately make sure that damaged or loose automatic power changeover (APCO) balises on the approach to an electric to self-powered changeover location are reported to the signaller.

# 4 Personal safety

## 4.1 Working near OLE

You must not carry out any work above live OLE or within 2.75 metres (9 feet) in any other direction from live OLE, unless a written method statement has been provided which has been approved by the equipment owner.

Except in specially defined conditions, you must not use a crane, plant or similar equipment on or near to the OLE unless:

- the OLE has been isolated and earthed as shown in your company instructions
- the ES is issued with an overhead line permit.

If you are using equipment with parts that can be extended, you must make sure that these are only used as shown in the method statement.

## 4.2 Working on vehicles

You must never go above the cant rail or climb above the floor level of the driving cab, or climb on the roof or open upper deck of a vehicle, or on the steps giving access to the roof of any vehicle unless one of the following applies.

- You are on a line where there is no OLE above or adjacent to the vehicle.
- The OLE has been isolated and earthed as shown in your company instructions and the ES has been issued with an overhead line permit.
- The specific conditions in local instructions have been met.
- Local isolation is allowed and you are sure an isolation has been taken.

## 4.3 Using long items

You must take extreme care when using or carrying long items, such as ladders, shunting poles and dispatch bats. You must make sure the item is no nearer to the OLE than the distance specified in your company instructions.

You must carry long items horizontally and, if necessary, get other people to help you.

When using ladders near OLE, you must only use ladders that are made of wood, or other safety-approved non-conducting material.

You must not use ladders that are reinforced with metal attachments running along the sides.

# 5 Communicating with the ECO

## 5.1 Directly or by another person

You can contact the ECO direct, or you can ask another person to contact the ECO on your behalf.

If another person asks you to contact the ECO, you must make sure that you get the necessary information from that person before speaking to the ECO. You must also get any other information that the ECO asks for.

## 5.2 Identifying yourself and the location

When contacting the ECO, you must state:

- your name, job title and employer
- the line or lines concerned
- the location (for example, the nearest bridge, station, signal, block marker or other structure)
- the number on the nearest OLE structure or identifying plate (this will tell the ECO exactly where you are)
- the telephone number or radio call number (whichever you are using) so that the ECO can contact you if necessary.

If the ECO gives you a message identification number, you must state it each time you speak to the ECO.



# 6 Emergency switch-off



An emergency switch-off of the OLE does not mean that train running has been stopped.

## 6.1 Immediate actions

You must immediately contact the ECO (or arrange for this to be done) if you become aware of:

- a derailment
- a fire on a vehicle, train or on the lineside
- a person in contact with or in danger of coming into contact with the OLE
- an incident or other emergency requiring, or likely to require, the electricity supply to be switched off.

If you receive a message from another person about an emergency, you must pass on all this information to the ECO.

When you contact the ECO, you must first say, **'This is an emergency call'**.

You must tell the ECO:

- the reason why you want the electricity to be switched off
- whether any person is in danger from live OLE
- whether the emergency services are waiting to give assistance.

If you are not at the site, you must relay information from the ECO to the site and from the site to the ECO.

## 6.2 Further actions

You must stay in contact with the ECO or, if you have reported the incident through another person, stay in contact with that person until you have been assured that:

- the electricity has been switched off and the OLE has been made safe to be approached but not to touch, or
- other arrangements have been made.

If the ECO agrees to the emergency switch-off, the ECO will decide who will be regarded as the person in charge of electrical emergency (PICEE).

If you are a person passing on this information on behalf of someone else, you must stay in contact with the ECO until an assurance has been given that one of these arrangements has been put in place.

### **6.3 PICEE managing the emergency switch-off**

If you are appointed by the ECO as the PICEE, the ECO will tell you the limits of the emergency switch-off.

You must identify yourself to anyone arriving on site.

If the emergency services arrive on site, you must tell the officer in charge from each emergency service about the presence of the OLE and which parts have been switched off.

The ECO will tell you before shortening the area of the emergency switch-off. You must tell everyone at the site about the new limits.

If passengers are to get out of a train which is not at a platform, you must make sure that all passengers are kept clear of the OLE.

If you hand over the responsibility of the emergency switch-off to someone else, you must tell the ECO immediately. You must give the name, job title and employer of the new PICEE taking over.

If you are the new PICEE, you must immediately confirm the emergency switch-off arrangements with the ECO.

As soon as the emergency is over and the affected section can be re-energised, you must warn everyone involved that the electricity is about to be switched on and make sure they are clear of the OLE.

You must then tell the ECO that the emergency is over and wait for further instructions.

If the emergency will go on for a long time or it will be necessary to issue an overhead line permit, the Nominated Person (NP) will contact you when arriving on site.

You and the NP must both contact the ECO so that responsibility for the emergency switch-off can be transferred from you to the NP.

## 7 Rescuing a person from the OLE

You must make sure the electricity is switched off, remote earthing has been applied and an overhead line permit has been issued before you approach a person who:

- is above the live OLE, or
- is within 2.75 metres (9 feet) of the live OLE.

## 8 Isolation of the OLE



An isolation of the OLE does not mean that train running has been stopped.

When a section or sub-section of OLE has been isolated, you must continue to treat it as being live until:

- an overhead line permit has been issued, or
- where local isolation instructions allow this, the OLE has been isolated and earthed and an assurance received as shown in the local instructions.

## 9 Overhead line permits

### 9.1 Issuing an overhead line permit

When the NP has made sure that the OLE has been isolated and earthed, the NP will hand the ES or COSS an overhead line permit. The ES must understand:

- the working limits on the overhead line permit
- where live equipment is adjacent to, or crosses over earthed equipment, which equipment is live and which is earthed
- the issue of the overhead line permit does not mean that train movements have been stopped.

The ES must sign the overhead line permit to show they understand the conditions.

The ES must then make sure everyone in the group fully understands the conditions shown on the overhead line permit, before work is allowed to start.

## 9.2 During the work

The ES must keep the overhead line permit until:

- work is completed and the ES and the group the ES is responsible for is clear of the line, or
- the ES is relieved by another ES, in which case the overhead line permit must be handed to the new ES and both people must sign it.

The new ES must make sure they understand about the conditions shown in section 9.1 of this handbook.

The new ES must tell the NP (either directly or through the ECO) that they have taken over the duties of the ES.

The ES must immediately tell the NP if the overhead line permit is lost. The NP will arrange to issue another overhead line permit endorsed 'Duplicate'.

## 9.3 Changes of personnel within the work group

The ES must make sure that each person coming onto the site of work after the overhead line permit has been issued fully understands the conditions shown below before being allowed to start work.

- The working limits on the overhead line permit.
- Where live equipment is adjacent to, or crosses over earthed equipment, which equipment is live and which is earthed.

## 9.4 When the work is suspended or completed

When the work is suspended or completed, the ES must make sure all personnel and materials are removed from, and are no closer than 2.75 metre (9 feet) from, the OLE.



The ES must then:

- instruct each person in the workgroup to treat the OLE as live and dangerous to life
- complete the overhead line permit
- give the overhead line permit to the NP who will countersign it.

If you have lost your OLE permit, you must tell the NP. You must carry out a visual inspection with the NP to make sure that all persons and materials are clear of the OLE.

## 10 Arranging coasting under the OLE

If you are the responsible person, when you arrive on site, you must establish whether the object or defect to the OLE means that trains, including both bi-mode trains and electric trains with pantographs lowered, can run or continue to run safely through the affected area.

If trains can run or continue to run but with bi-mode trains operating in self-powered mode and electric trains coasting with the pantographs lowered, you must decide whether the driver can easily identify the location. You must take account of the weather conditions and any other factor that may make this difficult.

If you believe it will be difficult for the driver of each train to easily identify the exact location, you must provide details of the block markers where the pantograph must be lowered and raised to make sure that the train does not affect the OLE.

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)




[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)

The logo for the Elizabeth Line, featuring a large purple circle with a white horizontal bar across its center. The text "ELIZABETH LINE" is written in white capital letters on the bar.

**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**



ELIZABETH LINE

TRANSPORT  
FOR LONDON

EVERY JOURNEY MATTERS

COS/HB19

## Handbook 19

Work on signalling equipment -  
duties of the signalling technician  
in the central operating section

Handbook 19

Issue 4

Date December 2020

Trial running

This handbook details the instructions for signalling technician when working on signalling equipment in the central operating section (COS).

The central operating section is from Portobello Junction (exclusive) to Abbey Wood Sidings and Pudding Mill Lane Junction (exclusive).

Published by:

Rail for London (Infrastructure)

The authoritative version of this document is available at <https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section>

Contents managed by RFLI

# Contents

- 1 Definitions**
- 2 Work that will not affect the normal passage of trains**
- 3 Work that will affect the normal passage of trains**
- 4 Not used**
- 5 Equipment that has failed**
- 6 Work on equipment when the line is under possession**

# 1 Definitions

## **Defective signal**

A signal which is not operating or displaying correctly, or where the light is out when it should be illuminated.

## **Equipment out of use**

Equipment that the signaller must not operate.

## **Equipment restricted**

Equipment that has had its functions limited but may continue to be operated by the signaller. This includes:

- a route setting position (RSP) restricted to prevent the signaller from issuing a movement authority (MA) beyond it
- points that have been restricted so they can only be used in the normal (or reverse) position.

## **Equipment removed**

Equipment that has been permanently taken out of operational use.

## **Signalling equipment**

This includes:

- axle counters
- track circuits
- points
- CBTC equipment
- interlockings
- data transmission equipment.

## **Work which affects the normal operation of signalling equipment**

Any work which will interfere with signalling equipment and needs the signaller's permission before it is carried out but which can be completed in a suitable interval between trains.

## **Work which affects the normal passage of trains**

Any work which will interfere with signalling equipment and would prevent trains passing or would allow trains to pass only by diversion or degraded-mode working.



## 1.1 When the instructions in this handbook apply

The instructions in this handbook apply:

- to a failure of signalling equipment
- to work on signalling equipment.

## 1.2 When the instructions in this handbook do not apply

The instructions in this handbook do not apply to work on signalling equipment when all the following are met.

The work:

- will not affect the normal passage of trains
- does not need the signaller's co-operation
- will not affect the normal operation of the signalling equipment.

## 1.3 Technician's responsibilities

You are responsible for any work associated with restrictions or taking equipment out of use.

You must get the signaller's permission before making, or arranging to make, any restriction or take any equipment out of use.

If you need to operate any signalling equipment for test purposes, you must:

- ask the signaller to operate it, or
- ask the signaller for permission before you operate it.

## 1.4 Using a Signal Engineering Work form (CR3187)

You must use form CR3187 when:

- signalling equipment will be taken out of use, restricted to allow work as shown in section 3 of this handbook, and
- trains, other than engineering trains in a possession, have to pass through the affected area.

You do not need to use form CR3187 if all the signalling equipment affected is within possession and it is planned to restore the equipment to normal use before the line possession is given up.

However, if the line blockage or possession will be given up and signalling equipment will stay restricted, you and the signaller must fill in form CR3187 before the line blockage or possession is given up.

You do not need to use form CR3187 during a failure of signalling equipment unless equipment will be taken out of use, restricted and it will not be possible to complete the work before trains have to pass.

If another signalling technician takes over from you before the restriction is made, or the equipment is taken out of use, you must make sure that person fully understands the arrangements that apply.

If form CR3187 has been used, you must give this to the new signalling technician.

If you are the new signalling technician, you must fully understand the arrangements that apply and if form CR3187 has been used, you must sign part 3 of your copy of this form.

## 2 Work that will not affect the normal passage of trains

### 2.1 When these instructions apply

The instructions in this section apply only if the work will not affect the normal passage of trains but will affect the normal operation of signalling equipment.

### 2.2 Before starting work

Before starting work which will affect the normal operation of signalling equipment, you must come to a clear understanding with the signaller about:

- what work needs to be done
- how the signalling equipment will be affected
- any other equipment that will be affected
- how long the work will take
- the time that permission will be given for the work to start
- the time by which the work must be completed.

## **2.3 When the work is completed**

You must tell the signaller when the work is completed and the equipment is in working order.

## **2.4 If the work cannot be completed**

As soon as you realise you cannot complete the work within the agreed time, you must tell the signaller.

# **3 Work that will affect the normal passage of trains**

## **3.1 When these instructions apply**

You must apply these instructions to work on signalling equipment which will affect the normal passage of trains.

## 3.2 Before starting work

You must come to a clear understanding with the signaller about:

- what work is to be done
- the details of equipment that will need to be, restricted or taken out of use
- any other equipment that will be affected
- how long the work will take
- how the work will affect train working
- the time that permission will be given for the work to start
- the time by which the work must be finished.

You must enter the details in part 2 of your copy of form CR3187 at the same time as the signaller.

You must not allow any restrictions to be made or take equipment out of use until the signaller has given you permission.

When the signaller has given you permission, you must:

- enter the details in part 2 of your copy of form CR3187 at the same time as the signaller
- restrict the agreed signalling equipment.

When the restrictions have been carried out or the equipment taken out of use, you must tell the signaller and enter the details in part 2 of your copy of form CR3187 at the same time as the signaller.

### **3.3 During the work**

No alteration to the work must be made unless you have first agreed the changes with the signaller.

If it is necessary to agree changes, you must again carry out the relevant instructions in 3.2 of this handbook. You must use a new form CR3187 and cancel the previous form.

## 3.4 When the work is completed

You must tell the signaller when the work is completed and the equipment is in working order.

You must fill in part 4 of your copy of form CR3187 at the same time as the signaller.

## 3.5 If all the work cannot be completed

If all the work cannot be completed, you must tell the signaller the details of:

- the work that has been completed
- equipment that is in working order
- work that has not been completed
- any equipment that will stay restricted
- any equipment that will be taken out of use
- what arrangements will be made to complete the work, if known.

You must fill in part 4 of your copy of form CR3187 for the equipment that is back in order at the same time as the signaller and then a new form for details of the equipment which will stay restricted.



## 4 Not used

4.1 Not used

4.2 Not used

4.3 Not used

# 5 Equipment that has failed

## 5.1 Before starting work on the failure

You must come to a clear understanding with the signaller about:

- what signalling equipment has failed
- what other equipment will be affected by the work to repair the failure
- whether any equipment needs to be restricted or taken out of use
- whether form CR3187 has to be used.

You must agree with the signaller the time work can start.

## 5.2 If the work needs equipment to be restricted or taken out of use

You must not make any restrictions unless the signaller has given you permission.

If form CR3187 is to be used, you must enter the details on part 2 of your copy at the same time as the signaller.

When the signaller has given you permission, you must:

- restrict the agreed signalling equipment
- tell the signaller when this has been done.

## 5.3 During the work

You must not make any alteration to the work unless you have first agreed the changes with the signaller.

## 5.4 When the work is completed

You must tell the signaller when the work is completed and the equipment is in working order.

If form CR3187 has been used, you must fill in part 4 of your copy at the same time as the signaller.

## 5.5 If all the work cannot be completed

If all the work cannot be completed, you must tell the signaller the details of:

- work that has been completed
- equipment that is in working order
- work that has not been completed
- any equipment that will stay restricted
- any equipment that will be taken out of use
- what arrangements will be made to complete the work, if known.

You must use form CR3187, giving details of all equipment that will be restricted or will be taken out of use.

## 6 Work on equipment when the line is under possession

You must apply this instruction as well as the relevant parts of instructions sections 2, 3, 4 and 5 if the signalling equipment that has failed or is to be worked on is within a possession.

If the signalling equipment affected is within a work site, after the signaller has given you permission to carry out the work, you must also get permission from the engineering supervisor (ES).

Please refer to specific modules for  
issue and in-force status



[rulesenquiries@tfl.gov.uk](mailto:rulesenquiries@tfl.gov.uk)



[https://tfl.gov.uk/corporate/  
publications-and-reports/crossrail-  
central-operating-section](https://tfl.gov.uk/corporate/publications-and-reports/crossrail-central-operating-section)



**ELIZABETH LINE**

**TRANSPORT  
FOR LONDON**

**EVERY JOURNEY MATTERS**