

GERM8000



# Rule Book

## Trackworkers Manual



This issue contains changes  
to the Rule Book published  
in the Periodical Operating  
Notice on 05/12/2020

# **TRACK WORKERS MANUAL**

## **GERM8000/trackworkers**

RSSB has produced this manual to provide end-users with access to the content of GERT8000 (The Rule Book) that is relevant to all roles who carry out activities on or near the line, including pilotman, route-setting agent, level crossing attendant, person in charge of loading and unloading, staff who set up speed restrictions etc as defined in the Rule Book Matrix published by RSSB.

The manual is intended to be read electronically and on a device of your choice. To facilitate navigation, the manual includes bookmarks and the contents page includes links enabling you to find the information you require quickly. The content can also be searched using keywords or phrases, for example, Single Line Working. It is not intended for printing.

If you require individual copies of the modules or handbooks contained within this manual, then these can be downloaded from Railway Group Standards or ordered in hardcopy from Willsons Printers: Newark.

Any party wishing to apply for a deviation or to propose a change should apply referencing the individual handbook(s) and/or module(s) and not this manual. The manual will be updated and re-issued as individual handbooks and modules are revised.

Any party wishing to access the impact assessments or briefing notes associated with the individual modules and handbooks can do so by referring to the specific module or handbook on Railway Group Standards.

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***Inforce dates are set out in the individual handbooks within this manual.***

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***Inforce dates are set out in the individual handbooks within this manual.***

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# GERT8000-HB1 Rule Book

## Handbook 1

### General duties and track safety for track workers

#### Issue 5.1



December 2020  
Comes into force 05 December 2020

Crystal  
Mark  
19014

Clarity approved by  
Plain English Campaign



**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**
- **guard**
- **shunter**
- **signaller**
- **crossing keeper**
- **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 to the operational railway are defined as track workers for the purpose of the Rule Book.**

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# 1 Definitions

## **A position of safety**

If the maximum speed is 100 mph (160 km/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).

## **Automatic track warning system (ATWS)**

An automatic system of warning track workers when a train is approaching.

## **Lookout-operated warning system (LOWS)**

A system operated by a lookout used for warning track workers when a train is approaching.

## **Train-operated warning system (TOWS)**

A system operated by trains used for warning track workers when a train is approaching.

## **Lineside**

You are on the lineside (shown green in diagram HB1.1) 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.

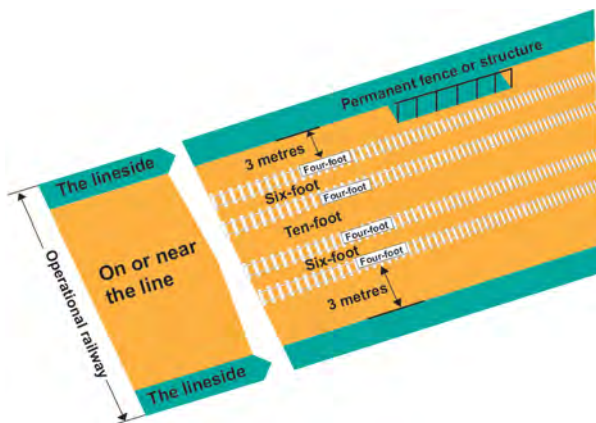
You are not on or near the line if you are crossing the line at a level crossing.

## On or near the line

You are on or near the line (shown orange in diagram HB1.1) 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.



**Diagram HB1.1**

### **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 off a moving rail vehicle. This does not apply to vehicles designed for continuous slow-speed movement such as the high-output ballast cleaner.

You must not get on a moving rail vehicle unless it is absolutely necessary, and then only if you can do so safely.

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 this 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 valid cab pass, you must:

- show your cab pass to the driver before entering the cab
- show the driver the additional 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 required personal protective equipment your company policy requires if you plan to leave the train at 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 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 safe work leader (SWL) 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 are either a COSS, IWA or an SWL, or
- a COSS or SWL is present and has given you permission.

## **4 Going on or near the line alone**

### **4.1 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.

The only occasion when you can go on or near the line without a COSS or SWL, is when you are walking alone.

You must never work alone unless you are a COSS, IWA or SWL.

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 a tunnel.

## **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 While walking alone**

Any items you carry while walking must not affect your ability to walk safely or to see or hear and acknowledge approaching trains.

You must use authorised walking routes if they are provided.

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.

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.

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.

#### **4.4 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 or SWL 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 SWL. The COSS or SWL must then stay with you while you are there.

You can identify the COSS or SWL by the armband on the left arm or the badge worn on the chest.

The COSS or SWL 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 SWL to explain it.

You must sign the safe-work briefing form (RT9909) to show you understand the safe system of work that is to be used.

You must follow all instructions given by the COSS or SWL.

### **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**

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 COSS or SWL gives you permission.

You must never distract a lookout.

## 5.5 Using site wardens

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.

## 5.6 Using ATWS, TOWS or LOWS

The COSS or SWL will tell you about the warning you will receive. You must immediately move to the position of safety when the warning is given.

You must not then leave the position of safety until the COSS or SWL gives you permission.

# 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 appears to be 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 or guard 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.
- An obstruction.
- A fire.
- Damage to structures or earthworks above or below the line.
- Any light which is out at an emergency indicator.
- A cow, bull or other 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 show a hand danger signal clearly to the driver 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.

## **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
PICOP (person in charge of the possession)	anyone except the ECO or signaller
Route-setting agent	points operator
Protection controller (PC)	each COSS or SWL
COSS or SWL	members of the work group

COSS or SWL

each lookout/site warden

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

#### Phrase

**This is an emergency call**

#### Meaning

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.

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

#### Phrase

**Over**

#### Meaning

I have finished my message and am expecting a reply.

**Out**

I have finished my  
message 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** - whisky**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 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 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.

## 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.

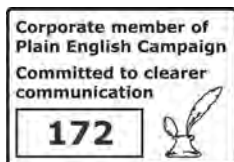
## **Fundamental operational principles**

- 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 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.

Printing this manual is not permitted

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GE/RT8000/HB2

Rule Book

# Handbook 2

# Handbook 2

## Instructions for track workers who use emergency protection equipment

**Issue 2**

**September 2015**

**Comes into force**

**05 December 2015**



**This handbook is for those personnel who need to go on the operational railway to carry out their duties, and have been trained to carry out emergency protection. It does not apply to:**

- **train drivers**
- **guards**
- **shunters**
- **signallers**
- **crossing keepers**
- **those who act as a designated person (DP).**

**We define all personnel, other than those listed above, who go on to the operational railway as track workers for the purpose of the Rule Book.**

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# 1 Detonators

You should check each detonator to make sure the date of manufacture stamped on it is not more than five years ago.

You must not use any detonator that is older than five years; or is showing signs of rust or decay or is damaged. You must return these to your issuing point.

If you have to place detonators at a signal, you must place the first next to the signal and the other two beyond the signal.

If there is a 3rd rail, if possible, place the detonator on the running rail furthest from the 3rd rail.

You must place detonators 20 metres (approximately 20 yards) apart.

If you have to place detonators on the line when not at a signal and you are to stay near the detonators, you must stand at least 30 metres (approximately 30 yards) beyond the detonators so that the train driver will see your handsignal after exploding the detonators.



**Detonator secured to rail**



## 2 Signal-post replacement switch

Signal-post replacement switches (SPRS) are provided at some automatic and semi-automatic signals. When operated, they place the signal to danger.

Although called a SPRS, they are not always on the signal post but will be near to the signal and may be on a separate post.



**Signal-post replacement key and switch**

### 3 Track-circuit operating clips

A track-circuit operating clip is a device which, in an emergency, can be clipped over the top of each running rail to operate the track circuit.

Do not use track-circuit operating clips where there is a 4th rail. In 3rd-rail areas, place the clip on the running rail furthest from the 3rd rail first.

If you have applied a track-circuit operating clip, it must not be removed until normal working can begin, or other protection has been given.

You must get the permission of the signaller before you remove a track-circuit operating clip.

A track-circuit operating clip must be used only once.



**Using a track-circuit operating clip**

## **4 Protecting a line that is unsafe**

### **4.1 Immediate actions**

If you are to protect a line that is obstructed or unsafe, except where there is a 4th rail, you must place a track-circuit operating clip, if available, on each affected line.

You must try to contact the signaller in the quickest way.

If you cannot contact the signaller, you must walk towards the direction that trains can approach from so that you can place three detonators, 20 metres (approximately 20 yards) apart, on each line concerned at 2 kilometres (1¼ miles). This is called full detonator protection.

You must display a hand danger signal to any train that approaches on the affected line.

### **4.2 If a train approaches**

If a train approaches before you get to the 2 kilometre (1¼ miles) point, you must, if it is safe to do so, immediately place three detonators on that line. You must also show the hand danger signal to warn the driver.

### **4.3 Reaching a telephone or signal box**

If you reach a telephone linked to the signal box or the signal box itself, you must place three detonators on the affected line and then speak to the signaller. If the signaller tells you the line is protected, you do not need to continue to the 2 kilometre (1¼ miles) point.

If you reach a signal fitted with a signal-post replacement switch, you must operate the switch before placing the three detonators and then speak to the signaller.

### **4.4 Reaching a tunnel**

If you reach a tunnel before reaching the 2 kilometre (1¼ miles) point, you must place three detonators on the affected line at the tunnel entrance.

You must, taking care for your own safety, continue through the tunnel to reach the 2 kilometre (1¼ miles) point. If this is within the tunnel, place the detonators at the far end of the tunnel.

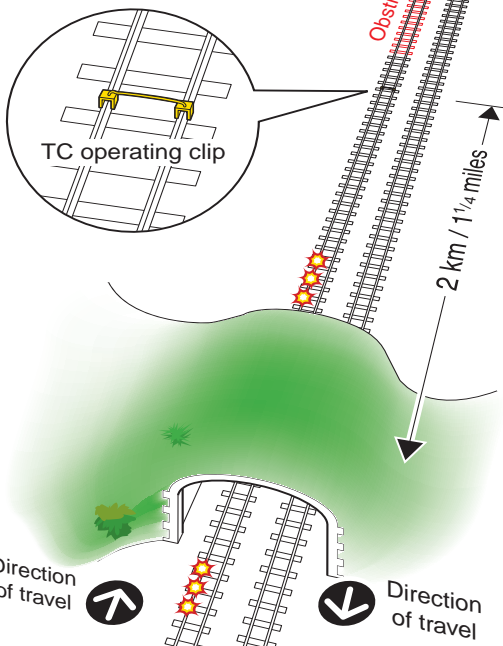
## Key



Track-circuit operating clip



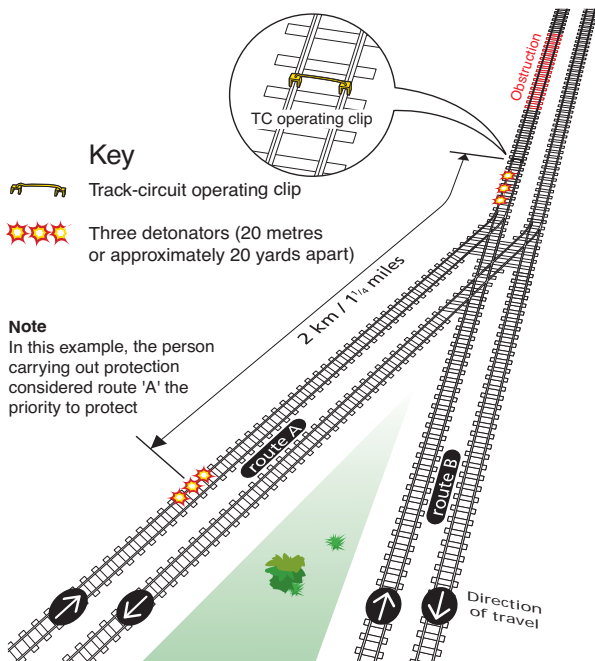
Three detonators (20 metres or approximately 20 yards apart)



## Reaching a tunnel

## 4.5 Reaching a junction

If you reach a junction before reaching the 2 kilometre (1¼ miles) point, you should place three detonators before the junction and then decide the order in which you will protect each line. This will depend on which line a train is more likely to approach on.



### Reaching a junction

## **4.6 Removing the protection**

You must not remove the protection placed on the line until the line is again safe or you are told to because some other type of protection is being given by someone else.

## **4.7 After full protection has been provided**

When you have carried out full protection, unless you are told differently, you must stay near the detonators and continue to display the hand danger signal.

## **Notes**



## **Notes**

## **Notes**



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Rule Book

# Handbook 3

## Handbook 3

### Duties of the lookout and site warden

**Issue 3**  
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## 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 armlet or badge with the word 'LOOKOUT' in red letters. When you are acting as a site warden, you must wear a white armlet or badge with the words 'SITE WARDEN' in blue letters.

You must wear the armlet on your left arm or if it is a badge, wear it on the upper chest.

You must not wear these armlets or badges at any other time.

## 3 Site-warden duties

The COSS or SWL will tell you who to watch and the boundary of the safe area as well as where you must stand.

You must not leave your post until the COSS or SWL tells you that you are no longer needed to act as site warden or you are relieved by another site warden.



The COSS or SWL will make sure you understand the limits of the safe area.

You must watch the group and make sure that no one moves beyond the safe limits laid down by the COSS or SWL.

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, unless you are also the COSS or SWL
- allow yourself to be distracted.

You must immediately let the COSS or SWL 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

| The COSS or SWL will tell you:

- if you are to be a site lookout, a distant lookout or an intermediate lookout
- 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 COSS or SWL 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 COSS or SWL 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.

### **Note:**

Distant lookouts and intermediate lookouts are not allowed during darkness, poor visibility or in a tunnel.

Site lookouts are only allowed during darkness, poor visibility or in a tunnel if the maximum speed of all approaching trains is no greater than 20 mph and the site lookout has sufficient sighting available.

This note does not apply when LOWS or pee wee is being used.

## **5 Site-lookout duties**

When you see a train approaching on the lines concerned, or the distant or intermediate lookout waves their chequered flag, you must immediately give the warning.

You must give the warning using one of the following methods as instructed by the COSS or SWL:

- 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.

If there is a distant or intermediate lookout, when you have seen everyone is moving to the position of safety, you must wave your chequered flag above your head to acknowledge that lookout's warning.

## **6 Distant lookout**

When you see a train approaching on any of the lines concerned, you must wave your chequered flag above your head as a warning to the site lookout or intermediate lookout if there is one.

Continue to wave your flag until the site lookout or intermediate lookout if there is one acknowledges it in the same way.

If there is more than one site lookout, each must acknowledge your warning.

## **7 Intermediate lookout**

When you see the distant lookout giving the warning by waving their chequered flag above the head, you must wave your chequered flag above your head to acknowledge this to the distant lookout.

You must continue to wave your flag above your head as a warning to the site lookout until the site lookout acknowledges it in the same way.

If there is more than one site lookout, each must acknowledge your warning.

## **Notes**



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Rule Book

# Handbook 4

## **Handbook 4**

### **Duties of a points operator and route-setting agent - moving and securing points by hand**

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# 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
- any failure or disconnection affecting switch diamonds
- any failure or disconnection affecting swing-nose crossings.

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 route-setting form.

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.

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, ES or SWL to do with the position the points need to be moved to.

The points operator must tell the PICOP, ES or SWL when the points have been correctly set and are secured for any movement that is to be made over them.

When the PICOP, ES or SWL 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 Switch diamonds and swing-nose crossings**

Use a clip and a scotch for movements over the points in all directions.

### **7.2 All other types of points**

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 in the following way.

### **On concrete sleepers**

The points must be secured by approved devices that are padlocked.

### **On wooden sleepers**

The closed blade must be secured with the clip, which must be padlocked, and a fishplate must be screwed to the sleeper by two screws so that the closed blade cannot move.

The open blade must be secured with a scotch.

**Note:** There are some approved devices that can be used instead of the above method. These are similar to those used on concrete sleepers.

## **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.

## **Notes**

## **Notes**

## **Notes**



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Rule Book

# Handbook 5

# Handbook 5

## Handsignalling duties

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## 1 Handsignals

If you have to give handsignals during daylight in good visibility you must use flags. If you have to give handsignals during darkness or poor visibility you must use a handlamp.

You must make sure the handsignal can be clearly seen by the person who it is intended for. Make sure it is not given in a way that it will be acted upon by someone else.

You must hold the flag or handlamp steadily and do not put it on the ground.

Be careful if giving handsignals near another signal that is at danger. Make sure you do not accidentally give a handsignal that could mislead a driver into passing that signal without authority.

## 2 Detonators

You must check each detonator to make sure the date of manufacture stamped on it is not more than five years ago.

You must not use any detonator that is older than five years; or is showing signs of rust or decay or is damaged. You must return these to your issuing point.

If you have to place a detonator at a signal, you must place it on the rail at the signal.

### 3 Signal-post replacement switch

Signal-post replacement switches (SPRS) are provided at some automatic and semi-automatic signals. When operated they place and hold the signal to danger.

Although called a SPRS, they are not always on the signal post but will be near to the signal and may be on a separate post.

If you are going to use the SPRS, you must first make sure the signal is showing a proceed aspect. If it is, you must:

- get the signaller's permission to place the key in the switch and operate it
- operate the key and then check that the signal has gone to danger
- tell the signaller the signal is at danger.

If the signal is not showing a proceed aspect when you arrive, you must tell the signaller and ask for further instructions.



**Signal-post replacement key and switch**

## **4 When a handsignaller can be used**

You must be competent to carry out the duties of a handsignaller.

There are only two occasions when you may carry out handsignalling duties. These are when appointed by the signaller for temporary block working or by the pilotman for single line working.

On both occasions, the signaller will give the handsignaller authority for train movements.

You must not act as a handsignaller for any other activity.

## **5 Temporary block working (TBW)**

### **5.1 Remaining where appointed**

When the signaller has told you which signal you are appointed to, you must stay at that signal until you are relieved by another handsignaller or the signaller tells you that you are no longer needed.

### **5.2 Entrance signal**

If you are appointed at the entrance signal leading to the TBW section, you must:

- make sure the signal is showing a red aspect
- place one detonator on the rail at the signal
- display a hand danger signal to each train approaching that signal until the train stops.

If the signal is not showing a red aspect, you must immediately tell the signaller. The signaller may ask you to use your signal-post replacement key to place the signal to danger.

When the signaller gives you permission for a train to proceed, you must:

- fill in ticket RT3184 using the details given to you by the signaller
- remove the detonator from the line
- give the driver the necessary instructions
- hand ticket RT3184 to the driver
- show a yellow handsignal to the driver.

When the train has entered the TBW section and has gone beyond the entrance signal, you must replace the detonator on the rail and then display the hand danger signal.

### **5.3 Exit signal**

If you are appointed at the exit signal from the TBW section, you must:

- make sure the signal is showing a red aspect
- place one detonator on the rail at the signal
- display a hand danger signal to each train approaching that signal until the train stops.

If the signal is not showing a red aspect, you must immediately tell the signaller.

When a train stops at the signal, you must:

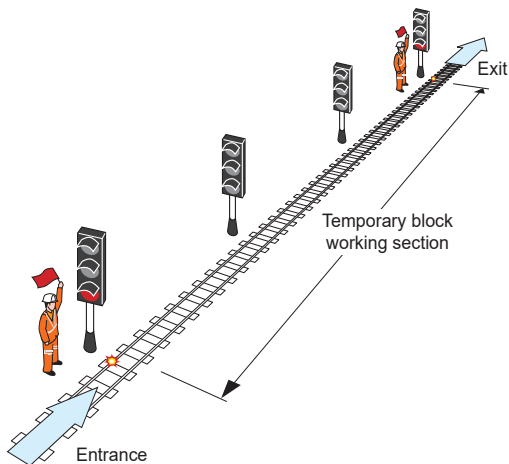
- get ticket RT3184 from the driver
- instruct the driver to obey the signal aspect
- remove the detonator from the rail
- tell the signaller the train has arrived quoting the train reporting number shown on ticket RT3184.

If the signaller tells you the signal cannot be cleared, you will have to instruct the driver to pass the signal at danger when you are instructed to do so by the signaller. After you have passed on any instructions from the signaller, you must show a yellow handsignal.

When the train has left the TBW section and has gone beyond the exit signal, you must replace the detonator on the rail and then display the hand danger signal.

You must tell the signaller when the train, complete with tail lamp, has gone at least 200 metres (approximately 200 yards) beyond the exit signal.



**Diagram HB5.1**

## 5.4 Where TBW is divided into two sections

If you are appointed at the exit signal from the first TBW section, you will need to deal with each train approaching as shown for the handsignaller at the exit signal and then deal with the train as shown for the handsignaller at the entrance signal.

The driver of each train will need to be instructed to pass the signal at danger when the signaller gives permission for the train to proceed.

## 6 Single line working (SLW)

### 6.1 Staying where appointed

When the pilotman has told you where you are to be appointed to, you must not leave that location until you are relieved by another handsignaller or the pilotman tells you that you are no longer needed.

You will normally be appointed opposite a signal as shown in diagram HB5.2.

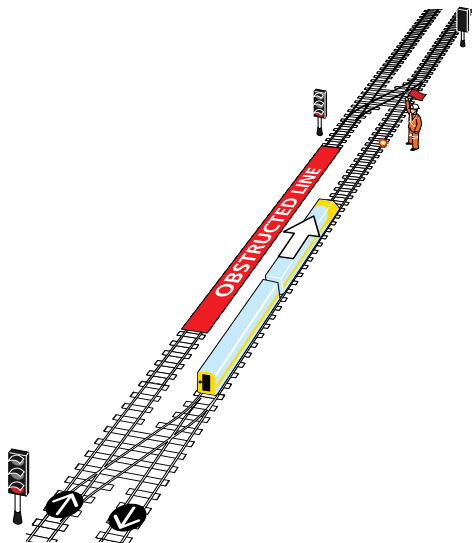


Diagram HB5.2

## 6.2 Trains travelling in the wrong direction

You must:

- on the line used for SLW, place one detonator on the rail opposite the signal
- display a hand danger signal to each train approaching in the wrong direction until the train stops.

When the signaller gives you permission for the train to proceed, you must:

- remove the detonator from the rail
- repeat the signaller's instructions to the driver
- show a yellow handsignal to the driver.

When the train has gone beyond your location, you must replace the detonator on the rail and then display the hand danger signal unless the signaller tells you the next train will be travelling in the right direction.

If the signaller tells you that the driver of an approaching train in the wrong direction has been authorised to obey your handsignal, and the signaller gives permission for the train to proceed, you must:

- remove the detonator from the rail, and
- show a yellow handsignal to the driver of the approaching train.

### 6.3 Trains travelling in the right direction

You do not need to give handsignals to any train travelling in the right direction.

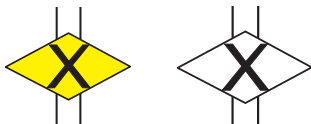
When you become aware that the next train will be travelling in the right direction, you must remove the detonator and hand danger signal.

You must replace the detonator and again display the hand danger signal once the train has passed.

## 7 Telephones with limited clearance

Some signals or telephones are positioned where there is limited clearance between adjacent lines. You will not be appointed at a signal, and you must not use a telephone where one of the signs shown below are displayed, unless arrangements have been made for your safety.

A yellow or white diamond with the letter **X** displayed at the signal.



A yellow roundel on the telephone cabinet.



A red and white chequered board or labels with the words 'Warning-Limited clearance' displayed on the sign.



## 8 Using tents near the line

Tents are sometimes provided for you when you are carrying out your handsignalling duties.

If you have to set up a tent, you must make sure:

- the tent is approved by Network Rail for the location it is to be used at (this is especially important on electrified lines)
- the tent is firmly secured
- where possible, the closed end of the tent is facing oncoming trains
- the tent is no closer than 2 metres (6 feet 6 inches) from an open line.

However, if the speed on the open line is 20 mph or less, the tent can be as close as 1.25 metres (4 feet) from that line.

## **Notes**





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## GERT8000-HB6 Rule Book

# Handbook 6

### General duties of an individual working alone (IWA)

#### Issue 6



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Crystal  
Mark  
19447

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## 1 Competence

To act as an individual working alone (IWA) you must have with you a valid IWA certificate of competence issued by your employer.

You must carry out the instructions shown in this handbook 6 whenever you are working alone on the operational railway.

## 2 Work that you can do without the line being blocked

### 2.1 Working more than 2 metres (6 feet 6 inches) from an open line

If the work will not affect the safety of the line and you will not come within 2 metres (6 feet 6 inches) of the nearest running rail of an open line, you may carry out the work without blocking that line.

### 2.2 Patrolling, examining or inspecting

You can patrol, examine or inspect an open line if you are sure you will be able to look up often enough (at least every 5 seconds) to see any train approaching and:

- you will be able to reach a position of safety at least 10 seconds before any approaching train arrives, and
- you can reach that position of safety without crossing any open line other than the one you are on.

You must not rely on these arrangements during darkness, poor visibility or when in a tunnel.

## **2.3 Working where there is an approved barrier**

If the work will not affect the safety of the line and there is a barrier or fence 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 work 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 2 metres (6 feet 6 inches) 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.

**Note:** A rigid or tensioned barrier placed at 0.9 metres (3 feet) from an open line along with automatic track warning system (ATWS) is sometimes used when on-track plant is being used close to an open line. You must not use a barrier at this distance as part of your safe system of work.

## 2.4 Using ATWS or TOWS

If the work will not affect the safety of the line and there is an automatic track warning system (ATWS) or train operated warning system (TOWS), you can use this equipment to give warning of approaching trains if:

- you are competent to use the equipment at that location
- the equipment will provide an adequate warning of all approaching trains on the line or lines concerned
- you will be able to stop what you are doing and reach the position of safety at least 10 seconds before the train arrives.

You must test the warning before starting work.

If the equipment is already in use when you arrive, you must reach a clear understanding with the other person using it so that you each know what is happening.

When leaving the site of work, you must agree with anyone else using the equipment whether or not to leave the equipment in use.

## 2.5 Crossing the line procedure

You can use this procedure if you are walking alone and need to:

- cross no more than four running lines
- walk past a structure that restricts clearance from a running line.

You can only use this procedure if all of the following apply.

- The location is one that has been approved for the use of the procedure, and you and signallers have been given details about the location and the conditions for using it.
- You are competent in using the procedure and your name has been given to signallers.
- You are not using the procedure during the time you are carrying out any work, including patrolling or inspecting, only when walking.
- You must not carry anything that will affect your ability to walk safely.

You must contact the signaller using a mobile phone.

You must tell the signaller:

- where you want to cross the line or pass by a structure
- your name and employer
- how long it will take to cross the line or pass by the structure.

When the signaller tells you that you can cross the line or pass by the structure you must:

- immediately cross the line or pass by the structure
- stay on the phone to the signaller until you have crossed the line or passed by the structure
- make sure that you are in a position of safety.

You must then tell the signaller that you are clear of any line.

## **3 Work that needs the line to be blocked**

### **3.1 Types of work**

Unless specifically allowed within your company instructions, you must consider the following as types of work that will affect 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 2 metres (6 feet 6 inches) of the line.
- Using a road vehicle within 2 metres (6 feet 6 inches) 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.



### **3.2 Before starting work that affects the safety of the line**

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.

- You have blocked the line as shown in handbook 8.
- The line has been blocked by a protection controller (PC) and you have agreed a safe system of work with that PC as shown in handbook 7.
- Your site of work is within an engineering supervisor's (ES) or safe work leader's (SWL) work site and you have agreed the safe system of work with the ES or SWL, as shown in handbook 9.
- Your site of work is within an engineering supervisor's (ES) or safe work leader's (SWL) protection zone and you have agreed the safe system of work with the ES or SWL, as shown in handbook 12.
- 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 9.

### **3.3 Placing possession protection**

You may place detonator protection for a possession as long as the PICOP has assured you that the protecting signal for the line concerned has been placed to danger.

You may place work-site marker boards for a work site within a possession as long as the ES or SWL has given you permission to do so.

**Aid to working out warning times**

	<b>Up</b>	<b>Down</b>
Maximum speed (from the Sectional Appendix or TSR or ESR)		
Time needed to stop work and down tools		
Time needed to reach a position of safety		
Add 5 seconds for working alone	5	5
Add 10 seconds (minimum time to be in a position of safety)	10	10
Total warning time needed (Must be no more than 45 secs)		
Sighting distance needed		
Sighting distance available		

Sighting distance chart (in metres) mph

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of									
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs			
125 mph	900m	1200m	1400m	1700m	2000m	2300m	2600m			
120 mph	900m	1100m	1400m	1650m	1900m	2200m	2500m			
115 mph	800m	1100m	1300m	1550m	1800m	2100m	2400m			
110 mph	800m	1000m	1300m	1500m	1800m	2000m	2300m			
105 mph	800m	1000m	1200m	1450m	1700m	1900m	2200m			
100 mph	700m	900m	1200m	1350m	1600m	1800m	2050m			
95 mph	650m	850m	1100m	1300m	1500m	1700m	1950m			
90 mph	650m	850m	1050m	1250m	1450m	1700m	1850m			
85 mph	600m	800m	950m	1150m	1350m	1600m	1750m			
80 mph	550m	750m	900m	1100m	1300m	1500m	1650m			
75 mph	550m	700m	850m	1050m	1200m	1400m	1550m			
70 mph	500m	650m	800m	950m	1100m	1300m	1450m			
65 mph	450m	600m	750m	900m	1050m	1200m	1350m			

## Sighting distance chart (in metres) mph

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of					
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs
60 mph	450m	550m	700m	850m	950m	1100m
55 mph	400m	500m	650m	750m	900m	1000m
50 mph	340m	500m	600m	680m	800m	900m
45 mph	320m	420m	520m	620m	720m	820m
40 mph	280m	360m	460m	540m	640m	720m
35 mph	240m	320m	400m	480m	560m	640m
30 mph	220m	280m	340m	420m	480m	540m
25 mph	180m	240m	280m	340m	400m	460m
20 mph	140m	180m	240m	280m	320m	360m
15 mph	120m	160m	180m	220m	240m	280m
10 mph	80m	100m	120m	140m	160m	180m
5 mph	40m	60m	80m	80m	80m	100m

## Sighting distance chart (in metres) km/h

Sighting distance chart (in metres) km/h

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of							
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs	
200 km/h	900m	1200m	1400m	1700m	2000m	2300m	2600m	
195 km/h	900m	1100m	1400m	1650m	1900m	2200m	2500m	
185 km/h	800m	1100m	1300m	1550m	1800m	2100m	2400m	
175 km/h	800m	1000m	1300m	1500m	1800m	2000m	2300m	
170 km/h	800m	1000m	1200m	1450m	1700m	1900m	2200m	
160 km/h	700m	900m	1200m	1350m	1600m	1800m	2050m	
155 km/h	650m	850m	1100m	1300m	1500m	1700m	1950m	
145 km/h	650m	850m	1050m	1250m	1450m	1700m	1850m	
135 km/h	600m	800m	950m	1150m	1350m	1600m	1750m	
130 km/h	550m	750m	900m	1100m	1300m	1500m	1650m	
120 km/h	550m	700m	850m	1050m	1200m	1400m	1550m	
115 km/h	500m	650m	800m	950m	1100m	1300m	1450m	
105 km/h	450m	600m	750m	900m	1050m	1200m	1350m	

## Sighting distance chart (in metres) km/h

Sighting distance chart (in metres) km/h

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
95 km/h	450m	550m	700m	850m	950m	1100m	1250m
90 km/h	400m	500m	650m	750m	900m	1000m	1150m
80 km/h	340m	500m	600m	680m	800m	900m	1050m
70 km/h	320m	420m	520m	620m	720m	820m	920m
65 km/h	280m	360m	460m	540m	640m	720m	820m
55 km/h	240m	320m	400m	480m	560m	640m	720m
50 km/h	220m	280m	340m	420m	480m	540m	620m
40 km/h	180m	240m	280m	340m	400m	460m	520m
30 km/h	140m	180m	240m	280m	320m	360m	420m
25 km/h	120m	160m	180m	220m	240m	280m	320m
15 km/h	80m	100m	120m	140m	160m	180m	220m
10 km/h	40m	60m	60m	80m	80m	100m	120m

Sighting distance chart (in miles and yards)

Maximum Speed	Sighting distance chart (in miles and yards)							
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs	
125 mph	920y	1240y	1540y	1m80y	1m380y	1m700y	1m1000y	
120 mph	1/2 mile	1180y	1480y	1 mile	1m300y	1m600y	1 1/2 mile	
115 mph	860y	1140y	1420y	1700y	1m220y	1m500y	1m780y	
110 mph	820y	1080y	1360y	1620y	1m140y	1m400y	1m660y	
105 mph	780y	1040y	1300y	1540y	1m40y	1m300y	1m560y	
100 mph	740y	980y	1240y	1480y	1720y	1m200y	1 1/4 mile	
95 mph	700y	940y	1180y	1400y	1640y	1m100y	1m340y	
90 mph	660y	1/2 mile	1100y	3/4 mile	1540y	1 mile	1m220y	
85 mph	640y	840y	1040y	1260y	1460y	1680y	1m120y	
80 mph	600y	800y	980y	1180y	1360y	1580y	1 mile	
75 mph	560y	740y	920y	1100y	1300y	1480y	1660y	
70 mph	520y	700y	860y	1040y	1200y	1380y	1540y	
65 mph	480y	640y	800y	960y	1120y	1280y	1440y	

## Sighting distance chart (in miles and yards)

Sighting distance chart (in miles and yards)

Maximum Speed	Sighting distance, in miles (m) and yards (y), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
60 mph	$\frac{1}{4}$ mile	600y	740y	$\frac{1}{2}$ mile	1040y	1180y	$\frac{3}{4}$ mile
55 mph	420y	540y	680y	820y	960y	1080y	1220y
50 mph	380y	500y	620y	740y	860y	980y	1100y
45 mph	340y	$\frac{1}{4}$ mile	560y	660y	780y	$\frac{1}{2}$ mile	1000y
40 mph	300y	400y	500y	600y	700y	800y	$\frac{1}{2}$ mile
35 mph	260y	360y	$\frac{1}{4}$ mile	520y	600y	700y	780y
30 mph	220y	300y	380y	$\frac{1}{4}$ mile	520y	600y	660y
25 mph	200y	260y	320y	380y	$\frac{1}{4}$ mile	500y	560y
20 mph	180y	200y	260y	300y	360y	400y	$\frac{1}{4}$ mile
15 mph	120y	160y	200y	220y	280y	300y	340y
10 mph	80y	100y	140y	160y	180y	200y	220y
5 mph	40y	60y	80y	80y	100y	100y	120y



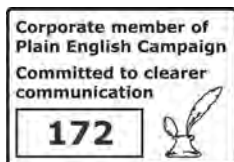
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## **Notes**

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# GERT8000-HB7 Rule Book

## Handbook 7

### General duties of a controller of site safety (COSS)

#### Issue 7



September 2020  
Comes into force 05 December 2020

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# 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 armlet 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 armlet or badge at any other time.

The COSS armlet or badge must have COSS in white letters on a blue background.

# 2 Work that you can do without the line being blocked

## 2.1 Work that does not affect the safety of the line

If the work will not affect the safety of the line and nobody will come within 2 metres (6 feet 6 inches) 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.



## **2.2 Patrolling, examining or inspecting when alone**

You can patrol, examine or inspect an open line when you are alone if you are sure you will be able to look up often enough (at least every 5 seconds) to see any train approaching and:

- you will be able to reach a position of safety at least 10 seconds before any approaching train arrives, and
- you can reach that position of safety without crossing any open line other than the one you are on.

You must not rely on these arrangements during darkness, poor visibility or when in a tunnel.

## **2.3 Crossing the line procedure**

You can use this procedure if you are walking alone, or with a group that is walking and need to:

- cross no more than four running lines
- walk past a structure that restricts clearance from a running line.

You can only use this procedure if all of the following apply.

- The location is one that has been approved for the use of the procedure, and you and signallers have been given details about the location and the conditions for using it.
- You are competent in using the procedure and your name has been given to signallers.
- You are not using the procedure during the time you or any of the group are carrying out any work, including patrolling or inspecting, only when walking.
- You, or any of the group, must not carry anything that will affect your ability to walk safely.

You must contact the signaller using a mobile phone.

You must tell the signaller:

- where you want to cross the line or pass by a structure
- your name and employer
- how long it will take to cross the line or pass by the structure.

When the signaller tells you that the group can cross the line or pass by a structure you must:

- tell the group that they can cross the line or pass by a structure
- immediately cross the line or pass by the structure
- stay on the phone to the signaller until everyone has crossed the line or passed by the structure
- make sure that everyone is in a position of safety.

You must then tell the signaller that the group is clear of any line.

## **3 Work that needs the line to be blocked**

### **3.1 Work group at risk from trains**

If the activity could be carried out using lookout or equipment warning but neither is available, the line concerned must be blocked or another safe system used.

## **3.2 Work affecting the safety of the line**

Unless specifically allowed in your company instructions, you must consider the following as types of work that affect 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 2 metres (6 feet 6 inches) of the line.
- Using a road vehicle within 2 metres (6 feet 6 inches) 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.

### 3.3 Before starting work

You must not start or allow your group to start work as shown in section 3.1 or 3.2 unless the line concerned is blocked by one of the following methods.

- You have blocked the line as shown in handbook 8 or the line has been blocked by a protection controller (PC) and you have agreed a safe system of work with that PC as shown in handbook 8.
- Your site of work is within an engineering supervisor's (ES) or safe work leader's (SWL) work site and you have agreed the safe system of work with the ES or SWL as shown in handbook 9.
- Your site of work is within an engineering supervisor's (ES) or safe work leader's (SWL) protection zone and you have agreed the safe system of work with the ES or SWL, as shown in handbook 12.
- 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 9.

### 3.4 Placing possession protection

You may place detonator protection for a possession as long as the PICOP has assured you that the protecting signal for the line concerned has been placed to danger or the route has been closed.

You may place work-site marker boards for a work site within a possession as long as the ES or SWL has given you permission to do so.

## 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, or
- you are replaced by another COSS or an SWL.

### 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.

**Equipment warning** - where there is equipment provided to give enough warning to allow everyone involved to reach a position of safety before any train arrives at the site of work.

**Lookout warning** - where one or more lookouts are positioned to provide enough warning to allow everyone involved to reach a position of safety before any train arrives at the site of work.

### **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 4.4, 4.5, 4.6, 4.7 or 4.8 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 no body 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.
- The line or lines concerned have been blocked by a PC and you have agreed a safe system of work with that PC as shown in handbook 8.
- Your site of work is within an ES or SWL's work site and you have agreed the safe system of work with the ES or SWL, as shown in handbook 9 or handbook 9 ERTMS.
- Your site of work is within an ES or SWL's protection zone and you have agreed the safe system of work with the ES or SWL, as shown in handbook 12.
- Your site of work is within a siding and you have agreed the safe system of work with the PICOS, as shown in handbook 9 or handbook 9 ERTMS.

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 2 metres (6 feet 6 inches) 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.

**Note:** A rigid or tensioned barrier placed at 0.9 metres (3 feet) from an open line along with automatic track warning system (ATWS) is sometimes used when on-track plant is being used close to an open line. You must not use a barrier at this distance as part of your safe system of work.

**4.6 Safe system of work (separated)**

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 armlet 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 test the warning before allowing work to start.

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 2 metres (6 feet 6 inches) to the nearest running rail of the open line.

## **4.7 Safe system of work using ATWS, TOWS or LOWS (equipment warning)**

If there is an automatic track warning system (ATWS), train operated warning system (TOWS) or lookout operated warning system (LOWS), you can use this equipment to give warning of approaching trains as long as all of the following conditions apply.

- You or a member of your group are competent to use the equipment at that location.
- The equipment will provide an adequate warning of all approaching trains on the line or lines concerned.
- You and all members of the group will be able to stop work and reach the position of safety at least 10 seconds before the train arrives.

You must test the warning before allowing work to start.

If the equipment is already in use when you arrive, you must reach a clear understanding with the other person using it so that you each know what is happening.

When leaving the site of work, you must agree with anyone else using the equipment whether or not to leave the equipment in use.

## **4.8 Safe system of work using lookouts (lookout warning)**

### **Conditions**

You may set up a safe system of work using one or more lookouts as long as all of the following conditions apply.

- There is no realistic alternative safe system of work that can be used.
- Using lookouts at that location is not prohibited.
- You do not act as a lookout.
- There will be no need for anyone to cross more than two open lines to reach the position of safety.
- The group will not need to walk more than 25 metres (approximately 25 yards) along the line to reach the position of safety.
- The warning time needed is not more than 45 seconds.
- The warning time will be enough for everyone in the group to stop work and to then reach the position of safety at least 10 seconds before any train arrives (this is called the required warning time).

## **Arranging lookouts**

You must make sure each lookout:

- knows the direction and lines that need to be watched for approaching trains
- is not distracted
- takes no part in the actual work
- has no other duties.

You must check that each lookout is competent and is correctly wearing a lookout armlet or badge.

You must position site lookouts so that:

- any train approaching can clearly be seen
- the required warning time is available (use distant and intermediate lookouts if necessary)
- the warning will be received by everyone in the group (if necessary, use more than one site lookout).

On single or bi-directional lines, or when single line working is taking place, you must make sure enough warning is given for both directions.

You must test the warning before allowing work to start.

## **Deciding what is an approaching train**

In deciding which lines the lookout needs to watch for approaching trains, you must consider all of the following.

- a) A line on which the group is walking or working.
- b) A line adjacent to a) that could also put anyone in the group in danger.

- c)** A line that has to be crossed to reach the position of safety.
- d)** A line on which a train could be routed towards a), b), or c) from any direction.
- e)** A line where, at the required sighting distance, it is not possible to tell whether a train is on a line shown in a) to d) above.

**Note:** A lookout is not needed for an adjacent line, as shown in b) above, if a train approaching on the adjacent line cannot put the group in danger, for example where the group will not pass beyond the six-foot rail.

### **Using distant and intermediate lookouts**

If the site lookout cannot achieve enough sighting to provide the required warning time, you may appoint distant and intermediate lookouts as long as the following conditions apply.

- It is daylight with clear visibility.
- Not more than one distant and one intermediate lookout is used in any direction.

You must make sure that any distant or intermediate lookouts are located in a position of safety.

However, if the site of work is mobile and the intermediate and distant lookouts will walk while carrying out their duties, they may leave the position of safety when they need to pass an obstruction.

You must make sure the distant lookout or intermediate lookout communicate correctly with each site lookout by using the blue and white chequered flags.

## **Method of warning used by a site lookout**

You must choose the warning to suit the type of work and the location from:

- a horn
- a whistle
- a touch.

You may, if necessary, also get the lookout to shout.

## **When a site lookout gives the warning**

You must make sure everyone goes to the position of safety when the warning is given.

If someone does not immediately stop work and go to the position of safety, the lookout will give an urgent warning.

Make sure tools and equipment are taken to the position of safety, unless they are too heavy to be moved by the slipstream of a passing train and are left clear of the line.

## **Working out the required warning time**

You must consider how long it will take to stop work and place any tools or equipment down and how long it will take to get to the position of safety.

You may take into account an emergency speed restriction (ESR) or temporary speed restriction (TSR) as long as it has been imposed for the work.

You must add the following:

- 5 seconds for each additional direction the site lookout will be looking
- 5 seconds for each distant lookout
- 5 seconds for each intermediate lookout.

You must then add 10 seconds to be in the position of safety before the train arrives.

Use the sighting distance chart, shown at the back of this handbook, to work out the required sighting distance needed for your safe system of work.

You must not use lookouts as your safe system if:

- they cannot achieve the required sighting distance
- the warning time needed is more than 45 seconds
- the number of lookouts needed is not available.

### **Using lookouts during darkness, poor visibility or when in or near a tunnel**

You may use lookouts during darkness, poor visibility or when in or near a tunnel as long as:

- the speed of approaching trains is no greater than 20 mph (30 km/h)
- the site lookout has enough sighting distance available
- you do not need to use a distant lookout or an intermediate lookout.



## 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 they are using equipment warning, the method of warning and the position of safety
- if they are using 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 (RT9909).

## 6 Visitor permits

If a person is issued with a 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 concerned must give you a document telling you that their visit onto the operational railway has been approved.

You must:

- brief the person on the safe system of work
- sign and keep the visitor permit
- stay with the person until they leave the operational railway.

### Aid to working out warning times

	Up	Down
Maximum speed (from the Sectional Appendix or TSR or ESR)		
Time needed to stop work and down tools		
Time needed for everyone to reach a position of safety		
Add 5 seconds for each additional direction the site lookout is looking		

	<b>Up</b>	<b>Down</b>
Add 5 seconds for each distant lookout		
Add 5 seconds if working alone		
Add 5 seconds for each intermediate lookout		
Add 10 seconds (minimum time to be in a position of safety)	10	10
Total warning time needed (Must be no more than 45 secs)		
Sighting distance needed		
Sighting distance available		



## Sighting distance chart (in metres) mph

Sighting distance chart (in metres) mph

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
60 mph	450m	550m	700m	850m	950m	1100m	1250m
55 mph	400m	500m	650m	750m	900m	1000m	1150m
50 mph	340m	500m	600m	680m	800m	900m	1050m
45 mph	320m	420m	520m	620m	720m	820m	920m
40 mph	280m	360m	460m	540m	640m	720m	820m
35 mph	240m	320m	400m	480m	560m	640m	720m
30 mph	220m	280m	340m	420m	480m	540m	620m
25 mph	180m	240m	280m	340m	400m	460m	520m
20 mph	140m	180m	240m	280m	320m	360m	420m
15 mph	120m	160m	180m	220m	240m	280m	320m
10 mph	80m	100m	120m	140m	160m	180m	220m
5 mph	40m	60m	60m	80m	80m	100m	120m

**Sighting distance chart (in metres) km/h****Sighting distance chart (in metres) km/h**

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
200 km/h	900m	1200m	1400m	1700m	2000m	2300m	2600m
195 km/h	900m	1100m	1400m	1650m	1900m	2200m	2500m
185 km/h	800m	1100m	1300m	1550m	1800m	2100m	2400m
175 km/h	800m	1000m	1300m	1500m	1800m	2000m	2300m
170 km/h	800m	1000m	1200m	1450m	1700m	1900m	2200m
160 km/h	700m	900m	1200m	1350m	1600m	1800m	2050m
155 km/h	650m	850m	1100m	1300m	1500m	1700m	1950m
145 km/h	650m	850m	1050m	1250m	1450m	1700m	1850m
135 km/h	600m	800m	950m	1150m	1350m	1600m	1750m
130 km/h	550m	750m	900m	1100m	1300m	1500m	1650m
120 km/h	550m	700m	850m	1050m	1200m	1400m	1550m
115 km/h	500m	650m	800m	950m	1100m	1300m	1450m
105 km/h	450m	600m	750m	900m	1050m	1200m	1350m

**Sighting distance chart (in metres) km/h****Sighting distance chart (in metres) km/h**

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
95 km/h	450m	550m	700m	850m	950m	1100m	1250m
90 km/h	400m	500m	650m	750m	900m	1000m	1150m
80 km/h	340m	500m	600m	680m	800m	900m	1050m
70 km/h	320m	420m	520m	620m	720m	820m	920m
65 km/h	280m	360m	460m	540m	640m	720m	820m
55 km/h	240m	320m	400m	480m	560m	640m	720m
50 km/h	220m	280m	340m	420m	480m	540m	620m
40 km/h	180m	240m	280m	340m	400m	460m	520m
30 km/h	140m	180m	240m	280m	320m	360m	420m
25 km/h	120m	160m	180m	220m	240m	280m	320m
15 km/h	80m	100m	120m	140m	160m	180m	220m
10 km/h	40m	60m	60m	80m	80m	100m	120m

## Sighting distance chart (in miles and yards)

Maximum Speed	Sighting distance, in miles (m) and yards (y), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
125 mph	920y	1240y	1540y	1m80y	1m380y	1m700y	1m1000y
120 mph	1½ mile	1180y	1480y	1 mile	1m300y	1m600y	1½ mile
115 mph	860y	1140y	1420y	1700y	1m220y	1m500y	1m780y
110 mph	820y	1080y	1360y	1620y	1m140y	1m400y	1m660y
105 mph	780y	1040y	1300y	1540y	1m40y	1m300y	1m560y
100 mph	740y	980y	1240y	1480y	1720y	1m200y	1¼ mile
95 mph	700y	940y	1180y	1400y	1640y	1m100y	1m340y
90 mph	660y	1½ mile	1100y	¾ mile	1540y	1 mile	1m220y
85 mph	640y	840y	1040y	1260y	1460y	1680y	1m120y
80 mph	600y	800y	980y	1180y	1380y	1580y	1 mile
75 mph	560y	740y	920y	1100y	1300y	1480y	1660y
70 mph	520y	700y	860y	1040y	1200y	1380y	1540y
65 mph	480y	640y	800y	960y	1120y	1280y	1440y



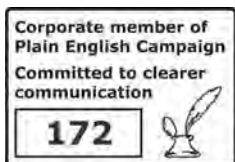
**Sighting distance chart (in miles and yards)**

Maximum Speed	Sighting distance, in miles (m) and yards (y), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
60 mph	1 <sup>4</sup> mile	600y	740y	1 <sup>1</sup> <sub>2</sub> mile	1040y	1180y	1 <sup>3</sup> <sub>4</sub> mile
55 mph	420y	540y	680y	820y	960y	1080y	1220y
50 mph	380y	500y	620y	740y	860y	980y	1100y
45 mph	340y	1 <sup>1</sup> <sub>4</sub> mile	560y	660y	780y	1 <sup>1</sup> <sub>2</sub> mile	1000y
40 mph	300y	400y	500y	600y	700y	800y	1 <sup>1</sup> <sub>2</sub> mile
35 mph	260y	360y	1 <sup>1</sup> <sub>4</sub> mile	520y	600y	700y	780y
30 mph	220y	300y	380y	1 <sup>1</sup> <sub>4</sub> mile	520y	600y	660y
25 mph	200y	260y	320y	380y	1 <sup>1</sup> <sub>4</sub> mile	500y	560y
20 mph	160y	200y	260y	300y	360y	400y	1 <sup>1</sup> <sub>4</sub> mile
15 mph	120y	160y	200y	220y	260y	300y	340y
10 mph	80y	100y	140y	160y	180y	200y	220y
5 mph	40y	60y	80y	80y	100y	100y	120y

## Notes

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# GERT8000-HB8 Rule Book

## Handbook 8

IWA, COSS or PC  
blocking a line

Issue 7



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# **1 Arranging to block a line**

## **1.1 When a line must be blocked**

If as described in handbook 6 or 7, it is necessary to block a line, as long as there are no trains or on-track plant (OTP) involved on the line concerned, you must carry out the instructions shown in this handbook.

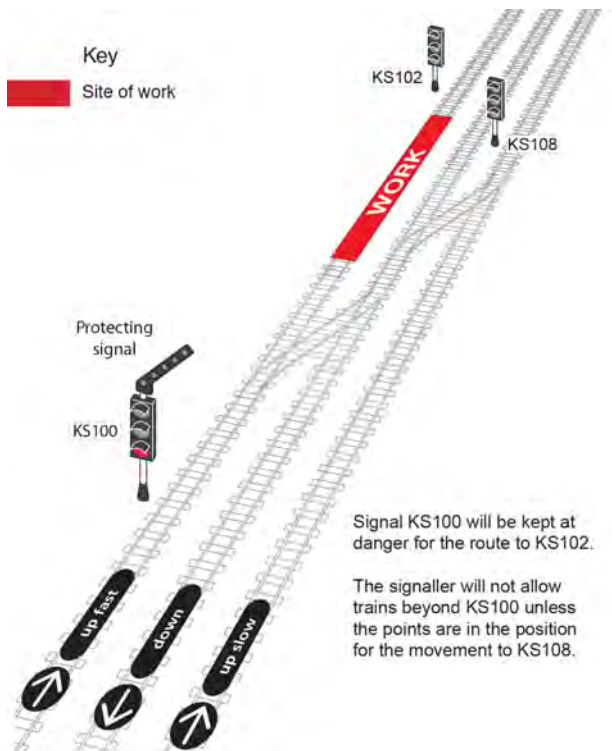
However, if you are to work in a possession, you must carry out the instructions shown in handbook 9 or handbook 9 ERTMS.



## 1.2 Agreeing the arrangements

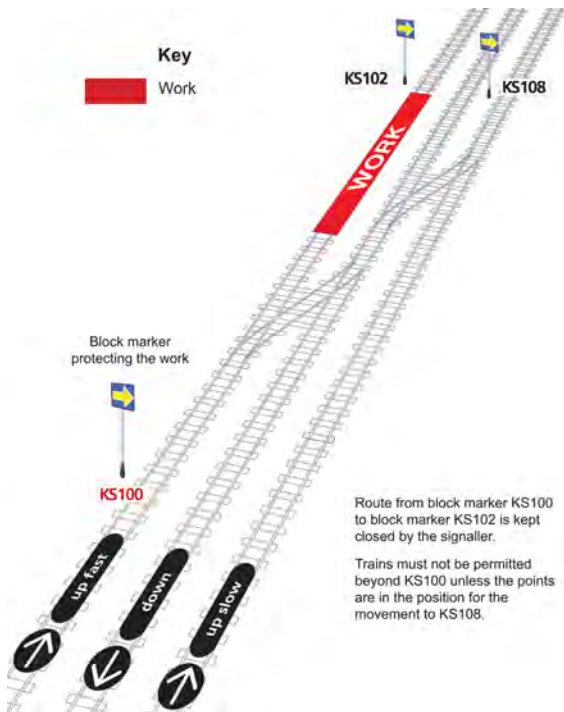
You must agree all of the following with the signaller.

- The line to be blocked.
- The nature of the work.
- The locations between which the work will take place.
- The amount of time needed to do the work.
- The time after which permission can be given for the line blockage to start.
- Which signals will be kept at danger or block markers at which the route will be closed to protect the activity, including those in both directions on a single or bi-directional line.
- Any additional protection needed.
- If the work will take place beyond points that need to be used for train movements.
- The arrangements if single line working is taking place.
- The arrangements to apply at each level crossing.



**Diagram HB8-1**

**Work taking place beyond points that will be used**



**Diagram HB8-2**

**Work taking place beyond points that will be used**

### **1.3 Working beyond points**

If the work will take place beyond points that need to be used for train movements, as shown in diagram HB8-1 or diagram HB8-2, the signaller will not allow a train to approach those points unless they are in the correct position to protect the work.

### **1.4 Working close to the protecting signal or protecting block marker**

Normally your site of work must not be closer than 200 metres to the protecting signal or block marker. If work that will affect the safety of the line must be done within this distance, you must tell the signaller and the following must apply.

- The previous signal must be kept at danger or the route closed at the previous block marker.
- Trains may go beyond that signal only as shown in diagram HB8-3 or diagram HB8-5.
- Trains may go beyond that block marker only as shown in diagram HB8-4 or diagram HB8-6.

## 2 Blocking the line

### 2.1 Recording the details

You must complete a line-blockage form (NR3180).

You must read your entry to the signaller to confirm that it is correct.

The signaller will tell you when the protecting signal has been placed to danger or the route closed at the protecting block marker and will confirm that the signal will be kept at danger or the route kept closed.

You must then arrange for the additional protection if it is necessary.

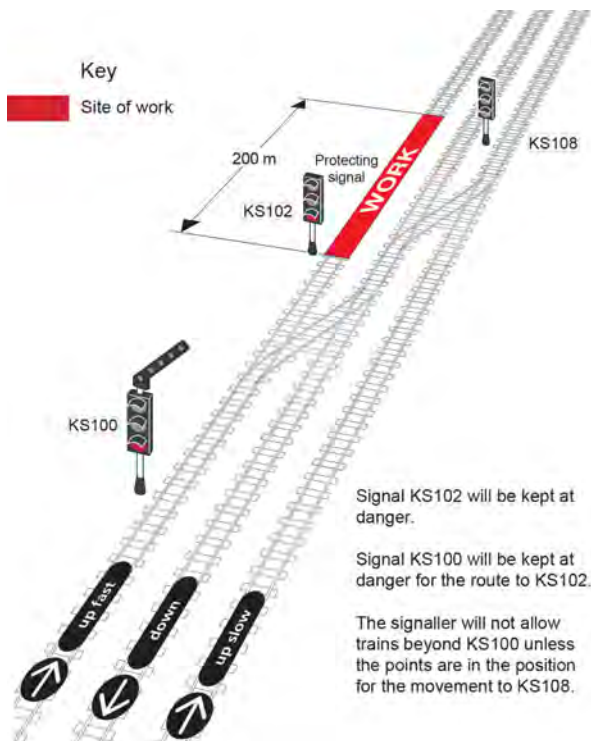
### 2.2 Additional protection

You must arrange for at least one of the following additional protection arrangements, as shown in section 2.3 to 2.7, to be provided on the line to be blocked whenever this is possible. However, you must always do so if the work will affect the safety of the line.

You must agree with the signaller what additional protection will be provided. The signaller will not give you an authority number until the additional protection is in place.

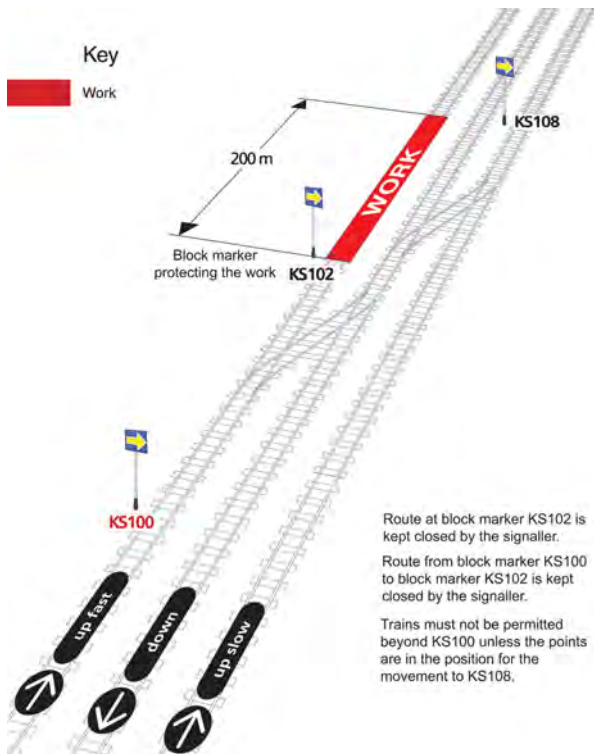
### 2.3 Disconnecting signalling equipment

You must ask the signaller to arrange for signalling equipment to be disconnected by the signalling technician to protect the line that is to be blocked.



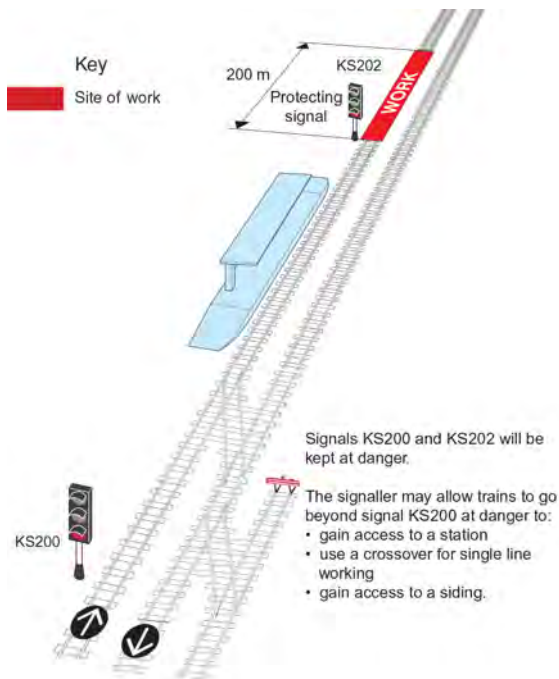
**Diagram HB8-3**

**Work taking place close to the protecting signal**



**Diagram HB8-4**

**Work taking place close to the protecting block marker**



### Diagram HB8-5

#### Work taking place close to the protecting signal





### Site of work

200 m

Block marker  
protecting the work

KS202

KS200

Routes at KS200 and KS202 will be kept closed.

You may allow trains to go beyond block marker KS200 to:

- gain access to a station
- use a crossover for single line working
- gain access to a siding.

### Work taking place close to the protecting block marker

## **2.4 Using a track circuit operating device**

Where authorised in the *Sectional Appendix*, you can use a track circuit operating device (T-COD) as long as the signalling equipment is working normally.

The work that is to be carried out must not affect the correct operation of the track circuit concerned.

You must get the signaller's permission before a T-COD is placed on the line.

You must tell the signaller when the T-COD has been applied.

## **2.5 A single line staff or token**

You must get the staff or token from the signal box or from the token instrument not at a signal box.

You must follow local instructions if the signal box closes and the staff or token is needed or when it is returned.

## **2.6 Detonator protection**

You must arrange for detonator protection to be placed at the protecting signal or block marker or clear of any points or through crossings beyond.

You must do this in both directions if:

- you are working on a single or bi-directional line
- single line working is in operation on the line concerned.

## 2.7 Engineering possession reminder (EPR)

Where authorised in the *Sectional Appendix*, you must ask the signaller to apply the EPR to protect the line that is to be blocked.

## 3 Granting the line blockage

The signaller will not grant the line blockage to you until the portion of line concerned is clear of all trains unless one of the following applies:

- Where authorised, you and the signaller can be sure that all trains have passed beyond your site of work.
- A train has become disabled, or is at a stand, and will make no further movements until the line blockage is given up.

When you are both sure that the details on your line-blockage form 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 NR3180 form. You may now treat the line blockage as granted.

## 4 During the line blockage

### 4.1 Protection at the site of work

When you have been given the authority number, you must place a red flag or red light on the approach to the site of work if:

- the work will affect the safety of any approaching train, or
- a group is working.

You must make sure that the red flag or red light is placed in the four-foot where it will be clearly visible to the driver of a train approaching on that line.

You must do this in both directions if:

- you are working on a single or bi-directional line
- single line working is in operation on the line concerned.

### 4.2 Handing over to another COSS or an SWL

When handing over to another COSS or an SWL, you must explain the details of the line blockage to the new COSS or SWL and give them the NR3180 form.

The new COSS or SWL must sign the NR3180 form.

## **5 Giving up or suspending the line blockage**

### **5.1 When the line blockage is to be given up or suspended**

When the line blockage is to be given up or is to be suspended, you must:

- make sure that any work that is to continue does not need a line blockage
- remove any red flag or red light that has been placed in the four-foot.
- remove any additional protection arrangements as shown in section 2 of this handbook.

If you have the staff or token as shown in section 2.5, you must:

- return the staff or token to the signal box at either end of the section, or
- return the token to an instrument that is not at a signal box.

You must then tell the signaller your name, the authority number and that the line blockage is no longer needed or is suspended.

If additional protection was provided by a disconnection as shown in section 2.3, after you have told the signaller that the line blockage is no longer needed or suspended, you must ask the signaller to get the signalling technician to reconnect the equipment.

## **5.2 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.

## **5.3 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 handbook.

The signaller will give you a new authority number, but you can continue to use the same NR3180 form.

However, if the line to be blocked or the protection arrangements are different, you must complete a new NR3180 form.

## **6 Role of the protection controller**

If there are two or more COSSs, IWAs or SWL who need a line blockage at the same place and same time, a protection controller (PC) must be appointed to take overall control of the shared line blockage.

The PC must wear an armlet on the left arm, or a badge on the upper body with PC in green letters on a white background.

The PC must carry out the instructions shown for the COSS in this handbook.

The PC must hold the NR3180 form and explain the details of the line blockage to each COSS, IWA or SWL who is to share the protection arrangements.

The COSS, IWA or SWL must sign the NR3180 form unless it has been previously planned that it will not be necessary and the COSS, IWA, PC or SWL are aware of what is to happen.

The PC must not give up the line blockage until each COSS, IWA or SWL has confirmed they no longer need the line blockage.

The COSS, IWA or SWL must sign the NR3180 form unless it has been previously planned that it will not be necessary and the COSS, IWA, PC or SWL are aware of what is to happen.

When a COSS or SWL hands over to another COSS or SWL, the new COSS or SWL must give their name to the PC.

If the PC hands over to another PC, the new PC must give their name to each COSS, IWA and SWL using the line blockage.

## Notes



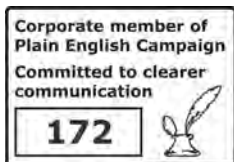
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# GERT8000-HB9 Rule Book

## Handbook 9

### IWA or COSS setting up safe systems of work within possessions

#### Issue 7



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Crystal  
Mark  
19450

Clarity approved by  
Plain English Campaign



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# 1 Definitions

## 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.

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).

## Work site

A work site is the portion of line within a possession of a running line where work will take place and usually has a work-site marker board at each end.

Each work site is under the control of an engineering supervisor (ES) or safe work leader (SWL). The ES or SWL is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The ES or SWL is also responsible for authorising every IWA or COSS to set up their safe system of work within the work site.



## 2 General

Before you, or you and your group, carry out any work within a possession you must first set up a safe system of work as shown in this handbook.

## 3 Working within a work site

### 3.1 Agreeing the site of work with the ES or SWL

Before starting work or allowing work to start in a work site, you must agree with the ES or SWL:

- the limits of your site of work
- the nature of the work
- the safe system of work you will use.

You must receive a work-site briefing from the ES or SWL and then sign the work-site certificate (RT3199).

### 3.2 Agreeing the arrangements before the work site is granted

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the ES or SWL are aware of what is to happen.

You may reach the agreement with the ES or SWL, receive the work-site briefing and sign the RT3199 form, as shown in section 3.1, before the work site is granted.

You must not allow work to start until the ES or SWL has told you that the work site has been granted and has given you an authority number.

You must record the authority number.

### **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 ES or SWL 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 no greater than 5 mph (10 km/h).

You must make sure that any other line at your site of work that is not inside the work site is blocked as shown in section 3.2 of handbook 6 or 3.3 of handbook 7.

### **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 in section 2.3 of handbook 6 or section 4.5 of handbook 7 between your site of work and any open line.

You must also:

- reach a clear understanding with the ES or SWL 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 no greater than 5 mph (10 km/h).

### **3.5 Safe system of work (separated)**

Before you can treat your safe system of work as separated, you must carry out the instructions shown in section 4.6 of handbook 7 for any adjacent open line.

You must also:

- reach a clear understanding with the ES or SWL 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 no greater than 5 mph (10 km/h).

A person acting as an IWA cannot use a site warden as part of this safe system of work.

### **3.6 Safe system of work using equipment warning**

You can use equipment warning for the lines open to traffic as long as it will provide an adequate warning of each train approaching on the line or lines concerned.

This safe system of work must not be used on any line within the work site.

### **3.7 Safe system of work using lookouts (lookout warning)**

You may use lookout warning as described in handbook 7 for any line within the work site.

During daylight, you may use a maximum speed of 25 mph (40 km/h) for the lines within the work site.

However, you must provide lookout protection in all directions.

A person acting as an IWA cannot use this safe system of work.

During darkness, poor visibility, or when in or near a tunnel, you may only use lookout warning if all the following conditions apply.

- The ES or SWL agrees that all movements within the work site will be 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.

A person acting as an IWA cannot use this safe system of work.

### **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 ES or SWL that movements will be made at no greater than 5 mph (10 km/h), you must make sure you, and your group if you have one, are in a safe position before any movement passes through your site of work.

### **3.9 When protection from the ES or SWL is no longer needed**

When you, and your group if you have one, are no longer on or near the line, or you are sure the work may safely continue without the protection provided by the ES or SWL, you must tell the ES or SWL and sign the RT3199 form.

### **3.10 When protection is no longer needed and the ES or SWL is to be advised by telephone**

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the ES or SWL are aware of what is to happen.

When you, and your group if you have one, are no longer on or near the line, or you are sure the work may safely continue without the protection provided by the ES or SWL, you must tell the ES or SWL that you no longer need protection, stating:

- your name
- the location of your work
- your authority number.

## **4 Working outside a work site**

### **4.1 Protection arrangements**

If your site of work is to be within a possession but outside a work site, you cannot treat your safe system of work as safeguarded.

You cannot treat your safe system of work as fenced or site-warden protected if this would involve the movement of trains or OTP to be stopped on any line that is under possession.

### **4.2 Working with the PICOP's authority**

This safe system of work can only be used if it has been planned and the PICOP is aware of what is to happen.

Before you allow work to start, you must contact the PICOP and agree:

- the lines under possession
- the limits of the area under the control of the PICOP
- the line you want to work on
- the time the possession is to be given up.

You must then ask for permission from the PICOP to use the possession arrangements to provide a speed restriction of 25 mph (40 km/h).

If you are a COSS and the PICOP agrees that you may use the possession arrangements, you must record this on the safe-work briefing form (RT9909).

If you are a COSS, as long as you are sure the agreed arrangements will provide enough warning time, you must set up warning arrangements using a maximum speed of 25 mph (40 km/h) in both directions for the lines under possession only.

If you are an IWA, you must be able to look up often enough in both directions to see any train approaching.

You must make sure your work is completed before the time the possession is to be given up.

When the work is completed, you must tell the PICOP that you no longer need to use the possession arrangements. If you are a COSS, you must record this on the safe-work briefing form.

You cannot use this safe system of work during darkness, poor visibility or when in or near a tunnel.

### **4.3 Working without the PICOP's authority**

If you are to work within a possession but without the PICOP's authority, you must not rely on the possession arrangements for your protection.

You must set up suitable warning arrangements using the maximum speed. You must be aware that trains can approach in either direction on all lines that are under possession.

## **5 Working in a siding**

If it is necessary to block one or more sidings for the work to take place, you must not allow that work to start until the PICOS has given you permission to do so.

If you are competent to do so, you may be the PICOS.



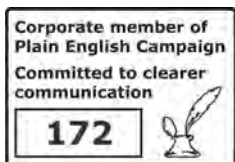
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## **Notes**

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GE/RT8000/HB9 ERTMS  
Rule Book

# Handbook 9 ERTMS

## Handbook 9

**IWA or COSS setting up  
safe systems of work  
within possessions on  
ERTMS lines where  
lineside signals are not  
provided**

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# 1 Definitions

## 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.

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).

## Work site

A work site is the portion of line within a possession of a running line where work will take place and has a work site marker board (WSMB) at each end.

Each work site is under the control of an engineering supervisor (ES) or safe work leader (SWL). The ES or SWL is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The ES or SWL is also responsible for authorising every IWA and COSS to set up their safe system of work within the work site.



## 2 General

Before you, or you and your group, carry out any work within a possession you must first set up a safe system of work as shown in this handbook.

## 3 Working within a work site

### 3.1 Agreeing the site of work with the ES or SWL

Before starting work or allowing work to start in a work site, you must agree with the ES or SWL:

- the limits of your site of work
- the nature of the work
- the safe system of work you will use.

You must receive a work-site briefing from the ES and then sign the work-site certificate (RT3199 ERTMS).

### 3.2 Agreeing the arrangements before the work site is granted

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the ES or SWL are aware of what is to happen.

You may reach the agreement with the ES or SWL, receive the work-site briefing and sign the RT3199 ERTMS, as shown in section 3.1, before the work site is granted.

You must not allow work to start until the ES or SWL has told you that the work site has been granted and has given you an authority number.

You must record the authority number.

### **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 ES or SWL 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 work, they will be made at extreme caution and no greater than 10 km/h (5 mph).

You must make sure that any other line at your site of work that is not inside the work site is blocked as shown in section 3.2 of handbook 6 or 3.3 of handbook 7.

### **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 in section 2.3 of handbook 6 or section 4.5 of handbook 7 between your site of work and any open line.

You must also:

- reach a clear understanding with the ES or SWL 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 10 km/h (5 mph).

### **3.5 Safe system of work using site wardens (site-warden protected)**

Before you can treat your safe system of work as site-warden protected, 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 ES or SWL 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 10 km/h (5 mph).

A person acting as an IWA cannot use this safe system of work.

### **3.6 Safe system of work using equipment warning**

You may use equipment warning for the lines open to traffic as long as it will provide an adequate warning of each train approaching on the line or lines concerned.

This safe system of work must not be used on any line within the work site.

### **3.7 Safe system of work using lookouts (lookout warning)**

You may use lookout warning as described in handbook 7 for any line within the work site.

During daylight, you may use a maximum speed of 40 km/h (25 mph) for the lines within the work site.

However, you must provide lookout protection in all directions.

A person acting as an IWA must not use this safe system of work.

During darkness, poor visibility, or when in or near a tunnel, you may only use lookout warning if all the following conditions apply.

- The ES or SWL agrees that all movements within the work site will be made at no more than 30 km/h (20 mph).
- The maximum speed of trains on any open line is no greater than 30 km/h (20 mph).
- Only site lookouts are needed to achieve the sighting distance.

A person acting as an IWA must not use this safe system of work.

### **3.8 When your safe system of work includes movements at no greater than 10 km/h (5 mph)**

If you have agreed with the ES or SWL that movements will be made at no greater than 10 km/h (5 mph), you must make sure you, and your group if you have one, are in a safe position before any movement passes through your site of work.

### **3.9 When protection from the ES or SWL is no longer needed**

When you, and your group if you have one, are no longer on or near the line or you are sure the work can safely continue without the protection provided by the ES or SWL, you must tell the ES or SWL and sign the RT3199 ERTMS certificate.

### **3.10 When protection is no longer needed and the ES or SWL is to be advised by telephone**

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the ES or SWL are aware of what is to happen.

When you, and your group if you have one, are no longer on or near the line, or you are sure the work may safely continue without the protection provided by the ES or SWL, you must tell the ES or SWL that you no longer need protection, stating:

- your name
- the location of your work
- your authority number.

## **4 Working outside a work site**

### **4.1 Protection arrangements**

If your site of work is to be within a possession but outside a work site, you cannot treat your safe system of work as safeguarded.

You cannot treat your safe system of work as fenced or site-warden protected if this would involve the movement of trains or OTP to be stopped on any line that is under possession.

### **4.2 Working with the PICOP's authority**

This safe system of work can only be used if it has been planned and the PICOP is aware of what is to happen.

Before you allow work to start, you must contact the PICOP and agree:

- the lines under possession
- the limits of the area under the control of the PICOP
- the line you want to work on
- the time the possession is to be given up.

You must then ask for permission from the PICOP to use the possession arrangements to provide a speed restriction of 40 km/h (25 mph).

If you are a COSS and the PICOP agrees that you may use the possession arrangements, you must record this on the safe-work briefing form (RT9909).

If you are a COSS, as long as you are sure the agreed arrangements will provide enough warning time, you must set up warning arrangements using a maximum speed of 40 km/h (25 mph) in both directions for the lines under possession only.

If you are an IWA, you must be able to look up often enough in both directions to see any train approaching. You must make sure your work is completed before the time the possession is to be given up.

When the work is completed, you must tell the PICOP that you no longer need to use the possession arrangements. If you are a COSS, you must record this on the RT9909 form.

You cannot use this safe system of work during darkness, poor visibility or when in or near a tunnel.

### **4.3 Working without the PICOP's authority**

If you are to work within a possession but without the PICOP's authority, you must not rely on the possession arrangements for your protection.

You must set up suitable warning arrangements using the maximum speed. You must be aware that trains can approach in either direction on all lines that are under possession.

## **5 Working in a siding**

If it is necessary to block one or more sidings for the work to take place, you must not allow that work to start until the PICOS has given you permission to do so.

If you are competent to do so, you may be the PICOS.



## **Notes**

## **Notes**



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GE/RT8000/HB10  
Rule Book

# Handbook 10

## Handbook 10

### **Duties of the COSS or SWL and person in charge when using a hand trolley**

**Issue 4**  
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# 1 General

Unless it says otherwise in company instructions, the instructions in this handbook apply when using hand-controlled trolleys and other manually propelled equipment mounted on 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 charge of the trolley while it is in use.

A COSS or SWL must make sure the line is blocked before the trolley is placed on the line. The COSS or SWL can be the person in charge of the trolley.

Each trolley must be fitted with an operational fail-safe braking system. The correct brake handle must be used when operating the trolley.

A trolley must not pass over an axle counter head unless reset arrangements have been agreed.

## 2 Duties of the COSS or SWL

### 2.1 Making sure the line is blocked

If you are the COSS, you must make sure the line is blocked as shown in handbook 8, 9 or handbook 9 ERTMS and the necessary arrangements for the trolley have been made before you allow the trolley to be placed on the line.

If you are the SWL, you must make sure the line is blocked as shown in handbook 21 and the necessary arrangements for the trolley have been made before you allow the trolley to be placed on the line.



## **2.2 On a running line not under possession**

You must agree with the signaller the position any points must be in. You must not allow the trolley to pass any signal at danger or a block marker without the signaller's authority.

## **2.3 On a running line in a possession**

If you are a COSS working within a possession, you must agree with the ES or SWL when you can allow the trolley to be placed on the line.

## **2.4 Within a siding**

If working within a siding, you must not allow the trolley to be placed on the line until the necessary protection arrangements have been made.

## **2.5 Level crossings**

You must not allow the trolley to:

- pass over a manned level crossing unless the barriers are lowered or the gates are closed to road traffic and you are sure it is safe to do so
- come within the controls of an ABCL or AOCL
- come within the controls of an AHBC unless it is under local control
- pass over an AHBC unless it is under local control and the attendant displays a green handsignal
- pass over a level crossing which has red and green warning lights unless you have made sure it is safe to do so
- pass over a CCTV, OD or RC crossing without the signaller's authority.

### **3 Duties of the person in charge of the trolley**

The person in charge of the trolley must make sure that:

- the trolley's braking system has been tested and is in good order
- the COSS or SWL has given permission before the trolley is put on the line
- the trolley is not placed on or used on a line which has a gradient greater than 1 in 50, unless specially authorised in local instructions
- the trolley is correctly loaded
- the trolley is not overloaded
- no-one rides on the trolley
- the trolley, or its load, does not foul any other line
- the trolley has at least two people with it when moving and one of them must be in charge of the brake
- a red flag or red light is displayed on the trolley - the flag or light must be visible in both directions
- when not being used, the trolley is placed well clear of the line and if left unattended, the trolley must be secured so it cannot be moved.



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# GERT8000-HB11 Rule Book

## Handbook 11

### Duties of the person in charge of the possession (PICOP)

Issue 8



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# 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.

## **Machine controller (MC)**

The person with overall responsibility for the safe operation of OTP and will be identified by an armlet or badge with MACHINE CONTROLLER or MC in black letters on a white background.

When the MC is also competent as a crane controller, they will instead wear an armlet or badge with CRANE CONTROLLER or CC in black letters on a white background.

## **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.

## **Person in charge of the siding possession (PICOS)**

The person responsible for taking and supervising a possession of a siding.

## **Token**

Any single line token, staff or tablet.



## **Train**

This includes a light locomotive, self-propelled rail vehicle, on-track machine, an RRV in rail mode and an RMMM.

## **2 Competence and identification**

To act as the person in charge of the possession (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.

## **3 Possession details**

### **3.1 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*.

### **3.2 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.

Operations Control will be responsible for letting you and the signaller know about the details of any agreed changes.

## 4 Taking the possession

### 4.1 Confirming the details with the signaller

You must contact the signaller who controls the signal leading to the section of line that is to be taken under possession.

You must state the published possession reference if there is one and then confirm:

- the line that you will be taking under possession
- whether possession is to be taken around one or more trains
- the signals leading to the possession that will be kept at danger or block markers from which the route will be kept closed
- the details of any points or crossings that may be used for trains outside the possession
- the position any points within the possession must be placed in
- the arrangements to be applied for every level crossing within the possession
- the exact location of the detonator protection and whether this is less than the standard distance
- the time the possession is to be taken.

## **4.2 Taking possession around one or more engineering trains**

When the possession will be taken or lengthened 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 signal, block marker or flexible train arrival point (FTAP).

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.

There is no limit to the number of engineering trains a possession can be taken or extended around, as long as the details have been published for each train concerned.

## **4.3 Arranging the possession protection**

When the line concerned is clear, other than any trains at a stand as shown in section 4.2 above, the signaller will tell you when the signals leading to the possession are at danger or the routes closed.

You must then complete section 1 of your possession arrangements form (RT3198).

You must then read the details back to the signaller.

When the signaller is satisfied that the details are correct, you will be told that you can arrange for the possession protection to be placed.

You may then authorise protection to be carried out as shown in section 4.4, 4.5 or 4.7 and authorise each engineering supervisor (ES) or safe work leader (SWL) to set up the work site and, if necessary, place work-site marker boards (WSMB) as shown in section 6.2.

#### **4.4 Arranging detonator protection at the standard distance**

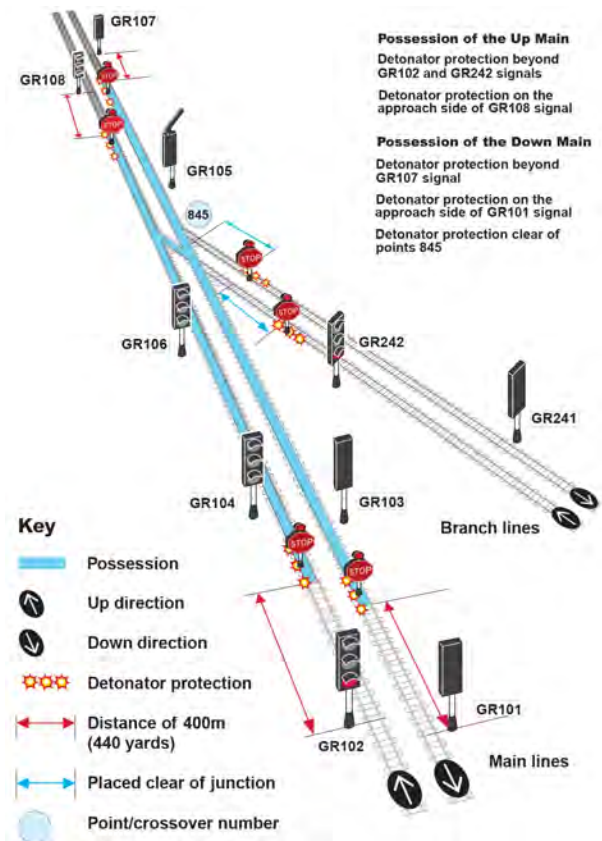
You must arrange for detonator protection to be placed as shown in diagram HB11.1, or where points are involved, diagram HB11.2.

You do not need to provide detonator protection:

- at a crossover, siding or loop where it joins the line under possession, or
- on a single line where you will have the token as protection.

Detonator protection consists of three detonators being placed on the same rail, 20 metres (approximately 20 yards) apart with a possession limit board (PLB) placed at the centre detonator.

If detonator protection is used on a single line, it must be placed at both ends as shown in diagram HB11.1 for signal GR102 or diagram HB11.2 for crossover 844.



**Diagram HB11.1**  
**Standard detonator protection**

## **4.5 If the standard distance is not possible**

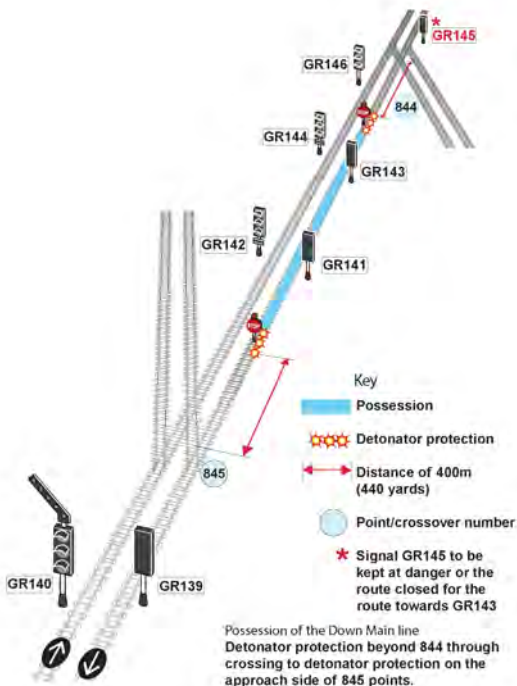
If, due to the work that is to take place, it is not possible to place the detonator protection at the standard distance as shown in diagram HB11.1 or diagram HB11.2, the following must apply.

- The detonator protection must be placed as close to the standard distance as possible.
- Any train movement approaching the detonator protection from within the possession must only be made as shown in section 8.12.

## **4.6 When all detonator protection has been placed**

When all detonator protection is in place, you must record the details on your RT3198 form and then tell the signaller.

When the signaller is satisfied the line concerned is correctly protected, the signaller will tell you that the possession is granted.



## Diagram HB11.2

### Standard detonator protection - points involved

## **4.7 Using the token as protection**

You do not need to arrange detonator protection on a single line if you use the token to provide protection.

You must get the token from the signal box or from a token instrument that is not at a signal box.

You must record the details on your RT3198 form.

You may now consider the possession granted.

You must keep the token until the possession is given up.

# **5 Arrangements for level crossings**

## **5.1 General**

You must not allow any train or OTP movement to take place, or any work to be carried out, that will affect the operation of any level crossing until the necessary arrangements have been put in place for that level crossing.

You must record on the RT3198 form the arrangements that are applied for each level crossing within the possession.

## **5.2 Automatic half barrier crossing (AHBC)**

You must make sure an attendant has been appointed and local control taken at each AHBC throughout the time the possession is in place.



## Exceptions

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls
- it is shown in the notices that the AHBC will be on local control only while it is affected by the work or train movements.

### **5.3 Automatic barrier crossing locally monitored (ABCL) and automatic open crossing locally monitored (AOCL)**

You must make sure the road traffic signals are switched off and the audible warnings disconnected at each ABCL and AOCL throughout the time the possession is in place.

You must also make sure the barriers are kept in the raised position at each ABCL.

## Exceptions

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls.

## **5.4 Barrier crossing with closed-circuit television (CCTV), barrier crossing with obstacle detection (OD) and remotely controlled crossing with barriers (RC)**

You must make sure an attendant has been appointed at each CCTV, OD and RC crossing throughout the time the possession is in place.

### **Exceptions**

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be trains passing normally in the right direction
- it is shown in the notices that a crossing attendant will be at the CCTV, OD or RC crossing only while it is affected by the work or train movements.

## **6 Work sites**

### **6.1 Setting up work sites**

You must not give permission for a work site to be set up or lengthened until any movement you have authorised has passed clear or has stopped short of the proposed work site.

### **6.2 Indicating each work site**

You must arrange to provide WSMBs if there are engineering trains or OTP within the possession.

You must arrange with the ES or SWL to place a WSMB in the 'four-foot' 100 metres (approximately 100 yards) from each end of the work site.

You must not allow a WSMB for one work site to be closer than 100 metres (approximately 100 yards) from the WSMB of another work site on the same line.

When the work site will be taken around a train, you must tell the ES or SWL the location of each train before you give permission to place the WSMBs.

You must record the exact location of each WSMB on your RT3198 form.

If a work site will be close to the detonator protection for the possession, the WSMB must normally be placed at least 100 metres (approximately 100 yards) from that detonator protection.

If, due to the work, a distance of 100 metres is not possible between the WSMB and the detonator protection, the WSMB must be placed at the detonator protection.

### **6.3 Allowing work to start inside the work site**

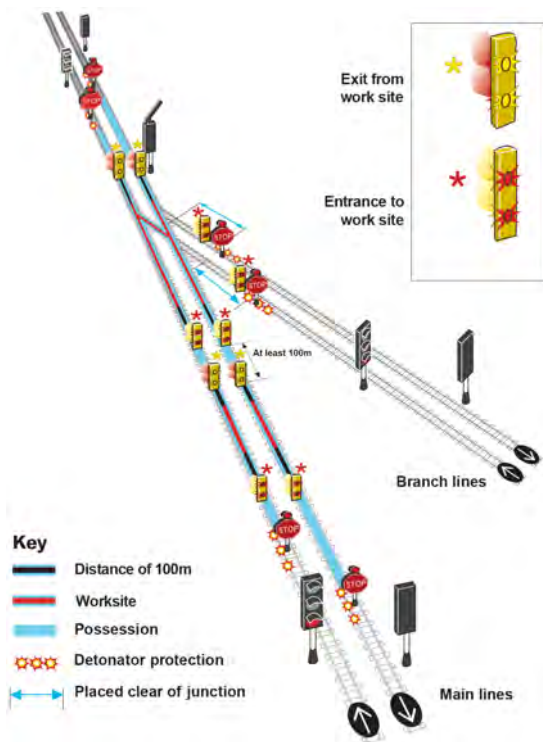
When the ES or SWL tells you the WSMB at each end of their work site is in position, you must dictate the details to the ES or SWL who will fill in a Work-site Certificate (RT3199).

You must include all details, including the arrangements made for each level crossing within that work site.

The ES or SWL 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 or SWL your full initials and authorise the work to start.

You must record the details on your RT3198 form.



**Diagram HB11.3**  
**Indication of work sites**

## **6.4 When a work site is suspended**

If the ES or SWL tells you the work site has been suspended but the WSMBs are to stay in place, you must record the details on your RT3198 form.

You must not allow a movement to pass a WSMB into a work site where work is suspended.

## **7 Allowing work outside a work site**

You may allow a COSS or IWA to set up a safe system of work that uses warning of approaching trains in the area between work sites or between the detonator protection and the work site.

You must make sure the COSS or IWA fully understands the details of the possession, including the time the possession is to be given up.

You must instruct each COSS or IWA that engineering trains or OTP may approach at any time and at a speed of up to 25 mph (40 km/h) in either direction on any line under possession.

You must record the details, including the name of each COSS or IWA, on your RT3198 form.

You must not give up the possession until each COSS or IWA involved has told you they no longer need to rely on the possession arrangements.

## 8 Train movements

### 8.1 General

#### Entering the possession

The signaller must keep the route closed and not clear any signal leading to the possession. The signaller will authorise the driver of each train entering the possession to pass the signal at danger or pass the end of authority (EoA) without a movement authority (MA) and proceed to the detonator protection.

The signaller will get your permission before doing this.

Only you can authorise train movements past the detonators into the possession or through points and crossings protecting the possession at an intermediate point.

If there is no detonator protection because you are using the token as protection, you must agree with the signaller the exact location the train must proceed to.

Only the ES or SWL can authorise a movement into a work site.

#### Points within the possession

If there are any unworked points within the possession, you must arrange for them to be secured if necessary, before a movement is made over them.

You must record the details on your RT3198 form.

Before you authorise any movement, you must make sure any points in the route are in the correct position.

If the MC with an item of OTP tells you that the OTP cannot be relied upon to operate train-operated points, you must make sure these points are correctly secured before authorising the OTP to pass over them in the trailing 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.

### **Signals and block markers within the possession**

The normal meaning of a proceed signal does not apply within a possession as the signalling is suspended.

However, drivers and MCs will not pass a signal at danger or a block marker without verbal authority.



You are responsible for giving this authority within the possession outside work sites and the ES or SWL is responsible for doing this within their work site.

### **Vehicles left outside a work site**

You must make sure a red light is showing at both ends of any vehicles stabled or detached outside a work site.

### **Recording details of movements**

You must record the time you authorise each movement. You must also record the time you are told when a movement has been completed.

## **8.2 Entering the possession at the detonator protection**

Before you give the signaller permission to let an engineering train proceed towards the detonator protection, you must make sure:

- the detonator protection is in place
- you have not authorised a conflicting movement.

You must not allow the detonator protection to be removed until the engineering train has stopped at it.

You must make sure that the detonator protection is replaced immediately after the engineering train has entered the possession.

When the detonator protection has been replaced you must tell the signaller.

### **8.3 Entering the possession at an intermediate point - between work sites**

Before you give the signaller permission to let an engineering train proceed from the protecting signal or block marker towards the possession, you must make sure:

- you or a competent person sent by you is at the intermediate point to give the 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, you must tell the signaller.

The signaller will then return the points to the agreed position.

### **8.4 Entering the possession at an intermediate point - directly into a work site**

Before you give the signaller permission to let an engineering train proceed from the protecting signal or block marker towards the possession, you must make sure:

- the ES or SWL, or a competent person sent by the ES or SWL, is positioned at the intermediate point to give the instructions to the driver
- you, the ES or SWL have not authorised a conflicting movement to take place.

Once the engineering train has entered the possession, you must get confirmation from the ES or SWL that it has entered the work site and is clear of the points or crossings concerned.

You must then tell the signaller that the engineering train is clear of the points or crossings at the intermediate point.

The signaller will then return the points to the agreed position.

## **8.5 Entering the possession from an adjacent siding under possession**

If a movement is to enter your possession from an adjacent siding under possession, you must first agree with the signaller and the person in charge of the siding possession (PICOS) how this is to be done.

If the movement is to pass directly from the siding under possession into the work site, you must make sure that:

- the ES or SWL, or a competent person sent by the ES or SWL, is positioned at the exit from the siding to give instructions to the driver
- you have not authorised a conflicting movement to take place.

## **8.6 Leaving a work site**

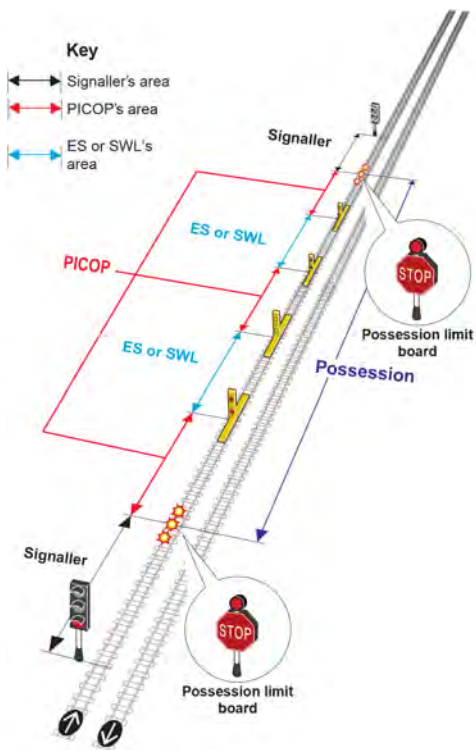
Only you can authorise a movement to leave a work site.

You must not allow the WSMB to be removed until the movement has stopped at it.

The WSMB must be replaced immediately the movement has passed beyond it.

Before you allow a train to proceed from the WSMB, you must make sure that:

- any previous movement authorised over that section of line has passed clear or is at a stand at the agreed stop signal, block marker or detonator protection
- you, or a competent person, tell the driver the exact location of the agreed stop signal, block marker or detonator protection or the exact location of any train waiting at the detonator protection.



**Diagram HB11.4**  
**Areas of responsibility**

## **8.7 Moving between detonator protection and the work site or between work sites**

Before you allow a train to proceed from the detonator protection or 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 WSMB
- you, or a competent person, tell the driver or MC the exact location of the next WSMB or the exact location of any train or vehicle waiting at that WSMB.

## **8.8 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.

## 8.9 Movement of multiple OTP

If more than one item of OTP is to travel in an area you control, you may allow them to travel at the same time as long as:

- the details are shown in the method statement
- any previous movement in that area has arrived at the other end or has been shunted clear at an intermediate point
- each MC involved in the movement is given the necessary instructions.

Once you have given authority for the movement to start, you must not allow any other movement in that section until all the OTP in the movement:

- have arrived at the WSMB at the other end of that section, or
- have been shunted clear.

## 8.10 Propelling

You must not allow any of the following movements to be propelled unless the details are published in the *Weekly Operating Notice* or *Engineering Notice* and are shown in the method statement.

- Movements entering the possession
- Movements within the possession but outside a work site
- Movements leaving the possession.

If it is necessary to propel when details have not been published, you must get authority from Operations Control before you can allow any of the above movements to be propelled.

### **8.11 Leaving the possession - standard detonator protection**

You may allow an engineering train to proceed to the detonator protection to wait for the signaller to give permission for the engineering train to leave the possession.

You must make sure the detonator protection is not removed until:

- the engineering train is at a stand at the detonator protection
- 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 detonator protection is immediately replaced.

When the detonator protection has been replaced, you must tell the signaller.



## **8.12 Movements towards the detonator protection - standard distance is not possible**

You must not allow an engineering train to approach the detonator protection until the signaller has given you permission to do so.

If the WSMB is placed at the detonator protection, you must then give the ES or SWL permission to allow the movement.

You must then tell the signaller immediately it has arrived at the detonator protection.

You must make sure the detonator protection is not removed until:

- the engineering train is at a stand at the detonator protection
- the signaller has given the necessary instructions to the driver
- the signaller has given permission for the engineering train to leave the possession.

When the engineering train has left the possession, you must make sure the detonator protection is immediately replaced.

When the detonator protection has been replaced, you must tell the signaller.

### **8.13 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.

The signaller will then return the points to the agreed position.

### **8.14 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.

### **8.15 Leaving the possession when there is no detonator protection**

When you are using the token as protection, you must agree with the signaller how each movement is to leave the possession.

## **9 Movements over level crossings**

### **9.1 Before making a movement**

Before authorising any movement that will pass over a level crossing, you must make sure any instructions in this section for the type of level crossing concerned are carried out.

Before the movement takes place, you must give details of the movement to those personnel operating:

- any CCTV, OD or RC level crossing
- other level crossing, if possible.

## **9.2 AHBC locally controlled**

You must tell the train driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

## **9.3 AHBC that is not being locally controlled**

OTP must not pass over the level crossing.

You may allow an engineering train that is to pass normally over the level crossing, to proceed in a direction for which there are controls.

You must first get permission from the signaller for the movement over the crossing and then tell the driver not to stop specially before passing over the level crossing.

## **9.4 CCTV, OD or RC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

## **9.5 CCTV, OD or RC that is not locally controlled**

You must not allow any movement in the wrong direction to pass over the level crossing.

For movements in the right direction, you must not authorise the driver or MC to pass the signal or block marker protecting the level crossing until the signaller has told you that the barriers have been lowered for the movement.

You must then tell the driver or MC not to stop specially at the level crossing.

## **9.6 AOCL and ABCL not switched off**

If the crossing has not been switched off as shown in section 5.3, the following must apply.

You must instruct the driver of an engineering train that is to pass over the crossing normally, to proceed over the crossing only when it is safe to do so.

For any engineering train movements not passing normally over the crossing and for all items of OTP, you must not allow the movement to take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **9.7 AOCL and ABCL that has been switched off**

If the crossing has been switched off as shown in section 5.3, the following must apply.

**During daylight**

You must instruct the driver of an engineering train that is to pass over the crossing to stop the train at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

The movement of OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

**During darkness**

The movement of an engineering train or OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the level crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

**9.8 Manned level crossings**

You must instruct the driver or MC to pass over the level crossing only if the level crossing barriers or gates are closed to road traffic.

If it is a traincrew operated (TMO) crossing, you must make sure that a competent person is available to operate the level crossing, before authorising the driver or MC to proceed.

## **9.9 Crossing with red and green lights (R/G)**

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **9.10 Barrow or foot crossings with white light indicators**

You must instruct the driver or MC to pass over the crossing only when it is safe to do so.

# **10 Changing the possession limits**

## **10.1 When the limits may be changed**

The limits of the possession may be shortened or lengthened as long as:

- the details of the changed limits, including the planned time, are published in the *Weekly Operating Notice* or *Engineering Notice*, or
- in exceptional circumstances, when agreed by Operations Control.

## **10.2 Recording the details**

You must record the changed details on the RT3198 form.

### **10.3 Placing the new detonator protection**

You must make sure the new detonator protection is placed before the old detonator protection is removed.

## **11 Change of personnel**

### **11.1 Change of PICOP**

If you are going off duty, you must:

- tell the new PICOP about the possession arrangements
- hand the RT3198 form to the new PICOP
- tell the signaller the name of the new PICOP.

If you are the new PICOP, you must sign the RT3198 form.

### **11.2 Change of ES or SWL**

The ES or SWL will tell you the name of the new ES or SWL if there is a change. You must record the details on the RT3198 form.

## **12 Giving up the possession**

### **12.1 Making sure the work is complete**

When each ES or SWL gives you an assurance that work is complete at their work site, you must tell them to remove the WSMBs.

You must not give permission to remove the WSMBs if you have given permission for a movement to proceed towards the work site.

The ES or SWL will tell you if a train is standing within the work site at a signal or block marker where it has been agreed that the possession will be given up around a train. You must record the details on the RT3198 form.

When the ES or SWL tells you the WSMBs have been removed, you must record the details on the RT3198 form.

When each IWA or COSS who is relying upon the possession arrangements in your area of control tells you they no longer need the possession arrangements, you must record the name of each IWA or COSS and the time on your RT3198 form.

## **12.2 Giving up the possession around engineering trains**

You may give up the possession with engineering trains standing at stop signals or block markers on the line under possession, as long as all of the following apply.

- The line is signalled by track circuit block or ERTMS and the trains are standing at a location where the detection is by track circuits and not by axle counters.
- The movement, after the possession is given up, will be in the normal signalled direction and will be driven from the leading cab.

You must make sure:

- you agree with the signaller the stop signals or block markers to be used
- all personnel on the engineering trains are told that the possession is to be given up and the line must be considered open.



You must not start the arrangements to give up the possession until the signaller has confirmed that engineering trains have arrived at the agreed signals or block markers.

### **12.3 Removing the possession arrangements**

When every ES or SWL has removed their WSMBs and each IWA or COSS working in your area of control has told you they no longer need your protection, you must arrange for the detonator protection to be removed.

If single line working is still in operation, you must tell the pilotman that the possession is being given up.

You must arrange to release any unworked points or train-operated points that have been secured.

If you have the token as protection and you are ready to give up the possession, you must:

- return the token to the signal box at either end of the section, or
- restore it at an instrument that is not at a signal box after reaching a clear understanding with the signaller about what you are going to do.

## **12.4 Telling the signaller the possession is no longer needed**

You must tell the signaller that the line is clear and safe for trains to run on (or if section 12.2 applies, clear and safe other than the engineering train standing at the agreed signal or block marker) when:

- any unworked points or train-operated points that had been secured have been released
- the detonator protection has been removed.

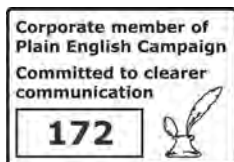
## **12.5 Confirming the possession is given up**

You must record the details on the RT3198 form. You must ask the signaller to read back the entry in the Train Register.

If you agree with the entry in the Train Register, this is confirmation that the possession has been given up.

Printing this manual is not permitted

Supersedes GERM8000-trackworkers Iss 7 with effect from 05/12/2020



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GE/RT8000/HB11 ERTMS  
Rule Book

# Handbook 11

# Handbook 11

# ERTMS

## **Duties of the person in charge of the possession (PICOP) on ERTMS lines where lineside signals are not provided**

**Issue 2**  
**September 2015**  
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# 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.

## **Machine controller (MC)**

The MC is the person with overall responsibility for the safe operation of OTP and will be identified by an armlet or badge with MACHINE CONTROLLER or MC in black letters on a white background.

When the MC is also competent as a crane controller, they will instead wear an armlet or badge with CRANE CONTROLLER or CC in black letters on a white background.

## **Maximum speed in a possession**

Depending on any lower speed that may apply the maximum speed entering, leaving and within a possession is 40 km/h (25 mph).

## **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.

## **Person in charge of a siding possession (PICOS)**

The PICOS is the person responsible for taking and supervising a possession of a siding.



## **Train**

This includes a light locomotive, self propelled rail vehicle, on-track machine, an RRV in rail mode and rail mounted maintenance machine.

## **2 Competence and identification**

To act as the person in charge of the possession (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 a PICOP. The armlet or badge must have PERSON I.C. POSSESSION in red letters on a yellow background.

## **3 Possession details**

### **3.1 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*.

### **3.2 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.

Operations Control will be responsible for letting you and the signaller know about the details of any agreed changes.

## **4 Taking the possession**

### **4.1 Confirming the details with the signaller**

You must contact the signaller who controls the block marker leading to the section of line that is to be taken under possession.

You must state the published possession reference if there is one and then confirm:

- the line that will be taken under possession
- the possession procedure to be used
- whether the possession is to be taken around one or more trains
- the locations between which the possession will be taken including the protecting block markers or points
- the details of any points or crossings that may be used for trains outside the possession
- the position points within the possession must be placed in
- the arrangements to be applied for each level crossing within the possession
- the exact location of the first work-site marker board (WSMB) in the normal direction of travel
- the exact location of the last WSMB in the normal direction of travel
- the time the possession is to be taken.

## **4.2 Taking possession around one or more engineering trains**

When the possession is to be taken or lengthened 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.

There is no limit to the number of engineering trains a possession can be taken around, as long as the details have been published for each train concerned.

## **4.3 Providing signalling protection (closing the route)**

When the line concerned is clear other than any trains at a stand as shown in section 4.2 above, the signaller will tell you when the routes from the agreed block markers to protect the possession have been closed.

You must then complete section 1 of your Possession Arrangements Form (RT3198 ERTMS).

You must then read the details back to the signaller.

## **4.4 When signalling protection has been provided**

When protection by block markers and points has been provided as shown in section 4.3, one of the following possession procedures must be carried out before the possession can be granted.

The only exception to this is possession procedure T3-A. This procedure must be carried out after the possession is granted.

You must record the details of the possession procedure used on the RT3198 ERTMS form.

## **4.5 Possession procedure T3-A (using a track circuit operating device T-COD)**

### **When this procedure can be used**

You may use procedure T3-A only if all the following apply.

- Use of a T-COD is authorised at the particular location.
- The signalling equipment is working normally at the time the T-COD is to be placed on the line.
- The work within the possession will not affect the correct operation of the track circuit concerned.

### **Competency in using a T-COD**

You must make sure the person who is to place the T-COD on the line is competent to do so.

## **Placing the T-COD on the line**

You must arrange for the T-COD to be placed on the line, only as shown in section 6.3, after the possession has been granted.

### **4.6 Possession procedure T3-D (disconnecting signalling equipment)**

#### **When this procedure can be used**

You may use procedure T3-D only if it is authorised at the particular location.

#### **Competency in disconnecting signalling equipment**

You must make sure the person who is to make the disconnections is competent to do so.

#### **Arranging for the disconnection to be made**

When the signaller has told you all routes leading to the possession have been closed, as shown in section 4.3, you must arrange for the signalling controls of these routes to be disconnected.

You must tell the signaller when this has been done.

### **4.7 Possession procedure T3-P (PICOP or PICOP's agent going to the signal box)**

#### **When this procedure can be used**

You may use procedure T3-P only if it is authorised at the particular location.

## **Competency of a PICOP's agent**

You must make sure that any person who is to act as your agent is competent to do so.

## **Going to the signal box**

When the signaller has told you all routes protecting the entrances and exits from the possession have been closed as shown in section 4.3, you must check that this has been done and that the possession is being correctly protected.

If you cannot personally go to the signal box that controls the routes protecting the entrances to and exits from the possession, you must arrange for a PICOP's agent to be in the controlling signal box to check that the correct routes have been closed.

You must get an assurance from the PICOP's agent that the protecting routes have been closed and the possession is correctly protected by the signaller.

You must then tell the signaller you are satisfied that the possession is correctly protected.

You do not need to go to, or send a PICOP's agent to, any intermediate signal boxes.

## **4.8 Possession procedure T3-E (barring the route)**

### **Possession procedure T3-E always to be used**

Possession procedure T3E must always be used except when it is not possible to do so and one of the other methods has been agreed at the planning meeting.

In exceptional circumstances, this may be agreed by Operations Control.

### **Competency in disconnecting signalling equipment**

You must make sure the person who is to carry out the route barring is competent to do so.

### **Arranging for the route barring to be carried out**

When the signaller has told you all routes leading towards the possession have been closed as shown in section 4.3, you must arrange for the signalling controls for these routes to be barred.

You must tell the signaller when this has been done.

## **4.9 Placing the first and last work-site marker boards**

The distance between the block marker or points used to protect the entrance to the possession and the first WSMB must be not less than 200 metres.

The block marker immediately beyond the last WSMB must be no closer than 200 metres. This must be the point where normal working starts for train movements in the right direction.

#### **4.10 When the first and last WSMBs have been placed**

When the first and last WSMBs are in place, you must record the details on your RT3198 ERTMS form and then tell the signaller.

When the signaller is satisfied the line concerned is correctly protected, the signaller will tell you that the possession is granted.

## **5 Arrangements for level crossings**

### **5.1 General**

You must not allow any train or OTP movement to take place, or any work to be carried out, that will affect the operation of any level crossing until the necessary arrangements have been put in place for that level crossing.

You must record the arrangements that are applied for each level crossing within the possession on your RT3198 ERTMS form.



## **5.2 Automatic half barrier crossing (AHBC)**

You must make sure an attendant has been appointed and local control taken at each AHBC throughout the time the possession is in place.

### **Exceptions**

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls
- it is shown in the notices that the AHBC will be on local control only while it is affected by the work or train movements.

## **5.3 Automatic barrier crossing locally monitored (ABCL) and automatic open crossing locally monitored (AOCL)**

You must make sure the road-traffic signals are switched off and the audible warnings disconnected at each ABCL and AOCL throughout the time the possession is in place.

You must also make sure the barriers are kept in the raised position at each ABCL.

### **Exceptions**

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls.

## **5.4 Barrier crossing with closed circuit television (CCTV), barrier crossing with obstacle detection (OD) and remotely controlled crossing with barriers (RC)**

You must make sure an attendant has been appointed at each CCTV, OD and RC crossing throughout the time the possession is in place.

### **Exceptions**

You do not need to do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be trains passing normally in the right direction
- it is shown in the notices that a crossing attendant will be at the CCTV, OD or RC crossing only while it is affected by the work or train movements.

## **6 Work sites**

### **6.1 Setting up work sites**

You must not give permission for a work site to be set up or lengthened until any movement you have authorised has passed clear or has stopped short of the proposed work site.

### **6.2 Indicating each work site**

You must arrange with each Engineering Supervisor (ES) or Safe Work Leader (SWL) to place a WSMB in the four-foot 100 metres (approximately 100 yds) from either end of the work site.

You must not allow a WSMB for one work site to be closer than 100 metres (100 yds) from the WSMB of another work site on the same line.

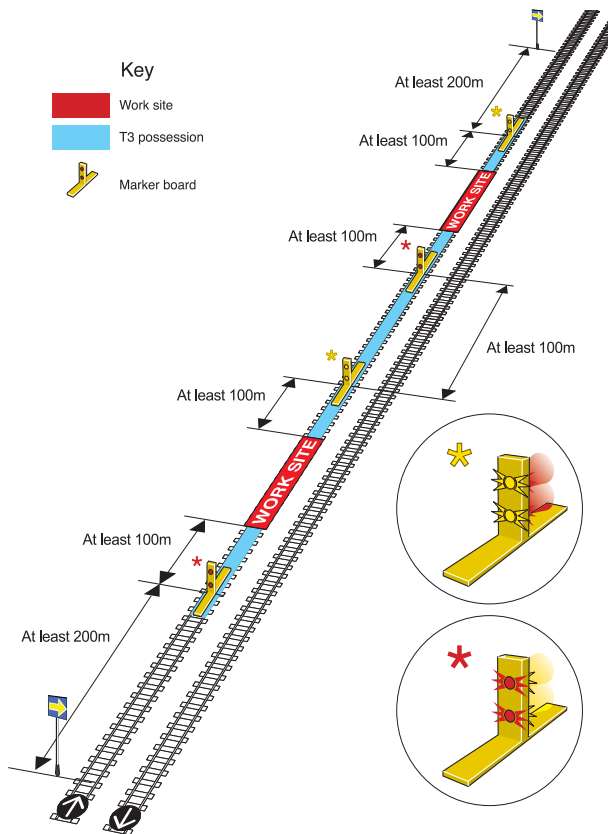
When the work site will be taken around a train, you must tell the ES or SWL the location of each train before you give permission to place the WSMBs.

The first WSMB at each end must be positioned so that it is on the possession side of both the block marker protecting the entrance and the block marker protecting the exit.

You must record the exact location of each WSMB on your RT3198 ERTMS form.

WSMBs must be provided unless there are no engineering trains or OTP within the possession.

The arrangements for WSMBs are shown in diagram HB11.1 ERTMS.



**Diagram HB11.1 ERTMS  
Indication of work site**

### **6.3 When possession procedure T3-A is being used**

Where possession procedure T3-A is used as shown in section 4.5, you must make sure the T-COD is placed at the same time and at the same place as the first WSMB in the normal direction of travel.

You must get the signaller's permission before a T-COD is placed on the line.

When the T-COD has been placed, you must get an assurance from the signaller that the track circuit concerned is showing occupied.

### **6.4 Allowing work to start inside the work site**

When the ES or SWL tells you the WSMB at each end of the work site is in position, you must dictate the details to the ES who will fill in a Work-site Certificate (RT3199 ERTMS).

You must include all details including the arrangements made for each level crossing within that work site.

The ES or SWL 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 or SWL your full initials and authorise the work to start.

You must record the details on your RT3198 ERTMS form.

## **6.5 Carrying out signalling work within the possession**

You must not allow signalling work to be carried out if it would affect the route barring or the functioning of the balises protecting the exits from the possession.

## **6.6 When a work site is suspended**

If the ES or SWL tells you the work site has been suspended but the WSMBs are to stay in place, you must record the details on your RT3198 ERTMS form.

You must not allow a movement to pass a WSMB into a work site where work is suspended.

# **7 Allowing work outside a work site**

You may allow a COSS or IWA to set up a safe system of work that uses warning of approaching trains in the area between work sites.

You must make sure the COSS or IWA fully understand the details of the possession, including the time the possession is to be given up.

You must instruct each COSS or IWA that engineering trains or OTP may approach at any time and at a speed of up to 40 km/h (25 mph) in either direction on any line under possession.

You must not give permission for a COSS or IWA to work between the protecting block marker or points and the first WSMB, or between the last WSMB and the block marker or points beyond the possession.

You must record the details, including the name of each COSS or IWA on your RT3198 ERTMS form.

You must not give up the possession until each COSS or IWA involved has told you they no longer need to rely on the possession arrangements.

## 8 Train movements

### 8.1 General

#### **Entering the possession**

The signaller must keep the routes closed leading to the possession. The signaller will authorise the driver of each train entering the possession to proceed to the first WSMB.

The signaller will get your permission before doing this.

Only the ES or SWL can authorise train movements into a work site.

Only you can authorise train movements through points and crossings protecting the possession at an intermediate point.

#### **Points within the possession**

If there are any unworked points within the possession, you must arrange for them to be secured if necessary, before a movement is made over them.

You must record the details on your RT3198 ERTMS form.

Before you authorise any movement, you must make sure any points in the route are in the correct position.

If the MC with an item of OTP tells you that the OTP cannot be relied upon to operate train-operated points, you must make sure that any such points are correctly secured before authorising the OTP to pass over them in the trailing 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 and to be prepared to stop within the distance that can be seen to be clear.

You must check the driver or MC clearly understands the location the movement is to proceed to.

You must tell the driver or MC the location of any permissible speed or temporary speed restriction lower than 40 km/h (25 mph) on the portion of line concerned.

## **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.



**Block markers within the possession**

Drivers and MCs will not pass a block marker without verbal authority.

You are responsible for giving this authority within the possession outside work sites and the ES or SWL is responsible for doing this within their work site.

**Vehicles left outside a work site**

You must make sure a red light is showing at both ends of any vehicles stabled or detached outside a work site.

You must not allow a train to be left, or vehicles to be detached, between the WSMB and the block marker or points protecting the possession at either end.

**Recording details of movements**

You must record the time you authorise each movement. You must also record the time you are told when a movement has been completed.

**8.2 Entering the possession at the first WSMB**

Before you give the signaller permission to let an engineering train proceed towards the first WSMB, you must make sure:

- the first WSMB is in place
- you have not authorised a conflicting movement.

You must make sure the first WSMB is not removed until the engineering train has stopped at it.

When the engineering train has entered the possession, you must arrange for the first WSMB to be replaced immediately.

When the WSMB has been replaced you must tell the signaller.

### **8.3 Entering the possession at an intermediate point between work sites**

Before you give the signaller permission to let an engineering train proceed from the protecting block marker towards the possession, you must make sure:

- you or a competent person sent by you is at the intermediate point to give the 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 at the intermediate point, you must tell the signaller.

The signaller will then return the points to the agreed position.

## **8.4 Entering the possession at an intermediate point - directly into a work site**

Before you give the signaller permission to let an engineering train proceed from the protecting block marker towards the possession, you must make sure:

- the ES or SWL, or a competent person sent by the ES or SWL, is positioned at the intermediate point to give the instructions to the driver
- you or the ES or SWL have not authorised a conflicting movement to take place.

Once the engineering train has entered the possession, you must get confirmation from the ES or SWL that it has entered the work site and is clear of the points or crossings concerned.

You must then tell the signaller that the engineering train is clear of the points or crossings at the intermediate point.

The signaller will then return the points to the agreed position.

## **8.5 Entering the possession from an adjacent siding under possession**

If a movement is to enter your possession from an adjacent siding under possession, you must first agree with the signaller and the PICOS how this is to be done.

If the movement is to pass directly from the siding under possession into the work site, you must make sure that:

- the ES, SWL or a competent person sent by the ES or SWL, is positioned at the exit from the siding to give instructions to the driver
- you have not authorised a conflicting movement to take place.

## **8.6 Leaving a work site**

Only you can authorise a movement to leave a work site.

You must not allow the WSMB to be removed until the movement has stopped at it.

The WSMB must be replaced immediately the movement has passed beyond it.

## **8.7 Moving between work sites**

Before you allow a train 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 WSMB
- you, or a competent person, tell the driver or MC the exact location of the next WSMB or the exact location of any train or vehicle waiting at that WSMB.

## **8.8 Assisting a failed train, failed OTP or removing a portion of a divided train**

You may allow a train 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.

## **8.9 Movement of multiple OTP**

If more than one item of OTP is to travel in an area that you control, you may allow them to travel at the same time as long as:

- the details are shown in the method statement
- any previous movement in that area has arrived at the other end or has been shunted clear at an intermediate point
- each MC involved in the movement is given the necessary instructions.

Once you have given authority for the movement to start, you must not allow any other movement in that section until all the OTP in the movement:

- have arrived at the WSMB at the other end of the section, or
- have been shunted clear.

## 8.10 Propelling

You must not allow any of the following movements to be propelled unless the details are published in the *Weekly Operating Notice* or the *Engineering Notice* and are shown in the method statement.

- Movements entering the possession.
- Movements within the possession but outside a work site.
- Movements leaving the possession.

If it is necessary to propel when details have not been published, you must get authority from Operations Control before you can allow any of the above movements to be propelled.

## 8.11 Leaving a possession at the last WSMB

You must tell the signaller when an engineering train is ready to leave the possession.

You must make sure that the WSMB is not removed until the movement has stopped at it and the signaller has given the necessary instructions about the movement.

You must:

- come to a clear understanding with the signaller before giving the driver instructions
- repeat to the driver the instructions given to you by the signaller
- authorise the driver to pass beyond the last WSMB.

You must arrange for the last WSMB to be replaced immediately after the train has passed beyond it.

### **8.12 Leaving the possession at an intermediate point**

You must tell the signaller when an engineering train is ready to leave a possession at an intermediate point.

You must:

- come to a clear understanding with the signaller before giving the driver instructions
- repeat to the driver the instructions given to you by the signaller.

You must tell the signaller when the movement has passed clear of the points or crossings concerned.

The signaller will then return the points to the agreed position.

### **8.13 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.

## **9 Movements over level crossings**

### **9.1 Before making a movement**

Before authorising any movement that will pass over a level crossing, you must make sure any instructions in this section for the type of level crossing concerned are carried out.

Before the movement takes place, you must give details of the movement to those personnel operating:

- any CCTV, OD or RC level crossing
- other level crossings, if possible.

### **9.2 AHBC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

### **9.3 AHBC that is not being locally controlled**

OTP must not pass over the level crossing.

You may allow an engineering train that is to pass normally over the level crossing to proceed in a direction for which there are controls.

You must first get permission from the signaller for the movement over the crossing and then tell the driver not to stop specially before passing over the level crossing.

### **9.4 CCTV, OD or RC locally controlled**

You must tell the driver or MC that the movement must not pass over the level crossing unless the crossing attendant displays a green handsignal.



## **9.5 CCTV, OD or RC that is not locally controlled**

You must not allow any movement in the wrong direction to pass over the level crossing.

For movements in the right direction, you must not authorise the driver or MC to pass the block marker protecting the level crossing until the signaller has told you that the barriers have been lowered for the movement.

You must then tell the driver or MC not to stop specially at the level crossing.

## **9.6 AOCL or ABCL not switched off**

If the crossing has not been switched off as shown in section 5.3, the following must apply.

You must instruct the driver of an engineering train that is to pass over the crossing, to proceed over the crossing only when it is safe to do so.

For any engineering train movements not passing normally over the crossing and for all items of OTP, you must not allow the movement to take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **9.7 AOCL and ABCL that has been switched off**

If the crossing has been switched off as shown in section 5.3, the following must apply.

### **During daylight**

You must instruct the driver of an engineering train that is to pass over the crossing to stop the train at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

The movement of OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **During darkness**

The movement of an engineering train or OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red light on both sides of the crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **9.8 Manned level crossings**

You must instruct the driver or MC to pass over the level crossing only if the level crossing barriers or gates are closed to road traffic.

If it is a traincrew-operated (TMO) crossing, you must make sure that a competent person is available to operate the level crossing, before authorising the driver or MC to proceed.

### **9.9 Crossing with red and green lights (R/G)**

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **9.10 Barrow or foot crossings with white light indicators**

You must instruct the driver or MC to pass over the crossing only when it is safe to do so.

## **10 Changing the possession limits**

### **10.1 When the limits may be changed**

The limits of the possession may be shortened or lengthened as long as:

- the details of the changed limits, including the planned time, are published in the *Weekly Operating Notice* or *Engineering Notice*, or
- in exceptional circumstances, when agreed by Operations Control.

### **10.2 Setting up another work site**

If it is necessary to set up another work site on the approach to the first WSMB or beyond the last WSMB, you must first get the signaller's permission to do so.

You must tell the signaller the exact location (mileage or kilometres and metres) of the new WSMB before allowing any further train movements.

The signaller must not give you permission to set up another work site until any movement already authorised has passed clear of the area concerned.

If possession procedure T3-A is being used, you must make sure a T-COD is placed on the line at the same time and place as the new first WSMB, as shown in section 6.3.

You must also, if necessary, arrange to remove the T-COD placed at the previous first WSMB.

### **10.3 Recording the details**

You must record the changed details on the RT3198 ERTMS form.

## **11 Change of personnel**

### **11.1 Change of PICOP**

If you are going off duty, you must:

- tell the new PICOP about the possession arrangements
- hand the RT3198 ERTMS form to the new PICOP
- tell the signaller the name of the new PICOP.

If you are the new PICOP, you must sign the RT3198 ERTMS form.

### **11.2 Change of ES or SWL**

The ES or SWL will tell you the name of the new ES or SWL if there is a change. You must record the details on the RT3198 ERTMS form.

## 12 Giving up the possession

### 12.1 Making sure the work is complete

When each ES or SWL gives you an assurance that work is complete at their work site, you must tell them to remove the WSMBs.

You must not give permission to remove the WSMBs if you have given permission for a movement to proceed towards the work site.

If, under possession procedure T3-A, a T-COD was placed at the WSMB, you must make sure this is removed at the same time as the WSMB is removed.

If the WSMBs removed are the first or last within the possession, you must immediately tell the signaller the exact location (mileage or kilometres and metres) of the new first or last WSMB.

When the ES or SWL tells you the WSMBs have been removed, you must record the details on the RT3198 ERTMS form.

When each IWA or COSS who is relying upon the possession arrangements in your area of control tells you they no longer need the possession arrangements, you must record the name of each IWA or COSS and the time on your RT3198 ERTMS form.

## **12.2 Giving up the possession around an engineering train**

You may give up the possession with an engineering train standing at a block marker on the line under possession, as long as all of the following apply.

- The train is standing at a location where the detection is by means of track circuits and not by axle counters.
- The movement, after the possession is given up, will be in the normal signalled direction and will be driven from the leading cab.

You must make sure:

- the block marker to be used is agreed with the signaller
- all personnel on the engineering train are told that the possession is to be given up and the line must be considered open.

You must not start the arrangements to give up the possession until the signaller has confirmed that the engineering train has arrived at the agreed block marker.

## **12.3 Removing the possession arrangements**

When every ES or SWL has removed their WSMBs and each IWA or COSS working in your area of control has told you they no longer need your protection, you must tell the signaller you are ready to give the possession up.

You must then arrange for any disconnection made under possession procedure T3-D to be reconnected or for any route barring carried out under possession procedure T3-E to be restored.

You must arrange to release any unworked points or train-operated points that have been secured.

## **12.4 Telling the signaller the possession is no longer needed**

You must tell the signaller that the line is clear and safe for trains to run on (or if section 12.2 applies, clear and safe other than the engineering train standing at the agreed block marker) when:

- any disconnections made under possession procedure T3-D have been reconnected
- any route barring carried out under possession procedure T3-E has been reconnected
- any unworked points or train operated points that had been secured have been released.

## **12.5 Confirming the possession is given up**

You must record the details on the RT3198 ERTMS form.

You must ask the signaller to read back the entry in the Train Register.

If you agree with the entry in the Train Register, this is confirmation that the possession has been given up.



## **Notes**

## **Notes**



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# GERT8000-HB12 Rule Book

## Handbook 12

Duties of the engineering supervisor (ES) or safe work leader (SWL) in a possession

Issue 8



September 2020  
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Mark  
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# 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.

## **Machine controller (MC)**

The person with overall responsibility for the safe operation of OTP and will be identified by an armlet or badge with MACHINE CONTROLLER or MC in black letters on a white background.

When the MC is also competent as a crane controller, they will instead wear an armlet or badge with CRANE CONTROLLER or CC in black letters on a white background.

## **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.

## **Person in charge of loading and unloading**

The person who is responsible for the movement of an engineering train while it is being loaded or unloaded within the work site.

## **Person in charge of the siding possession (PICOS)**

The person responsible for taking and supervising a possession of a siding.



## **Train**

This includes a light locomotive, self-propelled rail vehicle, on-track machine, an RRV in rail mode and a RMMM.

## **2 Competence and identification**

To act as the engineering supervisor (ES) or safe work leader (SWL), you must have with you a valid certificate of competence issued by your employer.

When you are carrying out the duties of the ES or SWL, 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.

If you are the SWL the armlet or badge must have **SWL** in blue letters on a yellow background.

## 3 Setting up the work site

### 3.1 Arranging to set up the work site

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 of each work-site marker board (WSMB)
- whether the work site is to be taken around one or more trains
- the arrangements to be applied for every level crossing within the work site.

### 3.2 Setting up or extending the work site around one or more engineering trains

When the work site will 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 train concerned is at a stand at its specified signal, block marker or flexible train arrival point (FTAP).

You must not allow any of these trains to move again until the WSMBs are in place and all the necessary arrangements for the work site have been made.

There is no limit to the number of engineering trains the work site can be set up or extended around, as long as the details have been published in the *Weekly Operating Notice* or *Engineering Notice*.

### **3.3 Setting up the work site**

When the PICOP authorises you to set up your work site, you may allow duties relating to the isolation of AC OLE or DC CRE equipment to start and for the placing of WSMBs.

You must not allow any other work to start until the PICOP has given you permission to do so.

### **3.4 Indicating the work site (Diagram HB12.1)**

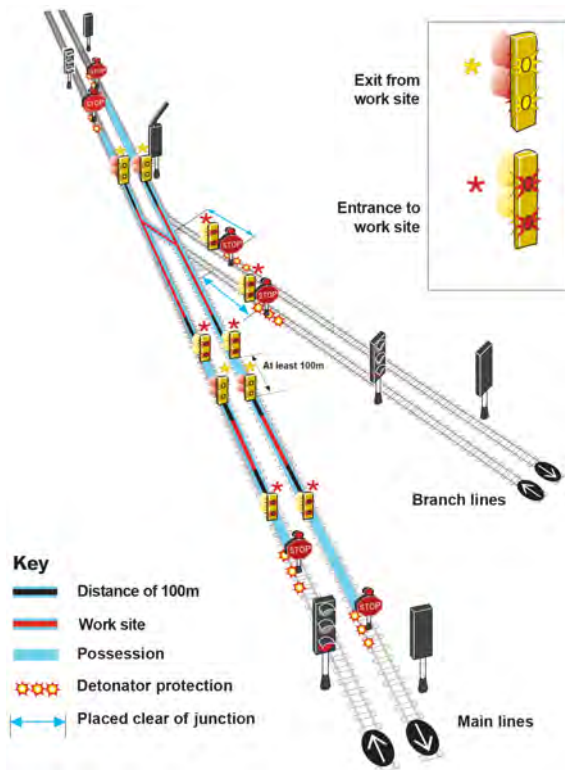
You must provide WSMBs if there are engineering trains or OTP within the possession.

You must place a WSMB in the 'four-foot' 100 metres (approximately 100 yards) from each end of the work site at the agreed mileage.

You must record the exact location of each WSMB on the Work-site Certificate (RT3199).

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.

If your work site will be close to the detonator protection for the possession, the WSMB must normally be placed at least 100 metres (approximately 100 yards) from that detonator protection.



**Diagram HB12.1**  
**Indication of work sites**

If due to the work, this 100-metre distance cannot be achieved, the following must apply.

- The WSMB must be placed at the detonator protection.
- Any train movements approaching that WSMB from within the work site, must only be made as shown in section 6.5.

If WSMBs are not provided, you must not allow any work to take place within 200 metres (approximately 200 yards) of the detonator protection.

### **3.5 When the work site is set up**

You must tell the PICOP when the WSMB 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 RT3199 certificate.

The details must include the arrangements made for each level crossing within the work site.

You must read the details back to the PICOP.

When the PICOP is satisfied that all details are in order for the work to start, you will be given the PICOP's full initials and authority to allow work to start.

You must enter these details on your RT3199 certificate.

You may now consider the work site granted.

## **4 Agreeing the safe system of work with each COSS/IWA**

### **4.1 Allowing work to take place**

When the work site has been granted, you may allow work to take place.

Before starting work, you must give each COSS and each IWA a work-site briefing.

You must agree with each COSS and each IWA:

- the limits of their site of work
- the nature of the work, and
- the safe system of work they will use.

You must enter the agreed details on your RT3199 certificate and get the COSS or IWA to sign it.

### **4.2 Agreeing the arrangements before the work site is granted**

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the IWA or COSS are aware of what is to happen.

You may give the work-site briefing, reach the agreement specified in section 4.1 with each IWA or COSS and get their signature on your RT3199 certificate before the work site is granted.

You must not allow work to start until you have told each IWA or COSS that the work site has been granted.

You must then give each COSS or IWA an authority number.

You must record the authority number on your RT3199 certificate.

### **4.3 Safe system of work where all lines are blocked (Safeguarded)**

Before the IWA/COSS can treat their safe system of work as safeguarded, they must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at no greater than 5 mph (10 km/h).

### **4.4 Safe system of work using a safety barrier (Fenced)**

Before the COSS/IWA can treat their safe system of work as fenced, there must be a safety barrier as shown in handbook 6 or handbook 7 between their site of work and any open line.

They must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at no greater than 5 mph (10 km/h).

## **4.5 Safe system of work (separated)**

Before the COSS/IWA can treat their safe system of work as separated, they must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at no greater than 5 mph (10 km/h).

A person acting as an IWA cannot use this safe system of work with site wardens in your work site.

## **4.6 Safe system of work using equipment warning**

The COSS/IWA can use equipment warning for the lines open to traffic as long as the equipment will provide an adequate warning of each train approaching on the line or lines concerned.

Equipment warning must not be used on any line within the work site.

## **4.7 Safe system of work using lookouts (Lookout warning)**

The COSS may use lookout warning as shown in handbook 7 for any line within the work site.



During darkness, poor visibility, or when in or near a tunnel, the COSS may only use lookout warning if:

- you agree that all movements within the work site will be made at a speed no greater 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 required sighting distance.

A person acting as an IWA cannot use this safe system of work in your work site.

## **5 Arrangements for level crossings**

### **5.1 General**

You must not allow any engineering train or OTP movement to take place, or any work to be carried out, that will affect the operation of any level crossing unless the PICOP has made the necessary arrangements for that level crossing.

The PICOP will tell you what arrangements have been made for each level crossing within your work site as shown in section 5.2, 5.3 and 5.4.

You must record these details on your RT3199 certificate.

### **5.2 Automatic half-barrier crossing (AHBC)**

The PICOP will make sure an attendant has been appointed and local control taken at each AHBC throughout the time the possession is in place.

## Exceptions

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls
- it is shown in the notices that the AHBC need be on local control only while it is affected by the work or train movements.

### **5.3 Automatic barrier crossing locally monitored (ABCL) and automatic open crossing locally monitored (AOCL)**

The PICOP will make sure the road traffic signals are switched off and the audible warnings disconnected at each ABCL and AOCL throughout the time the possession is in place.

The PICOP will also make sure the barriers are kept in the raised position at each ABCL.

## Exceptions

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls.

## **5.4 Barrier crossing with closed-circuit television (CCTV), barrier crossing with obstacle detection (OD) or remotely controlled crossing with barriers (RC)**

The PICOP will make sure an attendant has been appointed at each CCTV, OD or RC crossing throughout the time the possession is in place.

### **Exceptions**

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be trains passing normally in the right direction
- it is shown in the notices that a crossing attendant needs to be at the CCTV, OD or RC crossing only while it is affected by the work or train movements.

## **6 Train movements**

### **6.1 General**

#### **Points within the work site**

Before you authorise any movement, you must make sure that any points in the route are in the correct position.

If the MC with an item of OTP tells you that the OTP cannot be relied upon to operate train-operated points, you must make sure any of these points are correctly secured before authorising the OTP to pass over them in the trailing position.

**Instructions to drivers and machine controllers**

Only you can authorise a movement to enter the work site or a movement to be made within the work site.

You must instruct the driver of each 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.

**Train speed within the work site**

You must include instructions to the driver or MC on what speed to make the movement. This will depend on any agreement you have made with IWAs or COSSs working in your work site, as shown in section 4.

However, the actual speed will depend on:

- how far the driver or operator can see to be clear
- the distance needed to stop short of any obstruction or handsignal
- the instructions you give the driver or MC.

After you have given specific instructions to the driver or machine controller, you may allow movements to run at caution above 5 mph (10 km/h).

You must tell the driver or MC that the movement must be made at no greater speed than 5 mph (10 km/h) through the site of work if you have agreed this with an IWA or COSS.

If you have agreed that the COSS will use lookout warning during darkness or where the site of work is in or near a tunnel, you must instruct the driver or MC that the movement must be made at no greater speed than 20 mph (30 km/h) through the site of work.

### **Signals or block markers within the work site**

The 'normal' meaning of a proceed signal does not apply within a possession as the signalling is suspended.

However, drivers and MCs will not pass a signal at danger or a block marker without verbal authority.

You are responsible for giving this authority within the work site.

### **Recording details of movements**

You must record the time you authorise each movement. You must also record the time you are told when a movement has been completed.

## **6.2 Entering the work site**

You must not allow the WSMB to be removed until the movement has stopped at it.

When the movement has entered the work site, you must make sure the WSMB is immediately replaced.

When the WSMB has been replaced you must tell the PICOP.

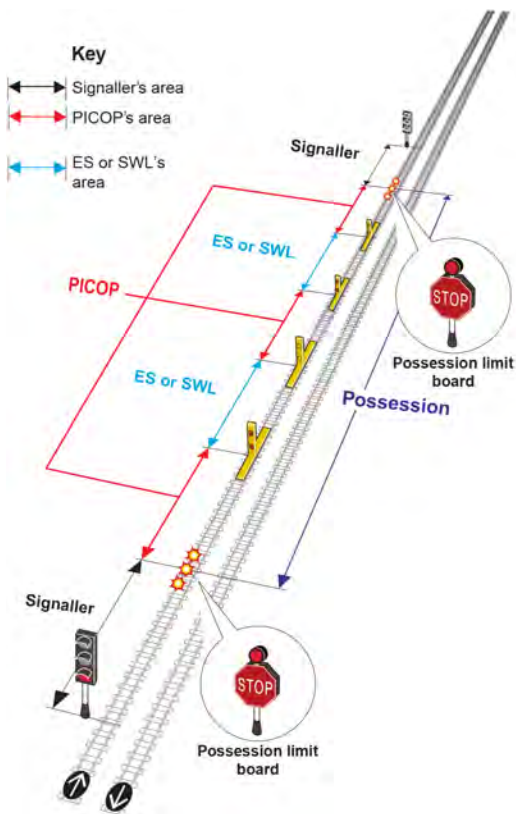
## **6.3 Entering the work site at an intermediate point**

Before the PICOP gives the signaller permission to let an engineering train proceed from the protecting signal or block marker towards the possession, the PICOP will make sure:

- you, or a competent person sent by you, is positioned at the intermediate point to give the instructions to the driver
- you have not authorised a conflicting movement to take place.

Once the engineering train has entered the work site and is clear of the points or crossings, you must tell the PICOP.

The signaller will then return the points to the position agreed with the PICOP.



**Diagram HB12.2**  
**Areas of responsibility**

## **6.4 Entering the work site from an adjacent siding under possession**

If a movement is to enter your work site from an adjacent siding under possession, you must first agree with the PICOP and the person in charge of the siding possession (PICOS) how this is to be done.

The PICOP will make sure that you, or a competent person sent by you, is positioned at the exit from the siding to give instructions to the driver.

You must make sure that you have not authorised a conflicting movement to take place.

## **6.5 Movements towards the WSMB when it is at the detonator protection**

You must not allow any movement to approach the WSMB until the PICOP has given you permission to do so.

You must then tell the PICOP immediately the movement has been completed.

## **6.6 Movement leaving the work site**

When a movement is ready to leave the work site, you must tell the PICOP.

You must not remove the WSMB until the movement is at a stand at it and the PICOP has given the driver or MC the necessary instructions.



## **6.7 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.

## **6.8 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 Movements over level crossings**

## **7.1 Before making a movement**

Before authorising any movement that will pass over a level crossing, you must make sure any instructions in this section for the type of level crossing concerned are carried out.

Before the movement takes place, you must give details of the movement to those personnel operating:

- any CCTV, OD or RC level crossing
- other level crossing, if possible.

## **7.2 AHBC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

## **7.3 AHBC that is not being locally controlled**

OTP must not pass over the level crossing.

You may allow an engineering train that is to pass normally over the level crossing to proceed in a direction for which there are controls.

You must first get permission from the signaller for the movement over the crossing and then tell the driver not to stop specially before passing over the level crossing.

## **7.4 CCTV, OD or RC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

## **7.5 CCTV, OD or RC that is not locally controlled**

You must not allow any movement in the wrong direction to pass over the level crossing.

For other movements, you must not authorise the driver or MC to pass the signal or block marker protecting the level crossing until the signaller has told you that the barriers have been lowered for the movement.

You must then tell the driver or MC not to stop specially at the level crossing.

## **7.6 AOCL or ABCL not switched off**

If the crossing has not been switched off as shown in section 5.3, the following must apply.

You must instruct the driver of an engineering train that is to pass over the crossing normally, to proceed over the crossing only when it is safe to do so.

For any engineering train movements not passing normally over the crossing and for all items of OTP, you must only allow the movement to take place if:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **7.7 AOCL or ABCL that has been switched off**

If the crossing has been switched off as shown in section 5.3, the following must apply.

### **During daylight**

You must instruct the driver of an engineering train that is to pass over the crossing to stop the train at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

The movement of OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **During darkness**

The movement of an engineering train or OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the level crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **7.8 Manned level crossings**

You must instruct the driver or MC to pass over the level crossing only if the level crossing barriers or gates are closed to road traffic.

If it is a traincrew-operated (TMO) crossing, you must make sure that a competent person is available to operate the level crossing, before authorising the driver or MC to proceed.

## **7.9 Crossing with red and green warning lights (R/G)**

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **7.10 Barrow or foot crossings with white light indicators**

You must instruct the driver or MC to pass over the crossing only when it is safe to do so.

# **8 Change of personnel**

## **8.1 Change of ES or SWL**

If you are going off duty, you must:

- tell the new ES or SWL about the work-site arrangements
- hand your RT3199 certificate to the new ES or SWL
- tell the PICOP the name of the new ES or SWL.

If you are the new ES or SWL, you must sign the RT3199 form.

## **8.2 Change of COSS**

If there is a change of COSS, the new COSS must sign your RT3199 certificate when taking duty. You must give the new COSS a work-site briefing.

## 9 Suspending the work site

If you are to suspend the work site, you must:

- leave the WSMBs in place
- tell the PICOP the work site has been suspended
- record the details on your RT3199 certificate.

## 10 Giving up the work site

### 10.1 Normal arrangements

When each COSS/IWA no longer needs to be on or near the line, or they are sure the work may safely continue without the protection provided by you, the COSS/IWA will tell you and sign your RT3199 certificate.

### 10.2 Arrangements where the COSS or IWA is to telephone the ES or SWL

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the COSS or IWA are aware of what is to happen.

When each COSS or IWA no longer needs to be on or near the line, or they are sure the work may safely continue without the protection provided by you, the COSS or IWA will tell you:

- their name
- the location of their work
- their authority number
- that they no longer need protection.

You must record the details on your RT3199 certificate.

### **10.3 When every COSS or IWA no longer needs protection**

You must ask the PICOP for permission to remove your WSMBs when the line is clear of all engineering trains or OTP (apart from any engineering train that the possession will be given up around) and every COSS or IWA has:

- stated that they no longer need your protection
- signed your RT3199 certificate (as shown in section 10.1) or phoned you, giving their authority number, as shown in section 10.2.

You can give up the work site with an engineering train standing at a signal or block marker that is within the work site, only if all the following apply.

- The line is signalled by track circuit block or ERTMS and the train is standing at a location where train detection is by track circuits and not by axle counters.
- The movement, after the possession is given up, will be in the normal signalled direction and will be driven from the leading cab.

If the possession is to be given up with an engineering train standing at a signal or block marker that is within the work site, you must tell the driver:

- the work-site marker boards are being removed and the work site given up
- not to make any further movement until the signaller tells the driver to proceed.

When you have removed all of the WSMBs, you must tell the PICOP that the work site is given up and one of the following applies.

- As far as you are concerned, the line is safe and clear.
- The line is clear except for an engineering train standing at a signal or block marker where the possession will be given up around it.

You must record the details on your RT3199 certificate.

## 11 Protection zones

### 11.1 Setting up the protection zone

You can only set up a protection zone (PZ) if details have been published in the *Weekly Operating Notice or Engineering Notice*.

You must contact the signaller who controls the signal protecting the portion of line where the PZ is to be set up.



You must state the published PZ reference, if there is one, and then agree with the signaller:

- the line you will be setting the PZ up on
- the locations the work will take place between
- whether the PZ will be set up around a train
- the signal leading to the PZ that will be kept at danger
- the exit signal beyond the PZ that will be kept at danger
- the limits of the PZ, which must be from at least 400 metres (440 yards) beyond the protecting signal to at least 200 metres (200 yards) before reaching the exit signal
- the signals that may need to be passed at danger within the PZ, and that you can give the driver authority to do so
- that wrong-direction movements may be necessary towards the start of the PZ and that you can give the driver permission to make those movements
- what type of additional protection will be used.

## **11.2 Setting up a PZ around an engineering train**

When the PZ is to be set up around an engineering train, the signaller must tell you when the train concerned is at a stand at its specified signal or flexible train arrival point (FTAP) location shown in the notices.

You must not allow the train to move again until the PZ has been granted and all the necessary arrangements have been made.

### 11.3 Arranging the additional protection

If additional protection will be provided by disconnecting signalling equipment, the signaller will agree the necessary disconnections with the signalling technician.

The signaller will tell you when the disconnections have been made.

You can use a track circuit operating device (T-COD) as additional protection only if all the following conditions apply.

- Using a T-COD at a particular location is authorised by the *Sectional Appendix*.
- The signalling equipment is working normally.
- The work will not affect the operation of the track circuit concerned.

When the signal protecting the PZ has been placed to danger, the signaller will check that the track circuit concerned is showing clear. The signaller will then give you permission to place the T-COD on the line or to activate it.

When you have placed the T-COD on the line or activated it, you must tell the signaller. The signaller will check that the track circuit is showing occupied.

When the signaller is sure that the line is properly protected and the signal beyond the PZ has been placed to danger, the signaller will tell you that the PZ has been granted.

## **11.4 Allowing work to take place**

When the PZ has been granted, you may allow work to take place.

Before starting work, you must give each COSS and each IWA a work-site briefing.

You must agree with each COSS and each IWA:

- the limits of their site of work
- the nature of the work
- the safe system of work they will use.

You must enter the agreed details on your RT3199 certificate and get the COSS or IWA to sign it.

## **11.5 Train movement entering the PZ**

The only trains that you can allow to enter the PZ are:

- the engineering train that is to work within the PZ
- an on-track machine that is to work as part of the same engineering work.

When the train arrives at the protecting signal, the signaller will ask you:

- for permission to allow the train to enter the PZ
- how far the train can proceed, either to a signal or to an FTAP.

Before you give permission for the train to enter the PZ, you must tell any COSS or IWA who is sharing your protection about the movement, and make sure that it is safe for the train to approach.

## **11.6 Movements within the PZ**

Only you can authorise the movement of a train within the PZ.

When the train has arrived at the specified signal or FTAP, you must make sure that the driver, and anyone else travelling on the train, knows:

- that they are within a PZ
- the limits of the PZ
- that only you can authorise any movement within the PZ.

Before you authorise any movement within the PZ, you must tell any COSS or IWA who is sharing your protection about the movement, and make sure it is safe for the train to approach.

You must tell the driver:

- where the train is required to move to
- to pass any signals at danger when necessary
- not to make any further movement until you authorise them to do so.

You can authorise a driver to make a wrong-direction movement when necessary, but you must make sure that any wrong-direction movement will not bring the train within 400 metres (440 yards) of the protecting signal.

## **11.7 Movement leaving the PZ**

When a train is ready to leave the PZ, you must tell the signaller.

Before you authorise the train to move, you must tell any COSS or IWA who is sharing your protection about the movement and make sure it is safe for the train to approach.

You must tell the driver:

- to proceed to the end of the PZ which is 200 metres (200 yards) before the exit signal
- to stop there and contact the signaller.

### **11.8 Giving up the PZ**

You can give up the PZ when:

- all trains have left the PZ
- each COSS or IWA has told you that they no longer need to be on or near the line, or they are sure that any work can continue without the protection provided by you.

You must tell the signaller that:

- the work has been completed
- all engineering trains have left the PZ
- all personnel are clear of the line
- additional protection can now be removed.

If additional protection was by disconnecting signalling equipment, the signaller will arrange for the necessary reconnections to be made after the PZ has been given up.

If additional protection was by a T-COD, you must remove or deactivate it. If the track circuit concerned is not showing clear, the signaller will check with you whether it has been removed or deactivated.

You must then confirm to the signaller that the PZ has been given up.

## **11.9 Working on the outside of a train**

You must ask the signaller to stop trains on any adjacent line which could put you, a member of traincrew, or anyone else in danger if, while the PZ is set up:

- you or another person has to walk alongside a train
- a person needs to check that the working equipment on an on-track machine (OTM) is correctly positioned.

You must ask for 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 line 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.

If you are satisfied that the details recorded by the signaller are correct, you must confirm that 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 person to work on the outside of the 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.

## **Notes**



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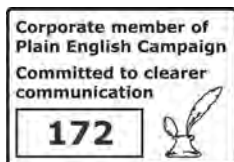
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GE/RT8000/HB12 ERTMS  
Rule Book

# Handbook 12 ERTMS

## Handbook 12 ERTMS

**Duties of the engineering supervisor (ES) or safe work leader (SWL) in a possession on ERTMS lines where lineside signals are not provided**

**Issue 2**  
**September 2015**  
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# 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).

## **Machine controller (MC)**

The MC is the person with overall responsibility for the safe operation of OTP and will be identified by an armlet or badge with MACHINE CONTROLLER or MC in black letters on a white background.

When the MC is also competent as a crane controller, they will instead wear an armlet or badge with CRANE CONTROLLER or CC in black letters on a white background.

## **Maximum speed in a possession**

Depending on any lower speed that may apply the maximum speed entering, leaving or within a possession is 40 km/h (25 mph).

## **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.



### **Person in charge of loading and unloading**

The person who is responsible for the movement of an engineering train while it is being loaded or unloaded within the work site.

### **Person in charge of the siding possession (PICOS)**

The person responsible for taking and supervising a possession of a siding.

### **Train**

This includes a light locomotive, self-propelled rail vehicle, on-track machine, an RRV in rail mode and an RMMM.

## **2 Competence and identification**

To act as the engineering supervisor (ES) or safe work leader (SWL) 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 in blue letters on a yellow background.

If you are the SWL the armlet or badge must have SWL in blue letters on a yellow background.

## **3 Setting up the work site**

### **3.1 Arranging to set up the work site**

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 work-site marker board (WSMB)
- whether the work site is to be taken around one or more trains
- the arrangements to be applied for every level crossing within the work site.

### **3.2 Setting up the work site around one or more engineering trains**

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 train concerned is at a stand at its specified block marker
- the possession has been taken.

You must not allow any of these trains to move again until the WSMBs are in place and all the necessary arrangements for the work site have been made.

There is no limit to the number of engineering trains the work site can be set up or extended around, as long as the details have been published in the *Weekly Operating Notice* or *Engineering Notice*.

### **3.3 Setting up the work site**

When the PICOP authorises you to set up your work site you may allow duties relating to the isolation of AC OLE or DC CRE equipment to start and for the placing of WSMBs.

You must not allow any other work to start until the PICOP has given you permission to do so.

### **3.4 Indicating the work site (diagram HB12.1 ERTMS)**

You must place a WSMB in the 'four-foot' 100 metres from each end of the work site at the agreed location.

You must record the exact location of each WSMB on the Work-site Certificate (RT3199 ERTMS).

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 WSMBs must be positioned at least 200 metres from the protecting block markers.



Work site

### T3 possession

Marker board

At least 200m

At least 100m

At least 100m

At least 100m

At least 100m

At least 100m

At least 200m

### Diagram HB12.1 ERTMS Indication of work sites

### **3.5 When the work site is set up**

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 RT3199 ERTMS certificate.

The details must include the arrangements made for each level crossing within the work site.

You must read the details back to the PICOP.

When the PICOP is satisfied that all details are in order for the work to start, you will be given the PICOP's full initials and authority to allow work to start.

You must enter these details on your RT3199 ERTMS certificate.

You may now consider the work site granted.

## **4 Agreeing the safe system of work with each COSS/IWA**

### **4.1 Allowing work to take place**

When the work site has been granted, you may allow work to take place.

Before starting work, each COSS and each IWA must receive a work-site briefing from you.

You must agree with each COSS and each IWA:

- the limits of their site of work
- the nature of the work, and
- the safe system of work they will use.

You must enter the details of your agreement on your RT3199 ERTMS certificate and get the COSS/IWA to sign it.

### **4.2 Agreeing the arrangements before the work site is granted**

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the COSS or IWA are aware of what is to happen.

You may give the work-site briefing, reach the agreement specified in section 4.1 with each COSS or IWA and get their signature on your RT3199 ERTMS certificate before the work site is granted.

You must not allow work to start until you have told each COSS or IWA that the work site has been granted.

You must then give each COSS or IWA an authority number.

You must record the authority number on your RT3199 ERTMS certificate.

### **4.3 Safe system of work where all lines are blocked (Safeguarded)**

Before the COSS/IWA can treat their safe system of work as safeguarded, they must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at caution and at no greater than 10 km/h (5 mph).

### **4.4 Safe system of work using a safety barrier (Fenced)**

Before the COSS/IWA can treat their safe system of work as fenced, there must be a safety barrier as shown in handbook 6 or handbook 7 between their site of work and any open line.

They must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at caution and at no greater than 10 km/h (5 mph).

#### **4.5 Safe system of work using site wardens (Site warden protected)**

Before the COSS can treat their safe system of work as 'site warden protected', they must agree with you that:

- there will be no engineering train or OTP movements at their site of work, or
- if there are engineering train or OTP movements, they will be made at caution and at no greater than 10 km/h (5 mph).

A person acting as an IWA cannot use this safe system of work in your work site.

#### **4.6 Safe system of work using equipment warning**

The COSS/IWA can use equipment warning for the lines open to traffic as long as it will provide an adequate warning of each train approaching on the line or lines concerned.

Equipment warning must not be used on any line within the work site.



## **4.7 Safe system of work using lookouts (Lookout warning)**

The COSS may use lookout warning as shown in handbook 7 for any line within the work site.

During darkness, poor visibility, or when in or near a tunnel, the COSS may only use lookout warning if:

- you agree that all movements within the work site will be made at a speed no greater than 30 km/h (20 mph)
- the maximum speed of trains on any open line is no greater than 30 km/h (20 mph)
- only site lookouts are needed to achieve the required sighting distance.

A person acting as an IWA cannot use this safe system of work in your work site.

## **5 Arrangements for level crossings**

### **5.1 General**

You must not allow any engineering train or OTP movement to take place, or any work to be carried out, that will affect the operation of any level crossing unless the PICOP has made the necessary arrangements for that level crossing.

The PICOP will tell you what arrangements have been made for each level crossing within your work site as shown in section 5.2, 5.3 and 5.4.

You must record these details on your RT3199 ERTMS certificate.

### **5.2 Automatic half-barrier crossing (AHBC)**

The PICOP will make sure an attendant has been appointed and local control taken at each AHBC throughout the time the possession is in place.

#### **Exceptions**

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls
- it is shown in the notices that the AHBC need be on local control only while it is affected by the work or train movements.

### **5.3 Automatic barrier crossing locally monitored (ABCL) and automatic open crossing locally monitored (AOCL)**

The PICOP will make sure the road-traffic signals are switched off and the audible warnings disconnected at each ABCL and AOCL throughout the time the possession is in place.

The PICOP will also make sure the barriers are kept in the raised position at each ABCL.

#### **Exceptions**

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be engineering trains passing normally in a direction provided with controls.

### **5.4 Barrier crossing with closed-circuit television (CCTV), barrier crossing with obstacle detection (OD) or remotely controlled crossing with barriers (RC)**

The PICOP will make sure an attendant has been appointed at each CCTV, OD or RC crossing throughout the time the possession is in place.

## Exceptions

The PICOP will not do this if:

- the crossing controls will not be activated by the work
- the only movements over the crossing will be trains passing normally in the right direction
- it is shown in the notices that a crossing attendant need be at the CCTV, OD or RC crossing only while it is affected by the work or train movements.

## 6 Train movements

### 6.1 General

#### Points within the work site

Before you authorise any movement, you must make sure that any points in the route are in the correct position.

If the MC with an item of OTP tells you that the OTP cannot be relied upon to operate train-operated points, you must make sure any such points are correctly secured before authorising the OTP to pass over them in the trailing position.

#### Instructions to drivers and machine controllers

Only you can authorise a movement to enter the work site or a movement to be made within the work site.

You must instruct the driver of each 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 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.

### **Train speed within the work site**

Movements within the work site may run at any speed up to 40 km/h (25 mph). However, the actual speed will depend on:

- how far the driver or operator can see to be clear
- the distance needed to stop short of any obstruction or handsignal
- the instructions you give the driver or MC.

You must include instructions to the driver or MC on what speed to make the movement. This will depend on any agreement you have made with IWAs or COSSs working in your work site as shown in section 4.

If you have agreed that movements will only be made at caution, you must tell the driver or MC that the movement must be made at caution and at no greater speed than 10 km/h (5 mph) through the site of work.

If you have agreed that the COSS will use lookout warning, during darkness or where the site of work is in or near a tunnel, you must instruct the driver or MC that the movement must be made at no greater speed than 30 km/h (20 mph) through the site of work.

You must tell the driver or machine controller the location of any permissible speed or temporary speed restriction lower than 30 km/h (20 mph) on the portion of line concerned.

### **Block markers within the work site**

Drivers and MCs will not pass a block marker without verbal authority.

You are responsible for giving this authority within the work site.

### **Recording details of movements**

You must record the time you authorise each movement. You must also record the time you are told when a movement has been completed.

## **6.2 Entering a work site**

You must not allow the WSMB to be removed until the movement has stopped at it.

When the movement has entered the work site, you must make sure the WSMB is immediately replaced.

When the WSMB has been replaced you must tell the PICOP.

### **6.3 Entering the work site at an intermediate point**

Before the PICOP gives the signaller permission to let an engineering train proceed from the protecting block marker towards the possession, the PICOP will make sure:

- you, or a competent person sent by you, is positioned at the intermediate point to give the instructions to the driver
- you have not authorised a conflicting movement to take place.

Once the engineering train has entered the work site and is clear of the points or crossings, you must tell the PICOP.

The signaller will then return the points to the position agreed with the PICOP.

### **6.4 Entering the work site from an adjacent siding under possession**

If a movement is to enter your work site from an adjacent siding under possession, you must first agree with the PICOP and the PICOS how this is to be done.

The PICOP will make sure that you, or a competent person you have sent, is positioned at the exit from the siding to give instructions to the driver.

You must make sure that you have not authorised a conflicting movement to take place.

## **6.5 Not used**

## **6.6 Movements leaving the work site**

When a movement is ready to leave the work site, you must tell the PICOP.

You must not remove the WSMB until the movement is at a stand at it and the PICOP has given the driver or MC the necessary instructions.

## **6.7 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.

## **6.8 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 Movements over level crossings**

### **7.1 Before making a movement**

Before authorising any movement that will pass over a level crossing, you must first make sure any instructions in this section for the type of level crossing concerned are carried out.

Before the movement takes place, you must give details of the movement to those personnel operating:

- any CCTV, OD or RC level crossing
- other level crossings, if possible.

### **7.2 AHBC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

### **7.3 AHBC that is not being locally controlled**

OTP must not pass over the level crossing.

You may allow an engineering train that is to pass normally over the level crossing to proceed in a direction for which there are controls.

You must first get permission from the signaller for the movement over the crossing and then tell the driver not to stop specially before passing over the crossing.

## **7.4 CCTV, OD or RC locally controlled**

You must tell the driver or MC that the movement must not pass over the crossing unless the crossing attendant is displaying a green handsignal.

## **7.5 CCTV, OD or RC that is not locally controlled**

You must not allow any movement in the wrong direction to pass over the level crossing.

For other movements, you must not authorise the driver or MC to pass the block marker protecting the level crossing until the signaller has told you that the barriers have been lowered for the movement.

You must then tell the driver or MC not to stop specially at the level crossing.

## **7.6 AOCL or ABCL not switched off**

If the crossing has not been switched off as shown in section 5.3, the following must apply.

You must instruct the driver of an engineering train that is to pass over the crossing normally, to proceed over the crossing only when it is safe to do so.

For any engineering train movements not passing normally over the crossing and for all items of OTP, you must only allow the movement to take place if:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

## **7.7 AOCL or ABCL that has been switched off**

If the crossing has been switched off as shown in section 5.3, the following must apply.

### **During daylight**

You must instruct the driver of an engineering train that is to pass over the crossing to stop the train at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

The movement of OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the crossing.

You must instruct the MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **During darkness**

The movement of an engineering train or OTP over the crossing must not take place unless:

- the crossing has been closed to road traffic, or
- a competent person is positioned at the crossing and has stopped road traffic by displaying a red handsignal on both sides of the level crossing.

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **7.8 Manned level crossing**

You must instruct the driver or MC to pass over the level crossing only if the level crossing barriers or gates are closed to road traffic.

If it is a traincrew-operated (TMO) crossing, you must make sure that a competent person is available to operate the level crossing, before authorising the driver or MC to proceed.

### **7.9 Crossing with red and green lights (R/G)**

You must instruct the driver or MC to stop at the crossing, sound the horn and then pass over the crossing only when it is safe to do so.

### **7.10 Barrow or foot crossing with white light indicators**

You must instruct the driver or MC to pass over the crossing only when it is safe to do so.

## **8 Change of personnel**

### **8.1 Change of ES or SWL**

If you are going off duty, you must:

- tell the new ES or SWL about the work-site arrangements
- hand your RT3199 ERTMS certificate to the new ES or SWL
- tell the PICOP the name of the new ES or SWL.

If you are the new ES or SWL, you must sign the RT3199 ERTMS certificate.

### **8.2 Change of COSS**

If there is a change of COSS, the new COSS must sign your RT3199 ERTMS certificate when taking duty. You must give the new COSS a work-site briefing.

## **9 Suspending the work site**

If you are to suspend the work site, you must:

- leave the WSMBs in place
- tell the PICOP the work site has been suspended
- record the details on your RT3199 ERTMS certificate.

## 10 Giving up the work site

### 10.1 Normal arrangements

When each COSS/IWA no longer needs to be on or near the line, or they are sure the work may safely continue without the protection provided by you, the COSS/IWA will tell you and sign your RT3199 ERTMS certificate.

### 10.2 Arrangements where the COSS or IWA is to telephone the ES or SWLs

**Note:** this arrangement is only permitted where it has been planned and published in advance and you and the COSS or IWA are aware of what is to happen.

When each COSS or IWA no longer needs to be on or near the line, or they are sure the work may safely continue without the protection provided by you, the COSS or IWA will tell you:

- their name
- the location of their work
- their authority number
- that they no longer need protection.

You must record the details on your RT3199 ERTMS certificate.

### **10.3 When every COSS or IWA no longer needs protection**

You must contact the PICOP and ask for permission to remove your WSMBs when the line is clear of all engineering trains or OTP and every COSS or IWA has stated that they no longer need your protection and:

- has signed your RT3199 ERTMS certificate, as shown in section 10.1, or
- has telephoned you, giving their authority number, as shown in section 10.2.

When you have removed all of the WSMBs, you must tell the PICOP that, as far as you are concerned, the line is safe and clear, and your work site is given up.

You must record the details on your RT3199 ERTMS certificate.

## **Notes**



## **Notes**

## **Notes**



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GE/RT8000/HB13  
Rule Book

# Handbook 13

## Handbook 13

### Duties of the person in charge of the siding possession (PICOS)

**Issue 2**  
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## 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 in a siding or group of sidings, you will be appointed to take possession of the sidings concerned 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 the possession (PICOP) of that possession or the engineering supervisor (ES) or safe work leader (SWL) of an adjacent work site.

If you are an IWA, you must not arrange a possession in sidings for the protection of anyone except yourself.

Local instructions may be published by Network Rail 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 either a COSS, IWA or SWL.

## **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 possible 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 or ground frame**

If the points leading to the siding are worked from a signal box or ground frame, you must not clip the points. However, you must get confirmation from the signaller or ground frame operator that the points will be kept in the position to prevent movements from entering the siding.

### **5.4 If movements can enter from either end**

If movements can enter the siding from either end, you must arrange line protection at both ends.

## **6 Siding next to a running line under possession**

### **6.1 Line protection arrangements**

If the possession of the siding is taken in association with a possession of an adjacent running line, you do not need to provide line protection to the siding as shown in section 5 unless one of the following applies.

- The siding is a through siding and you need to prevent access at the far end of the siding.
- The possession of the siding will be taken before the adjacent running line possession.

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, ES or SWL, as appropriate, and the signaller or ground frame operator, if involved, 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, DP, IWA or SWL 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.

This section 7 does not apply to an IWA.

## 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, DP, IWA or SWL 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 or ground frame operator, if involved.
- 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, DP, IWA or SWL confirms to you that they no longer need to share your protection
- the date and time the possession is given up.



## Notes

## Notes



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GE/RT8000/HB14  
Rule Book

# Handbook 14

## Handbook 14

### Duties of the person in charge of loading and unloading rail vehicles during engineering work

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# 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

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:

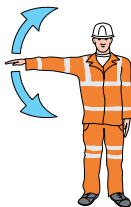
- clearly identify the correct train and driver
- keep in constant communication with the driver throughout each movement
- speak continuously or transmit a continuous bleep signal
- instruct the driver to stop immediately if you notice the transmission is failing.



**Move away from  
the shunter**



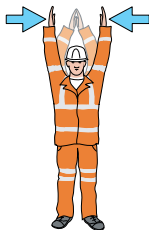
**Move towards  
the shunter**



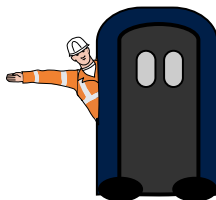
**Slow down**



**Stop immediately**

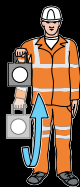


**Ease up**

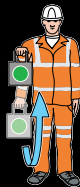


**Stop immediately  
when on a vehicle**

**Diagram HB14.1  
Hand signals during daylight**



Move **away** from hand signal



**Slowly** move **away** from hand signal



Move **towards** hand signal



**Slowly** move **towards** hand signal



Stop immediately



Ease up

**Diagram HB14.2**  
**Hand signals during darkness or poor visibility**

## Notes



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**172**







# GERT8000-HB15 Rule Book

## Handbook 15

### Duties of the machine controller (MC) and on- track plant operator

#### Issue 5



September 2017  
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# 1 Definitions

## **Loose shunting**

This means shunting vehicles that do not stay attached during the movement.

## **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 I.C. 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.

Each work site is under the control of an engineering supervisor (ES) or safe work leader (SWL). The ES or SWL is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The ES will wear an armlet on the left arm or a badge on the upper chest. The armlet or badge will have ENGINEERING SUPERVISOR in blue letters on a yellow background.

The SWL will wear an armlet on the left arm or a badge on the upper chest. The armlet or badge will have SWL 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 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
- to sound the horn at any whistle boards
- the location of any signal or block marker the OTP must stop at
- the location of the WSMBs
- 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
- level crossings
- 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, ES or SWL before these activities are carried out.

When the OTP has finished work and has been off-tracked and is clear of the line, the MC must tell the PICOS, ES or SWL.

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 or SWL 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 or SWL 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 COSS
- the COSS 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.

## **6.3 On or off-tracking on lines with conductor rails**

OTP must not be on or off-tracked or cross a line that has conductor rails until there is an isolation and:

- a conductor rail permit has been issued to the COSS
- the COSS has given permission to start work.

Additionally:

- there must be adequate gap in the conductor rail, or
- an approved conductor rail ramp must be used, or
- the conductor rail must have been lowered and protected.

You must carry out any other instructions to do with the conductor rail as shown on the EAC or ECC for the OTP.

## 7 Making rail movements

### 7.1 Getting authority for movements

Movements can only enter or take place within a work site when the ES or SWL gives permission. Only after the ES or SWL has given permission to the MC can the MC authorise the OTP movement.

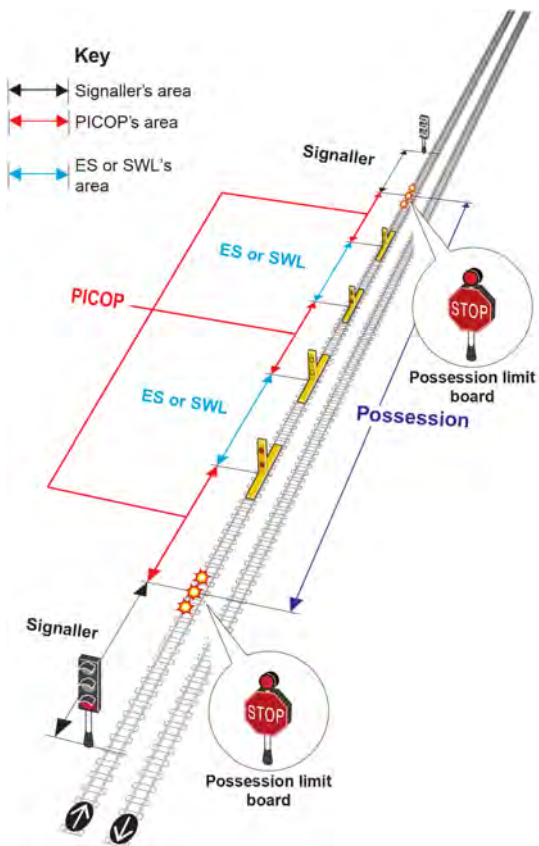
Movements can only leave or take place outside a work site when the PICOP gives permission. Only after the PICOP has given permission to the MC can the MC authorise the OTP movement.

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.



**Diagram HB 15.1**

**Possession of a running line with two work sites**

### 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 ES, PICOP or SWL.

Other movements may be authorised by the ES, PICOP or SWL at a speed up to 25 mph (40 km/h).

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.

The MC must tell either the ES, PICOP or SWL if the EAC or ECC states that the OTP cannot be relied on to operate train-operated points.

## **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**

Nobody 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 Level crossings**

The MC must authorise the OTP to pass over a level crossing only when permission has been given by either the ES, PICOP or SWL as appropriate.

The ES, PICOP or SWL must give the MC specific instructions about what must be done at each level crossing. The MC must give these instructions to the OTP operator.

## **7.11 Signals and block markers**

The MC must authorise the OTP to pass a block marker or a signal at danger only when permission has been given by either the ES, PICOP or SWL as appropriate.

## **7.12 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 or SWL.

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.

If propelling outside a work site the MC must get the permission of the PICOP.

Propelling outside of a work site is only allowed if the details have been published in the *Weekly Operating Notice* or *Engineering Notice* and is shown in the method statement.

## 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.

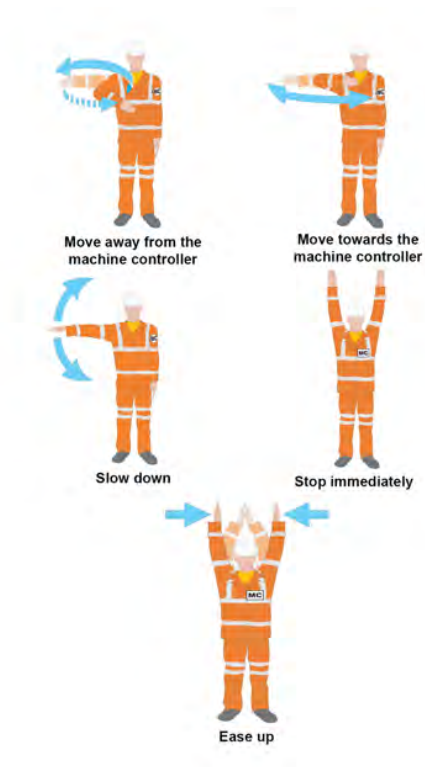
## 9.3 Using handsignals

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.



**Diagram HB.15.2 Handsignals during daylight**



Slowly move away from  
the machine controller



Slowly move towards the  
machine controller



Ease up



Stop immediately

**Diagram HB15.3 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 extendable 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 an ES's or SWL's work site and the ES or SWL 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 or SWL and the COSS or SWL 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 can be left unattended in rail mode only when the MC has the permission of the:

- ES or SWL, 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



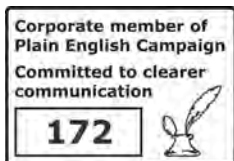
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Supersedes GERM8000-trackworkers Iss 7 with effect from 05/12/2020

## Notes

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# GERT8000-HB15 ERTMS Rule Book

## Handbook 15 ERTMS

Duties of the machine  
controller (MC) and on-  
track plant operator on  
ERTMS lines where  
lineside signals are not  
provided  
Issue 3



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# 1 Definitions

## Loose shunting

This means shunting vehicles that do not stay attached during the movement.

## 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 I.C. 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.

Each work site is under the control of an engineering supervisor (ES) or safe work leader (SWL). The ES or SWL is responsible for authorising the movement of engineering trains or OTP entering or within the work site.

The ES will wear an armlet on the left arm or a badge on the upper chest. The armlet or badge will have ENGINEERING SUPERVISOR in blue letters on a yellow background.

The SWL will wear an armlet on the left arm or a badge on the upper chest. The armlet or badge will have SWL 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 must not 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 a 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 a 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 shown in the specific instructions for the OTP concerned.

Except for those tests that can only be carried 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
- to sound the horn at any whistle boards
- the location of any block marker the OTP must stop at
- the location of the WSMBs
- 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
- level crossings
- 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, ES or SWL before these activities are carried out.

When the OTP has finished work, has been off-tracked and is clear of the line, the MC must tell the PICOS, ES or SWL.

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 or SWL 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 or SWL 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 COSS, and
- the COSS 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.

## **6.3 On or off-tracking on lines with conductor rails**

OTP must not be on or off-tracked or cross a line that has conductor rails until there is an isolation and:

- a conductor rail permit has been issued to the COSS, and
- the COSS has given permission to start work.

Additionally:

- there must be adequate gap in the conductor rail, or
- an approved conductor rail ramp must be used, or
- the conductor rail must have been lowered and protected.

You must carry out any other instructions to do with the conductor rail as shown on the EAC or ECC for the OTP.

## **7 Making rail movements**

### **7.1 Getting authority for movements**

Movements must only enter or take place within a work site when the ES gives permission. Only after the ES or SWL has given permission to the MC may the MC authorise the OTP movement.

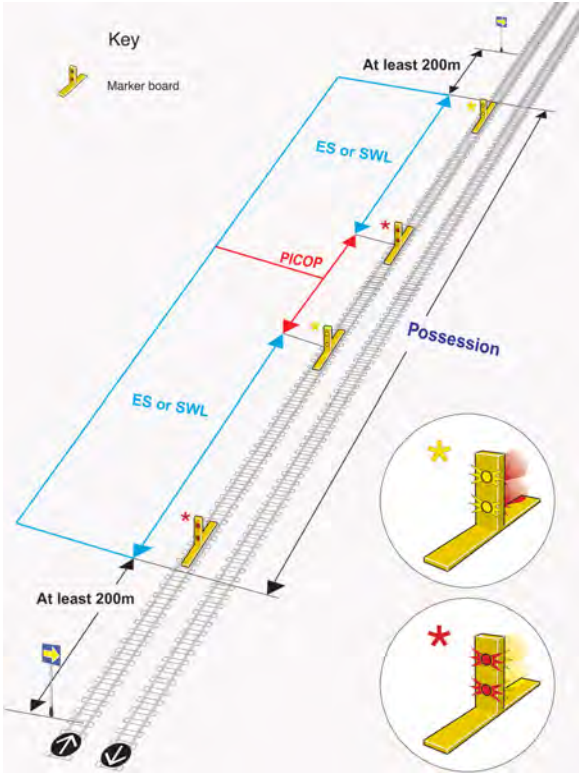
Movements must only leave or take place outside a work site when the PICOP gives permission. Only after the PICOP has given permission to the MC may the MC authorise the OTP movement.

Movements must only enter or take place in a siding when the PICOS gives permission. Only after the PICOS has given permission to the MC, may the MC authorise the OTP movement.

OTP is not allowed outside a 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.



### Diagram HB15.1 ERTMS Possession of a running line with two work sites



### **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 30 km/h (20 mph) 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 10 km/h (5 mph):

- over points
- anywhere within sidings
- controlled from the ground
- where speed has not been given by the ES, PICOP or SWL.

Other movements may be authorised by the ES, PICOP or SWL at a speed up to 40 km/h (25 mph).

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 15 km/h (10 mph).

## **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.

The MC must tell either the ES, PICOP or the SWL, if the EAC or ECC states that the OTP cannot be relied on to operate train-operated points.

## **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 may 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**

Nobody must ride on OTP or any vehicle attached to it unless it 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 must not 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 Level crossings**

The MC must authorise the OTP to pass over a level crossing only when permission has been given by either the ES, PICOP or SWL as appropriate.

The ES, PICOP or SWL must give the MC specific instructions about what must be done at each level crossing. The MC must give these instructions to the OTP operator.

## **7.11 Block markers**

The MC must authorise the OTP to pass a block marker only when either the ES, PICOP or SWL as appropriate has given permission.

## **7.12 Work-site marker boards**

The MC may authorise the OTP to pass a WSMB displaying two flashing red lights only when permission has been given by the ES or SWL.

The MC may 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.

If propelling outside a work site the MC must get the permission of the PICOP.

Propelling outside a work site is only allowed if the details have been published in the *Weekly Operating Notice* or *Engineering Notice* and is shown in the method statement.

## 9 Controlling OTP rail movements

### 9.1 General

Authority for movements may 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.

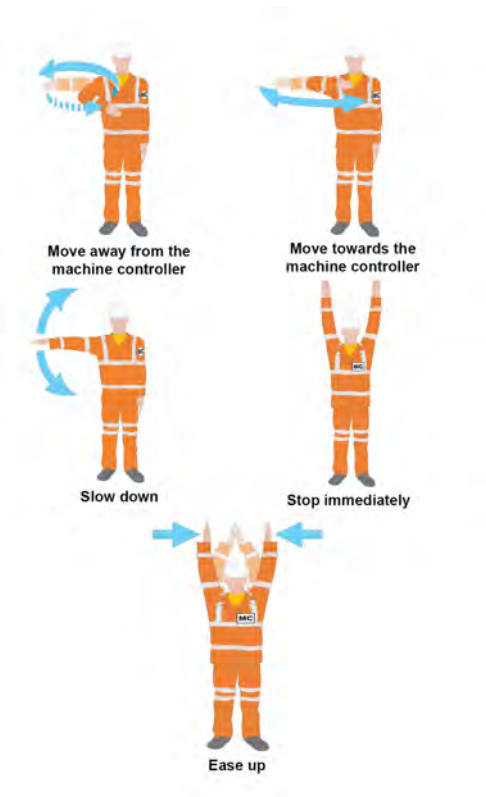
## 9.3 Using handsignals

When handsignals are being used to control movements from the ground, the MC must use the handsignals shown in diagram HB15.2 ERTMS or diagram HB15.3 ERTMS.

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.



**Diagram HB15.2 ERTMS Handsignals during daylight**



Slowly move away from  
the machine controller



Slowly move towards the  
machine controller



Ease up



Stop immediately

### Diagram HB15.3 ERTMS 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 extendable 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 an ES's or SWL's work site and the ES or SWL 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 line has been blocked by a COSS or SWL and the COSS or SWL 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 or SWL, 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 an MC

Movements may be made without an 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 to which the unaccompanied movement may proceed.

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 is kept between the OTP and the OTP ahead.

The speed must not exceed 30 km/h (20 mph) 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.

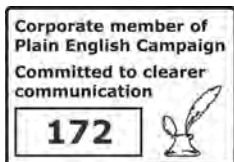
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## Notes

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# GERT8000-HB16

## Rule Book

# Handbook 16

## AC electrified lines

## Issue 4



September 2018  
Comes into force 01 December 2018

Crystal  
Mark  
19919

Clarity approved by  
Plain English Campaign



**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**
- **guard**
- **shunter**
- **signaller**
- **crossing keeper**
- **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.**

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# 1 Definitions

## 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.

## Overhead line permit

A permit (known as form C) signed and issued by the nominated person (NP) and given to a controller of site safety (COSS), designated person (DP) or safe work leader (SWL) who is to 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 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.

Table A of the *Sectional Appendix* shows which lines are electrified by the 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 all parts shown in diagram HB16.1 (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 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:

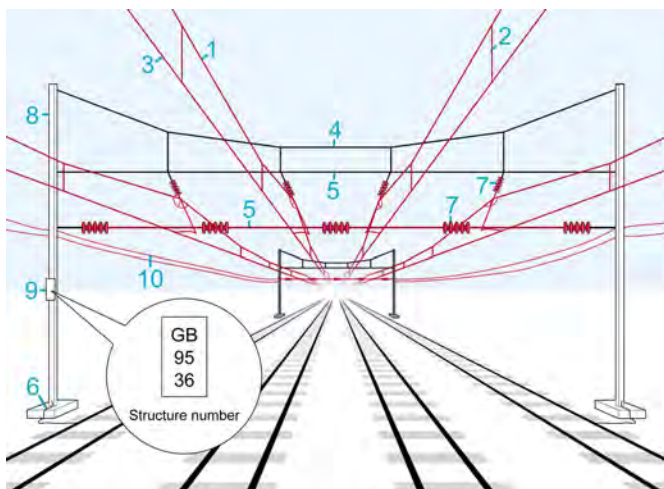
- An overhead line permit has been issued to the COSS or SWL.
- The OLE has been isolated and earthed and an assurance has been received as shown in local isolation instructions.

### **3.2 Objects on or near to the OLE**

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 HB16.1**

**Typical headspan construction**

**1** Catenary wire **2** Dropper **3** Contact wire **4** Headspan wire

**5** Cross span wires **6** Structure bond **7** Insulators **8** Mast or structure

**9** Structure number plate **10** Along-track conductors

### **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 Network Rail instructions
- the COSS or SWL 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 Network Rail instructions and the COSS or SWL 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. You must make sure they do not come within 2.75 metres (9 feet) of live OLE.

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

**Note:** 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 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).

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 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

**Note:** 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 COSS or SWL an overhead line permit. The COSS or SWL 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 COSS or SWL must sign the overhead line permit to show they understand the conditions.

The COSS or SWL 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 COSS or SWL must keep the overhead line permit until:

- work is completed and the COSS or SWL and the group the COSS or SWL is responsible for is clear of the line, or
- the COSS or SWL is relieved by another COSS or SWL, in which case the overhead line permit must be handed to the new COSS or SWL and both people must sign it.

The new COSS or SWL must make sure they understand about the conditions shown in section 9.1 of this handbook.

The new COSS or SWL must tell the NP (either directly or through the ECO) that they have taken over the duties of the COSS or SWL.

The COSS or SWL 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 COSS or SWL 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 COSS or SWL must make sure all personnel and materials are removed from, and are no closer than 2.75 metres (9 feet) from, the OLE.

The COSS or SWL 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 decide whether the object or defect to the OLE means that trains, including both bi-mode trains and electric trains with the 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 make sure that the following boards are erected.

### 20 mph (30 km/h) pantograph signs



## **Notes**

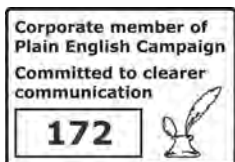
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GE/RT8000/HB17

Rule Book

# Handbook 17

# Handbook 17

## DC electrified lines

**Issue 3**  
**September 2015**  
**Comes into force**  
**05 December 2015**

Crystal  
Mark  
19920



Clarity approved by  
Plain English Campaign

**This handbook is for those personnel who need to go on the operational railway in a DC electrified area to carry out their duties, with the exception of a:**

- **train driver**
- **guard**
- **shunter**
- **signaller**
- **crossing keeper**
- **designated person (DP).**

**The personnel listed above will not receive this handbook but will get Rule Book module DC DC 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.**

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**Note:** This handbook does not apply in the Merseyrail area or between Drayton Park and Moorgate. Network Rail publishes local instructions separately for these.

# 1 Definitions

## 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 conductor rail equipment (CRE).

The ECO will switch off the electrical supply to:

- the electrical section affected
- the abutting electrical section either side.

## Conductor rail permit

A permit that is signed and issued by the authorised person and given to the controller of site safety (COSS), designated person (DP) or safe work leader (SWL) who is to carry out work on or near to the CRE.

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

If a conductor rail permit has been issued it does not mean train movements have stopped.

## 2 Competence

You must not go on or near the line in an area with CRE unless your certificate of competence in personal track safety states that it is valid on lines electrified by the DC system.

Table A of the *Sectional Appendix* shows which lines are electrified by the DC system.

If new CRE 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 CRE is live, you must treat it as live and dangerous to life.

## **3 Dangers of the system**

### **3.1 Treating the CRE as being live**

CRE, shoe gear and under-floor 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.

Live CRE is dangerous to life. You must treat CRE as being live at all times unless one of the following applies.

- A planned isolation has been taken and a conductor rail permit has been issued to the COSS or SWL.
- A temporary isolation has been taken as shown in Network Rail instructions.
- A local isolation has been taken as shown in local isolation instructions.
- The ECO has given an assurance that the CRE has been switched off in an emergency.

You must not:

- touch or step on CRE or guard boarding
- allow clothing, tools, equipment or any object you are carrying to touch CRE unless they are intended for this purpose
- step between the conductor rail and the adjacent running rail
- touch broken or displaced CRE
- touch the collector shoes on any train, whether or not the collector shoes are touching the conductor rail
- step into flood water which may be in contact with the CRE
- direct a jet of water or any other liquid onto the CRE.

Traction return current passing through the running rail is not normally dangerous to life. However, you must not touch the running rail at the same time as touching any metalwork nearby that is not directly connected to the running rails.

You must treat cables running alongside and crossing under lines as being live. You must not interfere with these cables or their protective covers.

You must not touch broken running rails or bridge the gap between them.

### **3.2 Reporting damage, defects and flood water**

You must immediately make sure the following are reported to the ECO:

- damage to cables, cable routes or connected equipment
- flashovers or electrical explosions seen or heard in any electrical equipment
- any leakage of oil from a cable or cable oil tank
- damage to a conductor rail
- burning, smoking or excessive flashing of conductor rails or cables connected to them
- a broken or parted rail or broken conductor rail
- a broken or defective bond
- a broken or defective insulator
- equipment or debris in contact with the conductor rail and running rail.

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

If you become aware that the line is flooded above sleeper level, you must report this to the ECO in the quickest way possible. You must state the depth and extent of the flooding.

You must also report to the ECO any change to the extent of the flooding.



## **4 Personal safety**

### **4.1 Precautions that must be taken**

You must always take care when working close to the CRE. You must also take special care if you or anything you are using or carrying will be nearer than 300 mm (1 foot) to the CRE.

If you are applying a track-circuit operating clip, or a track-circuit operating device (T-COD), you must always apply it to the running rail furthest from the conductor rail first and then to the running rail nearest to the conductor rail.

When removing a track-circuit operating clip, or a T-COD, you must remove it from the rail nearest to the conductor rail first and then from the rail furthest from the conductor rail.

If you have to place detonators, you must attach them to the running rail which is furthest from the conductor rail.

If the emergency services need to go on or near the line, the person in charge at the site must tell the officer in charge from each emergency service about the presence of the conductor rail and which parts have been switched off.

If you are to manually operate or secure points and the conductor rail is not gapped or protected by guard boarding next to the motor or blade to be secured, you must place a conductor rail shield over the conductor rail before starting work.

## **4.2 Moving materials or equipment**

You should avoid carrying materials or equipment over the conductor rail. If you need to carry an object over a conductor rail, you must make sure that it does not come into contact with a live conductor rail.

You must not drag objects across, or drop them on, a conductor rail.

## **4.3 Attending to vehicles**

If possible, you must work on the side away from the conductor rail when performing tasks such as:

- operating handbrakes
- coupling vehicles
- uncoupling vehicles
- passing beneath the buffer level of coupled vehicles
- going underneath vehicles.

If it is not possible to do this on the side away from the conductor rail, other than when operating handbrakes, you must first place a conductor rail shield over the conductor rail.

If a conductor rail shield is not available, or cannot be fitted, arrangements must be made for the electricity to be switched off.

You may examine a vehicle without first getting the electricity switched off as long as you do not touch the conductor rail or overhead trolley wires, or any electrical equipment connected to them.

However, if severe arcing has taken place, you must get the electricity switched off before carrying out the examination.

## **5 Communicating with the ECO**

### **5.1 Directly or by another person**

You can contact the ECO, 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 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

**Note:** An emergency switch-off of the CRE 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 or train or a lineside fire
- a person in contact with or in danger of coming into contact with the CRE
- an incident or other emergency requiring, or likely to require, the electricity supply to be switched off
- an emergency evacuation of passengers from a train.

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 CRE
- whether short-circuiting bars have been applied
- whether the emergency services are waiting to give assistance.

If you are not at the site, you must relay the 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 one of the following applies:

- the electricity has been switched off, 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 the 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 Using a short-circuiting bar**

If you cannot contact the ECO direct or through another person to get the electricity switched off in an emergency, you may apply a short-circuiting bar. However you must only do this if you are competent to do so and a person is in danger through contact with the CRE.

You must not use a short-circuiting bar where there is a guard board between the conductor rail and the adjacent running rail or a yellow plastic shroud is fitted to the underside of the conductor rail.

Before you use a short-circuiting bar, you must make sure there is no conductor-rail section gap between where you apply it and the section of conductor rail you need to be switched off.

You must consider any other portions of conductor rail to be live until the ECO gives an assurance they have been switched off.

Once you have applied the short-circuiting bar, you must leave it in position until it is no longer needed.

You must tell the ECO as soon as you have used a short-circuiting bar and give the exact location where it was applied.

You must get permission from the ECO before you remove a short-circuiting bar and then tell the ECO when you have removed it.

## **6.4 PICEE Managing the emergency switch-off**

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

You must identify yourself to anyone arriving on site.

If the emergency services are called to site, you must tell the officer in charge from each emergency service about the presence of the CRE 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 CRE.

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 switched on, you must:

- warn everyone involved that the electricity is about to be switched on
- make sure everyone is clear of the CRE
- remove any short-circuiting bars or other materials used during the emergency switch-off and place them clear of the CRE.

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 is necessary for work to be carried out on or close to the CRE, an isolation must be taken as shown in section 8.

When the planned or temporary isolation has been taken, the ECO will tell you that you are no longer required to carry out any further duties as the PICEE.



## 7 Rescuing a person from the CRE

If it is necessary to rescue a person from live CRE, you should arrange for an emergency switch-off or use a short-circuiting bar as shown in section 6.

If it is not possible to get the electricity switched off or you cannot use a short-circuiting bar, you can try to rescue a person from live CRE as long as:

- you cover your hands with something which is dry and will not conduct electricity
- you stand on dry non-conducting material
- you do not use any metal objects.

If you cannot do this, you must only try to move the person using dry insulating material.

## 8 Types of isolation

**Note:** Isolation of the traction current does not mean that train running has been stopped.

### 8.1 Planned isolation

The COSS or SWL must not allow work to start that requires an isolation until the COSS or SWL has received a conductor rail permit (CRP).

The COSS or SWL must explain to everyone in the group the limits of the isolation and any hazards or conditions specified on the CRP, before allowing them to start work.

The COSS or SWL must keep the CRP until the group has finished working. The COSS or SWL must then immediately return the CRP to the person who issued it.

You must immediately tell the authorised person (AP) if your CRP is lost. The AP will arrange to issue you with another CRP endorsed 'Duplicate'.

If another COSS or SWL is to take over before the work is completed, the limits of the isolation must be explained to the new COSS or SWL and the CRP must then be handed to the new COSS or SWL.

If you are the new COSS or SWL, you must make sure you understand the limits of the isolation and any hazards or conditions before taking over the CRP.

If when your work is complete, you find that you have lost your CRP, you must tell the AP. You must carry out a visual inspection with the AP to make sure that all personnel and materials are clear of the CRE.

## **8.2 Temporary isolation**

These isolations must be granted as shown in Network Rail instructions and only to a person who has been trained in those instructions.

## **8.3 Local isolation**

A local isolation can only be taken where a local isolation instruction has been issued.

## **9 Protecting isolated sidings where there is no local instruction**

If you are the person in charge of the siding possession (PICOS), you must arrange for points to be placed and kept in the position to prevent trains entering the area to be isolated.

The points must be protected against movement by:

- the signaller or operator using reminder appliances if worked from a signal box, ground frame or shunt panel, or
- securing them if they are hand points.

You must record the details in writing.

## **10 Track isolating switches and hook switches**

You may only operate a track isolating switch or hook switch if you are competent to do so and have the authority of the ECO.

The ECO will give you instructions on whether the switches are to be opened or closed and the order in which they are to be operated. You must immediately tell the ECO when you have operated the switch.

You must replace the white sleeve to a normally open hook switch when restoring it to its normal position to prevent it from being operated accidentally.

You must keep a track isolating switch enclosed and locked to stop unauthorised interference. You must fit a caution notice to a normally open track isolating switch to prevent it being operated accidentally.

## **11 Short circuits**

If you are asked to examine the conductor rail for a short circuit, you must treat the conductor rail as being live at all times because the ECO may try to restore the electricity supply at any time.

If you see an object that is causing or is likely to be causing the short circuit, you must not try to remove it until the ECO tells you it is safe to do so.

You must not enter a tunnel until you have told the ECO that you are about to do so. You must tell the ECO immediately you have left the tunnel. When you are in the tunnel, the ECO will not try to restore the electricity supply.

## **12 Moving electric trains between live and isolated sections**

If you are responsible for authorising train movements, before authorising a train that has collector shoes to enter or leave an isolated section, you must get confirmation from the driver that all collector shoes are secured in the raised position clear of the conductor rail.

## Notes



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Rule Book

# Handbook 18

# Handbook 18

## Duties of a level crossing attendant

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# **1 Arriving at the crossing**

When you arrive at the crossing you must report to the signaller and wait for further instructions.

You must not open the door to the local control unit or crossing clear unit until the signaller tells you to take local control.

# **2 Automatic half-barrier crossing (AHBC)**

## **2.1 Taking local control**

You must put the crossing on local control only when told to do so by the signaller.

## **2.2 After local control has been taken**

While the barriers are raised, you must make sure a red flag, or red light during darkness or poor visibility, is displayed at each side of the crossing so that it is clearly visible to the driver of any train that may approach.

When you are told that a train is approaching, you must lower the barriers in time to avoid delaying the train.

If you are lowering the barriers by hand, you must first lower one barrier just enough to activate the red road signals and then lower both barriers fully.

When it is safe for a train to pass over the crossing, you must remove the red flag or light and show a green handsignal to the driver. You must take care that road users do not mistake this handsignal for permission to cross.

If the protecting signal or block marker can be seen from the crossing, you must make sure that the train has passed the signal or block marker or that the driver has been authorised to pass the signal or block marker before showing the green handsignal.

When a train has passed over the crossing, you may raise the barriers as long as no other train is approaching.

### **2.3 Local control for a line blockage or possession**

The signaller will tell you which lines are affected and when a movement needs to be made over the crossing on any open line.

**Line blockage:** the COSS, PC or SWL will tell you when a movement needs to be made over the crossing.

**Possession:** the ES, PICOP or SWL will tell you when a movement needs to be made over the crossing.

When you have been told or you become aware that a movement is to pass over the crossing, you must lower the barriers.

### **2.4 Local control in other circumstances**

The signaller will tell you about the circumstances and what you must do.

## **3 Closed-circuit television (CCTV) or remote control (RC) crossing**

### **3.1 When the crossing is not on local control**

If the signaller cannot get a satisfactory picture of the crossing, you will be told when the barriers are about to be lowered. While the barriers are being lowered, you must tell the signaller if it becomes necessary to stop the lowering process.

You must tell the signaller when the barriers are lowered and the crossing is clear.

If the movement is in a direction for which there is no signalled route, the signaller will tell you to display a green handsignal to the driver.

If you have agreed with the signaller that the barriers will be kept lowered until a road user wants to cross, you must immediately tell the signaller about any road user wanting to use the crossing.

### **3.2 Taking local control**

You must put the crossing on local control only when told to do so by the signaller.

If the barriers are already lowered, you must not raise them until the signaller tells you to do so.

### 3.3 When the crossing is on local control

If you are lowering the barriers by hand, you must first lower one barrier just enough to activate the red road signals. You must then lower the barriers fully.

You must lower nearside barriers first.

If a barrier does not rise in response to the button, you must immediately stop the raising sequence. You must lower any barriers that have started to rise as soon as it is safe to do so. The defective barrier must then be operated by hand. The other barriers can then be raised using the button.

### 3.4 Local control for a line blockage or possession

The signaller will tell you which lines are affected and when a movement needs to be made over the crossing on any open line.

**Line blockage:** the COSS, PC or SWL will tell you when a movement needs to be made over the crossing.

**Possession:** the ES, PICOP or SWL will tell you when a movement needs to be made over the crossing.

When you have been told or you become aware that a movement is to pass over the crossing, you must lower the barriers and display a green handsignal to the driver.

When the train has passed over the crossing, you must raise the barriers.

### **3.5 After local control has been taken in other circumstances**

The signaller will tell you about each approaching train. You must lower the barriers and tell the signaller when the barriers are fully lowered and the crossing is clear.

If the movement is in a direction for which there is no signalled route, the signaller will tell you to display a green handsignal to the driver.

When the train has passed over the crossing, you must ask the signaller for permission to raise the barriers.

## **4 Obstacle detection (OD) crossing**

### **4.1 Operating the crossing-clear unit (CCU)**

You must put the crossing in CCU mode only when told to do so by the signaller.

The barriers will lower automatically. When the barriers are fully lowered and the crossing is clear, you must press the 'crossing clear' buttons.

If the movement is in a direction for which there is no signalled route, the signaller will tell you to display a green handsignal to the driver.

If the crossing becomes obstructed, you must immediately operate the 'all signals on' control and tell the signaller.



## 4.2 Operating the local-control unit (LCU)

You must put the crossing on local control only when told to do so by the signaller.

If the barriers are already lowered, you must not raise them until the signaller tells you to do so.

## 4.3 When the crossing is on local control

If you are lowering the barriers by hand, you must first lower one barrier just enough to activate the red road signals. You must then lower the barriers fully.

You must lower nearside barriers first.

If a barrier does not rise in response to the controls, you must immediately stop the raising sequence. You must lower any barriers that have started to rise as soon as it is safe to do so. The defective barrier must then be operated by hand. The other barriers can then be raised using the controls.

## 4.4 Local control for a line blockage or possession

The signaller will tell you which lines are affected and when a movement needs to be made over the crossing on any open line.

**Line blockage:** the COSS, PC or SWL will tell you when a movement needs to be made over the crossing.

**Possession:** the ES, PICOP or SWL will tell you when a movement needs to be made over the crossing.

When you have been told, or you become aware, that a movement is to pass over the crossing, you must lower the barriers and display a green handsignal to the driver.

When the train has passed over the crossing, you must raise the barriers.

#### **4.5 After local control has been taken in other circumstances**

The signaller will tell you about each approaching train. You must lower the barriers and tell the signaller when the barriers are fully lowered and the crossing is clear.

If the movement is in a direction for which there is no signalled route, the signaller will tell you to display a green handsignal to the driver.

When the train has passed over the crossing, you must ask the signaller for permission to raise the barriers.

### **5 When the crossing is to be restored to normal working**

The signaller will tell you when the crossing can be restored to normal working.

You must not leave the crossing until the signaller gives permission.



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# GERT8000-HB19 Rule Book

## Handbook 19

### Work on signalling equipment - duties of the signalling technician

#### Issue 4



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# 1 General

## 1.1 Definitions

The following terms and their meanings apply within this handbook.

### **Defective signal**

A signal which is not operating or displaying correctly, or where the light is out when it should be illuminated.

### **Equipment disconnected**

Equipment that has had its functions limited so that it cannot be operated by the signaller. This includes a signal adjusted to show only its most restrictive aspect or route setting barring.

### **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:

- temporary approach controls on signals
- signals with restricted aspects
- on an ERTMS line, 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:

- signals and associated indicators such as right away (RA), close doors (CD) and OFF indicators
- points, track circuits, axle counters and treadles
- automatic warning system (AWS), train protection warning system (TPWS)
- ERTMS equipment
- train operated warning systems (TOWS)
- level crossing controls
- interlockings and block signalling equipment
- 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.

## **1.2 When the instructions in this handbook apply**

The instructions in this handbook apply:

- to a failure of signalling equipment
- to work on signalling equipment
- when a release of signalling controls is needed.

## **1.3 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.

The instructions in this handbook do not apply when signalling equipment is to be disconnected to provide additional protection for a line blockage.

## **1.4 Technician's responsibilities**

You are responsible for any work associated with disconnections, restrictions or taking equipment out of use.

You must get the signaller's permission before making, or arranging to make, any disconnection or restriction or take any equipment out of use.

If trains are put in danger, you can make an emergency signal disconnection without asking the signaller's permission. However, you must tell the signaller as soon as possible what you have done.

If you need to operate a lever, button, switch or other signalling equipment for test purposes, you must:

- ask the signaller to operate it, or
- ask the signaller for permission before you operate it.

## **1.5 Using a Signal Engineering Work form (RT3187)**

You must use form RT3187 when:

- signalling equipment will be taken out of use, disconnected or 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 RT3187 if all the signalling equipment affected is within the area of a line blockage, protection zone or possession and it is planned to restore the equipment to normal use before the line blockage, protection zone or possession is given up.

However, if the line blockage, protection zone or possession will be given up but signalling equipment will stay disconnected or restricted, you and the signaller must fill in form RT3187 before the line blockage, protection zone or possession is given up.

You do not need to use form RT3187 during a failure of signalling equipment unless equipment will be taken out of use, disconnected or 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 disconnection or restrictions are made, or the equipment is taken out of use, you must make sure that person fully understands the arrangements that apply.

If form RT3187 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 RT3187 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 disconnected, 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 RT3187 at the same time as the signaller.

You must not allow any disconnections or 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 RT3187 at the same time as the signaller
- disconnect or restrict the agreed signalling equipment.

When the disconnections or 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 RT3187 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 RT3187 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 RT3187 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 disconnected or 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 RT3187 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 disconnected or restricted.

## 4 Releasing signalling controls

### 4.1 When these instructions apply

You may only release signalling controls when one of the following applies.

- a) A track circuit has failed holding points and it is necessary to move those points to the opposite position.
- b) A track circuit or other equipment has failed holding a route and it is necessary to release that route so that movements that are clear of the failure can be signalled.
- c) An obstruction of the line, derailment or engineering work is keeping a track circuit occupied, and it is necessary to signal movements that will be clear of the obstruction.

You must not release a control which will allow:

- a line clear to be given on any block indicator, or
- a proceed aspect or indication to be displayed by a signal held at danger by a track circuit or axle counter failure
- an MA to be issued beyond an end of authority (EoA) when a track circuit or axle counter failure is preventing it on that route.

### 4.2 Procedure for releasing signalling controls

You must come to a clear understanding with the signaller as to which controls are to be released.



You must fill in part 1 of your copy of Release of Signalling Controls form (RT3186) at the same time as the signaller.

If you agree to a release being given, you must then fill in part 2 of your copy of form RT3186 at the same time as the signaller.

You must then:

- release the agreed signalling control
- tell the signaller when you have done this.

You must then fill in part 3 of your copy of form RT3186 at the same time as the signaller.

### **4.3 Change of signalling technician**

If a release of signalling controls is still in place when another signalling technician is to take over from you, you must make sure the signalling technician taking over fully understands the arrangements that apply.

If you are the new signalling technician, you must sign part 5 of your copy of form RT3186 while the signalling technician you are taking over from is present. You must then tell the signaller you have taken over.

### **4.4 Cancelling a release of signalling controls**

When the signaller asks you to restore the signalling controls, you must fill in part 4 of your copy of form RT3186 at the same time as the signaller.

You must then:

- restore the signalling controls
- tell the signaller when you have done this.

You must then cancel your copy of form RT3186 by writing 'CANCELLED' across it.

## 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 disconnected, restricted or taken out of use
- whether form RT3187 has to be used.

You must agree with the signaller the time work can start.

### 5.2 If the work needs equipment to be disconnected, restricted or taken out of use

You must not make any disconnections or restrictions unless the signaller has given you permission.

If form RT3187 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:

- disconnect or 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 RT3187 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 disconnected or 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 RT3187, giving details of all equipment that will stay disconnected, 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 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) or safe work leader (SWL).

## **7 Working single lines by pilotman**

If a token is needed to operate a ground frame and the token is not available, you must release a token when the signaller asks you to do so.

Before you release a token, you must make sure the pilotman has shown you the completed pilotman's form.

You must hand the token to the pilotman who will keep it until either normal working resumes or you need the token.

On a one-train working line, when the train has arrived with the pilotman, you must personally:

- unlock the ground frame to allow the train to work at the ground frame
- lock the ground frame when the train has finished its work.

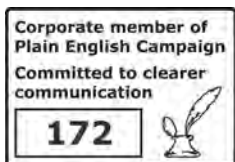
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## **Notes**

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# GERT8000-HB20 Rule Book

## Handbook 20

### General duties of a safe work leader (SWL) working outside a possession

Issue 3



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## **1 Competence and identification**

To act as a safe work leader (SWL), you must have with you a valid SWL certificate of competence issued by your employer.

You must wear a SWL armlet on the left arm or a SWL badge on the upper chest when you are carrying out the duties of a SWL.

You must not wear the SWL armlet or badge at any other time.

Except when you are the SWL in charge of a work site in a possession, the armlet or badge must have SWL in white letters on a blue background.

## **2 Work that you can do without the line being blocked**

### **2.1 Work that does not affect the safety of the line**

If the work will not affect the safety of the line and nobody will come within 2 metres (6 feet 6 inches) 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.

## **2.2 Patrolling, examining or inspecting when alone**

You can patrol, examine or inspect an open line when you are alone if you are sure you will be able to look up often enough (at least every 5 seconds) to see any train approaching and:

- you will be able to reach a position of safety at least 10 seconds before any approaching train arrives, and
- you can reach that position of safety without crossing any open line other than the one you are on.

You must not rely on these arrangements during darkness, poor visibility or when in a tunnel.

## **2.3 Crossing the line procedure**

You can use this procedure if you are walking alone, or with a group that is walking and need to:

- cross no more than four running lines
- walk past a structure that restricts clearance from a running line.

You can only use this procedure if all of the following apply.

- The location is one that has been approved for the use of the procedure and you and signallers have been given details about the location and the conditions for using it.
- You are competent in using the procedure and your name has been given to signallers.
- You are not using the procedure during the time you or any of the group are carrying out any work, including patrolling or inspecting, only when walking.
- You, or any of the group, must not carry anything that will affect your ability to walk safely.

You must contact the signaller using a mobile phone.

You must tell the signaller:

- where you want to cross the line or pass by a structure
- your name and employer
- how long it will take to cross the line or pass by a structure.

When the signaller tells you that the group can cross the line or pass by a structure you must:

- tell the group that they can cross the line or pass by a structure
- immediately cross the line or pass by the structure
- stay on the phone to the signaller until everyone has crossed the line or passed by the structure
- make sure that everyone is in a position of safety.

You must then tell the signaller that the group is clear of any line.

## **3 Work that needs the line to be blocked**

### **3.1 Work group at risk from trains**

If the activity could be carried out using lookout or equipment warning but neither is available, the line concerned must be blocked or another safe system used.

## **3.2 Work affecting the safety of the line**

Unless specifically allowed in your company instructions, you must consider the following as types of work that affect 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 2 metres (6 feet 6 inches) of the line.
- Using a road vehicle within 2 metres (6 feet 6 inches) 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.



### 3.3 Before starting work

You must not start or allow your group to start work as shown in section 3.1 or 3.2 unless the line concerned is blocked by one of the following methods.

- You have blocked the line as shown in handbook 21.
- The line has been blocked by a protection controller (PC) and you have agreed a safe system of work with that PC, as shown in handbook 21.
- Your site of work is within a siding and you have taken possession of the siding, or 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, or
- you are replaced by another SWL or a 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.

**Site warden warning** - 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.

**Equipment warning** - where there is equipment provided to give enough warning to allow everyone involved to reach a position of safety before any train arrives at the site of work.

**Lookout warning** - where one or more lookouts are positioned to provide enough warning to allow everyone involved to reach a position of safety before any train arrives at the site of work.

### **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 4.4, 4.5, 4.6, 4.7 or 4.8 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 21.
- The line or lines concerned have been blocked by a PC and you have agreed a safe system of work with that PC.
- 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 2 metres (6 feet 6 inches) 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.

**Note:** A rigid or tensioned barrier placed at 0.9 metres (3 feet) from an open line along with automatic track warning system (ATWS) is sometimes used when on-track plant is being used close to an open line. You must not use a barrier at this distance as part of your safe system of work.

## **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 armlet 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 test the warning before allowing work to start.

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 2 metres (6 feet 6 inches) to the nearest running rail of the open line.

#### **4.7 Safe system of work using ATWS, TOWS or LOWS (equipment warning)**

If there is an automatic track warning system (ATWS), train operated warning system (TOWS) or lookout operated warning system (LOWS), you can use this equipment to give warning of approaching trains as long as all of the following conditions apply.

- You or a member of your group are competent to use the equipment at that location.
- The equipment will provide an adequate warning of all approaching trains on the line or lines concerned.
- You and all members of the group will be able to stop work and reach the position of safety at least 10 seconds before the train arrives.

You must test the warning before allowing work to start.

If the equipment is already in use when you arrive, you must reach a clear understanding with the other person using it so that you each know what is happening.

When leaving the site of work, you must agree with anyone else using the equipment whether or not to leave the equipment in use.

## **4.8 Safe system of work using lookouts (lookout warning)**

### **Conditions**

You may set up a safe system of work using one or more lookouts as long as all of the following conditions apply.

- There is no realistic alternative safe system of work that can be used.
- Using lookouts at that location is not prohibited.
- You do not act as a lookout.
- There will be no need for anyone to cross more than two open lines to reach the position of safety.
- The group will not need to walk more than 25 metres (approximately 25 yards) along the line to reach the position of safety.
- The warning time needed is not more than 45 seconds.
- The warning time will be enough for everyone in the group to stop work and to then reach the position of safety at least 10 seconds before any train arrives (this is called the required warning time).

## Arranging lookouts

You must make sure each lookout:

- knows the direction and lines that need to be watched for approaching trains
- is not distracted
- takes no part in the actual work
- has no other duties.

You must check that each lookout is competent and is correctly wearing a lookout armlet or badge.

You must position site lookouts so that:

- any train approaching can clearly be seen
- the required warning time is available (use distant and intermediate lookouts if necessary)
- the warning will be received by everyone in the group (if necessary, use more than one site lookout).

On single or bi-directional lines, or when single line working is taking place, you must make sure enough warning is given for both directions.

You must test the warning before allowing work to start.

## Deciding what is an approaching train

In deciding which lines the lookout needs to watch for approaching trains, you must consider all of the following.

- a) A line on which the group is walking or working.
- b) A line adjacent to a) that could also put anyone in the group in danger.



- c) A line that has to be crossed to reach the position of safety.
- d) A line on which a train could be routed towards a), b), or c) from any direction.
- e) A line where, at the required sighting distance, it is not possible to tell whether a train is on a line shown in a) to d) above.

**Note:** A lookout is not needed for an adjacent line, as shown in b) above, if a train approaching on the adjacent line cannot put the group in danger, for example where the group will not pass beyond the six-foot rail.

### **Using distant and intermediate lookouts**

If the site lookout cannot achieve enough sighting to provide the required warning time, you may appoint distant and intermediate lookouts as long as the following conditions apply.

- It is daylight with clear visibility.
- Not more than one distant and one intermediate lookout is used in any direction.

You must make sure that any distant or intermediate lookouts are located in a position of safety.

However, if the site of work is mobile and the intermediate and distant lookouts will walk while carrying out their duties, they may leave the position of safety when they need to pass an obstruction.

You must make sure the distant lookout or intermediate lookout communicate correctly with each site lookout by using the blue and white chequered flags.

## **Method of warning used by a site lookout**

You must choose the warning to suit the type of work and the location from:

- a horn
- a whistle
- a touch.

You may, if necessary, also get the lookout to shout.

## **When a site lookout gives the warning**

You must make sure everyone goes to the position of safety when the warning is given.

If someone does not immediately stop work and go to the position of safety, the lookout will give an urgent warning.

Make sure tools and equipment are taken to the position of safety, unless they are too heavy to be moved by the slipstream of a passing train and are left clear of the line.

## **Working out the required warning time**

You must consider how long it will take to stop work and place any tools or equipment down and how long it will take to get to the position of safety.

You may take into account an emergency speed restriction (ESR) or temporary speed restriction (TSR) as long as it has been imposed for the work.

You must add the following:

- 5 seconds for each additional direction the site lookout will be looking
- 5 seconds for each distant lookout
- 5 seconds for each intermediate lookout.

You must then add 10 seconds to be in the position of safety before the train arrives.

Use the sighting distance chart, shown at the back of this handbook, to work out the required sighting distance needed for your safe system of work.

You must not use lookouts as your safe system if:

- they cannot achieve the required sighting distance
- the warning time needed is more than 45 seconds
- the number of lookouts needed is not available.

### **Using lookouts during darkness, poor visibility or when in or near a tunnel**

You may use lookouts during darkness, poor visibility or when in or near a tunnel as long as:

- the speed of approaching trains is no greater than 20 mph (30 km/h)
- the site lookout has enough sighting distance available
- you do not need to use a distant lookout or an intermediate lookout.

## **4.9 Working in a siding**

If you are competent to do so, you may be the PICOS.

If it is necessary to block one or more sidings for the work to take place, you must not allow that work to start until you have taken possession of the siding, or if you are not the PICOS, the PICOS has given you permission to start work.

## **5 SWL briefing**

Before your group goes on or near the line, you must make sure each person 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 they are using equipment warning, the method of warning and the position of safety
- if they are using 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 (RT9909).

## 6 Visitor permits

If a person is issued with a 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 concerned must give you a document telling you that their visit onto the operational railway has been approved.

You must:

- brief the person on the safe system of work
- sign and keep the visitor permit
- stay with the person until they leave the operational railway.

### Aid to working out warning times

	Up	Down
Maximum speed (from the Sectional Appendix or TSR or ESR)		
Time needed to stop work and down tools		
Time needed for everyone to reach a position of safety		
Add 5 seconds for each additional direction the site lookout is looking		

	<b>Up</b>	<b>Down</b>
Add 5 seconds for each distant lookout		
Add 5 seconds if working alone		
Add 5 seconds for each intermediate lookout		
Add 10 seconds (minimum time to be in a position of safety)	10	10
Total warning time needed (Must be no more than 45 secs)		
Sighting distance needed		
Sighting distance available		

## Sighting distance chart (in metres) mph

Sighting distance chart (in metres) mph

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
125 mph	900m	1200m	1400m	1700m	2000m	2300m	2600m
120 mph	900m	1100m	1400m	1650m	1900m	2200m	2500m
115 mph	800m	1100m	1300m	1550m	1800m	2100m	2400m
110 mph	800m	1000m	1300m	1500m	1800m	2000m	2300m
105 mph	800m	1000m	1200m	1450m	1700m	1900m	2200m
100 mph	700m	900m	1200m	1350m	1600m	1800m	2050m
95 mph	650m	850m	1100m	1300m	1500m	1700m	1950m
90 mph	650m	850m	1050m	1250m	1450m	1700m	1850m
85 mph	600m	800m	950m	1150m	1350m	1600m	1750m
80 mph	550m	750m	900m	1100m	1300m	1500m	1650m
75 mph	550m	700m	850m	1050m	1200m	1400m	1550m
70 mph	500m	650m	800m	950m	1100m	1300m	1450m
65 mph	450m	600m	750m	900m	1050m	1200m	1350m

## Sighting distance chart (in metres) mph

Sighting distance chart (in metres) mph

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
60 mph	450m	550m	700m	850m	950m	1100m	1250m
55 mph	400m	500m	650m	750m	900m	1000m	1150m
50 mph	340m	500m	600m	680m	800m	900m	1050m
45 mph	320m	420m	520m	620m	720m	820m	920m
40 mph	280m	360m	460m	540m	640m	720m	820m
35 mph	240m	320m	400m	480m	560m	640m	720m
30 mph	220m	280m	340m	420m	480m	540m	620m
25 mph	180m	240m	280m	340m	400m	460m	520m
20 mph	140m	180m	240m	280m	320m	360m	420m
15 mph	120m	160m	180m	220m	240m	280m	320m
10 mph	80m	100m	120m	140m	160m	180m	220m
5 mph	40m	60m	80m	80m	80m	100m	120m



## Sighting distance chart (in metres) km/h

Sighting distance chart (in metres) km/h

Maximum Speed	Sighting distances, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
200 km/h	900m	1200m	1400m	1700m	2000m	2300m	2600m
195 km/h	900m	1100m	1400m	1650m	1900m	2200m	2500m
185 km/h	800m	1100m	1300m	1550m	1800m	2100m	2400m
175 km/h	800m	1000m	1300m	1500m	1800m	2000m	2300m
170 km/h	800m	1000m	1200m	1450m	1700m	1900m	2200m
160 km/h	700m	900m	1200m	1350m	1600m	1800m	2050m
155 km/h	650m	850m	1100m	1300m	1500m	1700m	1950m
145 km/h	650m	850m	1050m	1250m	1450m	1700m	1850m
135 km/h	600m	800m	950m	1150m	1350m	1600m	1750m
130 km/h	550m	750m	900m	1100m	1300m	1500m	1650m
120 km/h	550m	700m	850m	1050m	1200m	1400m	1550m
115 km/h	500m	650m	800m	950m	1100m	1300m	1450m
105 km/h	450m	600m	750m	900m	1050m	1200m	1350m

## Sighting distance chart (in metres) km/h

Sighting distance chart (in metres) km/h

Maximum Speed	Sighting distance, in metres (m), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
95 km/h	450m	550m	700m	850m	950m	1100m	1250m
90 km/h	400m	500m	650m	750m	900m	1000m	1150m
80 km/h	340m	500m	600m	680m	800m	900m	1050m
70 km/h	320m	420m	520m	620m	720m	820m	920m
65 km/h	280m	360m	460m	540m	640m	720m	820m
55 km/h	240m	320m	400m	480m	560m	640m	720m
50 km/h	220m	280m	340m	420m	480m	540m	620m
40 km/h	180m	240m	280m	340m	400m	460m	520m
30 km/h	140m	180m	240m	280m	320m	360m	420m
25 km/h	120m	160m	180m	220m	240m	280m	320m
15 km/h	80m	100m	120m	140m	160m	180m	220m
10 km/h	40m	60m	80m	80m	80m	100m	120m

Sighting distance chart (in miles and yards)

Sighting distance chart (in miles and yards)									
Maximum Speed	Sighting distance, in miles (m) and yards (y), needed to give a warning time of								
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs		
125 mph	920y	1240y	1540y	1m80y	1m380y	1m700y	1m1000y		
120 mph	$\frac{1}{2}$ mile	1180y	1480y	1 mile	1m300y	1m600y	$\frac{1}{2}$ mile		
115 mph	860y	1140y	1420y	1700y	1m220y	1m500y	1m780y		
110 mph	820y	1080y	1360y	1620y	1m140y	1m400y	1m660y		
105 mph	780y	1040y	1300y	1540y	1m40y	1m300y	1m560y		
100 mph	740y	980y	1240y	1480y	1720y	1m200y	$\frac{1}{4}$ mile		
95 mph	700y	940y	1180y	1400y	1640y	1m100y	1m340y		
90 mph	660y	$\frac{1}{2}$ mile	1100y	$\frac{3}{4}$ mile	1540y	1 mile	1m220y		
85 mph	640y	840y	1040y	1260y	1460y	1680y	1m120y		
80 mph	600y	800y	960y	1180y	1380y	1580y	1 mile		
75 mph	560y	740y	920y	1100y	1300y	1480y	1660y		
70 mph	520y	700y	860y	1040y	1200y	1380y	1540y		
65 mph	480y	640y	800y	960y	1120y	1280y	1440y		

## Sighting distance chart (in miles and yards)

Sighting distance chart (in miles and yards)

Maximum Speed	Sighting distance in miles (m) and yards (y), needed to give a warning time of						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
60 mph	$\frac{1}{4}$ mile	600y	740y	$\frac{1}{2}$ mile	1040y	1180y	$\frac{3}{4}$ mile
55 mph	420y	540y	680y	820y	960y	1080y	1220y
50 mph	380y	500y	620y	740y	860y	980y	1100y
45 mph	340y	$\frac{1}{4}$ mile	560y	680y	780y	$\frac{1}{2}$ mile	1000y
40 mph	300y	400y	500y	600y	700y	800y	$\frac{1}{2}$ mile
35 mph	260y	360y	$\frac{1}{4}$ mile	520y	600y	700y	780y
30 mph	220y	300y	380y	$\frac{1}{4}$ mile	520y	600y	660y
25 mph	200y	260y	320y	380y	$\frac{1}{4}$ mile	500y	560y
20 mph	160y	200y	260y	300y	360y	400y	$\frac{1}{4}$ mile
15 mph	120y	160y	200y	220y	260y	300y	340y
10 mph	80y	100y	140y	160y	180y	200y	220y
5 mph	40y	60y	80y	80y	100y	100y	120y

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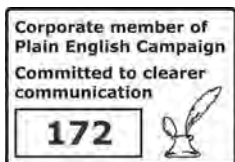
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# GERT8000-HB21 Rule Book

## Handbook 21

### Safe work leader (SWL) blocking a line

#### Issue 4



September 2018  
Comes into force 01 December 2018



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# 1 Arranging to block a line

## 1.1 When a line must be blocked

If as described in handbook 20, it is necessary to block a line, you must carry out the instructions shown in this handbook.

## 1.2 Agreeing the arrangements

You must agree all of the following with the signaller.

- The line to be blocked.
- The nature of the work.
- The locations between which the work will take place.
- The amount of time needed to do the work.
- The time after which permission can be given for the line blockage to start.
- Which signals will be kept at danger or block markers at which the route will be closed to protect the activity, including those in both directions on a single or bi-directional line.
- Any additional protection needed.
- If the work will take place beyond points that need to be used for train movements.
- The arrangements if single line working is taking place.
- The arrangements to apply at each level crossing.

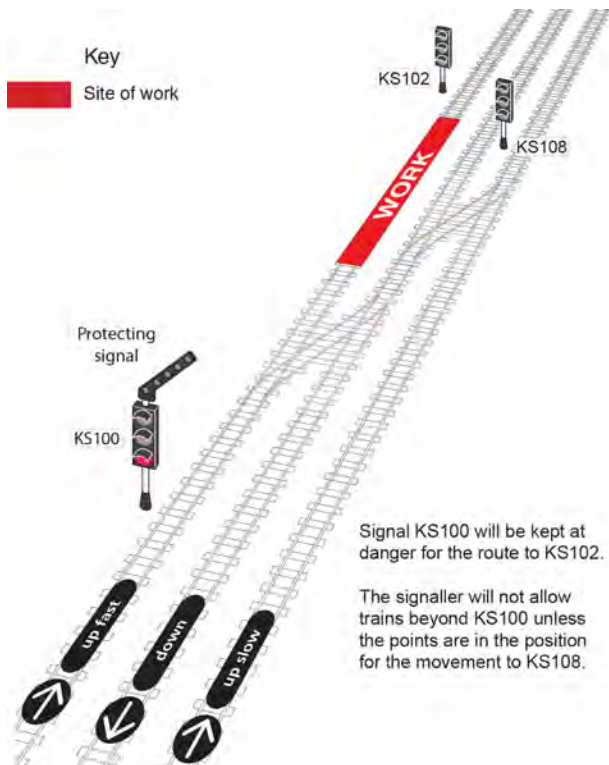
### **1.3 Working beyond points**

If the work will take place beyond points that need to be used for train movements, as shown in diagram HB21-1 or diagram HB21-2, the signaller will not allow a train to approach those points unless they are in the correct position to protect the work.

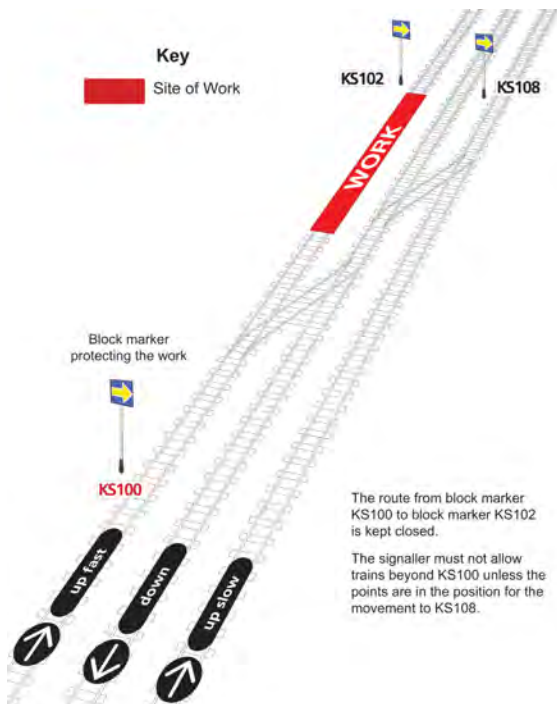
### **1.4 Working close to the protecting signal or protecting block marker**

Normally your site of work must not be closer than 200 metres to the protecting signal or protecting block marker. If work that will affect the safety of the line must be done within this distance, you must tell the signaller and the following must apply.

- The previous signal must be kept at danger or the route kept closed at the previous block marker.
- Trains may go beyond that signal only as shown in diagram HB21-3 and diagram HB21-5.
- Trains may go beyond that block marker only as shown in diagram HB21-4 or diagram HB21-6.

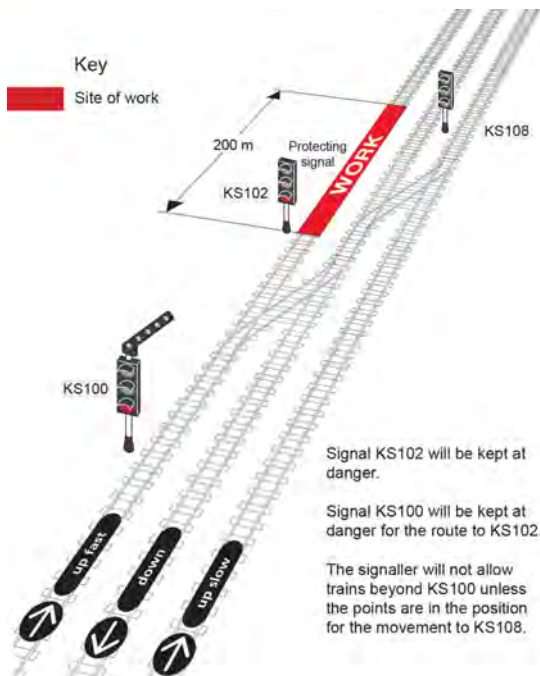


**Diagram HB21-1 Work taking place beyond points that will be used**



**Diagram HB21-2**

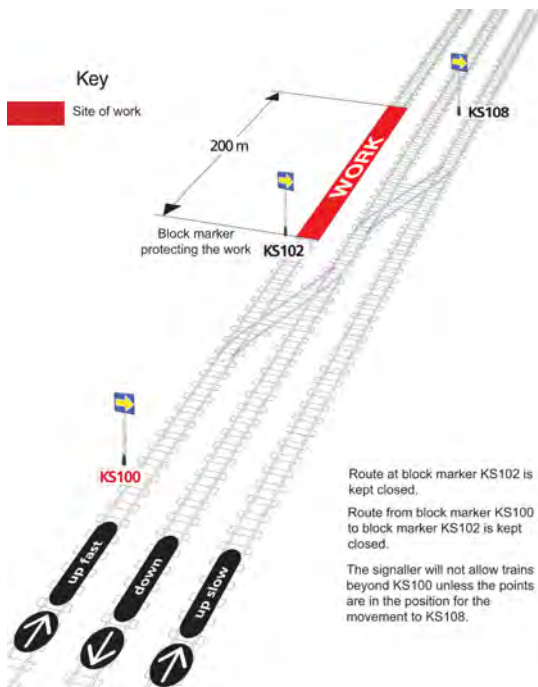
**Work taking place beyond points that will be used**



**Diagram HB21-3**

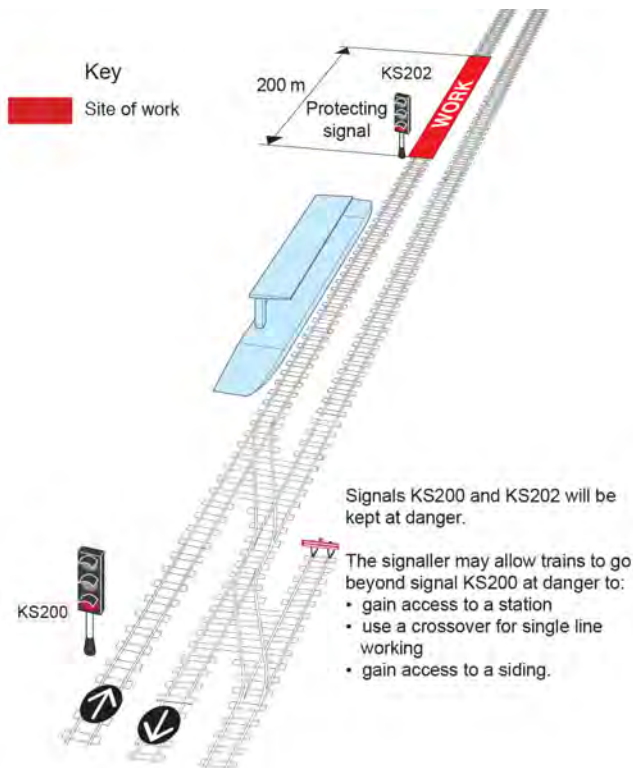
**Work taking place close to the protecting signal**





**Diagram HB21-4**

**Work taking place close to the protecting block marker**



**Diagram HB21-5**

**Work taking place close to the protecting signal**



### Work taking place close to the protecting block marker

## 2 Blocking the line

### 2.1 Recording the details

You must complete a line-blockage form (NR3180).

You must read your entry to the signaller to confirm that it is correct.

The signaller will tell you when the protecting signal has been placed to danger or the route closed at the protecting block marker and will confirm that the signal will be kept at danger or the route kept closed.

You must then arrange for the additional protection if it is necessary.

### 2.2 Additional protection

You must arrange for at least one of the following additional protection arrangements, as shown in section 2.3 to 2.7, to be provided on the line to be blocked whenever this is possible. However, you must always do so if the work will affect the safety of the line.

You must agree with the signaller what additional protection will be provided. The signaller will not give you an authority number until the additional protection is in place.

### 2.3 Disconnecting signalling equipment

You must ask the signaller to arrange for signalling equipment to be disconnected by the signalling technician to protect the line that is to be blocked.

## **2.4 Using a track circuit operating device**

Where authorised in the *Sectional Appendix*, you can use a track circuit operating device (T-COD) as long as the signalling equipment is working normally.

The work that is to be carried out must not affect the correct operation of the track circuit concerned.

You must get the signaller's permission before a T-COD is placed on the line.

You must tell the signaller when the T-COD has been applied.

## **2.5 A single line staff or token**

You must get the staff or token from the signal box or from the token instrument not at a signal box.

You must follow local instructions if the signal box closes and the staff or token is needed or when it is returned.

## **2.6 Detonator protection**

You must arrange for detonator protection to be placed at the protecting signal or block marker or clear of any points or through crossings beyond.

You must do this in both directions if:

- you are working on a single or bi-directional line
- single line working is in operation on the line concerned.

## 2.7 Engineering possession reminder (EPR)

Where authorised in the *Sectional Appendix*, you must ask the signaller to apply the EPR to protect the line that is to be blocked.

## 3 Granting the line blockage

The signaller will not grant the line blockage to you until the portion of line concerned is clear of all trains unless one of the following applies:

- Where authorised, you and the signaller can be sure that all trains have passed beyond your site of work.
- A train has become disabled or is at a stand, and will make no further movements until the line blockage is given up.

When you are both sure that the details on your NR3180 form 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 NR3180 form. You may now treat the line blockage as granted.

## 4 During the line blockage

### 4.1 Protection at the site of work

When you have been given the authority number, you must place a red flag or red light on the approach to the site of work if:

- the work will affect the safety of any approaching train, or
- a group is working.

You must make sure that the red flag or red light is placed in the four-foot where it will be clearly visible to the driver of a train approaching on that line.

You must do this in both directions if:

- you are working on a single or bi-directional line
- single line working is in operation on the line concerned.

### 4.2 Handing over to another COSS or SWL

When handing over to another COSS or a SWL, you must explain the details of the line blockage to the new COSS or SWL and give them the NR3180 form.

The new COSS or SWL must sign the NR3180 form.

## 5 Giving up or suspending the line blockage

### 5.1 When the line blockage is to be given up or suspended

When the line blockage is to be given up or is to be suspended, you must:

- make sure that any work that is to continue does not need a line blockage
- remove any red flag or red light that has been placed in the four-foot
- remove any additional protection arrangements as shown in section 2 of this handbook.

If you have the staff or token as shown in section 2.5, you must:

- return the staff or token to the signal box at either end of the section, or
- return the token to an instrument that is not at a signal box.

If additional protection was provided by a disconnection as shown in section 2.3, after you have told the signaller that the line blockage is no longer needed or suspended, you must ask the signaller to get the signalling technician to reconnect the equipment.



## **5.2 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.

## **5.3 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 handbook.

The signaller will give you a new authority number, but you can continue to use the same NR3180 form.

However, if the line to be blocked or the protection arrangements are different, you must complete a new NR3180 form.

## **6 Sharing a line blockage**

If there are two or more COSSs, IWAs or SWL who need a line blockage at the same place and same time, a Protection Controller (PC) must be appointed to take overall control of the shared line blockage.

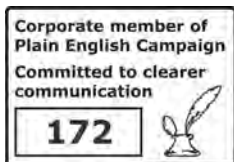
You must sign the NR3180 form unless it has been previously planned that it will not be necessary and you and the PC are aware of what is to happen.

When you hand over to another SWL or a COSS, the new SWL or COSS must give their name to the PC.

If the PC hands over to another PC, the new PC must give you their name.

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# GERT8000-M2 Rule Book



## Train stopped by train failure

### Issue 6






## Module M2

September 2018  
Comes into force 01 December 2018



## Conventions used in the Rule Book

	Example
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.	
A white i in a blue box indicates that there is information provided at the bottom of the page.	
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You will need this module if you carry out the duties of a:

- driver
- signaller.

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- 3.3 Assisting train moving towards the failed train
- 3.4 Driver of the failed train conducting the assisting train
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- 3.6 When the failed train is being assisted
- 3.7 On a single line worked by token



# 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 both agree:

- the exact location of the failed train
- that the failed train will not be moved
- the type of assisting train needed, and
- the direction from which it is needed.

**driver,  
signaller**

### 1.3 Making sure the failed train is safe

After you have asked for assistance, you must not move your train until:

- the assisting train arrives, or
- you have agreed alternative arrangements with the signaller and anyone else concerned.

**driver**

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 on a single line and are in possession of the token, you must keep the token until the assisting train arrives.

## Train stopped by train failure

### 1.4 Telling the guard

driver

Before you leave the failed train to carry out protection, you must tell the guard (if provided):

- that you are leaving the train to carry out protection
- the direction from which assistance will be provided, if known.

### 1.5 Providing assistance protection

driver

You do not need to provide assistance protection where permissive working is in operation.

#### Standard arrangement

You must place three detonators 20 metres (approximately 20 yards) apart on the line on which your failed train is standing 300 metres (approximately 300 yards) from your train in the direction from which the assistance will approach.

#### Protection involving a stop signal or block marker

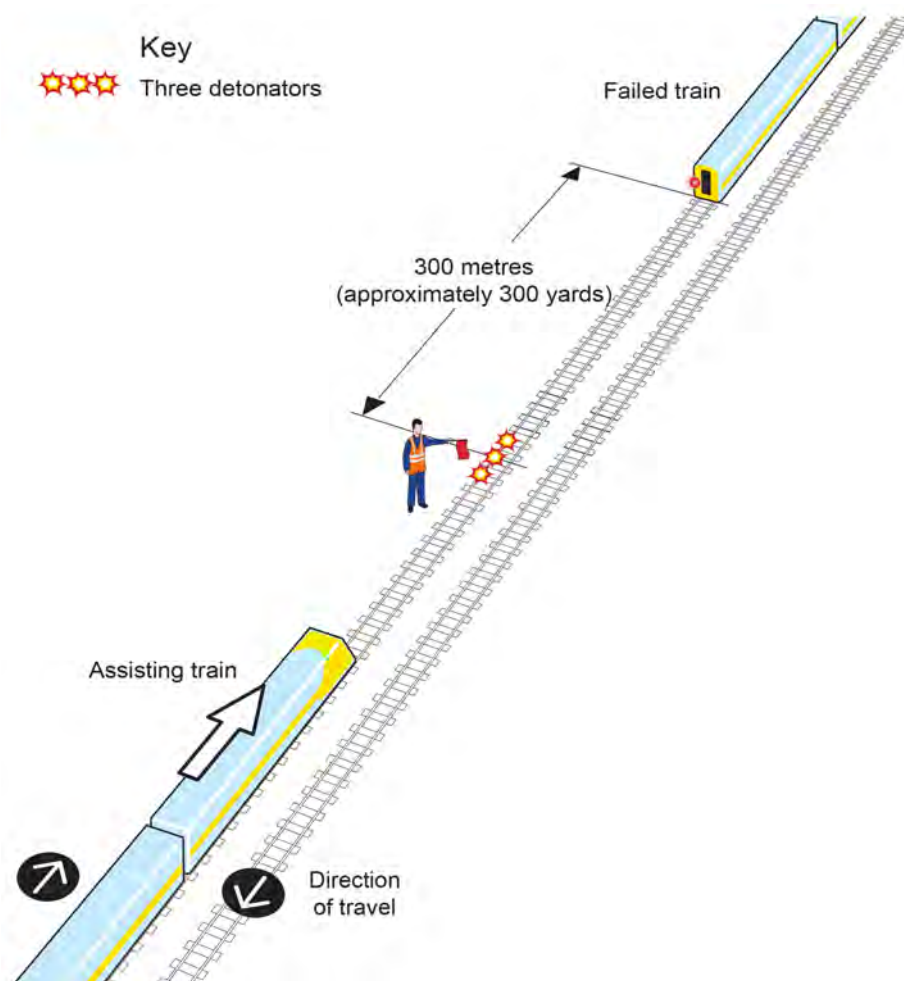
You must place the protection at the stop signal or block marker in the direction from which the assisting train will approach, if:

- the signal or block marker is less than 300 metres (approximately 300 yards) from where your failed train is standing, and
- the signaller can confirm that this stop signal or block marker is protecting your failed train.

#### Change of direction for assistance

If you are carrying out assistance protection and the signaller tells you that the assisting train will be coming from the opposite direction, you must:

- pick up any detonators that you had placed on the line
- carry out assistance protection in the other direction.

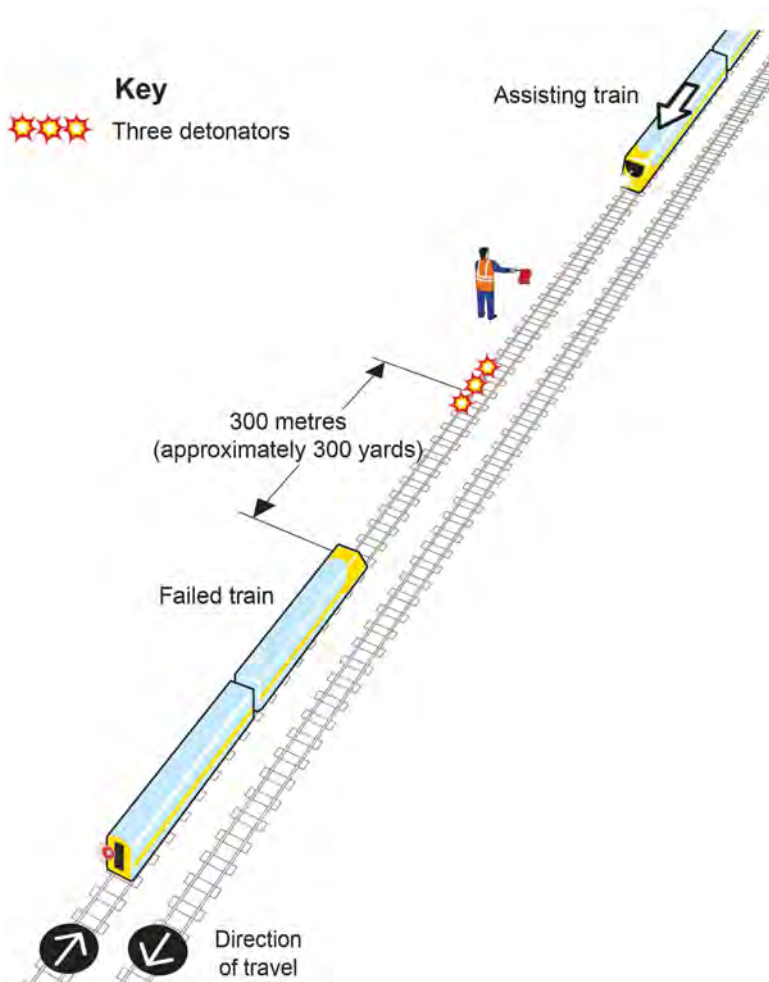


**Diagram M2.1**

**Protection when assistance comes from the rear**

## Train stopped by train failure

driver



**Diagram M2.2**

**Protection when assistance comes from the front**

# 2

## Protecting the failed train with emergency protection

*The person responsible: driver*

### 2.1 When to place emergency protection

If your train has failed and you cannot contact the signaller immediately, you only need to carry out emergency protection when your train has failed within:

- an emergency special working section, or
- a temporary block working section.

driver

### 2.2 Providing emergency protection

After placing standard assistance protection in rear of your train, you must continue until:

- you have reached the full protection distance of 2 kilometres (approximately 1¼ miles), where you must place three detonators on the line 20 metres (approximately 20 yards) apart, or
- you can communicate with the signaller.

driver

If a train approaches before you reach the full protection distance, you must immediately place three detonators on the line and show a hand danger signal to the driver.

If you reach a telephone linked to a signal box, or reach a signal box, within the full protection distance, you must:

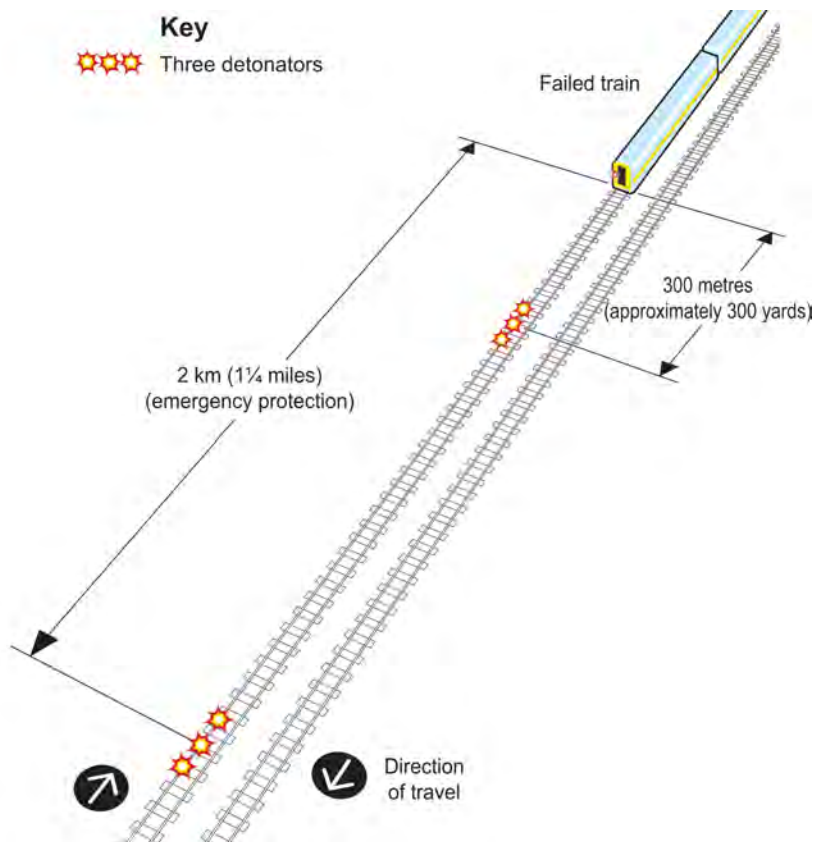
- first place three detonators on the line at the telephone or at the signal box
- speak to the signaller.

If you reach a tunnel entrance before reaching the full protection distance, you must place three detonators at the tunnel entrance.

## Train stopped by train failure

### driver

If the full protection distance then falls inside the tunnel, you must continue through the tunnel to the far end and place three detonators there.



**Diagram M2.3**

**Emergency protection**

# 3

## Providing assistance

*The people responsible: driver, signaller*

### 3.1 Waiting for the assisting train to arrive

#### a) Staying at the assistance protection point

You must stay at the assistance protection point and wait for the assisting train to arrive, except if:

driver

- you still need to speak to the signaller, in which case you must continue as far as necessary
- you have placed the assistance protection detonators within a tunnel, in which case you must continue through the tunnel to the far end and wait there
- you have to carry out emergency protection.

#### b) Displaying a hand danger signal

You must display a hand danger signal to the driver of the assisting train when it approaches.

### 3.2 Signaller allowing the assisting train to enter the section

You must make sure that the driver of the failed train is:

signaller

- conducting the assisting train, or
- waiting at the protection point to meet the assisting train, or
- proceeding immediately to the protection point.

## Train stopped by train failure

### signaller

If the driver is not at the protection point ready to meet the assisting train, you must:

- ask the driver of the failed train how long it will take to get to the protection point
- wait a suitable time before authorising the driver of the assisting train to enter the section.

You must tell the driver of the assisting train:

- the exact location of the failed train
- how the failed train is protected
- the point from which the assisting train will be met
- where the failed train must be taken to.

If necessary, you must instruct the driver to pass at danger the signal protecting the obstructed line or pass an end of authority (EoA) without a movement authority (MA).

### 3.3 Assisting train moving towards the failed train

### driver (assisting train)

During the movement towards the failed train, you must proceed at caution and keep a look out for, and stop to pick up, the driver of the failed train.

You can speak to the driver of the failed train using the train radio, to get or give any necessary information, at any time before or during the movement.

You must only enter a tunnel if:

- you have already picked up the driver of the failed train, or
- you know that the driver of the failed train is not in the tunnel and that the tunnel is clear.

You must stop immediately on exploding detonators.



If you have not already picked up the driver of the failed train, or the driver is not waiting at the assistance protecting point, you must:

- stay at that location
- wait for the driver of the failed train to arrive.

After you have been told the exact location of the failed train, you must proceed at caution towards the train.

driver  
(assisting  
train)

### 3.4 Driver of the failed train conducting the assisting train

You must get in the driving cab of the assisting train and tell the driver the exact location of the failed train.

driver

### 3.5 Coupling to the failed train

If you are the driver of the assisting train, you must make sure that:

- your train is coupled to the failed train
- the automatic brake, if compatible, is connected.

driver  
(assisting  
train)

### 3.6 When the failed train is being assisted

If you are the driver of the train that is assisting at the rear of the failed train, you must:

- temporarily isolate the TPWS before the movement starts
- reinstate the TPWS when the movement is finished.

If you are the driver of an assisting train on which ERTMS is in operation, you must:

- before the movement starts, make sure that ERTMS is in the correct mode
- when the movement is finished, not make any further movement until you have the correct authority to do so.

driver  
(assisting  
train)

## Train stopped by train failure

### driver

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.

### **3.7 On a single line worked by token**

### driver

If you are the driver at the leading end of the movement, you must keep the token until both trains are clear of the section.





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**GE/RT8000/P1**  
**Rule Book**

# Single line working

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

- driver
- pilotman
- signaller.

Conventions used in the Rule Book	Example
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## Single line working

# 1

## Principle

When one line of a double line becomes blocked, single line working by pilotman allows trains to travel over the other line in either direction.

## 2

## Setting up single line working

*The people responsible: **pilotman, signaller***

### 2.1 Appointment and identification of pilotman

You will be appointed by the Network Rail area operations manager to take charge of the arrangements for single line working.

**pilotman**

You must wear on your left arm a red armlet with PILOTMAN in white letters.

### 2.2 Agreeing the arrangements

#### 2.2.1 Before single line working can be introduced

Before single line working can be introduced, you must reach a clear understanding with each other and any other signaller involved about the arrangements which will apply.

**pilotman,  
signaller**

You must agree with each other the time when the Pilotman's Single Line Working Form (RT3191) will be completed.

#### 2.2.2 Information for the pilotman

You must remind the pilotman about any of the following and agree what arrangements will be applied, if they will be affected by the single line working:

**signaller**

- controlled level crossings which are protected by signals
- automatic level crossings
- barrow or foot crossings with white light indications
- unworked points
- intermediate signal boxes which are closed and at what time they will open.

## Single line working

### signaller

You must tell the pilotman about any temporary or emergency speed restrictions that affect the single line or any train returning to the proper line.

You must also tell the pilotman if the obstructed line is:

- protected by a line blockage as shown in module TS1 *General signalling regulations*, regulation 13.2, or
- under possession as shown in module T3 *Possession of a running line for engineering work*, or
- occupied by a failed train which has been protected as shown in module M2 *Train stopped by train failure*.

### 2.2.3 Dealing with points

You must make sure that points worked by or released from your signal box are secured for the safety of facing movements if they are not fitted with a facing point lock.

You may ask the pilotman to have these points secured if they are remote from your signal box.

## 2.3 Pilotman's form

### pilotman

At the agreed time, and only if the line to be used for single line working is clear, you must complete and sign a pilotman's single line working form.

You must then dictate your form to:

- the signaller controlling each crossover between which single line working is to apply
- the signaller at any intermediate signal box which is open.

You must enter the name of each signaller on your pilotman's form.

## 2.4 Signaller's form

You must complete a Signaller's Single Line Working Form (RT3192) when the pilotman dictates the details to you.

signaller

You must make a suitable entry in the Train Register.

## Single line working

## 3

**After the forms have been dictated**

*The people responsible: **pilotman**, **signaller***

**3.1 Adjusting the protection for the obstructed line****pilotman**

If trains are to draw forward or set back at either end of the single line, you must make sure there is enough room between the crossover and any protection placed to protect the obstructed line.

If necessary, you must arrange for the position of the protection to be adjusted.

You must make sure that the position of any protection does not allow an electric train to reach a section which is isolated.

**3.2 Arranging additional protection for the obstructed line****pilotman**

You must also arrange for a possession limit board, or a red flag during daylight, or red light during darkness, to be placed in the four-foot of the obstructed line:

- at the exit end of a line under emergency protection
- on the approach to the obstruction where it is in the same signal section as the crossover and is protected only by the signal.

**3.3 When the obstructed line is protected by a line blockage****pilotman**

When the obstructed line is protected under a line blockage as shown in module TS1 *General signalling regulations*, regulation 13.2, you must not introduce single line working if the line blockage protection is in the same signal section as the crossover at either end.



This does not apply if the line blockage is beyond the facing crossover that will be used for single line working.

pilotman

## 3.4 Controlling right-direction movements

You must arrange for signals on the unobstructed line to be worked normally, wherever possible.

signaller

## 3.5 Controlling wrong-direction movements

### 3.5.1 Signaller controlling wrong-direction movements

You must control trains in the wrong direction by giving instructions to the pilotman and to handsignallers, if appointed. You must make sure these individuals clearly understand what to tell drivers and to work only to your instructions.

signaller

You must tell the handsignaller if the instructions for the train movement have already been given to the driver.

### 3.5.2 Arranging handsignallers

You must arrange for handsignallers to be positioned to control wrong-direction movements over the single line (see the table on page 12 and diagrams P1.1 and P1.2 on pages 13 and 14).

pilotman

### 3.5.3 When a handsignaller is not required

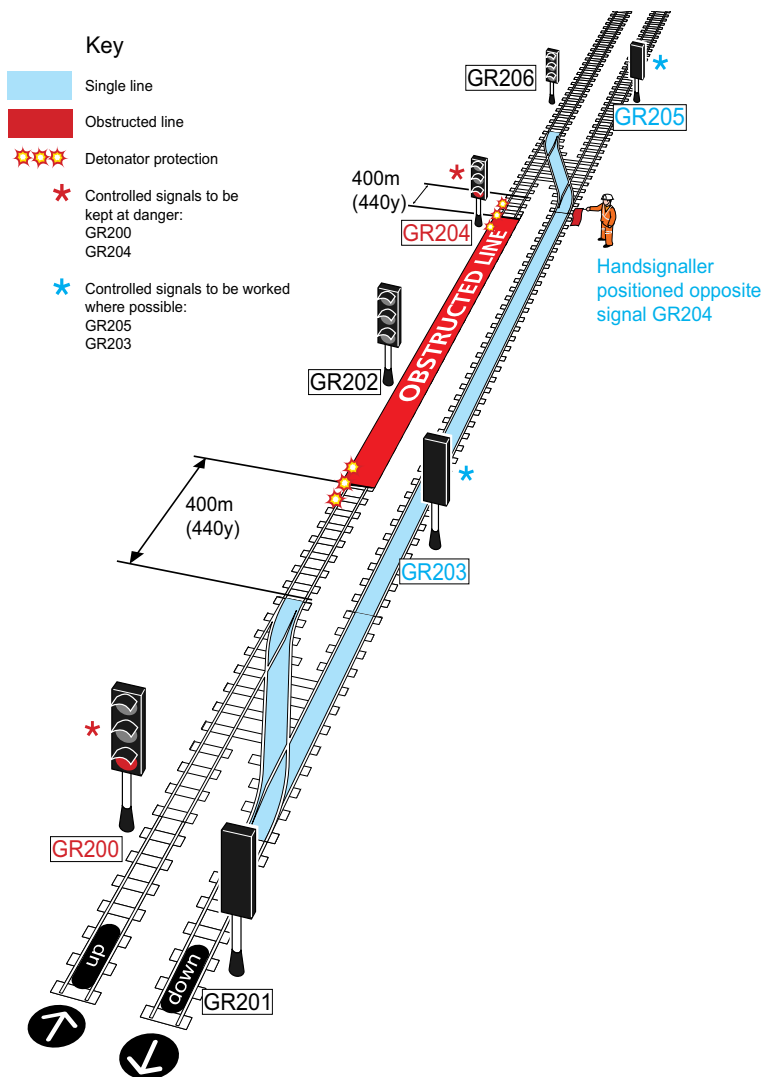
You do not need to position a handsignaller to control wrong-direction movements back to the proper line if:

- a main aspect signal which applies to trains leaving the single line is provided at the crossover, or
- you travel with every train over the single line in the wrong direction.

You do not need to position a handsignaller at an intermediate signal box that is open, if you have agreed with the signaller that the handsignal will be displayed from the signal box.

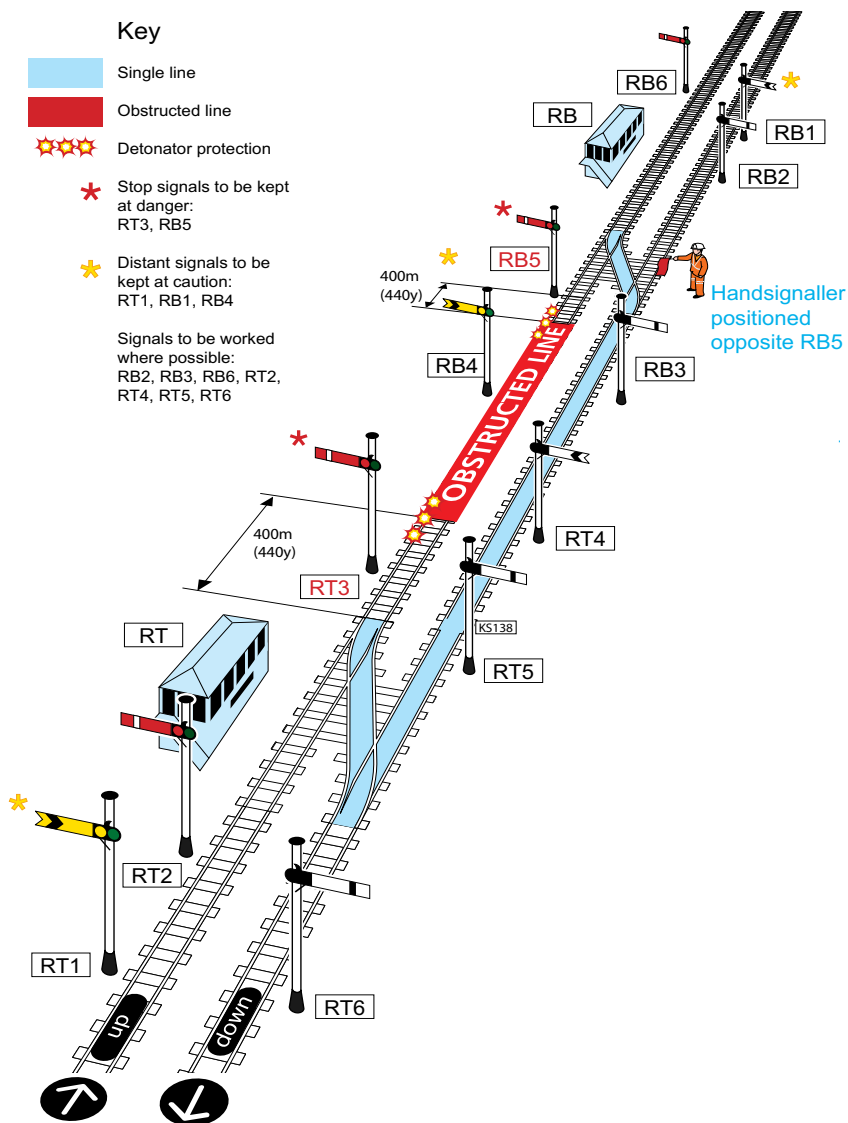
## Single line working

Location		Handsignal for driver to proceed
<b>Signals</b>	On a track circuit block line - opposite the signal protecting the crossover where trains return to the proper line. (See diagram P1.1 on page 13.)	Yellow (Only if a handsignaller is provided.)
	On an absolute block line - opposite the home signal which is worked from the same signal box that controls the crossover where trains return to the proper line. (See diagram P1.2 on page 14.)	Yellow (Only if a handsignaller is provided.)
	Opposite any other signal where trains might have to stop.	Yellow
<b>Level crossing</b>	At an AHBC under local control.	Green
	At a CCTV, OD or RC level crossing where an attendant is appointed.	Green
	At any manned level crossing protected by signals.	Green
	At any controlled level crossing protected by signals where the handsignal is shown opposite the signal protecting the level crossing.	Yellow
	<b>Note:</b> No handsignal will be given at: <ul style="list-style-type: none"> <li>• a CCTV, OD or RC level crossing where an attendant is <b>not</b> appointed</li> <li>• any manned level crossing protected by signals where the normal position of the barriers or gates is across the road.</li> </ul>	
<b>Signal box</b>	At an intermediate signal box unless it is closed.	Yellow
<b>Points</b>	At unworked points when approaching in the facing direction.	Green (Placed on the ground next to the points.)



**Example of typical possession with single line working arrangements - track circuit block line**  
**Diagram P1.1**

# Single line working



**Example of typical possession of single line working arrangements - absolute block line**  
**Diagram P1.2**

### 3.5.4 During poor visibility

Unless a main aspect signal is provided, you must always position a handsignaller to control wrong-direction movements back to the proper line during poor visibility.

pilotman

### 3.5.5 Shunting signals and position-light signals

If possible, you must work these signals normally to control wrong-direction movements.

signaller

You must find out if any of these signals will not be able to be worked for movements over the single line.

pilotman

## 3.6 Dividing the single line

### a) In a track circuit block area

You may divide the single line into two sections for wrong-direction movements as long as:

pilotman

- this arrangement is authorised in the *Signal Box Special Instructions*
- this arrangement is authorised by the Network Rail area operations manager
- an intermediate handsignaller is appointed as shown in the *Signal Box Special Instructions*.

### b) In an absolute block area

You may divide the single line for wrong-direction movements at each intermediate signal box that is open.

## Single line working

### 3.7 Securing points

#### 3.7.1 Unworked points on the single line

**pilotman**

You must make sure that these points:

- are secured and padlocked for the safety of movements over them
- have a green flag or green light placed alongside them which is clearly visible to the drivers of all wrong-direction movements.

#### 3.7.2 Points worked from a closed intermediate signal box

If any points worked from an intermediate signal box which is closed are facing to movements, you must make sure they are secured and padlocked for the safety of trains travelling over the single line in the wrong direction.

#### 3.7.3 Remote points

You must arrange to secure any points which become facing, that are remote from the signal box.

You must arrange to secure and padlock any power-operated points on the single line over which movements are to be authorised at a greater speed than 15 mph (25 km/h), as shown in section 6.2.

#### 3.7.4 Checking points secured by anyone else

If anyone else has secured points, you must personally check that they have been properly secured before the first train passes over them in the facing direction.

You may do this while accompanying the first train over the single line. If you do, you must tell the driver to stop the train before each set of points.

## 3.8 Telling personnel affected

### 3.8.1 Person in charge of any station

You must arrange to tell the person in charge of any station where the platform working will be affected that you are introducing single line working.

pilotman

### 3.8.2 Personnel working on or near the line used for single line working

You must tell anyone working on or near the line which is being used for single line working that single line working is in operation and which line is being used. You must do this:

- while accompanying the first train over the single line, or
- if you are not accompanying that train, by instructing the driver to stop and tell them.

You do not need to do this if the single line working is published in the *Weekly Operating Notice* and the details have not changed.

### 3.8.3 Crossing keepers

You must make sure that crossing keepers are told about the arrangements for the single line working and for the working of block indicators, where provided. If necessary, you may do this while accompanying the first train.

# 4

## Completing the arrangements

*The people responsible: **signaller, pilotman***

### 4.1 Signaller confirming the arrangements

#### signaller

You must tell the pilotman when you have made all your arrangements.

When the pilotman tells you that single line working can start, you must make a suitable entry in the Train Register.

### 4.2 Pilotman allowing single line working to start

#### pilotman

You must make sure all arrangements have been made before you allow single line working to start.

You must tell each signaller:

- when you have made all your arrangements
- the precise location of each handsignaller
- that single line working can start.



# 5

## Authority for movements

*The people responsible: **pilotman, signaller***

### 5.1 Pilotman's authority

You must:

**pilotman**

- be present and personally authorise movements which will enter or foul the single line (except as shown in section 5.2)
- before authorising the movement, get permission from the signaller who controls the entrance to the single line
- get the signaller's permission before authorising a driver to pass any signal at danger.

### 5.2 Signaller's authority

You may authorise a movement to pass to and from an unaffected route at a junction at the end of the single line. In this case:

**signaller**

- you may work signals normally
- you do not need to tell the driver that single line working applies.

You may authorise a train to pass through a trailing crossover which is on the approach to the obstruction.

You may authorise an assisting train to enter or foul the single line without the pilotman being present, as long as you have the pilotman's permission.

If you are the signaller at an intermediate signal box, you must not allow a train to enter or foul the single line unless the pilotman is present.

# 6

## Pilotman instructing drivers

*The person responsible: **pilotman***

### 6.1 Authorising movements in either direction

#### **pilotman**

Before authorising a movement to enter the single line in either direction, you must tell the driver:

- over which line the single line working applies, and
- between which crossovers.

If there is more than one crossover at either end of the section, you must make sure the driver clearly understands which crossover is being used for single line working.

You must instruct the driver to pass over any AHBC that is under local control only if authorised by a green handsignal shown at the crossing.

### 6.2 Additional instructions for wrong-direction movements

#### **pilotman**

Before authorising a movement over the single line in the wrong direction, you must also tell the driver about any of the following that apply.

#### **a) Signalling arrangements**

You must tell the driver:

- the location of any intermediate handsignaller
- if a main aspect signal will be used to control movements back to the proper line
- the location of any handsignaller placed to control movements back to the proper line.

If there is no main aspect signal or handsignaller to control movements back to the proper line, you must accompany the train and instruct the driver to stop the train and contact the signaller:

**pilotman**

- on a TCB line, opposite the signal which applies to the obstructed line protecting the crossover where trains return to the proper line
- on an absolute block line, opposite the home signal worked from the signal box controlling that crossover.

## **b) Level crossing arrangements**

### **CCTV, OD or RC level crossing at which no attendant has been appointed**

You must instruct the driver to:

- approach the crossing at caution
- pass over the crossing only if it is safe to do so.

### **Manned level crossing**

You must instruct the driver to pass over any manned level crossing only if either of the following conditions apply.

- Crossing protected by signals - pass over only when authorised by a handsignal shown at the crossing.
- Crossing where the normal position of the barriers or gates is across the road - pass over when the driver is sure that the crossing is closed to road traffic.

### **Level crossing with red and green warning lights**

Unless wrong-direction controls are provided, you must instruct the driver to:

- stop short of the level crossing
- sound the horn
- pass over the crossing only if it is safe to do so.

## Single line working

### pilotman

#### **Barrow or foot crossing with white-light indications**

Unless wrong-direction controls are provided, you must instruct the driver to approach at caution and not pass over the crossing unless it is safe to do so.

#### **c) Points and crossings arrangements**

You must tell the driver of each train to approach at caution all points, switch diamonds and swing-nose crossings and to check, if possible, they are in the correct position and not to exceed 15 mph (25 km/h) over them if:

- the points are mechanically operated
- the points are unworked
- power-operated points have not been secured and padlocked.

#### **Where power-operated points have been secured and padlocked**

You must tell the driver of the first train to approach at caution all points, switch diamonds and swing-nose crossings and check, if possible, they are in the correct position and not to exceed 15 mph (25 km/h) over them.

You must tell the driver of each subsequent train about the location of any points, switch diamonds or swing-nose crossings over which speed must be reduced below 50 mph (80 km/h) (including the crossovers leading to and from the single line) and what speed is to apply.

#### **d) Other information**

You must remind the driver about any temporary speed restrictions.

You must tell the driver about:

- emergency speed restrictions
- intermediate signal boxes which are closed.

### 6.3 Driver's single line working ticket

After you have given the driver all the necessary instructions, you must give the driver a completed Driver's Single Line Working Ticket (RT3193).

pilotman

You do not need to do this if the train is to enter the single line 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.

### 6.4 Train worked by more than one locomotive at the front

If the train is worked by more than one locomotive at the front, you must:

pilotman

- give the necessary instructions to each driver
- show the driver's ticket to each driver
- give the ticket to the driver of the leading locomotive.

## Single line working

## 7

**Pilotman's duties during single line working**

*The person responsible: **pilotman***

**7.1 Travelling with the driver**

**pilotman**

Unless there is another train to follow, you must ride with the driver in the leading cab.

When you arrive at the other end of the single line, you must:

- collect the cancelled driver's ticket
- immediately tell the signaller that you have arrived.

**7.2 Opening an intermediate signal box**

**pilotman**

Before allowing an intermediate signal box to open, you must dictate a single line working form to the signaller.

**7.3 Moving secured power-operated points**

**pilotman**

If the signaller tells you that it is necessary to move power-operated points that have been secured and padlocked to permit movements at greater than 15 mph (25 km/h), you must arrange to release them.

When the points have again been secured, you must treat the next train to proceed in the wrong direction as the first train, as shown in section 6.2 c).

# 8

## Signaller's duties during single line working

*The person responsible: **signaller***

### 8.1 Clearing the controlling signal for right-direction movements

Before you clear the signal controlling the entrance to the single line for right-direction movements, you must make sure the pilotman has given the driver the necessary instructions.

**signaller**

### 8.2 Speed restrictions

You must tell the pilotman about any temporary or emergency speed restrictions that are introduced during single line working that will:

**signaller**

- apply on the single line
- affect any train returning to the proper line.

### 8.3 Moving secured power-operated points

If it becomes necessary to move power-operated points which have been secured and padlocked to permit movements at greater than 15 mph (25 km/h), you must tell the pilotman.

**signaller**

# 9

## Driver's duties during single line working

*The person responsible: **driver***

### 9.1 Before entering the single line

**driver**

Before entering the single line, you must make sure that you:

- can properly identify the pilotman who will wear the PILOTMAN armband
- clearly understand all the instructions the pilotman has given you
- have the personal authority of the pilotman to enter the single line.

You must also make sure the pilotman has given you a Driver's Single Line Working Ticket (RT3193). However, you do not need this ticket if your train is to enter the single line 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.

If the train is being worked by more than one locomotive at the front, the pilotman will show the driver's ticket to each driver and then give the ticket to the driver in the leading cab.

### 9.2 Obeying handsignals

**driver**

When instructed by the pilotman, you must make sure you clearly understand at which locations your train will be controlled by a handsignal (see table on page 12).

You must stop at each of these locations unless a proceed handsignal is shown.



## 9.3 Right-direction movements

You must obey each signal when travelling over the single line in the right direction.

driver

You do not need to travel at any reduced speed, other than at locations where you must proceed at caution or as described in section 9.5.

## 9.4 Wrong-direction movements

### 9.4.1 Controlling movements

Your train movement in the wrong direction will be controlled by handsignals, except where it is possible for shunting or position light signals to be worked. A handsignaller will not be provided if there is a main aspect signal to return the train to the proper line at the end of the single line.

driver

### 9.4.2 Train speed

You must not exceed 50 mph (80 km/h), or the permissible speed if lower.

### 9.4.3 Signals on the obstructed line

You must disregard fixed signals on the obstructed line, except:

- on a TCB line, the signal protecting the crossover where trains return to the proper line
- on an absolute block line, the home signal worked from the signal box controlling that crossover.

### 9.4.4 Level crossings

When approaching any level crossing, not fitted with wrong-direction controls, you must carry out the pilotman's instructions (see section 6.2 b).

## Single line working

**9.4.5 Returning to the proper line****driver**

If there is no main aspect signal or handsignaller to control wrong-direction movements returning to the proper line, the pilotman will accompany you and will instruct you to stop the train:

- on a TCB line, opposite the signal which applies to the obstructed line protecting the crossover where trains return to the proper line
- on an absolute block line, opposite the home signal worked from the signal box controlling that crossover.

If the crossover where trains return to the proper line is facing to movements, you must:

- get the signaller's permission for your train to proceed over the crossover, or
- if a signal is provided for the movement, proceed when the signal is cleared.

If the crossover is trailing to movements, you must ask the signaller for instructions about drawing forward and then setting back over the crossover to return to the proper line.

**9.5 First train over the single line****a) When accompanied by the pilotman****driver**

If you are the driver of the first train over the single line, you must stop, if instructed to do so, to allow the pilotman to:

- tell anyone who is working on or near the line used for the single line working that single line working has been introduced
- tell any crossing keeper about the single line working arrangements
- check that points are properly secured.

### **b) When not accompanied by the pilotman**

If you are the driver of the first train over the single line you must, if instructed by the pilotman before you entered the single line, stop and tell anyone who is working on or near the line used for single line working:

driver

- that single line working has been introduced, and
- the line over which it applies.

## **9.6 Disposing of the driver's single line working ticket**

### **a) When accompanied by the pilotman**

On reaching the end of the single line you must:

driver

- cancel your ticket by writing 'CANCELLED' across it
- give the ticket to the pilotman.

### **b) When not accompanied by the pilotman**

You do not need to stop at the end of the single line to give up the ticket unless specially instructed to do so. However, you must:

- as soon as possible, cancel the ticket by writing 'CANCELLED' across it
- hand in the ticket as shown in your company's instructions.

## 10

## Working of trains to and from the point of obstruction

*The person responsible: **pilotman***

### 10.1 Method

#### **pilotman**

When both lines of a double line are blocked and trains are required to work to and from the point of obstruction, you must introduce single line working arrangements over one line only.

You must make sure the single line working forms and tickets are amended to reflect this method of working.

If there is another signaller involved on the other side of the obstruction, you must tell that signaller when arrangements for working trains to and from the point of obstruction have been introduced and withdrawn.

This arrangement can be introduced on both sides of the obstruction, but separate pilotmen will need to be appointed for each side.

### 10.2 Protection arrangements

#### **pilotman**

You must make sure one of the following is provided at the place where trains will have to stop on the approach to the obstruction.

- A signal kept at danger.
- Emergency protection as described in module M1 *Dealing with a train accident or train evacuation* or handbook 2 *Instructions for track workers who use emergency protection equipment*.
- Possession protection as described in module T3 *Possession of a running line for engineering work*.

If the emergency protection or possession protection has already been placed, you must, if necessary, arrange for that protection to be moved to a more suitable location.

### 10.3 Travelling with the driver

For each train to travel over the single line, you must:

**pilotman**

- issue a driver's ticket to the driver
- accompany the driver.

## 11

## Single line working on track circuit block lines where more than one running line is available

*The people responsible: **pilotman, signaller***

**Note:** the locations, signal numbers and point numbers given in this section refer to the example of typical arrangements shown in diagram P1.3 on page 33.

### 11.1 Method

#### pilotman

You may introduce single line working over one of the unobstructed lines if all the following apply.

- There are more than two running lines.
- All lines in one direction are blocked.
- Two or more lines in the opposite direction remain open.

You must arrange for:

- trains running in the normal direction to travel over an unobstructed line that is not being used for single line working
- trains that cannot run in the normal direction, because of the blockage, to travel over the single line under single line working arrangements as set out in this module.

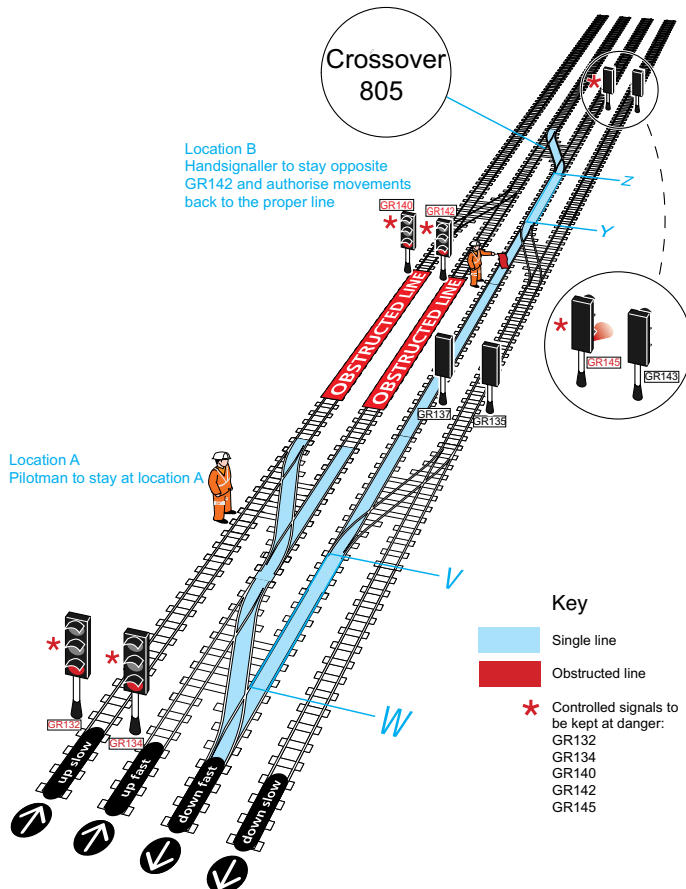
You must arrange for single line working forms and tickets to be amended to reflect the method of working.

### 11.2 Wrong-direction movements

#### pilotman

You must arrange for trains arriving at location A on the up fast or up slow line, to proceed under your authority over the down fast line under single line working arrangements, as far as crossover 805 at location B where they must return to the proper line.

- Up trains** Must pass over the down fast line under single line working on the authority of the pilotman at location A.
- Down trains** Must pass normally over the down slow line.



**Example of typical single line working arrangements on TCB lines  
where more than one running line is available**

**Diagram P1.3**

## Single line working

**11.3 Where conflicting movements can be avoided****signaller**

Whenever possible, to avoid trains travelling in the right direction conflicting with trains travelling in the wrong direction, you must:

- divert trains travelling in the right direction to another line before they reach the single line working
- allow these trains to continue on that line beyond the single line working.

You must not give permission to the pilotman to authorise an up train to leave location A, unless:

- the crossover is set, and where necessary, secured in the correct position
- the line is clear up to the overlap of the next signal beyond crossover 805 at location B.

**11.4 Where conflicting movements cannot be avoided****pilotman,  
signaller**

Where conflicting movements cannot be avoided, the following arrangements must be applied.

**a) Positioning a handsignaller****pilotman**

You must position a handsignaller opposite GR142 signal at location B.

**b) Giving permission for up trains to leave location A****signaller**

You must not give permission to the pilotman to authorise an up train to leave location A unless:

- the line is clear to a point 183 metres (200 yards) beyond the handsignaller located opposite GR142
- you have not authorised any conflicting movement within this distance.



### **c) Giving permission for up trains to pass GR142 at location B**

You may give permission for the handsignaller located opposite signal GR142 to authorise an up train to return to the proper line as long as:

signaller

- the crossover is set, and where necessary, secured in the correct position
- the line is clear up to the overlap of the next signal beyond crossover 805
- you have not authorised any conflicting movement.

### **d) Authorising the movement of down trains at location B**

You do not need to be present at location B to authorise movements of trains between Z and Y.

pilotman

You do not need permission from the pilotman before you authorise a down train to pass signal GR145 at danger to proceed between Z and Y to cross to the down slow line.

signaller

### **e) Authorising down trains at location A**

You do not need permission from the pilotman before you authorise a down train to cross from the down slow line to the down fast line between V and W.

## **11.5 Telling the driver**

If the single line working arrangements have not been published in the *Weekly Operating Notice*, you must tell the driver of each train travelling in the normal direction that trains on the adjoining line may be running in the opposite direction.

signaller

# 12

## Dealing with a failed train

*The people responsible: **pilotman, signaller***

### 12.1 If the pilotman is on the failed train

#### **pilotman**

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*.

You must get the signaller's permission before making any movement if the train is to return to the same end of the single line from which it entered.

### 12.2 If the pilotman is not on the failed train

#### **pilotman**

You must travel with the assisting train if:

- the assistance is to come from the rear, and
- the failed train is to be withdrawn to the rear.

### 12.3 Getting permission from the pilotman

#### **signaller**

You must get permission from the pilotman before authorising an assisting train to proceed onto the single line.

# 13

## Change of pilotman or signaller

*The people responsible: **pilotman, signaller***

### 13.1 Change of pilotman

When you are relieved, you must:

**pilotman**

- make sure the new pilotman understands the arrangements for single line working
- tell each signaller the name of the new pilotman.

Once you have been relieved, you must not ride in the driving cab of any train over the single line.

If you are the new pilotman, you must sign the pilotman's form.

You must record the name of the new pilotman and the time on your signaller's form.

**signaller**

### 13.2 Change of signaller

When you are relieved, you must make sure the new signaller understands the arrangements for single line working, and signs the signaller's form in your presence.

**signaller**

If you are the new signaller, you must tell the pilotman your name as soon as possible.

You must record the new signaller's name and the time on your pilotman's form.

**pilotman**

# 14

## Withdrawing single line working

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

### 14.1 Pilotman's authority

#### pilotman

Only you can authorise the withdrawal of single line working.

You can authorise single line working to be withdrawn before the obstructed line is clear if:

- the arrangements have been published, or
- you have agreement from Operations Control.

You must tell each signaller immediately when single line working is to be withdrawn.

### 14.2 When the last train is clear of the single line

#### pilotman

You must withdraw the arrangements for single line working that apply as follows:

#### a) Protection and signalling

You must arrange for any:

- handsignallers to be withdrawn
- secured points to be released
- green flags or green lights to be removed
- red flags or red lights provided under section 3.2 of this module to be removed.

#### b) Station working

You must arrange to tell the person in charge at any station where the platform working was affected:

- that single line working has been withdrawn
- whether the obstructed line is open or is to stay blocked.

### c) Level crossings

You must arrange to tell any crossing keeper affected:

pilotman

- that single line working has been withdrawn
- whether the obstructed line is open or is to stay blocked.

If the crossing keeper cannot be told, you must arrange for the driver of the first train through the section to be instructed to stop at the crossing and tell the crossing keeper.

### d) Personnel working on or near the line used for single line working

You must arrange for the driver of the first train that is to proceed after single line working is withdrawn, to stop and tell anyone who is working on or near the line which is being used for single line working:

- that single line working has been withdrawn
- whether the obstructed line is open or is to stay blocked.

You do not need to do this if the single line working is published in the weekly operating notice and the details, including the time single line working is withdrawn, have not changed.

### e) Obstructed line

You must tell the individual working alone (IWA), controller of site safety (COSS) or safe work leader (SWL), as appropriate, that single line working has been withdrawn, if work on the obstructed line is to continue:

- under line blockage as shown in module TS1 *General signalling regulations* regulation 13.2, Handbook 8 *IWA, COSS or PC blocking a line* or Handbook 21 *Safe work leader (SWL) blocking a line*, or
- under possession as shown in module T3 *Possession of a running line for engineering work*.

## Single line working

### 14.3 Resuming normal working

#### pilotman

When the single line working arrangements have been withdrawn, you must:

- tell each signaller involved to cancel their form
- confirm with each signaller that they have done this
- cancel your pilotman's form.

#### signaller

You can allow normal working to resume when you have cancelled your signaller's form and told the pilotman.

Where single line working had been introduced on both sides of an obstruction, you must not resume normal working until you have been told by the pilotmen on both sides of the obstruction that single line working is withdrawn.

You must make a suitable entry in the Train Register.

#### pilotman, signaller

You must forward your cancelled single line working forms and driver's tickets as shown in company instructions.

### 14.4 First train through the section

#### driver

If you are the driver of the first train through the section, if instructed by the signaller to do so, you must stop to tell anyone working on or near the line that was used for single line working:

- that single line working has been withdrawn
- whether the obstructed line is open or is to stay blocked.

If instructed, you must also stop and tell any crossing keeper.



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# GERT8000-P2 Rule Book



## Working single and bi-directional lines by pilotman

Issue 5

## Module P2



September 2019  
Comes into force 07 December 2019



## Conventions used in the Rule Book

A black line in the margin indicates a change to that rule when published for the first time, and will then appear until the module is reissued.

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

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### Example



driver



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

- driver
- pilotman
- signaller.

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## 1

## When working by pilotman must be introduced

### 1.1 Circumstances

Except as shown in section 1.2, working by pilotman must be introduced when any of the following applies.

- a) **The token has been lost.**
- b) **Trains have to work to and from the point of obstruction**
- c) **The signal controlling the entrance to a single or bi-directional line cannot be cleared or a movement authority (MA) cannot be received by a train for any of the following reasons**
  - 1 The signal or signalling equipment has failed or has been disconnected.
  - 2 A track circuit has failed.
  - 3 Level-crossing equipment has failed.
  - 4 The token instrument has failed.

### 1.2 Exceptions

#### 1.2.1 Modified working

Working by pilotman is not needed in any of the circumstances listed in sections 1.1 a) and 1.1 c) if modified working arrangements are authorised.

#### 1.2.2 Other exceptions

The exception to section 1.1 b) is as follows.

Working by pilotman is not needed on one side of the obstruction on a line worked with a token if a token is available and trains can be worked under the instructions for a single line with a train staff.

The exceptions to section 1.1 c) are as follows.

### **1. The signal or ERTMS signalling equipment has failed or has been disconnected**

Working by pilotman is not needed on:

- lines where a token is provided and the driver has the token
- track circuit block lines or ERTMS lines if all the track circuits relating to the affected portion of single line are clear.

### **2. A track circuit or non-ERTMS signalling equipment has failed**

Working by pilotman is not needed:

- on lines where a token is provided and the driver has the token
- on bi-directional lines if trains are allowed to proceed in one direction only
- on track circuit block or ERTMS lines if authorised in the *Sectional Appendix*.

### **3. Level-crossing equipment has failed**

Working by pilotman is not needed:

- on lines where a token is provided and the driver has the token
- on track circuit block or ERTMS lines if authorised in the *Sectional Appendix*
- on track circuit block or ERTMS lines if all track circuits relating to the affected portion of single line are clear.

#### **4. The token instrument has failed**

Working by pilotman is not needed on a line worked with a token if a token is available and trains can be worked under the instructions for a single line with a train staff.



# 2

## Setting up working by pilotman

*The people responsible: pilotman, signaller*

### 2.1 Appointment and identification of the pilotman

You will be appointed by the Network Rail area operations manager.

pilotman

You must wear on your left arm a red armlet with PILOTMAN in white letters.

### 2.2 Agreeing the arrangements

Before introducing working by pilotman, you must reach a clear understanding with each other and any other signaller concerned about:

pilotman,  
signaller

- the arrangements which will apply
- the time when the Pilotman's Form for Working Single and Bi-directional Lines by Pilotman (RT3154 or RT3154 ERTMS) will be completed
- which signals will need to be passed at danger
- which signals must be obeyed
- which ends of authority (EoA) will need to be passed without an MA
- the EOAs at which an MA must be received
- any instructions about level crossings
- any other relevant instructions.

## 2.3 Completing the pilotman's and signaller's forms

### a) Pilotman's form

**pilotman**

At the agreed time, and only when the line is clear, you must:

- complete and sign your pilotman's form
- dictate it to each signaller who controls an entrance to the single-line section
- enter the name of each signaller on your form.

### b) Signaller's form

**signaller**

You must complete your Signaller's Form for Working of Single and Bi-directional Lines by Pilotman (RT3155 or RT3155 ERTMS), as dictated by the pilotman.

## 2.4 Where there is no communication between signal boxes

**signaller**

Where another signal box is involved and there is no means of communicating with it, you must tell the pilotman.

**pilotman**

You must go to each signal box to dictate the pilotman's form. You must not use a train for this purpose.

**pilotman,  
signaller**

After the forms for working by pilotman have been dictated at one end of the single-line section, normal working must not resume until these forms have been cancelled by the pilotman. This applies even if the equipment has been repaired or found to be in working order.

## 2.5 Putting the token out of use

**pilotman**

Where the line is worked with a token, you must get an assurance from the signallers at both ends of the section that the token has been restored to the token instrument.

You must get the token from the signaller if it is needed to operate a ground frame.

pilotman

If the token is at the signal box at the other end of the section, you must get an assurance from the signaller at that end that the token has been secured in a safe place. You must get the token as soon as you arrive.

If you have the token, you must keep it with you until one of the following applies:

- you are relieved by another pilotman
- the signalling technician needs it
- normal working is resumed.

## 2.6 Working of ground frames

### a) Ground frames released by the token

You must get the token from the signaller if it is needed to operate a ground frame.

pilotman

If a token is not available, the signaller will arrange for the signalling technician to attend to release it. You must show the signalling technician your pilotman's form.

You must keep the token until normal working is to be resumed or the signalling technician needs it.

### b) Other ground frames

If a ground frame needs to be released, the signaller will arrange for the signalling technician to unlock it.

pilotman

You must be present at the ground frame when it is unlocked and stay at the ground frame until the signalling technician has locked it.

## 2.7 Completing the arrangements

### pilotman

You must make sure all of the requirements of this section have been completed before authorising the first train to travel over the single-line section.

### signaller

You must make a suitable entry in the Train Register.

### pilotman, signaller

You may then start working by pilotman.

# 3

## During working by pilotman

*The people responsible: driver, pilotman, signaller*

### 3.1 Authority for movements

#### a) Pilotman's authority

You must:

pilotman

- be present and personally authorise movements which will enter or foul the single-line section (except as shown in section 3.1 b)
- before authorising the movement, get permission from the signaller who controls the entrance to the single-line section
- get the signaller's permission before authorising a driver to pass any signal at danger or any EoA without an MA.

#### b) Signaller's authority

As long as you have the permission of the pilotman, you may authorise a movement of an assisting train to enter an occupied single-line section without the pilotman being present.

signaller

### 3.2 Pilotman instructing drivers

When the signaller has given permission for the train to enter the single-line section, you must:

pilotman

- tell the driver why working by pilotman has been introduced
- give the driver any necessary instructions
- give the driver a completed Driver's Ticket for Working of Single and Bi-directional lines by Pilotman (RT3156 or RT3156 ERTMS)
- instruct the driver to pass at danger the signal controlling the entrance to the single-line section, or to pass an EoA at the entrance to the single-line section without an MA.

**pilotman**

You do not need to complete a driver's ticket if the train is to enter a one-train working line, or is to enter the single-line 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.

**3.3 Entering the single-line section****a) Before entering the single-line section****driver**

Before entering the single-line section, you must make sure:

- you can properly identify the pilotman who will wear the PILOTMAN armband
- you clearly understand all the instructions the pilotman has given to you
- you have the personal authority of the pilotman to enter the single-line section
- the pilotman has given you a Driver's Ticket for Working Single and Bi-directional Lines by Pilotman (RT3156 or RT3156 ERTMS), except as shown in section 3.3 b).

**b) Entering the single-line section without a driver's ticket**

You do not need a driver's ticket if your train is to enter a one-train working line, or is to enter the single-line 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.

The signaller will authorise you to enter the occupied single-line section if the pilotman is not present.

### 3.4 Train worked by more than one locomotive at the front

If the train is worked by more than one locomotive at the front, you must:

pilotman

- give the necessary instructions to each driver
- show the driver's ticket to each driver
- give the driver's ticket to the driver of the leading locomotive.

### 3.5 Pilotman travelling with the driver

You must ride with the driver in the leading cab, unless you are to travel on a following train.

pilotman

If you need the train to stop at the end of the single-line section, you must instruct the driver to do so.

You must accompany every train:

- during a complete block failure if there is no communication between signal boxes
- on a one-train working line
- where you are told that the signaller cannot make sure that the single-line section is clear after the passage of each train.

### 3.6 Travelling over the single line

You must carry out the instructions shown on your driver's ticket.

driver

You may travel at the permissible speed except when the driver's ticket states otherwise.

The arrangements for working by pilotman must continue to apply until the train reaches the end of the pilotman working section even if you receive an MA during the movement.

### 3.7 Arriving at the other end of the single line

#### driver

When you reach the other end of the single-line section, you must cancel your driver's ticket by writing 'CANCELLED' across it and then hand it to the pilotman.

If the pilotman is not with you, you do not have to stop unless the pilotman has instructed you to do so. If you have been instructed to stop, you must tell the signaller that your train has arrived complete with tail lamp.

If you do not have to stop, you must cancel your driver's ticket at the first opportunity, and hand it in as shown in your company instructions.

#### pilotman

You must collect the cancelled driver's ticket from the driver and immediately tell the signaller that you have arrived.

On a one-train working line where it is not normally necessary to ask the signaller's permission to start the return journey, you do not need to tell the signaller that you have arrived.

### 3.8 Recording in the Train Register

#### signaller

You must record the time that the train enters and leaves the single-line section in the Train Register, even if you do not normally record these times.

### 3.9 Change of pilotman or signaller

#### a) Change of pilotman

#### pilotman

When you are relieved, you must:

- make sure the new pilotman understands the arrangements for working by pilotman
- tell each signaller the name of the new pilotman
- not ride in the driving cab of any train over the single-line section.



If you are the new pilotman, you must sign the pilotman's form.

pilotman  
signaller

You must record the name of the new pilotman and the time on your signaller's form.

### **b) Change of signaller**

When you are relieved, you must make sure the new signaller understands the arrangements for working by pilotman and signs the signaller's form in your presence.

If you are the new signaller, you must tell the pilotman your name as soon as possible.

You must record the new signaller's name and the time on your pilotman's form.

pilotman

Working single and bi-directional lines by  
pilotman

## 4

**Working by pilotman to and from  
the point of obstruction***The person responsible: pilotman***pilotman**

If you are required to introduce working by pilotman to and from the point of obstruction, you must do so between the obstruction and the nearest appropriate:

- signal box, or
- junction, or
- other place.

You must make sure one of the following is provided at the place where trains will have to stop on the approach to the obstruction.

- A signal kept at danger.
- An EoA at which the signaller has closed the route.
- Emergency protection as described in module M1 *Dealing with a train accident or train evacuation* or in handbook 2 *Instructions for track workers who use emergency protection equipment*.
- Possession protection as described in module T3 *Possession of a running line for engineering work* or module T3 ERTMS *Possession of an ERTMS running line for engineering work where line side signals are not provided*.

If the emergency protection or possession protection has already been placed, you must, if necessary, arrange for that protection to be moved to a more suitable location so that trains can reach the place where they are required to stop.

You must tell the signaller controlling the entrance to the single-line section on the other side of the obstruction when working by pilotman has been introduced and withdrawn.

**pilotman**

You must not complete a driver's ticket.

You must accompany every train over the single-line section.

These arrangements may be introduced on both sides of the obstruction, but separate pilotmen will need to be appointed on each side.

**pilotman**

## 5

**Dealing with a failed train**

*The people responsible: pilotman, signaller*

**5.1 If the pilotman is on the failed train****pilotman**

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*.

You must get the signaller's permission before making any movement if the train is to return to the same end of the single-line section from which it entered.

**5.2 If the pilotman is not on the failed train****pilotman**

You must travel with the assisting train if:

- the assistance is to come from the rear, and
- the failed train is to be withdrawn to the rear.

**5.3 Getting permission from the pilotman****signaller**

You must get permission from the pilotman before authorising an assisting train to proceed into the occupied single-line section.

# 6

## Withdrawing working by pilotman

*The people responsible: pilotman, signaller*

### 6.1 Pilotman's actions

Only you can authorise the withdrawal of working by pilotman.

pilotman

When the last train is clear of the single-line section, you must tell each signaller that working by pilotman has been withdrawn and then:

- cancel your pilotman's form
- instruct each signaller to cancel their signaller's form
- get an assurance from each signaller that this has been done.

If you have a token, you must hand it to the signalling technician who will take it away or restore it to the token instrument.

You must hand in the cancelled pilotman's form and any driver's tickets as shown in company instructions.

### 6.2 Signaller's actions

When instructed to do so by the pilotman, you must cancel your signaller's form, and tell the pilotman when this has been done.

signaller

You must make a suitable entry in the Train Register.

Where working by pilotman had been introduced on both sides of an obstruction, you must not resume normal working until you have been told by the pilotmen on either side of the obstruction that working by pilotman is withdrawn.

You must hand in the cancelled signaller's form as shown in company instructions.

## 7

**Modified working arrangements***The people responsible: driver, signaller***7.1 Where modified working can be used****signaller**

Modified working arrangements may be used to allow a train to pass through a single-line section without introducing working by pilotman.

You may only use modified working arrangements where it is authorised in the *Sectional Appendix* and *Signal Box Special Instructions*.

An authority to use modified working arrangements applies to one train movement only.

**7.2 Before introducing modified working****signaller**

Where it is authorised, you may only use modified working arrangements if all the following conditions are met.

- Direct communication is available with any other signaller concerned and you both reach a clear understanding of what is to happen.
- You have made sure the single-line section is clear.
- The responsible person as shown in the *Signal Box Special Instructions* has personally given you and any other signaller concerned authority to use the modified working arrangement for that train.

You must record the name of the responsible person and the time authority is received in the Train Register.

**7.3 If more than one signaller is involved****signaller**

The responsible person will speak to any other signaller involved before speaking to you again to authorise modified working.

After you receive the authority from the responsible person, you must get permission from any other signaller involved for the train to pass through the single-line section.

signaller

If you are the other signaller involved, you may give permission for the train to approach as long as:

- the responsible person has told you that the modified working arrangement has been authorised for this train, and
- the line is clear as shown in the relevant train signalling regulations.

You must pass messages by telephone as follows.

'From \_\_\_\_\_ signal box to \_\_\_\_\_ signal box: Is line clear for train \_\_\_\_\_ to pass through the single-line section from \_\_\_\_\_ to \_\_\_\_\_ under modified working arrangements?'

'From \_\_\_\_\_ signal box to \_\_\_\_\_ signal box: Line is clear for train \_\_\_\_\_ to pass through the single-line section from \_\_\_\_\_ to \_\_\_\_\_ under modified working arrangements.'

## 7.4 Signaller instructing the driver

When you have the authority of the responsible person and where necessary, the permission of another signaller, for a train to enter the single-line section, you must:

signaller

- tell the driver what is happening
- dictate or give to the driver a completed Modified Working Arrangements Driver's Ticket (RT3177)
- instruct the driver to stop at the end of the single-line section, if necessary
- instruct the driver to pass at danger the signal controlling the entrance to the single-line section, or to pass the EoA at the entrance to the single-line section without an MA.

## 7.5 Completing a driver's ticket

### driver

You must complete a driver's ticket, if necessary, at the signaller's dictation.

If the train is worked by more than one locomotive at the front, you must show the completed driver's ticket to each other driver.

You must not enter the single-line section until you have a completed modified working arrangements driver's ticket.

You do not need a driver's ticket if your train is to enter the single-line 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.

## 7.6 When the train enters the single line

### signaller

You must record in the Train Register the time the train enters the single-line section, even if you do not normally record these times.

If there is more than one signaller involved, you must tell the other signaller when the train enters the section. Where block bells are provided, you must send **train entering section**.

## 7.7 Travelling over the single line

### driver

You must carry out the instructions on your driver's ticket.

You must not exceed 50 mph (80 km/h), or the permissible speed if lower.



## 7.8 Train failure on the single line

You must get the permission of the responsible person before allowing an assisting train to enter an occupied single-line section.

signaller

You must not dictate or give a driver's ticket to the driver of the assisting train.

## 7.9 Arriving at the other end of the single line

When the train arrives at the other end of the single-line section, you must stop if the signaller has instructed you to do so. You must cancel your driver's ticket by writing 'CANCELLED' across it. You must then tell the signaller that the train has arrived complete with tail lamp.

driver

If you do not have to stop, you must cancel your driver's ticket at the first opportunity.

You must hand in the ticket as shown in company instructions.

driver

On a one-train working line where it is not normally necessary to ask the signaller's permission to start the return journey, you do not need to tell the signaller that your train has arrived.

You must record in the Train Register the time the train leaves the single-line section, even if you do not normally record these times.

signaller

If there is more than one signaller involved, you must tell the other signaller when the train leaves the section. If block bells are provided, you must send **train out of section**.

## 7.10 When another train is to pass

You must get another authority from the responsible person each time a train is to pass through the single-line section under modified working arrangements.

signaller

## 7.11 Intermediate signal boxes or sidings

### signaller

You must not:

- allow an intermediate signal box to switch in until the train carrying a modified working arrangements ticket has arrived at the other end of the single-line section, complete with tail lamp
- give permission for an intermediate siding to be used.

## 7.12 Changing to working by pilotman

### signaller

You must get authority from the responsible person to change from modified working arrangements to working by pilotman.





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**GE/RT8000/SP**  
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# Speeds

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

- driver
- signaller
- train preparer.

#### Conventions used in the Rule Book

#### Example

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.

**driver**

A white **i** in a blue box indicates that there is information provided at the bottom of the page.



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## 6

### **Blanket speed restrictions**

## 1

## Definitions

### Blanket speed restriction

A speed restriction which applies to an area rather than a geographical location.

### Differential speeds

If there is a differential permissible speed, or a differential temporary or emergency speed restriction, the higher speed applies to passenger, parcels and postal trains (loaded or empty) and light locomotives. The lower speed applies to all other trains.

### Emergency speed restriction

A speed restriction on an ERTMS line without lineside signals which has been imposed without ERTMS supervision.

A speed restriction on an ERTMS line with lineside signals which:

- has been imposed without ERTMS supervision
- has not been published in the *Weekly Operating Notice*
- has been published, but the times, speed or limits are different from those published
- has been imposed again after being withdrawn early
- has been shown in an amendment to the *Weekly Operating Notice*.

On any other line a speed restriction which:

- has not been published in the *Weekly Operating Notice*
- has been published, but the times, speed or limits are different from those published
- has been imposed again after being withdrawn early
- has been shown in an amendment to the *Weekly Operating Notice*.

### **Enhanced permissible speeds**

These speeds apply to class 221 and class 390 trains in tilting mode. Where differential signs are provided, the bottom figure shows the higher speed and applies to class 390 trains in tilting mode. The top figure applies to class 221 trains in tilting mode.

### **Permissible speed**

The speed which is published in Table A of the *Sectional Appendix*.

### **Temporary speed restriction**

A speed restriction on an ERTMS line without lineside signals which has been imposed by means of ERTMS supervision.

A speed restriction on an ERTMS line with lineside signals which has been imposed by means of ERTMS supervision and the details of which have been published in the *Weekly Operating Notice*.

On any other line a speed restriction, the details of which have been published in the *Weekly Operating Notice*.

# 2

## Permissible speeds

*The people responsible: **driver, train preparer***

### 2.1 Permissible speeds and enhanced permissible speeds

#### driver

You must:

- control the speed of your train to no more than the permissible speeds, or any enhanced permissible speed that applies to your train, on all sections of the line
- make sure the whole of your train has passed clear of a section of line with a lower speed before increasing your speed.

Where there are differential permissible speeds, you must control the speed of your train to no more than the speed that applies to that train.

Where permissible speeds are shown with letters, they apply only to the trains shown by the letters. You can allow your train to travel at no more than that speed, providing it is a train of the type to which the permissible speed applies.

This is what the letters mean.

<b>HST</b>	High speed trains
<b>MU</b>	Multiple-unit trains
<b>DMU</b>	Diesel multiple-unit trains
<b>EMU</b>	Electric multiple-unit trains
<b>SP</b>	Sprinter multiple-unit trains
<b>CS</b>	Class 67 locomotives

The classes of train that can travel at these speeds are shown in the *Sectional Appendix*.

## 2.2 Locomotives running light or hauling trains

You must make sure that locomotive-hauled trains in the formation shown, or locomotives running light, do not exceed the speeds shown in the table below where the permissible speed is more than 60 mph (95 km/h).

Train formation	Permissible speed	
	90 mph (145 km/h) or above	85 mph (135 km/h) or less
Any number of locomotives running light, or  one or two locomotives with one, two or three coaching stock vehicles, or  three or more locomotives and any number of coaching stock vehicles.	75 mph (120 km/h)	60 mph (95 km/h)

You must make sure that locomotive-hauled trains conveying any mark 1 or mark 2 coaching vehicles, postal or parcels vehicles, or mark 3 sleeper coaching stock vehicles do not exceed the speeds shown in the table below where the permissible speed is more than 75 mph (120 km/h).

Train formation	Permissible speed		
	100 mph (160 km/h) or above	90 or 95 mph (145 or 155 km/h)	80 or 85 mph (130 or 135 km/h)
A locomotive with four, five or six vehicles, or  two locomotives and from four to 10 vehicles.	90 mph (145 km/h)	80 mph (130 km/h)	75 mph (120 km/h)

You do not need to apply any of the restrictions in this section to some classes of locomotives, if shown in your train operating company instructions.

driver,  
train  
preparer

## 3

**Temporary speed restriction (TSR)***The person responsible: **driver*****3.1 Driving over a TSR****driver**

When driving over a TSR, you must:

- control the speed of your train to no more than the speed shown on the warning board or the speed shown on the DMI
- make sure the whole of your train has passed clear of a section of line with a lower speed before increasing your speed.

Where there are differential speeds shown on the warning board you must control the speed of your train to no more than the speed that applies to that train.

**3.2 Normal arrangements with lineside equipment**

The following equipment is used in connection with a TSR.

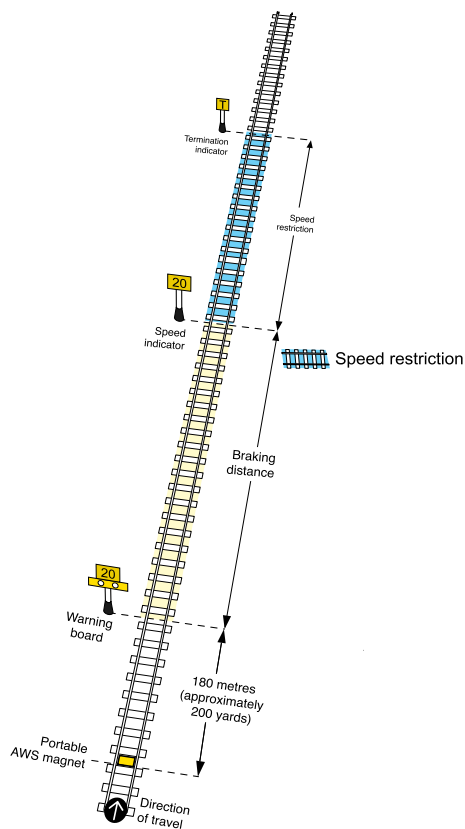
A portable AWS magnet is normally placed 180 metres (approximately 200 yards) on the approach to the warning board.

A warning board is placed on the approach to the speed indicator. The distance between the warning board and the speed indicator is normally the appropriate braking distance for the permissible speed at that location.

A speed indicator is placed at the start of the TSR.

A termination indicator is placed at the end of the TSR.

Diagram SP.1 on page 9 shows a normal TSR.



**TSR normal arrangements**  
**Diagram SP.1**

## signaller

### 3.3 Arrangements on ERTMS lines

On lines where lineside signals are not provided, AWS magnets and lineside equipment are not provided.

On lines where lineside signals are provided, the arrangements for the provision of AWS magnets and lineside equipment also apply.

You must make sure that planned TSRs are programmed into the system in enough time before they become active.

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.

### 3.4 Where there is a fixed AWS magnet

Diagram SP.2 on page 11 shows a TSR where there is already a fixed AWS magnet associated with a:

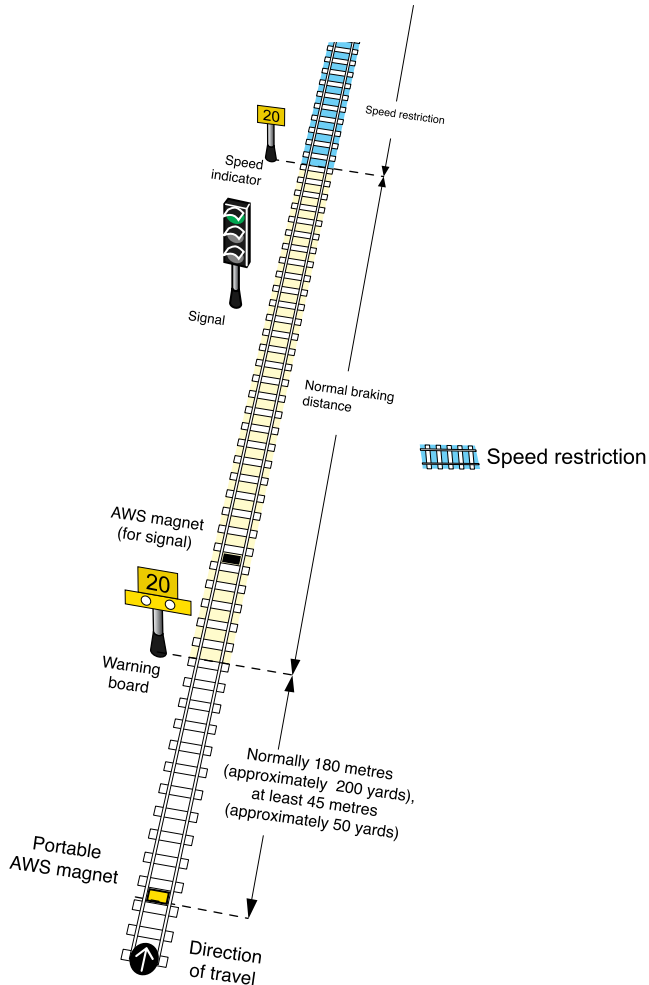
- signal
- permissible speed indicator
- level crossing warning board.

The warning board is not placed between a fixed AWS magnet and the equipment to which it applies.

If possible, the portable AWS magnet and the warning board are kept at the normal distance apart, but may be placed at a reduced distance of not less than 45 metres (approximately 50 yards).

The warning board may be placed at the signal, in which case the associated electro-magnet is disconnected and a temporary AWS magnet is not provided. The driver will always receive an AWS warning indication, no matter what aspect is displayed at the signal.





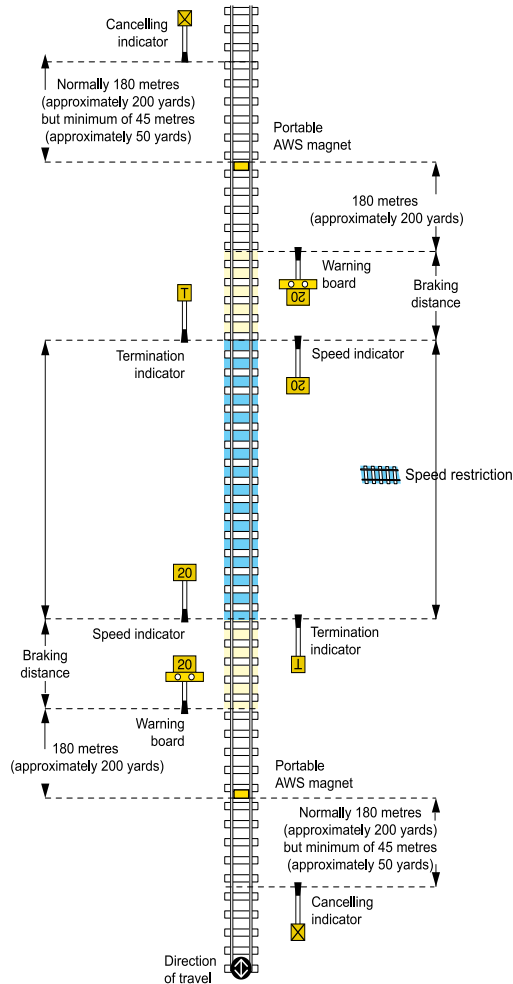
**Where there is already a fixed AWS magnet**  
**Diagram SP.2**

### **3.5 TSRs on single and bi-directional lines**

On a single or bi-directional line, equipment for a TSR is provided in both directions.

Diagram SP.3 on page 13 shows an example of the arrangements.

A cancelling indicator is normally placed 180 metres (approximately 200 yards) beyond the AWS magnet at each end of the restriction facing trains that have already passed through the speed restriction, but may be placed at a reduced distance of not less than 45 metres (approximately 50 yards).



**Single and bi-directional lines**

**Diagram SP.3**

### 3.6 Consecutive TSRs

#### a) If there is a lower speed restriction beyond a higher speed restriction

If there are two TSRs with a lower speed restriction immediately beyond a higher speed restriction, a termination indicator is not placed at the end of the higher speed TSR. Instead a speed indicator is placed showing the speed for the lower speed TSR.

Diagram SP.4 a) on page 15 shows two TSRs like this.

#### b) If there is not sufficient distance to position the boards and indicators in the normal way

If there is not sufficient distance to position the warning boards and indicators in the normal way, then:

- the second warning board is placed at least 45 metres (approximately 50 yards) beyond the first warning board
- the second portable AWS magnet is placed immediately beyond the first warning board.

Diagram SP.4 b) on page 15 shows two TSRs like this.

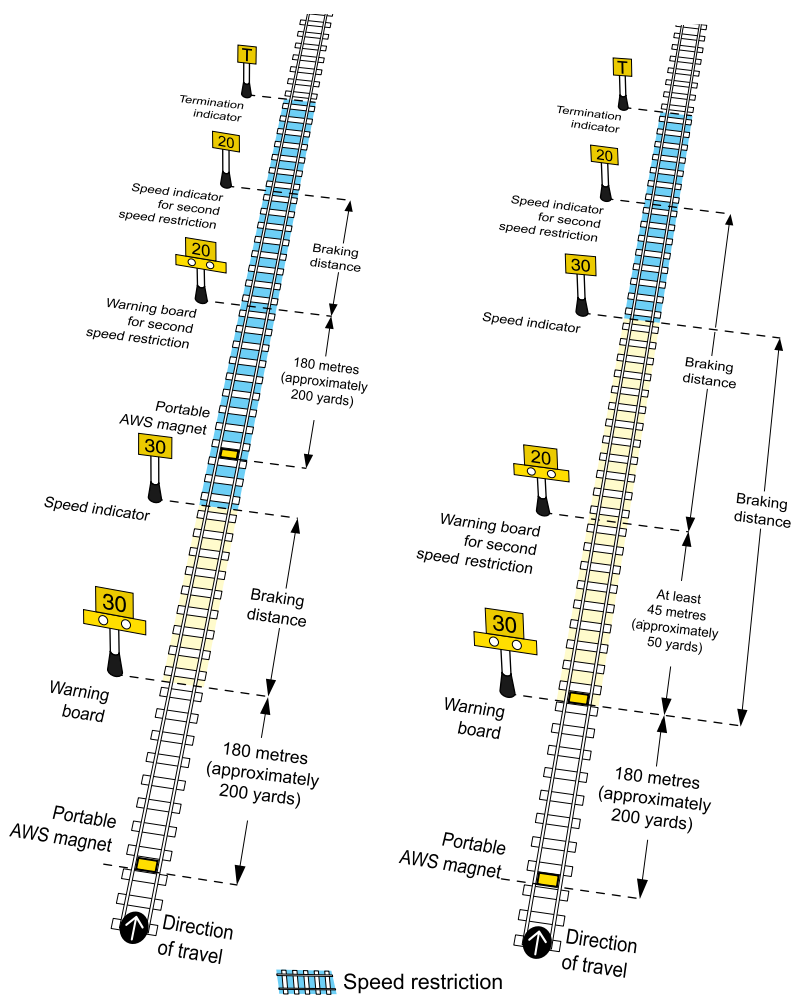
#### c) If there is a higher speed restriction beyond a lower speed restriction

If there are two TSRs with a higher speed restriction immediately beyond a lower speed restriction, a warning board is not provided for the second TSR. A termination indicator is not placed at the end of the lower speed TSR. Instead a speed indicator is placed showing the speed for the higher speed TSR.

Diagram SP.5 on page 16 shows two TSRs like this.

#### d) Termination indicator

Only one termination indicator is provided. This is located at the end of the second TSR.

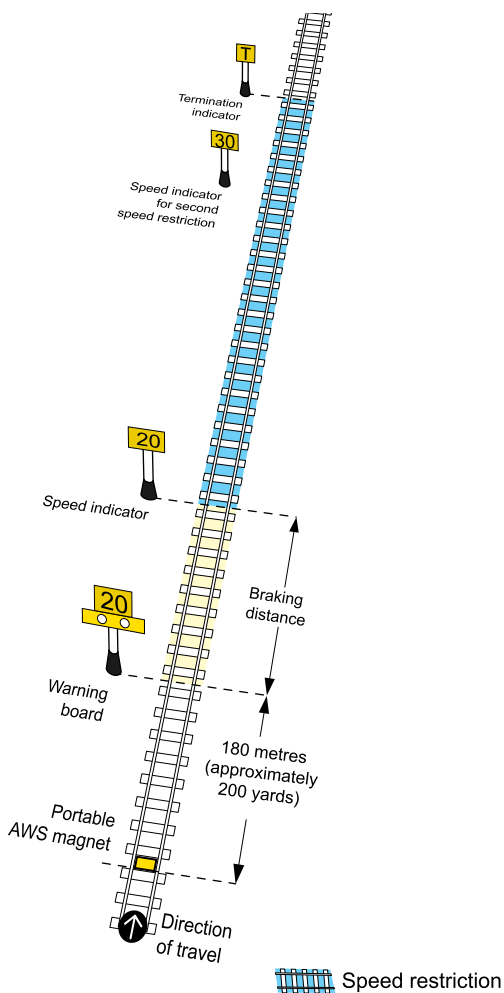


### Consecutive TSRs

Diagram SP.4 a)

Diagram SP.4 b)

# Speeds



**Consecutive TSRs**  
**Diagram SP.5**

## 3.7 One TSR inside another

### **a) If there is a lower speed restriction inside a higher speed restriction**

If there are two TSRs with the lower speed restriction inside the higher speed, equipment is provided in the normal way except that the termination indicator is not placed at the end of the lower speed TSR. Instead a speed indicator is placed showing the speed of the higher speed TSR.

Diagram SP.6 a) on page 18 shows outer and inner TSRs like this.

### **b) If there is not enough distance to position the boards and indicators in the normal way**

If there is not enough distance to position the warning boards and indicators in the normal way, then:

- the second warning board is placed at least 45 metres (approximately 50 yards) beyond the first warning board
- the second portable AWS magnet is placed immediately beyond the first warning board.

Diagram SP.6 b) on page 18 shows two TSRs like this.

### **c) If there is a higher speed restriction inside a lower speed restriction**

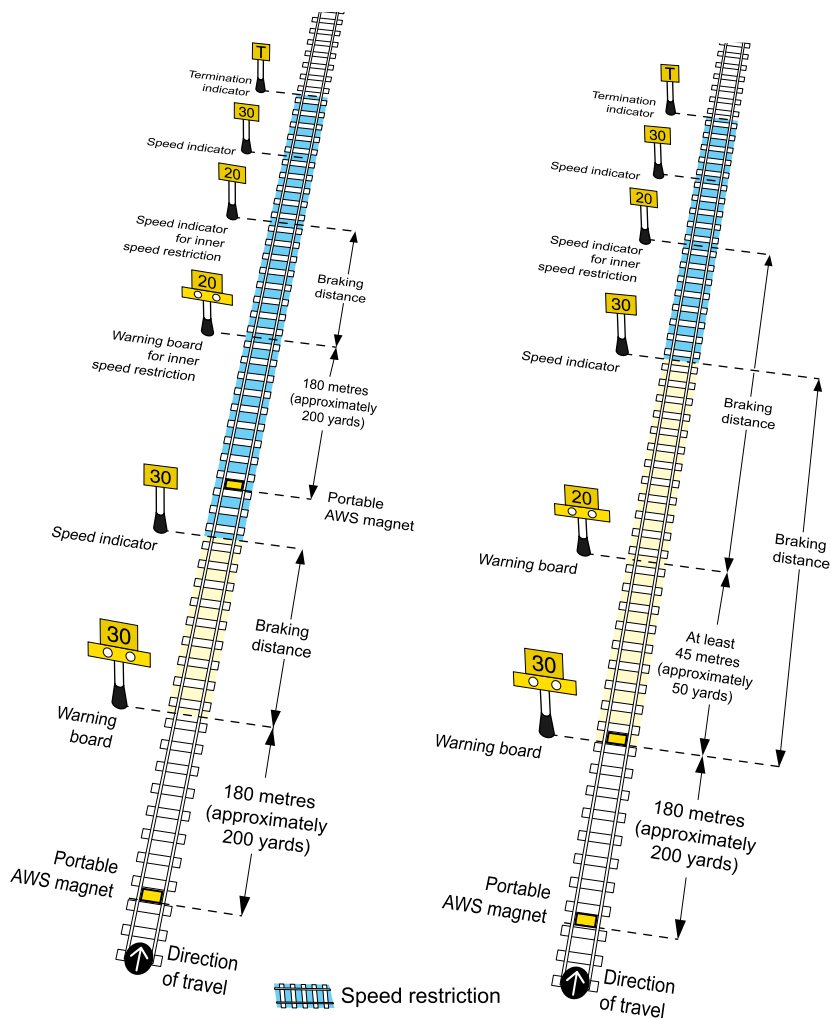
If there are two TSRs with the higher speed restriction inside the lower speed, a warning board is not provided for the higher speed TSR. A termination indicator is not placed at the end of the lower speed TSR. Instead a speed indicator is placed showing the speed for the higher speed TSR.

Diagram SP.7 on page 19 shows two TSRs like this.

### **d) Termination indicator**

Only one termination indicator is provided. This is located at the end of the second TSR.

# Speeds

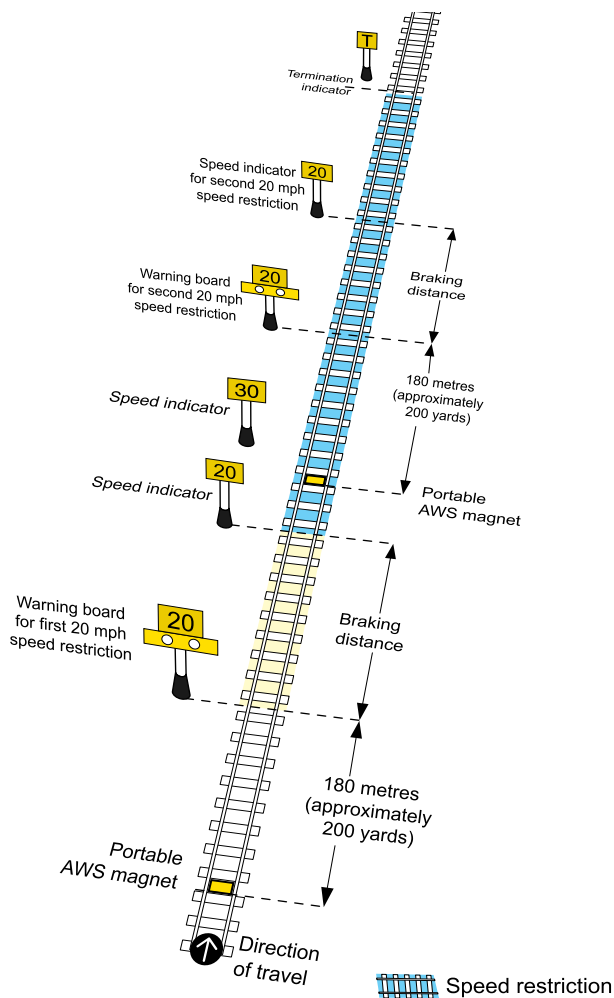


**One TSR inside another**

**Diagram SP.6 a)**

**Diagram SP.6 b)**





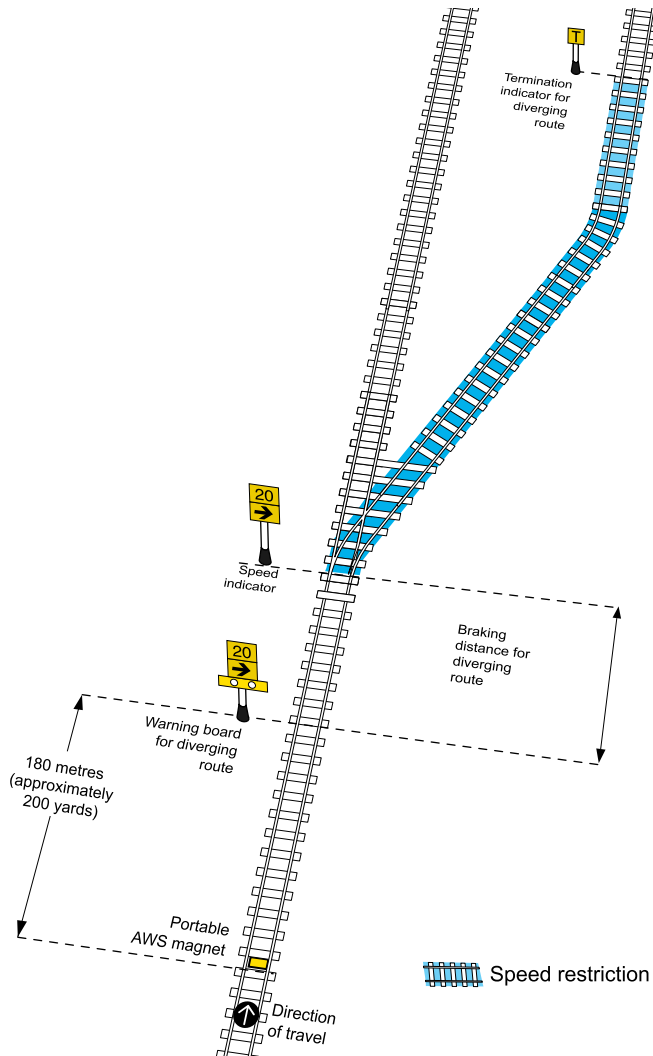
**One TSR inside another**  
**Diagram SP.7**

## **3.8 TSRs at a diverging junction**

### **a) TSR on diverging route only**

Diagram SP.8 on page 21 shows a TSR on the diverging route only.

Equipment is provided in the normal way except that the warning board and speed indicator have a direction indicator to show that the TSR applies to the diverging route only.



**TSR on diverging route only**

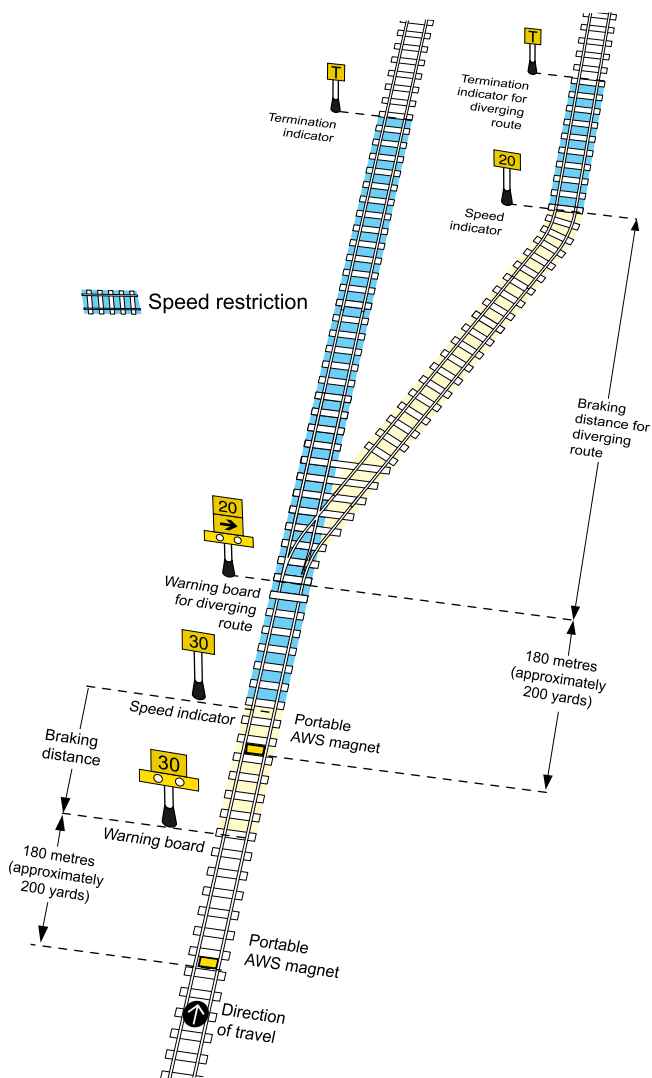
**Diagram SP.8**

**b) TSR on one route commences beyond the junction**

Diagram SP.9 on page 23 shows a TSR on one route which commences before the diverging junction, and a TSR on the other route commences beyond the junction.

The warning boards for both TSRs are positioned on the approach to the junction, but only the speed indicator on the diverging route is beyond the junction.

Equipment is provided in the normal way except that one warning board has a direction indicator to show that the TSR applies to the diverging route only.



**TSR on one route commences beyond the junction**

**Diagram SP.9**

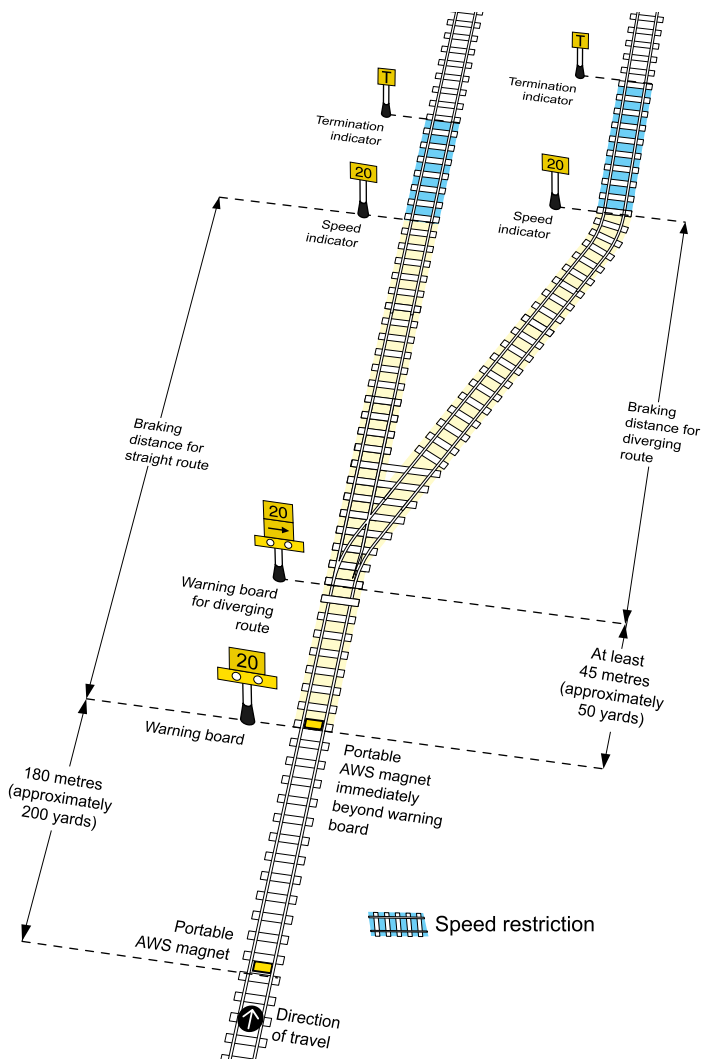
**c) TSRs on both routes commencing beyond the junction**

Diagram SP.10 on page 25 shows TSRs on both routes which both commence beyond a diverging junction. The warning boards for both TSRs are positioned on the approach to the junction, but the speed indicators on both routes are beyond the junction.

Equipment is provided using the normal arrangement except that one warning board has a direction indicator to show that the TSR applies to the diverging route only.

However, if there is not sufficient distance to position the warning boards and indicators in the normal way, then:

- the warning board for the straight route is positioned on the approach side of the second warning board
- the second warning board is placed at least 45 metres (approximately 50 yards) beyond the first warning board
- the second portable AWS magnet is placed immediately beyond the first warning board.



**TSR on both routes commencing beyond the junction**

**Diagram SP.10**

### 3.9 TSRs beyond a station or siding connection

These instructions apply to a TSR if the warning board is on the approach to a:

- passenger station
- connection from a siding
- connection from a dead-end platform line.

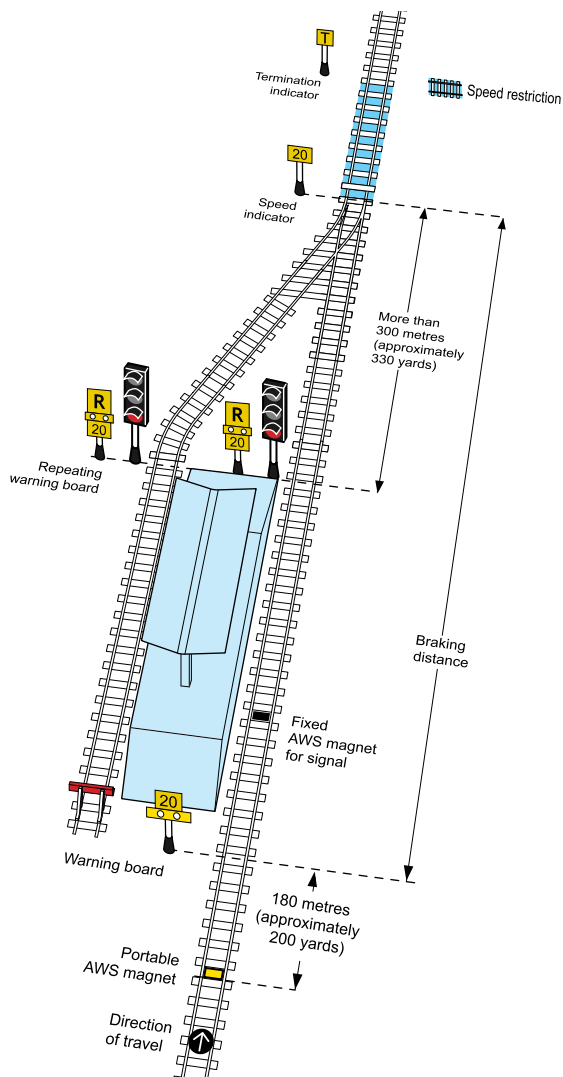
If the speed indicator is more than 300 metres (approximately 330 yards) beyond the station or sidings connection, a repeating warning board is placed as a reminder of the TSR as shown in diagram SP.11 on page 27.

The repeating warning board is placed at one of the following locations.

- Next to the platform starting signal (if there is one).
- Next to the siding exit signal.
- Immediately ahead of the station, siding connection or dead-end platform line.

A portable AWS magnet is not provided on the approach to the repeating warning board.





**TSR beyond a station or siding connection**  
**Diagram SP.11**

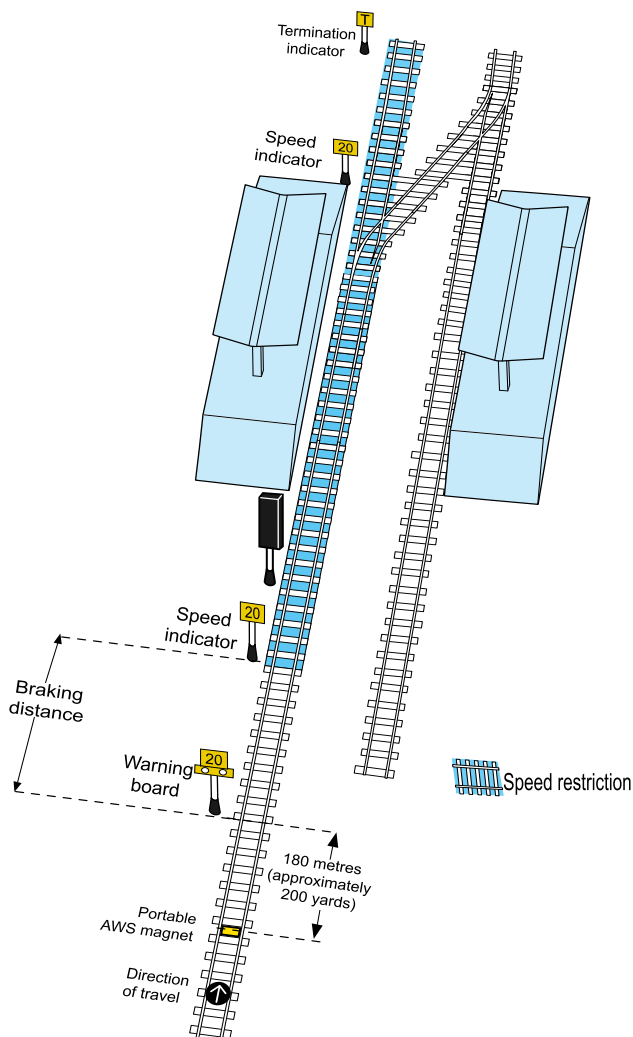
### **3.10 TSR at a location where trains can reverse or change drivers**

These instructions apply to a TSR at a location where trains can reverse or regularly change drivers.

An additional speed indicator is placed within the TSR as a reminder of the TSR as shown in diagram SP.12 on page 29.

The additional speed indicator is placed at one of the following locations.

- Next to the starting signal.
- Immediately ahead of the station.



**TSR at a location where trains can reverse or change drivers**

**Diagram SP.12**

### 3.11 TSR across an ERTMS transition

On lines where lineside signals are provided, if the TSR starts within an ERTMS area but ends outside the ERTMS area, an additional speed indicator will be placed at the end of cab signalling board. See diagram SP.13 on page 31.

This arrangement also applies on a single or bi-directional line.

### 3.12 When a TSR is to be moved

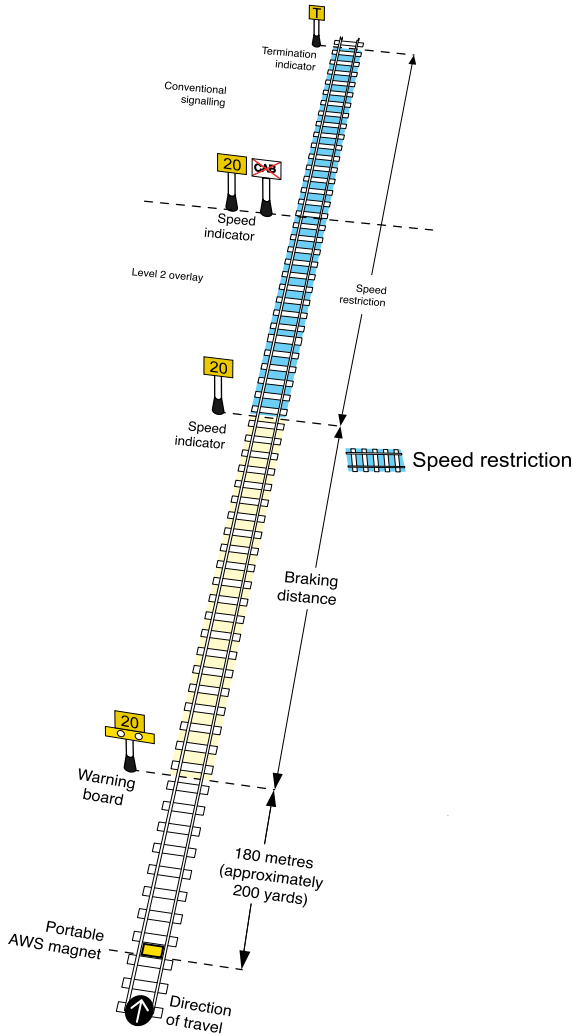
A TSR can be moved if the arrangements have been published in the *Weekly Operating Notice* and one of the following is applied.

- The warning board, speed indicator and termination indicator are all moved in the direction of travel.
- The warning board and speed indicator are moved towards the termination indicator.
- The termination indicator is moved towards the speed indicator.

### 3.13 When a TSR is not introduced

When a TSR has been published in the *Weekly Operating Notice* but the restriction is no longer needed, the details are published in a special notice at least 24 hours before the TSR is due to start. However, the warning boards and indicators are not provided.

If it is not possible to do this at least 24 hours before the TSR is due to start, the TSR is set up as planned but the normal permissible speed will apply. The warning boards and speed indicator show either the permissible speed or a SPATE indicator.



**TSR across an ERTMS transition**

**Diagram SP.13**

### **3.14 When a TSR is eased or removed early**

When a TSR is eased to allow a higher speed earlier than that shown in the *Weekly Operating Notice*, the warning boards and speed indicator are changed to show the higher speed.

When a TSR is removed earlier than the time shown in the *Weekly Operating Notice*, the warning boards and speed indicator show either the permissible speed or a SPATE indicator.

# 4

## Emergency speed restriction (ESR)

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

### 4.1 Signaller's actions

If it is necessary to allow trains to pass over the ESR before the equipment is in place, you must stop each train which will travel over the ESR and tell the driver:

**signaller**

- the location where the ESR begins and ends
- the speed limit imposed.

You must continue with these arrangements until the equipment has been set up, and on an ERTMS line, the signalling system is supervising the speed restriction.

### 4.2 Driver's actions

When driving over an ESR before the equipment is in place, you must:

**driver**

- 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.

After the equipment has been provided, you must control the speed of your train to no more than the speed shown on the warning board.

Where there are differential speeds shown on the warning board, you must control the speed of your train to no more than the speed that applies to that train.

### 4.3 Normal arrangements

When an ESR is to last for more than a short time, equipment is provided as soon as possible. The normal equipment for a TSR is provided, and in addition an emergency indicator.

A portable AWS magnet is normally placed 180 metres (approximately 200 yards) on the approach to the emergency indicator.

The emergency indicator is placed at least 180 metres (approximately 200 yards) and not more than 400 metres (approximately 440 yards) on the approach to the warning board.

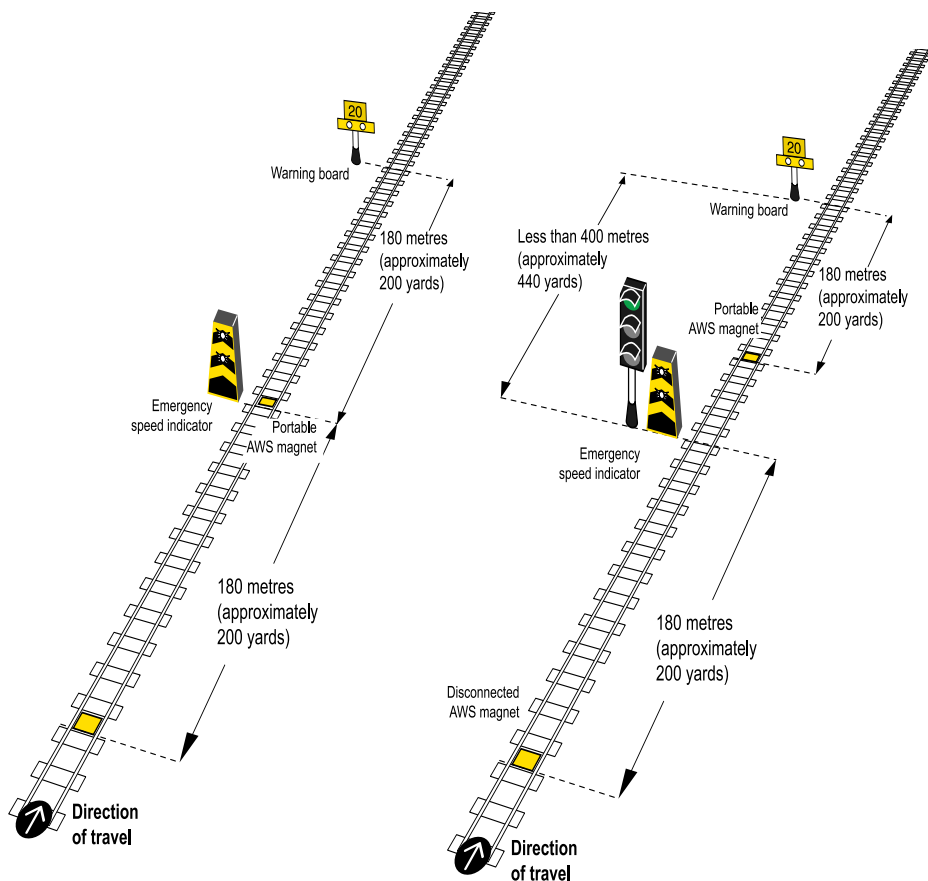
The portable AWS magnet for the warning board is placed at or beyond the emergency indicator.

Diagram SP.14 a) on page 35 shows the normal arrangements for an emergency indicator.

signaller

On an ERTMS line you must make arrangements for the ESR to be programmed into the system.





### Emergency indicator

Diagram SP.14 a)

Diagram SP.14 b)

## 4.4 Where there is a fixed AWS magnet

Diagram SP.14 b) on page 35 shows how an ESR is set up where there is already a fixed AWS magnet associated with a:

- signal
- permissible speed indicator
- level crossing warning board.

The emergency indicator is not placed between a fixed AWS magnet and the equipment to which it applies.

If possible, the portable AWS magnet and the warning board are kept at the normal distance apart, but may be placed at a reduced distance of not less than 45 metres (approximately 50 yards).

The emergency indicator may be placed at the signal, in which case the associated electro-magnet is disconnected and a portable AWS magnet is not provided. The driver will always receive an AWS warning indication, no matter what aspect is displayed at the signal.

## 4.5 Emergency indicator to stay in position

The emergency indicator will stay in position until:

- details of the speed restriction appear in the *Weekly Operating Notice*, or
- the speed restriction is withdrawn.

# 5

## Defective or missing ESR or TSR equipment

*The people responsible: driver, signaller*

### 5.1 Speed restriction boards or indicators missing or incorrect

You must tell the signaller immediately if you see that a warning board, a repeating warning board or a speed indicator is:

driver

- missing
- in a different place from the one published in the *Weekly Operating Notice*
- is more restrictive than that shown in the *Weekly Operating Notice*.

You must also tell the signaller immediately if the speed shown on the DMI is different to that shown on lineside equipment or the *Weekly Operating Notice*.

If necessary you must stop your train specially.

You do not have to tell the signaller if you have already been told about this.

You must report the defect the driver has told you about to Operations Control.

signaller

You must tell the driver of each train which will travel over the restriction about the irregularity until it has been put right.

## 5.2 Speed restriction boards or indicators that are, or are becoming, difficult to see

### driver

If you see a warning board, repeating warning board or speed indicator that is, or is becoming, difficult to see, you must tell the signaller at the first opportunity.

### signaller

You must report this to Operations Control.

If the driver has reported that a warning board or indicator is difficult to see, you must also stop each train approaching the warning board or indicator and tell the driver about the difficulty until it has been put right.

## 5.3 Defective or missing emergency indicator

### driver

You must tell the signaller immediately, if necessary stopping the train specially, if you see anything wrong with the emergency indicator.

### signaller

You must report this to Operations Control.

You must stop each train approaching the emergency indicator and tell the driver about the ESR until the irregularity has been put right.

# 6

## Blanket speed restrictions

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

If a blanket speed restriction is imposed over an area, emergency indicators and other track equipment are not provided.

If you are told by Operations Control that a blanket speed restriction is to be imposed, you must arrange for the driver of each affected train to be told about the speed restriction and the locations between which it is to be observed.

**signaller**

You do not need to do this if Operations Control has arranged to tell drivers by other means.

When a blanket speed restriction is imposed over an area, you must control the speed of your train to no more than the speed restriction throughout that defined area.

**driver**

## Notes



**Corporate member of  
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communication**

**172**





# Handbook RS521



## Signals, Handsignals, Indicators and Signs

### Issue 6



RS521

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# **Signals, Handsignals, Indicators and Signs Handbook RS521**



**First issued December 2013  
Issue 6, September 2020**

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Rail Safety and Standards Board Limited**

You will need this handbook if you need to understand the meaning of signals, handsignals, indicators and signs.

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- 1.2 Signal types - identification

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- 2.2 Four-aspect signalling - normal sequence
- 2.3 Junction indicators
- 2.4 Route indicators
- 2.5 Flashing yellow aspects
- 2.6 Splitting distant signals
- 2.7 Position-light signals
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## 13

### Lineside handsignals

## 1.1 Definitions

### Stop signal

A stop signal is a signal that can show a stop aspect or indication.

It also includes:

- position-light signals
- shunting signals
- limit of shunt signals or indicators
- stop boards
- buffer stop indications
- possession limit boards
- work-site marker boards.

### Distant signal

A distant signal is a signal which cannot show a stop aspect or indication.

Some colour light distant signals are identified by a white triangle or the letters 'R' or 'RR' on the signal identification plate.

### Automatic signal

A signal operated by the passage of trains. The signaller or a person operating a signal post replacement switch can place some automatic signals to danger.

### Controlled signal

A signal operated by the signaller, some of which may be set by the signaller to work automatically.

### Semi-automatic signal

A signal normally operated by the passage of trains, but can also be controlled from a signal box or a ground frame, or by a person operating a signal post replacement switch.

### Intermediate block home signal

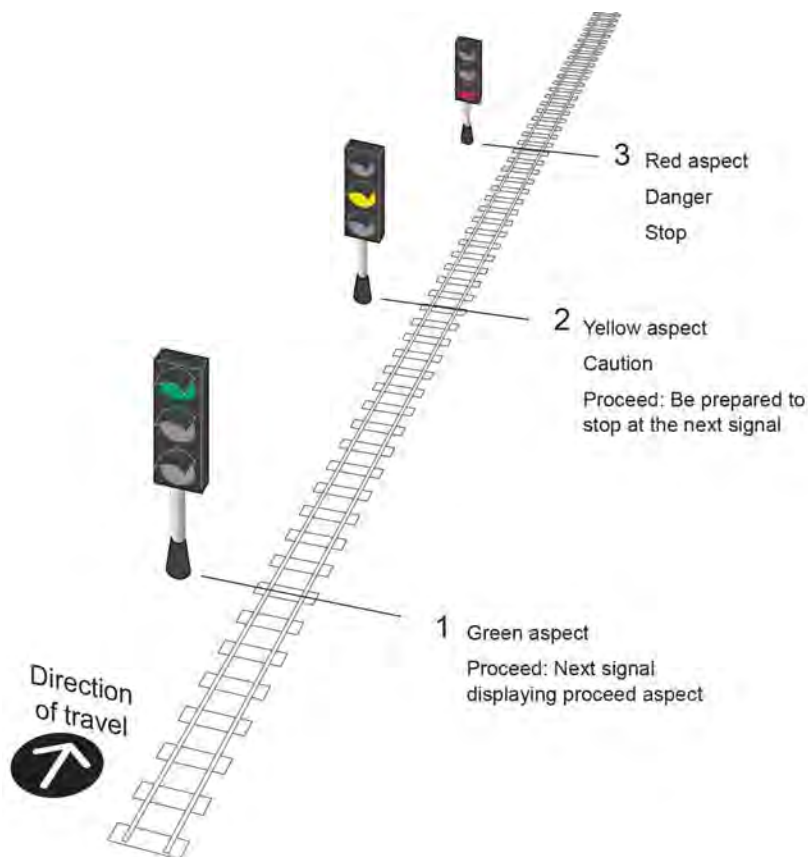
A stop signal that controls the exit from an intermediate block section, and the entrance to an absolute block section or another intermediate block section.





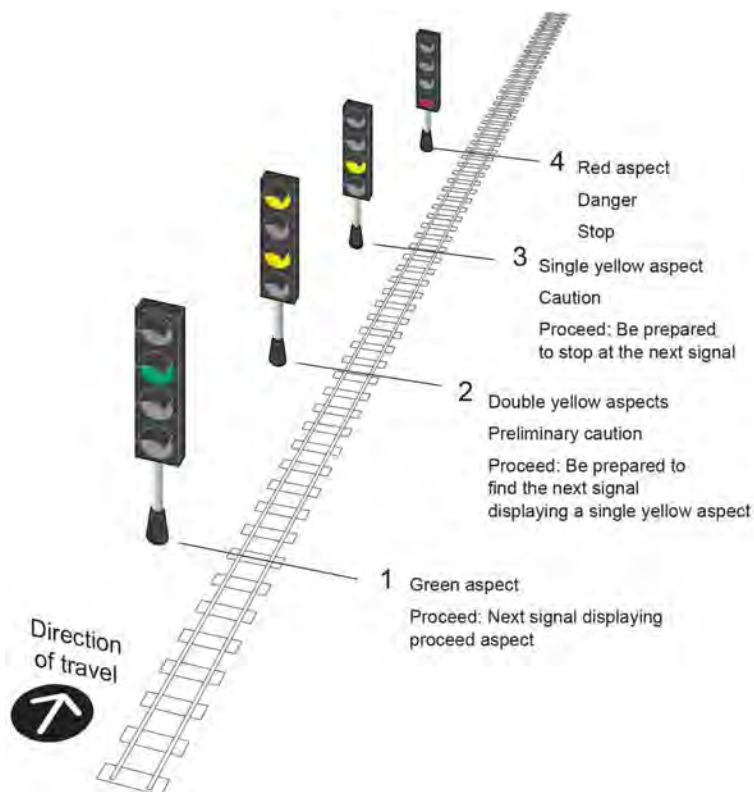
## 2.1 Three-aspect signalling - normal sequence

The normal sequence of three-aspect signalling is:



## 2.2 Four-aspect signalling - normal sequence

The normal sequence of four-aspect signalling is:



## 2.3 Junction indicators

Junction indicators are provided to show that a train is being signalled to a route to the left or right of the straight route.

A junction indicator is normally located above the signal, and will display a line of white lights when a proceed aspect is displayed.

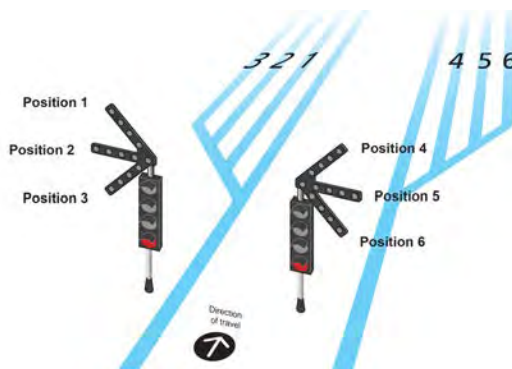


When the straight route is obvious, there is normally no junction indicator provided for this route.

Where there is no obvious straight route, a junction indicator will be provided for all signalled routes.

Where the straight route is not the highest-speed route, the junction indicator will normally apply to the lower-speed route.

Where the diverging routes ahead are both of equal speed, a junction indicator will be provided for each route.



## 2.4 Route indicators

At some locations a route indicator is provided at the signal. The indicator will display either a letter or a number to show the route onto which the movement is being signalled.

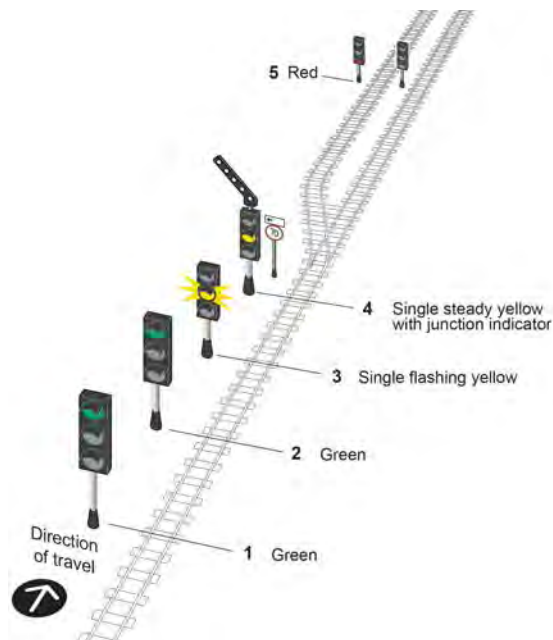
Route indicators may also be associated with a junction indicator.



## 2.5 Flashing yellow aspects

A flashing yellow aspect means facing points at a junction ahead are set for a diverging route with a lower speed than that for the straight route.

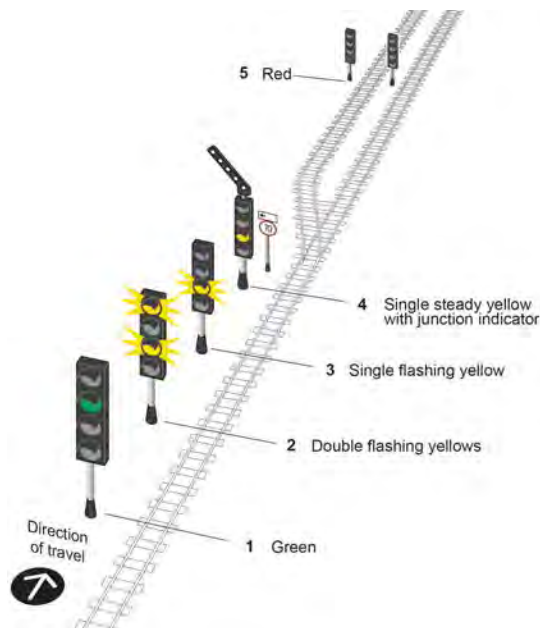
The normal sequence of three-aspect flashing yellow signalling is:



### Three-aspect flashing yellow signalling

When a single steady yellow aspect is displayed together with a junction indicator at signal 4, this has the normal meaning of a yellow aspect, be prepared to stop at the next signal (number 5). This applies even though a flashing aspect may have been displayed at signal 3.

The normal sequence of four-aspect flashing yellow signalling is:



## Four-aspect flashing yellow signalling

If the train is between signals 2 and 3 when signal 4 is cleared for the diverging route, signal 3 may then display one flashing yellow aspect. This applies even though a steady aspect has been displayed at signal 2.

When a single steady yellow aspect is displayed together with a junction indicator at signal 4, this has the normal meaning of a single yellow aspect, be prepared to stop at the next signal (number 5). This applies even though a flashing aspect may have been displayed at signal 3.

### Flashing yellow signalling in ERTMS areas

For trains on which ERTMS is operating the ability of approaching signals to display flashing aspects will be disabled. Only standard aspect sequences will be displayed to these trains. Route or junction indicators will continue to operate.

## 2.6 Splitting distant signals

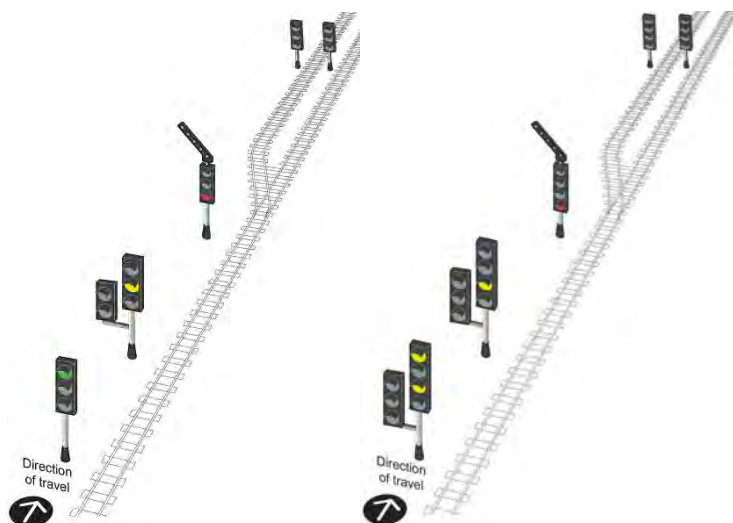
Splitting distant signals are used to show which route is set at a diverging junction.

Splitting distant signals may be provided with three or four aspect signalling.

Examples of a four aspect primary head with left-hand off-set head, and a three aspect primary head with right-hand off-set head are shown below.





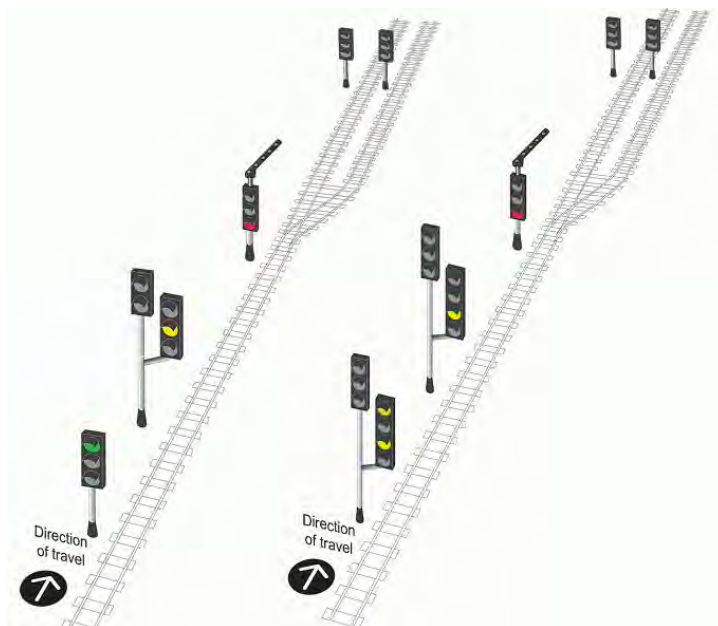


### **Splitting distant signals with junction signal at danger where there is a left-hand diverging route**

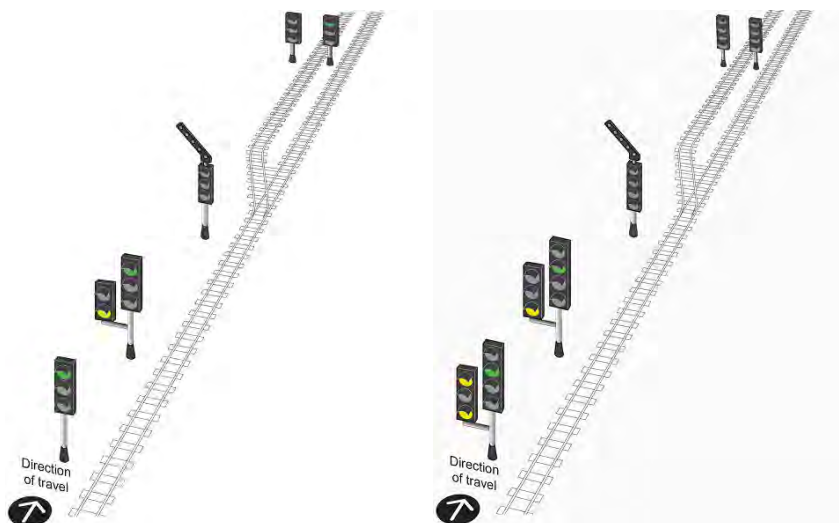
The junction signals are at danger so no aspect is shown in the off-set heads.

## 2

## Colour light signals

**Splitting distant signals with junction signal at danger where there is a right-hand diverging route**

The junction signals are at danger so no aspect is shown in the primary heads.

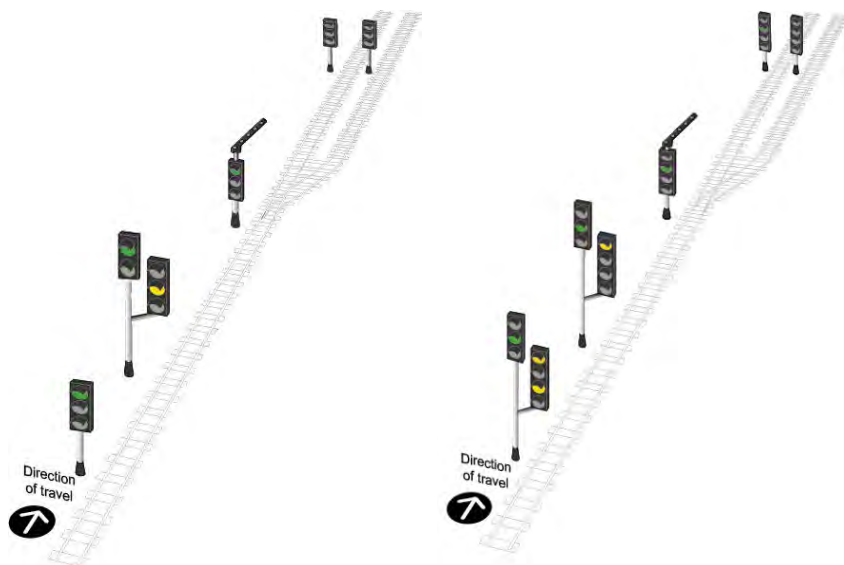


### **Splitting distant signals with junction signal cleared for the straight route where there is a left-hand diverging route**

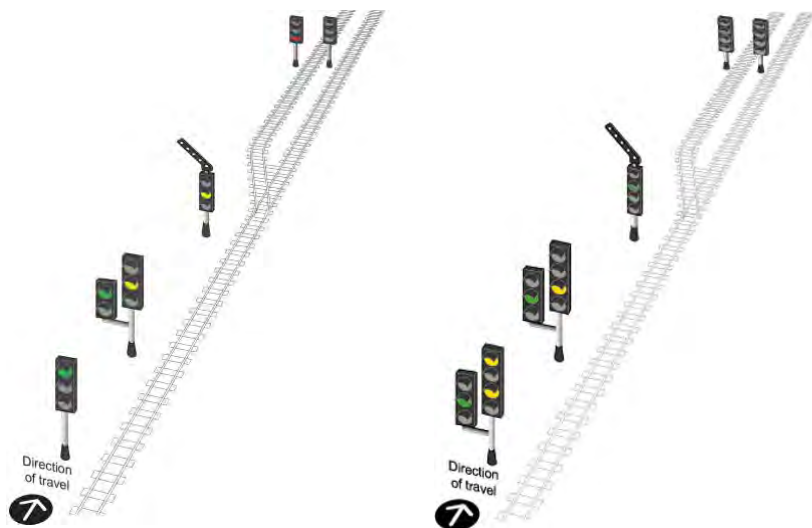
The aspects displayed in the primary heads indicate what aspect is shown at the first signal after the junction. The off-set heads on the approach to the junction signal display aspects appropriate for the junction signal being at danger.

## 2

## Colour light signals

**Splitting distant signals with junction signal cleared for the straight route where there is a right-hand diverging route**

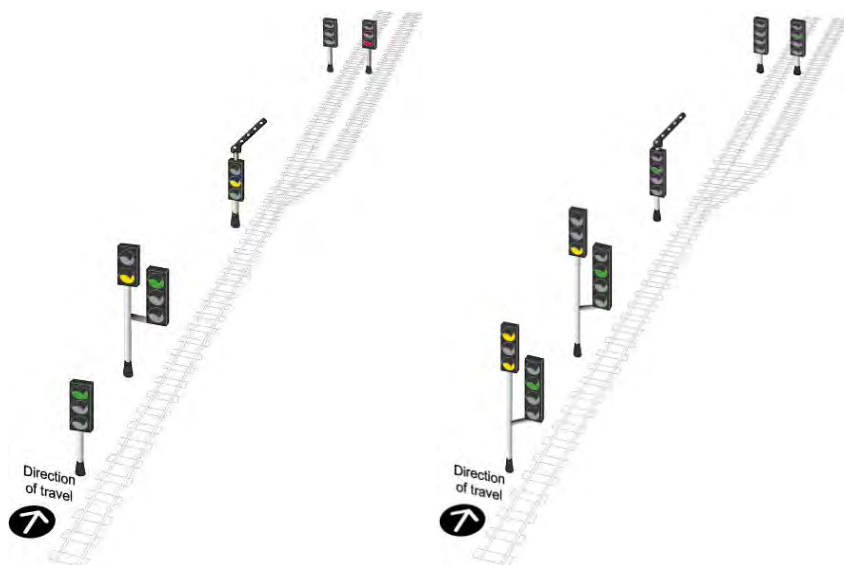
The aspects displayed in the primary heads indicate what aspect is shown at the first signal after the junction. The off-set heads on the approach to the junction signal display aspects appropriate for the junction signal being at danger.



### **Splitting distant signals with junction signal cleared for the left-hand diverging route**

The junction signal is cleared for the left-hand diverging route and is not approach released so the aspects displayed in the off-set heads indicate what aspect is shown at the first signal after the junction. The primary heads on the approach to the junction display aspects that are appropriate for the junction signal being at danger.

# 2 Colour light signals



## Splitting distant signals with junction signal cleared for the right-hand diverging route

The junction signal is cleared for the right-hand diverging route and is not approach released so the aspects displayed on the off-set heads indicate what aspect is shown at the first signal after the junction. The primary heads on the approach to the junction signal display aspects appropriate for the junction signal being at danger.

## 2.7 Position-light signals

### Position-light signals that display a red aspect

These position-light signals are normally positioned at ground level independent of a main aspect.

When proceeding on the authority of a main aspect, any position-light signals along the route between main running signals will show a proceed aspect.

The signal identification plate may also have a direction arrow showing the line to which the signal applies.

These indicate stop.



### Position-light signals that display a yellow aspect

Position-light shunting signals that display a yellow aspect are stop signals applying only to movements in the direction to which the signal can be cleared. Other movements can pass the signal without it being cleared.

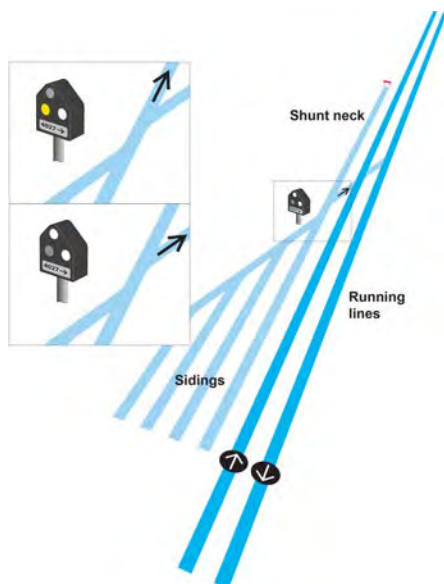
The signal identification plate may also have a direction arrow showing the line to which the signal applies.

These indicate stop.



The signal can be passed in the 'stop' position when a movement is being made towards the shunt neck or siding and not the running line.

The route may be obstructed, including by a train or vehicle.



Yellow position-light signal



### Position-light signals that display a proceed aspect

If a position-light signal displays two white lights at 45°, this authorises the driver to proceed at caution towards the next train, signal or buffer stop, and be prepared to stop short of any obstruction.



### Position-light signals associated with a main aspect

These are normally positioned below the main aspect they are associated with, and often on the same signal post.

The normal aspect for a position-light signal is unlit. This means 'obey the main signal'.



When the position-light signal shows two white lights at 45° it authorises the driver to proceed at caution towards the next train, signal or buffer stop, and be prepared to stop short of any obstruction.



### **Position light signal that has an associated route indicator**

Route indicators associated with position-light signals are of miniature design, and display a letter or a number that shows the route onto which the train is being signalled.



## **2.8 Colour light signals not in use**

When not in use, main and position-light signals are covered up.

Main aspects may also have a large 'X' displayed over the cover.



## 3.1 Distant signals

These signals show the following indications.

### Caution

Indication by day: arm horizontal.

Indication by night: yellow light or reflectorised indication.

Meaning: be prepared to stop at the next stop signal, or other specified place to which the distant signal applies.



### Clear

Indication by day: arm raised or lowered 45°.

Indication by night: green light.

Meaning: all associated stop signals worked from the same signal box are clear.



If there is only one distant signal provided for a diverging junction, this signal applies to all trains that approach it.

# 3 Semaphore signals

## 3.2 Stop signals

These signals show the following indications.

### Danger

Indication by day: arm horizontal.

Indication by night: red light.

Meaning: stop.



### Clear

Indication by day: arm raised or lowered 45°.

Indication by night: green light.

Meaning: proceed.



If there is a distant signal on the same post as a stop signal:

- the stop signal is worked by the signal box at that location, and
- the distant signal is normally worked by the signal box ahead.



The stop signal that controls movements into a loop, siding or no-block line may be a miniature semaphore arm.

Meaning when cleared: proceed at caution and be prepared to stop short of any train, vehicle or any obstruction.



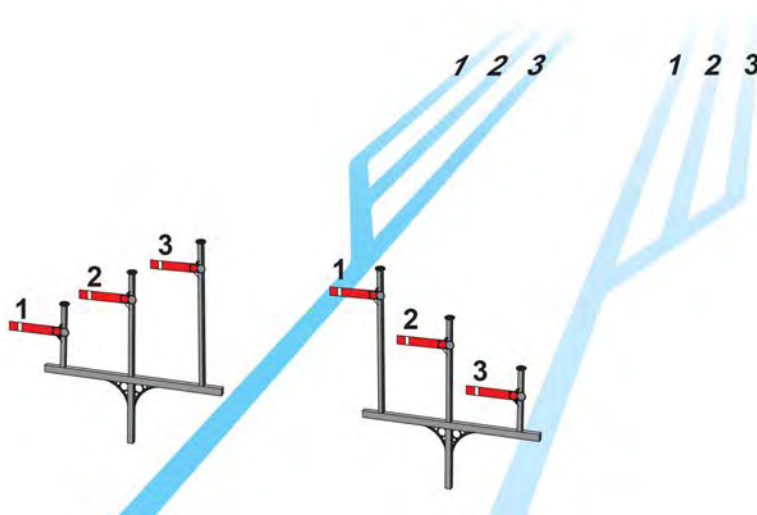
## 3.3 Route indications

Indications of route within semaphore-signalled areas may be given by one of the following methods.

- 'Stepping'.
- 'Stacking'.
- A route indicator.

The diagram below shows the 'stepping' arrangement of signals. This arrangement is the normal method of route indication on running lines in semaphore areas.

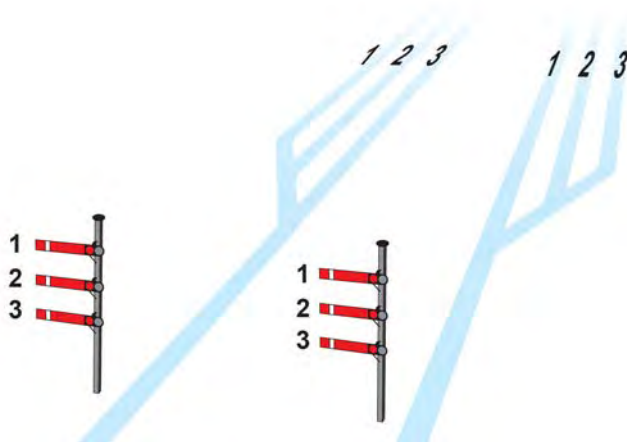
Signal 1 applies to the route on the extreme left. Signals 2 and 3 apply to successive routes to the right.



**Stepping**

The diagram below shows the 'stacking' arrangement. This arrangement is the normal method of route indication for shunting signals in yards and sidings, and also on running lines where there is little gantry space.

Signal 1 applies to the route on the extreme left. Signals 2 and 3 apply to successive routes to the right.



### Stacking

At some locations a route indicator is provided at the signal. The indicator will display a figure or letter to show the route onto which the movement is being signalled.



### Route Indicator

## 3.4 Semaphore subsidiary signals

Semaphore subsidiary signals are always associated with the main arm of a semaphore stop signal.

The subsidiary signal will always be positioned below the main semaphore arm with which it is associated, and on the same signal post.

When the subsidiary signal is in the 'normal' position this means 'obey the main arm'.

The 'normal' indication is:

- the arm in the horizontal position
- a red, white or no light displayed.

The proceed indication is:

- the arm raised or lowered 45°
- a green light displayed.

When the signal is cleared, it authorises the driver to:

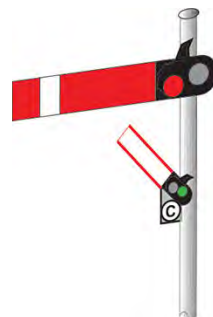
- pass the main arm at danger
- proceed at caution towards the next train, signal or buffer stop, and be prepared to stop short of any obstruction.

At some locations, clearing the subsidiary signal will also show an indicator displaying either the letter 'C' or 'S'.

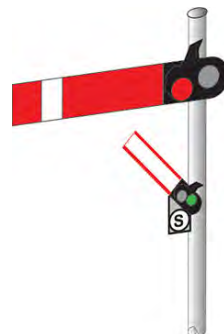


**Calling-on**

When this signal is cleared with the letter 'C' showing, it authorises the driver to proceed at caution towards the next train, signal or buffer stop, and be prepared to stop short of any obstruction.

**Shunt-ahead**

When this signal is cleared with the letter 'S' showing, it authorises the driver to proceed for shunting purposes only.





## 3.5 Semaphore shunting signals that display a red aspect

Semaphore shunting signals that display a red aspect are stop signals.

Shunting signals have a:

- white disc with a red horizontal bar, or
- miniature semaphore arm with a vertical white stripe.

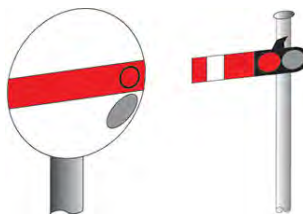
These signals show the following indications.

### Danger

Indication by day: arm or bar horizontal.

Indication by night: red light.

Meaning: stop.

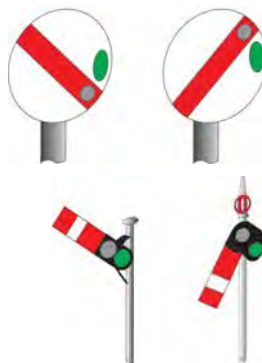


### Proceed

Indication by day: disc turned 45° or arm raised or lowered 45°.

Indication by night: green light.

Meaning: proceed at caution as far as the line is clear.



### 3.6 Semaphore shunting signals that display a yellow aspect

Semaphore shunting signals that display a yellow aspect are stop signals applying only to movements in the direction to which the signal can be cleared. Other movements can pass the signal without it being cleared.

Shunting signals have a:

- white disc with a yellow bar
- black disc with a yellow bar
- miniature semaphore arm with a vertical black stripe.

These signals show the following indications.

#### Stop

Indication by day: bar or arm horizontal.

Indication by night: yellow light.

Meaning: stop. The driver may pass the signal in the 'stop' position when the movement is being made towards the shunt neck or siding and not the running line.

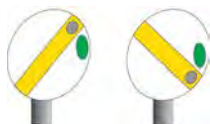


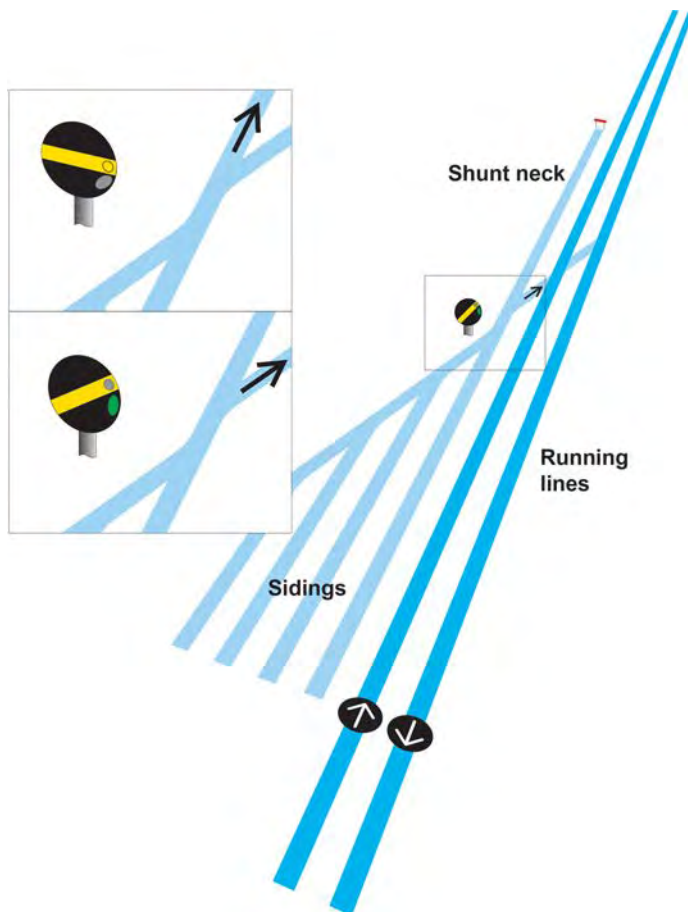
#### Proceed

Indication by day: disc turned 45° or arm raised or lowered 45°.

Indication by night: green light.

Meaning: proceed at caution as far as the line is clear.

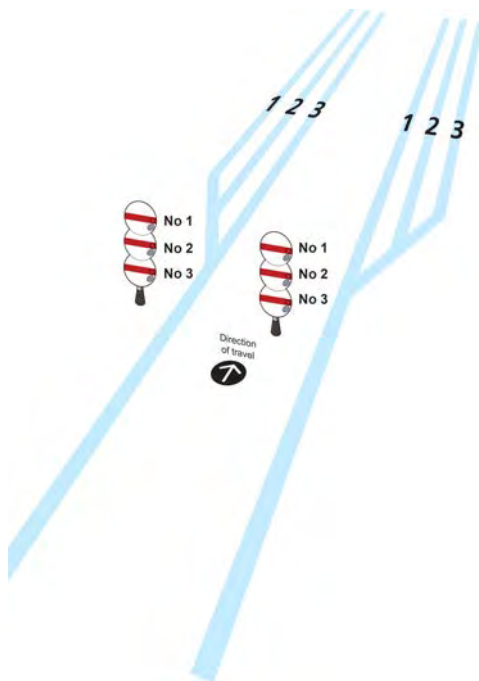




Yellow shunt signal

### 3.7 Route indications by shunting signals

These signals show the following indications. Signal 1 applies to the route on the extreme left. Signals 2 and 3 apply to successive routes to the right.



### 3.8 Semaphore signals not in use

When semaphore signals are not in use, they have:

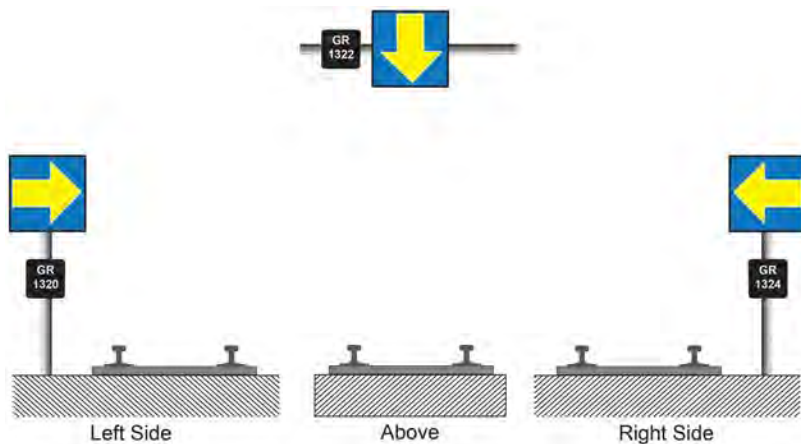
- a large X fixed on the signal arm, or
- the disc covered over.



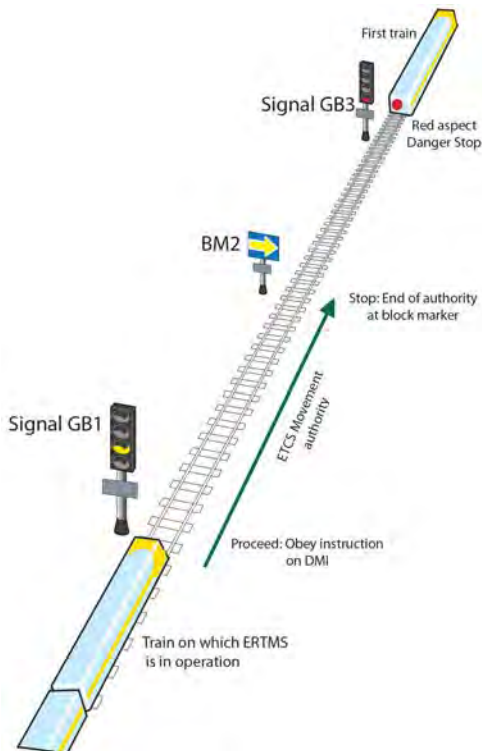
## 4.1 Block markers

A 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.



## 4.2 ERTMS lines where lineside signals are provided



A train on which ERTMS is operating can be issued with a movement authority (MA) to any intermediate block marker. In this case signal GB1 will display a yellow aspect.

If a train is not fitted with ERTMS or a train on which ERTMS is operating in other than full supervision (FS) or on sight (OS), then even if the route is set to block marker BM2 signal GB1 will display a red aspect.

### 4.3 Cab signalling boards

#### Warning of start of cab signalling board

This board indicates that ERTMS signalling is about to start.



#### Start of cab signalling board

This board indicates that ERTMS signalling is about to start.



#### End of cab signalling board

This board indicates the end of ERTMS signalling.





## 4.4 Shunt entry boards

Shunt entry boards consist of a reflective board showing a white chevron on a violet background. The chevron points toward the line to which the shunt entry board applies.

Shunt entry boards mark the entry of a shunt route on ERTMS cab signalled lines where lineside signals are not provided.

The identity of a shunt entry board is shown on an identification plate in white characters on a black background.



## 5.1 Limit of shunt signals or indicators

Limit of shunt signals or indicators are either:

- instructions on illuminated signs, or
- two red lights horizontally displayed.

No part of the train may pass a limit of shunt signal or indicator unless authorised by the signaller.



If a limit of shunt signal or indicator is passed without authority, it is a signal passed at danger.

## 5.2 Stop boards

A stop board shows the word 'Stop' and may also:

- show other instructions
- be illuminated.

The driver or person controlling the movement may only proceed past the stop board when:

- the instructions on the stop board have been carried out, or
- permission to do so has been given by the authorised person.

If a stop board is passed without authority, it is a signal passed at danger.

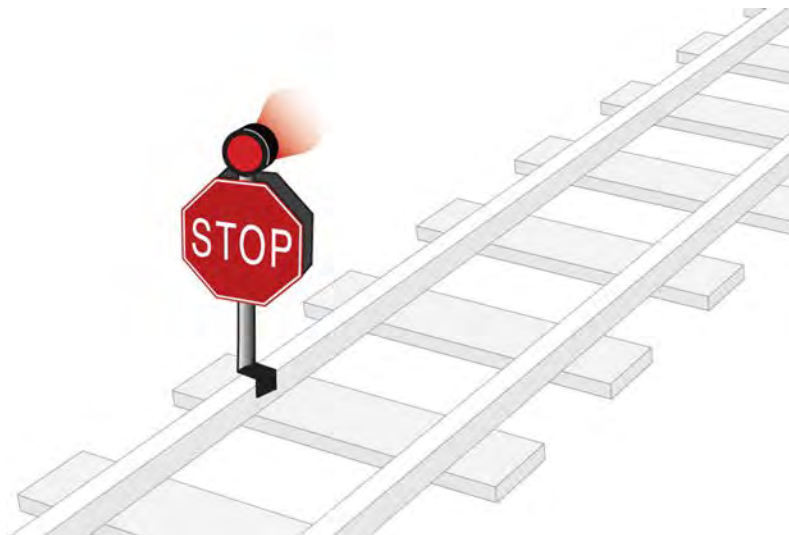


### 5.3 Possession limit boards (PLB)

A PLB identifies the boundary of a possession. They may also be used as part of the protection for a line blockage.

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.

## 5.4 Work-site marker boards

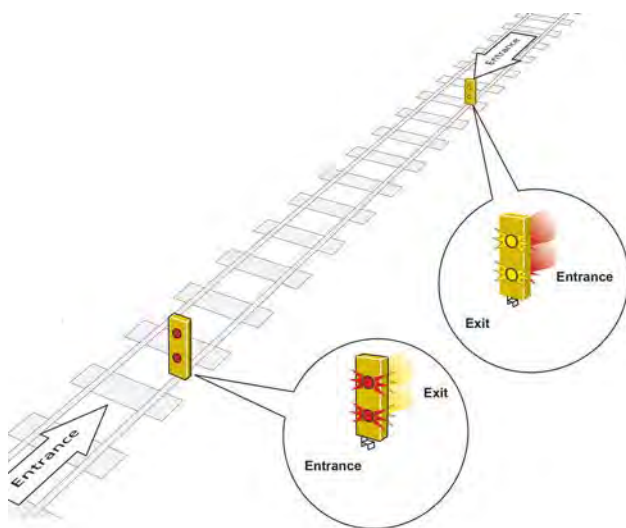
Work-site marker boards may be provided within a possession of a running line.

The 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 Engineering Supervisor or Safe Work Leader 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 are treated as a stop signal.



If a work-site marker board is passed without authority, it is a signal passed at danger.

## 5.5 Signal passed at danger (SPAD) indicator

Where provided, SPAD indicators are normally positioned about 50 metres (55 yards) beyond certain signals.

The indicator has a three-aspect signal head which is fitted with a blue backplate.

### Indications and meanings

The indicator is not normally lit. If a signal is passed at danger, the indicator will be activated. It will then display:

- a flashing red light in the top and bottom aspect
- a steady red light with the word STOP in the centre aspect



If the indicator is activated, any movement on the line to which the signal applies or any other line, is to be brought to a stand immediately and the signaller contacted.

## 5.6 Points indicators

A points indicator is associated with hydro-pneumatic and certain other types of points and is identified by a sign showing the words 'Points indicator'.

They display the following indications.

Indication: A red light that may be steady or flashing or no light is showing.

Meaning: Stop at the points indicator and contact the signaller unless otherwise authorised.



Indication: A steady yellow light.

Meaning: The points to which it applies are fitting correctly.



If a points indicator is passed without authority, it is a signal passed at danger.

## 5.7 Banner repeating and co-acting signals

### Banner repeating signals

Banner repeating signals are provided on the approach to certain signals which have restricted sighting (for example because of curvature of the line, buildings or tunnels), to give advance information of the signal aspect.

Position: On

Meaning: distant signal to which it applies is at caution.



Position: Off

Meaning: distant signal to which it applies is showing clear.



Position: On

Meaning: the signal to which it applies is at danger.



Position: Off

Meaning: the signal to which it applies is displaying a proceed aspect.



Position: Off

Meaning: the signal to which it applies is displaying a green aspect.



Position: On for the Straight Route

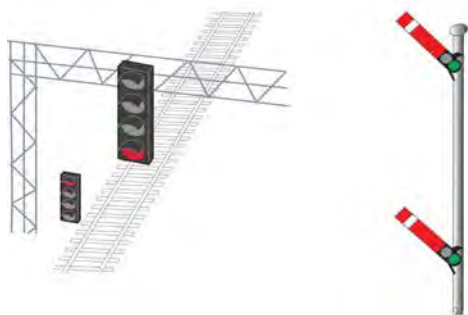
Off for the Diverging Route

Meaning: the signal to which it applies is displaying a proceed aspect for the diverging line and danger for the straight route.



### Co-acting signals

Co-acting signals are provided to give both short and long distance sighting of the signal. A co-acting signal repeats the exact aspect or indication of the main signal. Co-acting signals are always the same type (colour light or semaphore) as the main signal.





## 5.8 'Off' indicators



If an 'OFF' indicator is provided at a platform, it will:

- show the word 'OFF' when the signal to which it applies shows a proceed aspect
- allow a guard or platform staff to check the signal is clear before commencing the train despatch procedure
- show no indication when the signal to which it applies is at danger.

On a bi-directional platform line, the 'OFF' indication may be accompanied by an 'UP' or 'DN' or other indication to show which route has been set.

An 'OFF' indication does not always mean the line ahead is clear as the signal to which it applies may have been cleared for another train standing ahead in the same platform.

'OFF' indicators may be provided at locations other than platforms to show the driver that the signal to which they apply is displaying a proceed aspect.

### 5.9 'Close-doors' indicator

Close-doors indicators display the letters 'CD' when illuminated, and let the driver know that it is safe to close the power-operated doors on the train.



### 5.10 'Right-away' indicators

Right-away indicators display the letters 'R' or 'RA'.

If this indicator is illuminated, it tells the driver that station duties are complete, the train is secure and that it is safe to proceed.



### 5.11 Rear clear marker

This sign informs the driver that the train has cleared a defined location to the rear.



### 5.12 Mid-platform train berth marker

This sign informs the driver of the sub-divisions along a station platform to permit its use by more than one train.



### 5.13 Whistle boards

A whistle board may be provided on the approach to some level crossings.

The whistle board can be a retro-reflective round sign or a cut out.











## 5.14 Preliminary route indicators

A preliminary route indicator is provided where it is necessary for a driver to receive advance information about the route that has been set beyond a junction signal ahead of the train.

A preliminary route indicator displays an arrow pointing in the same direction as any junction indicator displayed at the junction signal that the preliminary route indicator applies to. If the junction signal is displaying a proceed aspect without a junction indicator, the associated preliminary route indicator will display an arrow pointing straight up.

If the junction signal is at danger, the preliminary route indicator is not illuminated.

The table below gives examples of the preliminary route indicator display which depends on what is displayed on the junction signal concerned.

Junction signal ahead showing:	Preliminary route indicator	Junction signal ahead showing:	Preliminary route indicator
Proceed with position 1 JI		Proceed with position 4 JI	
Proceed with position 2 JI		Proceed with position 5 JI	
Proceed with position 3 JI		Proceed with position 6 JI	
Proceed with no JI		Stop aspect	

### **5.15 Automatic warning system (AWS) cancelling indicators**

On single and bi-directional lines, the AWS magnet will normally be suppressed for movements for which it does not apply, this means the AWS will not operate.

However, there are some locations where the AWS magnet is not suppressed.

In these cases a cancelling indicator is provided to tell the driver that the AWS warning indication does not apply to trains travelling in that direction.

Where the AWS magnet is permanently installed. The indicators look like this.



Where the AWS magnet is provided in connection with a temporary or emergency speed restriction on a single or bi-directional line. The indicators look like this.



The cancelling indicator is normally positioned 180 metres (approximately 200 yards) after passing over the AWS magnet.

### 5.16 AWS gap indicators

In some AWS fitted areas AWS equipment is not provided throughout. These areas are identified with the following signs.

**Where AWS is not provided at a station on a line equipped with AWS.**



Start of AWS gap



End of AWS gap

### 5.17 AWS on a bi-directional line

On some bi-directional lines, AWS equipment is not provided in the opposite direction. These portions of line are identified with the following signs.

However, for a temporary or emergency speed restriction, AWS will be provided in both directions.

**Where AWS is not provided in the opposite direction on a bi-directional line.**



Start of the relevant section of line concerned



End of the section normal arrangements resume

## 6.1 Level crossing signs

### Automatic barrier crossing locally monitored, automatic open crossing locally monitored crossings and open crossings

The warning board means that there is an automatic barrier crossing locally monitored, automatic open crossing locally monitored or an open crossing ahead.

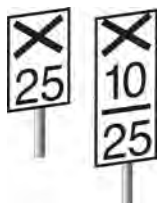


**Warning board**

The speed restriction board shows the permissible speed from the board to the level crossing.

If differential speeds are shown on the speed restriction board, they have the meanings shown in section 7.4.

At open level crossings the speed restriction or stop board is combined with a whistle board.



Speed restriction board



Combined speed and whistle board

On ERTMS lines a speed restriction board is not provided but the speed restriction approaching the crossing will be shown on the driver machine interface (DMI).



## Wrong-direction boards

Wrong-direction speed restriction boards are positioned on the approach to level crossings that have wrong-direction controls.



The numerals show the permissible speed from the board to the level crossing. Black numerals on a white background denote mph and white numerals on a black background denote km/h.

## Sighting board on ERTMS lines

This sign indicates the point at which the driver is required to ensure that the level crossing is clear and to observe the driver's level crossing indicator.



## 6.2 Level crossing indicators

A level crossing indicator is associated with locally monitored level crossings.

They display the following indications.

Indication: A red light that may be steady or flashing or no light is showing.

Meaning: Stop before reaching the level crossing and ensure it is safe before passing over it.



Indication: A flashing white light.

Meaning: The level crossing is working correctly, and providing the level crossing is clear, it is safe to proceed over it.



## 7.1 Permissible speed indicators



Permissible speed indicators show the start of the permissible speed.

Black text on a white background and cut-out signs show the speed in mph. White text on black background shows the speed in km/h.

In limited clearance areas the indicators are sometimes oval-shaped.



## 7.2 Warning indicators

Warning indicators are provided on the approach to certain speed indicators and give a warning of a reduction in permissible speed ahead.

Black text on a white background shows the speed in mph. White text on black background shows the speed in km/h.



There may also be a fixed AWS magnet on the approach to the indicator.

# 7 Speed indicators

## 7.3 Permissible speed indicators at diverging junctions

These show the speed to the left or right of the straight route at a diverging junction.



If there are diverging junctions to both the left and right and the permissible speed is the same, there is only one indicator.

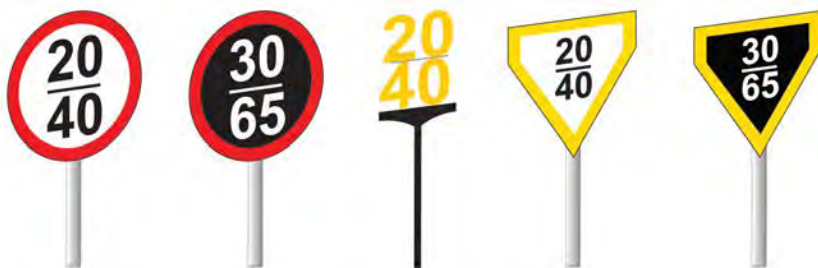


## 7.4 Differential permissible speed indicators

The bottom figure always shows the higher speed. It applies to:

- passenger trains (loaded or empty)
- parcels and postal trains (loaded or empty)
- light locomotives.

The top figure applies to all other trains.



## 7.5 Permissible speed indicators with letters

These show the permissible speed and apply only to the trains shown by the letters.



This is what the letters mean.

<b>HST</b>	High speed trains.
<b>MU</b>	Multiple-unit trains.
<b>DMU</b>	Diesel multiple-unit trains.
<b>EMU</b>	Electric multiple-unit trains.
<b>SP</b>	Sprinter multiple-unit trains
<b>CS</b>	Class 67 locomotives.

The classes of train that can travel at these speeds are shown in the *Sectional Appendix*.

## 7.6 Enhanced permissible speed (EPS) indicators

These show the enhanced permissible speed in mph and apply to tilting trains in tilting mode.



Where differential signs are provided, the bottom figure always shows the higher speed and applies to class 390 trains in tilting mode. The top figure applies to class 221 trains in tilting mode.



Warning indicators are provided on the approach to certain EPS speed indicators and give a warning of a reduction in the enhanced permissible speed ahead.



## 8.1 Temporary speed restriction signs

### Warning boards

A warning board is placed on the approach to a temporary speed restriction ahead.

An AWS magnet is provided on the approach to a warning board.

There will be no AWS in AWS gap areas.



### Speed indicator

A speed indicator shows the start of the speed restriction and the permitted speed over the restriction.

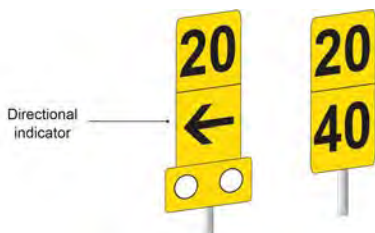


On ERTMS lines where lineside signals are provided, if the speed restriction starts within an ERTMS area but ends outside the ERTMS area, an additional speed indicator will be placed at the end of cab signalling board.



## Directional indicators

A directional indicator on a warning board or speed indicator shows that there is a speed restriction ahead on a portion of line that goes off to the left or right of the straight route at a diverging junction.



## Differential temporary speed restrictions

A temporary speed restriction can show different speeds which apply to different types of trains.

The bottom figure always indicates the higher speed. It applies to:

- passenger trains (loaded or empty)
- parcels or postal trains (loaded or empty)
- light locomotives.

The top figure applies to all other trains.



## Termination indicator

The termination indicator shows the end of the speed restriction.



## 8

## Speed restriction signs

**SPATE indicator**

The SPATE indicator shows the speed restriction has been withdrawn or will not be imposed.

SPATE is an abbreviation of 'Speed Previously Advised Terminated Early'.

**Repeating warning board**

A repeating warning board is placed on the end of a platform or a connection from a siding or dead-end platform line to remind the driver there is a temporary speed restriction ahead.

The board will also have the associated speed indicator or a spate indicator below the board.



## 8.2 Emergency indicator



When an emergency speed restriction is to be imposed an emergency indicator will also be used.

The indicator has flashing white lights which will be working at all times.

An AWS magnet is provided on the approach to an emergency indicator for an emergency speed restriction ahead.

There will be no AWS in AWS gap areas.

## 9.1 Neutral section signs

### Neutral section warning board

This sign provides advance warning of a neutral section.



### Neutral section indication board

This sign identifies the commencement of a neutral section.



## 9.2 Coasting signs

This 'advance lower pantograph' sign provides warning of a lower pantograph sign ahead.

The sign also has flashing white lights.

This sign means 'lower pantograph'.

This sign means 'raise pantograph'.

This sign means 'do not raise pantograph'.



## GSM-R radio area

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



## Areas where GSM-R radio is not provided

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



## 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.



# 10 Radio signs

## 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 signaller's GSM-R phone number.



## 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.



## 11.1 Telephones

### Signal post telephones

Telephones associated with a signal are similar to these. If the telephone has a number on the cabinet the number states the maximum amount of minutes that can elapse before the signaller is contacted by the driver.



### Lineside telephones

These telephones are provided to contact the signaller.





## 11.2 Limited clearance telephones

### Telephones with yellow or white diamonds with the letter X or a yellow roundel.

If any of these signs are displayed it means that the signal post telephone is not in a position of safety. It may only be used to contact the signaller:

- in an emergency
- if told that the adjacent line has been blocked.



### Telephone with limited clearance warning signs

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.

## 11.3 Signals without telephones

### White diamond sign



This sign means that a telephone is not provided but the presence of the train or shunting movement is indicated to the signaller.

### White diamond sign with a telephone number displayed

This sign means that a telephone is not provided but the presence of the train or shunting movement is indicated to the signaller. If GSM-R or CSR is not available the signaller may be contacted using the telephone number on the plate.



A driver may only leave the cab in order to use a lineside telephone to contact the signaller:

- in an emergency
- if told that the adjacent line(s) has been blocked.

# 12 Other lineside signs

## 12.1 Low adhesion hazard signs

### Entrance to a low adhesion area

This sign informs the driver of the entrance to a low adhesion area.



### Exit from a low adhesion area

This sign informs the driver of the exit from a low adhesion area.



## 12.2 Sandite markers



These signs inform the driver of sites where Sandite should be applied. There are three signs.

- Three marks - advance warning of Sandite application site.
- Two marks - start applying Sandite.
- One mark - stop applying Sandite.

# 12 Other lineside signs

## 12.3 Signal reminder signs

This sign informs the driver of a particular signal ahead.



## 12.4 Countdown markers

These signs inform the driver of the distance between the sign and the signal concerned.

There are three signs.

- Three marks - distance to signal normally 300m.
- Two marks - distance to signal normally 200m.
- One mark - distance to signal normally 100m.



## 12.5 Coasting boards

This board advises that the driver may coast to a stopping point or significant speed reduction beyond the board.



## 12.6 Car stop markers

These signs inform the driver of the correct stopping point for the train.



## 12.7 Mile posts

These signs are situated on the lineside and used to identify locations. The number denotes the mileage and each mark under the number denotes quarter of a mile.



## 12.8 Gradient signs



These signs are situated on the lineside and used to identify the change in gradient at that particular location. Gradients are expressed as a ratio. e.g '1 in 460' means the track rises (or falls) one unit in every 460 units. The angles of the gradient signs indicate the direction of the slope.

## 12.9 Spring catch points sign

These signs are placed on the approach to spring catch points.



## 12.10 Bridge identity plates

These signs identify the location of bridge structures.



## 12.11 Safety signs

### Limited clearance sign

This sign means there is no position of safety on this side of the railway for the length of the structure. It is not safe to enter or stand at that location when a train is approaching.



# 12 Other lineside signs

## 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 that staff must not pass beyond this sign while trains are running unless carrying out emergency protection. This is because it would not be possible to reach a position of safety or refuge safely. Extreme care is necessary if carrying out emergency protection.



## 12.12 End of emergency special working sign

This sign indicates the end of an emergency special working section.

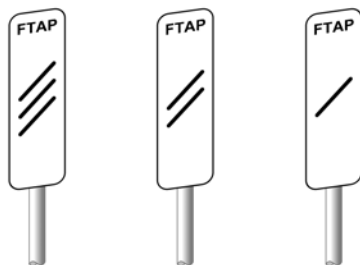


### 12.13 Flexible train arrival point signs

When an engineering train or on-track machine is to stop at a flexible train arrival point (FTAP) location before working in a possession or a protection zone, signs will be provided to guide the driver.

These signs have no significance for any other train.

Three countdown markers in succession will be provided on the approach to the FTAP.



An FTAP sign will be provided at the location where the train is to stop.





## Red handsignal

A red flag during daylight or a red light during darkness or poor visibility means 'STOP'.



## Yellow handsignal

A yellow flag during daylight or a yellow light during darkness or poor visibility is used when giving authority to pass a signal at danger.



## Green handsignal

A green flag during daylight or a green light during darkness or poor visibility is used to give authority to pass over a level crossing.



### Lookout handsignal

A blue and white chequered flag is used between lookouts to inform of an approaching train. Drivers can ignore this handsignal.







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# AWS and TPWS Handbook

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# **AWS and TPWS Handbook**

RS/522 Issue 3 (December 2015)



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You will need this AWS and TPWS handbook if you carry out the duties of a:

- driver
- signaller.



This symbol indicates extra information or guidance regarding the instructions.

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# 1

## Automatic warning system

### 1.1 General information

#### 1.1.1 Background

The Automatic Warning System (AWS) has been implemented as the national warning system on the UK main line passenger railway network since the 1950s.

#### 1.1.2 The purpose of AWS

The original concept of AWS was to provide the driver with an audible and visual indication of whether the distant signal was clear or at caution.

Should the driver fail to respond to a warning indication, an emergency brake application will be initiated.

Since the introduction of multi-aspect signalling, the majority of signals are fitted with AWS.

It should be noted that AWS does not relieve the driver of the responsibility of observing and obeying lineside signals and indicators.

#### 1.1.3 Provision of AWS

AWS consists of track and train equipment. The track equipment consists of an AWS magnet that is normally provided 180 metres (approximately 200 yards) on the approach to a signal. The AWS magnet may be positioned at a greater distance from the signal on high-speed lines or at a lesser distance from the signal on lower speed and platform lines.

This system works by the train detecting sequences and polarities of magnetic fields passing between the track equipment and the train equipment via a receiver under the train.

At through stations where the permitted speed is 30 mph or less and the layout is complex, AWS track equipment need not be provided. Where this occurs, these are called AWS gap areas.

# Automatic warning system

AWS magnets are not provided at semaphore stop signals. Where a distant signal is mounted on the same post as a semaphore stop signal then AWS is provided for the distant signal.

Where a line is not fitted with AWS, this is shown in the *Sectional Appendix*.

Where a reduction in permissible speed is provided with a warning indicator (i.e. the permissible speed on the approach is 60 mph or more and the reduction in the permissible speed is at least one third) an AWS permanent magnet is provided 180 metres (approximately 200 yards) on the approach to the warning indicator. These are sometimes referred to as 'Morpeth magnets'.

AWS magnets are also used to alert the driver to the following.

- Level crossing warning boards or indicators.
- Temporary speed restriction warning boards.
- Emergency speed restriction warning boards and emergency indicators.

## 1.2 Track equipment

The AWS track equipment comprises various components mounted in the centre of the four-foot.

### **Permanent magnet**

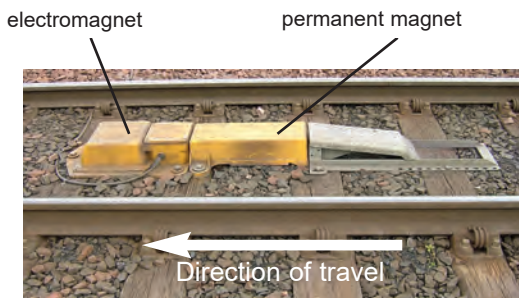
The train will first encounter a permanent magnet. Following the train passing over a permanent magnet where an electromagnet is either not provided or not energised, the AWS gives a warning indication to the driver.

### **Electromagnet**

An energised electromagnet, when presented after the permanent magnet, gives the driver a 'clear' indication when approaching a green signal or a semaphore distant signal showing 'clear'.

## 1

## Automatic warning system



**An example of AWS track equipment**

### **Suppressor magnet**

Suppressor magnets are used to suppress permanent magnets when they are not required to apply to a train movement (for example, magnets applicable to the opposite direction on a single or bi-directional line).

### **Depot test magnet**

A permanent magnet, used to test the operation of a train's AWS equipment, may be provided at the exit of certain maintenance depots.

### **Portable magnet**

Portable AWS magnets are provided to give a warning to the driver, on the approach to temporary and emergency speed restrictions.



**An example of a portable magnet**

### 1.3 Train equipment

The following equipment is provided on each fitted traction unit.

#### AWS receiver

The AWS receiver is located under a traction unit and detects the sequences and polarities of magnetic fields from the AWS track magnets.

#### AWS audible indicator

The audible indicator gives a **warning** or a **clear** indication that is distinguishable from all other audible cab indications. The audible indication is either:

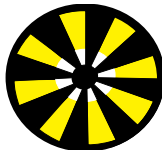
- a **clear** indication (bell or electronic equivalent), or
- a **warning** indication (horn or electronic equivalent).

#### AWS visual indicators

The visual indications are as follows.



The black indication advises the driver that the associated signal is showing a green aspect or 'all clear'. It also advises the driver that the audible warning has not been acknowledged and, if not acknowledged, the brakes will be applied.



The yellow and black indication advises the driver that a warning indication has been acknowledged.

#### AWS/TPWS acknowledgement button

The AWS/TPWS acknowledgement button is used to acknowledge an AWS audible warning. If an AWS audible warning is not acknowledged within two to three seconds an emergency brake application will occur.

**AWS isolation/fault indicator**

Some traction units are fitted with a visual indicator to advise the driver of a fault with the AWS, and when the AWS has been isolated. The yellow isolation/fault indicator gives three indications.

- Off                      AWS state is normal.
- Flashing              A fault has been detected in the train  
AWS equipment.
- On (steady)          The train AWS equipment has been isolated.

**1.4 AWS indications and their meanings****1.4.1 Warning indication**

The driver will receive a **warning** indication in the driving cab on the approach to a:

- colour light signal displaying a single or double yellow (steady or flashing) or a red aspect
- semaphore distant signal displaying a caution indication
- warning indicator provided for some permissible speed reductions
- warning board provided for an automatic barrier crossing locally monitored (ABCL), an automatic open crossing locally monitored (AOCL) or an open crossing (OC)
- warning board or emergency indicator for a temporary or emergency speed restriction
- cancelling indicator for an AWS warning which does not apply to the train.

The driver will also receive a warning indication when passing over an AWS depot test magnet.

AWS is not capable of distinguishing between a red, double yellow or single yellow aspect.

# Automatic warning system

## 1.4.2 Clear indication

The driver will receive a **clear** indication in the driving cab when approaching:

- a colour light signal showing a green aspect, or
- a semaphore distant signal displaying a clear indication.

The driver does not have to acknowledge a clear indication.

## 1.5 Areas where AWS is not provided

In some AWS fitted areas AWS equipment is not provided throughout. These areas are identified with the following signs.

Where AWS is not provided at a station on a line equipped with AWS.

Start of AWS gap



End of AWS gap



Where AWS is not provided in the wrong direction on a bi-directional line (if a wrong-direction movement approaches a temporary or emergency speed restriction, AWS will be provided).

Start of relevant section of line concerned



End of the section normal arrangements resume



# Automatic warning system

## 1.6 AWS suppression and AWS cancelling indicators

On single and bi-directional lines, the AWS magnet is normally suppressed for movements for which it does not apply and the AWS will not operate.

However, where the AWS magnet is not suppressed, a cancelling indicator is provided to advise the driver that the AWS warning indication does not apply to trains travelling in that direction.

The following signs are used:

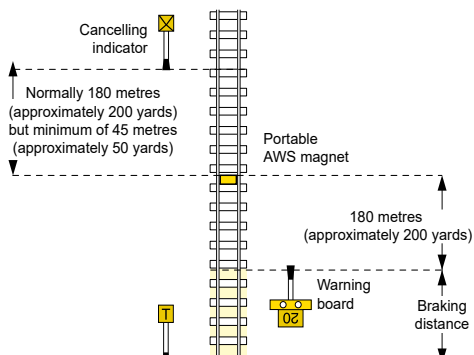
Where the AWS magnet is permanently installed.



Where the AWS magnet is provided in connection with a temporary or emergency speed restriction.



The cancelling indicator is normally positioned 180 metres (approx. 200 yards) after passing over the AWS magnet.



**Single and bi-directional lines**

# 2

## Train protection and warning system

### 2.1 General information

#### 2.1.1 Background

Widespread fitment of the Train Protection and Warning System (TPWS) began in early 2000, in order to meet the requirements of the Railway Safety Regulations 1999.

#### 2.1.2 The purpose of TPWS

The purpose of TPWS is to stop the train by automatically initiating a brake demand, where TPWS track equipment is fitted, if the train has:

- passed a signal at danger without authority
- approached a signal at danger too fast
- approached a reduction in permissible speed too fast
- approached buffer stops too fast.

TPWS is not designed to prevent SPADs but to mitigate against the consequences of a SPAD, by preventing a train that has had a SPAD from reaching a conflict point ahead of the signal.

TPWS does not relieve the driver of responsibility for observing signals and speed restrictions.



### **2.1.3 Provision of TPWS**

TPWS is provided at certain signals, approaching some speed restrictions and all buffer stops on platform lines. Not all signals are provided with TPWS equipment as fitment is dependent on the risk involved.

The TPWS system consists of track and train equipment. The track equipment creates an electro-magnetic field which an aerial under the train detects.

TPWS is provided:

- on passenger lines, at all main running signals capable of showing a stop aspect (including some stop boards) which protect crossing or converging movements
- at any signal capable of showing a stop aspect on a non-passenger line, where that signal that protects a crossing of, or convergence with, a passenger line
- at stop signals where conflicting movements could take place in the overlap of the next stop signal ahead
- on the approach to the buffer stops at the end of passenger platforms. These are fitted approximately 65 metres (70 yards) from the buffer stops, and will trigger a brake application at speeds greater than 10 mph
- on the approach to permissible speed reductions, where the permissible speed on the approach is 60 mph or more and the reduction in the permissible speed is at least one third.

## 2.2 Track equipment

### 2.2.1 Components and positioning

TPWS track equipment consists of a train stop system (TSS) and overspeed sensor system (OSS).

The provision and positioning of TPWS track equipment takes into account the:

- braking performance of trains
- attainable speed of trains on the approach to the signal or other location
- distance from the stop signal to the point of conflict at the crossing or convergence ahead
- gradient of the line on the approach to the signal or other location.

### 2.2.2 Train Stop System (TSS)

The TSS is mounted in the four-foot at the associated signal. It is energised when the signal is at danger. It is de-energised when the signal is showing a proceed aspect or indication.



**Typical TSS loops**

## 2.2.3 Overspeed Sensor System (OSS)

An OSS comprises two transmitters: an arming loop and a trigger loop. When a train passes over an arming loop, the on-train equipment detects it and starts an internal timer. If the train passes over a trigger loop within a designated time period, indicating that the train is exceeding the 'set speed', then the on-train TPWS equipment will initiate a brake demand.

The timer on a freight locomotive is calibrated so that the speed at which a brake demand is initiated at an OSS is 20% lower than that for a passenger train. This is to take into account the different braking characteristics of passenger and freight trains.

The 'set speed', over which a brake demand will be initiated, is determined by the distance between the arming loop and the trigger loop. The 'set speed' is based on factors such as permissible speed, gradient, distance to conflict point and braking characteristics.

Where OSS loops are provided on the approach to stop signals, they are only energised when the signal is at danger, whereas those on the approach to reductions in permissible speed and buffer stops are always energised.

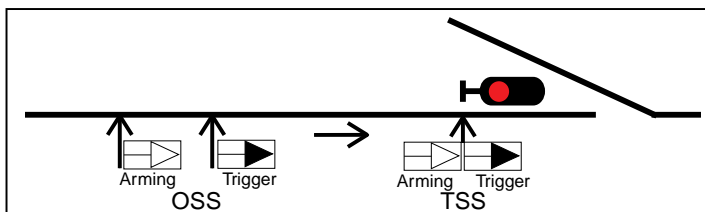
OSS loops may also be provided for some temporary speed restrictions.



**Typical OSS loops**

### 2.2.4 TPWS fitment

Signals fitted with TPWS have a TSS and may also have an OSS. Some signals have more than one OSS.



**TPWS fitment**

## 2.3 Train equipment

### 2.3.1 On-train TPWS equipment

The following equipment is provided on each fitted traction unit.

- TPWS receiver.
- TPWS control panel (standard or enhanced version).
- AWS/TPWS acknowledgement button.
- TPWS temporary isolation switch.
- AWS/TPWS full isolation switch.

### 2.3.2 TPWS receiver

The TPWS receiver is located at the front of a train. It senses the train's passage over TPWS loops and sends this information to the control unit.

### 2.3.3 TPWS control panel (standard version)



**Examples of standard TPWS control panels**

The TPWS control panel is found in the driving cab and has two indicators and one illuminated button as follows:

#### **Brake demand indicator**

The red brake demand indicator gives three indications.

- Off                      No brake demand has been initiated.
- Flashing              TPWS or AWS has initiated a brake demand that has yet to be acknowledged by the driver.
- On (steady)          The brake demand has been acknowledged by the driver.

#### **Temporary isolation/fault indicator**

The yellow temporary isolation/fault indicator gives three indications.

- Off                      TPWS state is normal.
- Flashing              A fault has been detected in the train TPWS equipment, or the start-up test has not been completed successfully.
- On (steady)          The train TPWS equipment has been temporarily isolated.

The on-train TPWS carries out a self-test whenever the driving cab is opened, to check that the equipment is functioning correctly. When this test starts, all three indicators illuminate.

If the test is completed successfully, then the indicators extinguish.

If a fault is detected during the power-up test, or the test is not successful, then the 'Temporary Isolation/Fault' light flashes. This might happen if the TPWS receiver is over an active loop, in which case the test cannot be completed while the train remains over the loop.

The driver's instructions in respect of defective TPWS can be found in Rule Book module TW5.

### **Train stop override button**

Where authority has been given in accordance with the rules to pass a signal at danger, the yellow button is used to override the brake demand from the TSS loop for approximately 20 seconds (generally for passenger trains) or 60 seconds (generally for slower accelerating freight trains).

Once pressed the Train Stop Override button will illuminate. It will extinguish when the train passes over the TSS.

### **AWS/TPWS acknowledgement button**

In driving cabs fitted with the standard TPWS control panel, the AWS/TPWS acknowledgement button is used to acknowledge TPWS brake demands.

If the TPWS system initiates a brake demand, the TPWS brake demand indicator will flash and the brakes will apply. Note that there will be no audible warning.

Once the AWS/TPWS acknowledgement button is pressed and released, the TPWS brake demand indicator will go on (steady). The brakes will release and the indicator will clear, 60 seconds after the brake demand was initiated.

It is important to note that there is a potential for confusion over the cause of the emergency brake demand if the AWS/TPWS acknowledgement button is pressed 60 seconds or more after the initial brake demand. In these circumstances the brake demand indicator will immediately be extinguished.

### 2.3.4 TPWS control panel (enhanced version)



**Example of enhanced TPWS control panel**

Some driving cabs are fitted with an enhanced version of the TPWS control panel. This comprises the following indicators/buttons.

#### **Brake demand indicators**

Enhanced versions of the TPWS control panel are fitted with three illuminated brake demand indicator buttons, labelled as follows.

- SPAD (red).
- OVERSPEED (yellow).
- AWS (yellow).

Each of these indicator buttons has three states:

- Off                      No brake demand has been initiated.
- Flashing              A brake demand has been initiated and is awaiting driver's acknowledgement. When the button is pressed and released, the indicator will go on (steady).
- On (steady)          The brake demand has been acknowledged by the driver.

Whenever a brake demand is initiated because of a SPAD or an overspeed, the flashing indicator is accompanied by a spoken message, preceded by an 'alert' tone. This states 'SPAD alert, contact signaller' or 'Overspeed, contact signaller' as appropriate. The message is repeated until the brake application has been acknowledged.

### **Temporary isolation/fault indicator**

The yellow temporary isolation/fault indicator gives three indications.

- Off                    TPWS state is normal.
- Flashing            A fault has been detected in the train TPWS equipment, or the start-up test has not been completed successfully.
- On (steady) The train TPWS equipment has been temporarily isolated.

The on-train TPWS carries out a self-test whenever the driving cab is opened, to check that the equipment is functioning correctly. When this test starts, all three indicators illuminate and TPWS applies the brakes. If the test is completed successfully, then the indicators extinguish and TPWS no longer applies the brakes.

If a fault is detected during the power-up test, or the test is not successful, then the 'Temporary Isolation/Fault' light flashes and the TPWS keeps the brakes applied. This might happen if the TPWS receiver is over an active loop, in which case the test cannot be completed while the train remains over the loop.

The on-train TPWS also carries out a self-test periodically when in service. If a fault is detected during this test, then the 'Temporary Isolation/Fault' light flashes, but the brakes are not applied automatically.

The driver's instructions in respect of defective TPWS can be found in Rule Book module TW5.

### **Train stop override button**

Where authority has been given in accordance with the rules to pass a signal at danger, the yellow button is used to override the brake demand from the TSS loop.



This is effective for approximately 20 seconds (generally for passenger trains) or approximately 60 seconds (generally for slower accelerating freight trains). Once pressed the Train Stop Override button will illuminate. It will extinguish when the train passes over the TSS.

### **Brake release button**

The brake release button is used in conjunction with the brake demand indicator/button to release the brakes after acknowledging the brake demand. The brakes are released by pressing the brake release button at the same time as pressing the appropriate brake demand indicator/button.

If the brake demand was initiated by both an overspeed and by AWS, then pressing the overspeed brake demand indicator/button with the brake release button also releases the AWS-initiated brake demand.

### **AWS/TPWS acknowledgement button**

In driving cabs fitted with the enhanced TPWS control panel, the AWS/TPWS acknowledgement button is used solely to acknowledge AWS warnings, and has no involvement with TPWS.

### **2.3.5 TPWS temporary isolation switch**

The TPWS temporary isolation switch is generally mounted in the driver's cab but out of reach of the normal driving position.



**TPWS temporary isolation switch**

The operation of the TPWS temporary isolation switch allows the driver to perform certain operational movements, which would otherwise cause an unintentional brake demand, such as movements during temporary block working, propelling or within T3 possessions.

The rules and regulations detail when the TPWS temporary isolation switch may be operated.

If the TPWS is temporarily isolated, this will not affect the AWS.

### 2.3.6 AWS/TPWS full isolation switch

Traction units are fitted with AWS and TPWS full isolation switches. These may be separate, or combined, switches. They cannot be reached from the driving position. Some traction units are fitted with a visual indicator to advise the driver that the on-board AWS equipment is isolated.



#### Examples of AWS/TPWS full isolation switches

It may be necessary to operate the AWS/TPWS full isolation switch when there is a fault with the AWS system.

If a train stops directly over an AWS magnet, then the driver will not be able to cancel the AWS. If no other option is available (for example, changing ends), it may be necessary for the driver to operate the AWS/TPWS full isolation switch.

In cabs fitted with the standard TPWS control panel, if the driver isolates the AWS, the TPWS will be isolated automatically.

## **2.4 Signal box equipment**

### **2.4.1 Power signal boxes**

In recent signalling installations, TPWS track equipment faults are indicated by a blue 'fault' indication on the signalling panel or VDU workstation. On other signalling panels, a TPWS track equipment fault at a signal is indicated via a simulated 'lamp out' fault in the signal lamp indication repeater circuit.

During a failure of the TPWS track equipment, the signal indication on the panel will appear blank, whilst the signal is displaying a red aspect.

Initially the signaller will not know whether the TPWS track equipment or the signal lamp has failed. It may be necessary to ask the driver to confirm if the signal is lit or not.

In colour light areas, if there is a TPWS fault at a signal, the signal in rear will usually be held at danger until the affected signal displays a proceed aspect and its TPWS is no longer required to be energised.

### **2.4.2 Mechanical signal boxes**

In mechanical signal boxes, the position of the lever in the frame determines the operational condition of the TPWS at that signal. If the lever is in the normal position, then the signal will be at danger and therefore the TPWS equipment for that signal will be armed.

In mechanical signalling, it is considered too restrictive to hold the signal in rear at danger should there be a TPWS fault and therefore a failure indication unit (FIU) is provided to monitor the status of the TPWS.

In the event of a TPWS failure at an individual signal, an audible alarm will sound and a blue light will flash. Once the audible alarm has been acknowledged and cancelled, the blue light remains as a reminder, but stops flashing.

## 3

# Failures and irregularities



**Example of a failure indication unit**

The signaller performs a test to establish that the FIU is capable of detecting a fault. This test is performed at least every 12 hours and is carried out by signallers at each shift change and when the signal box opens. It is important that faults and failures of the AWS or TPWS equipment are reported fully and promptly. This is essential as it prevents important data about the performance of the equipment becoming lost.

The prompt reporting of wrong-side failures allows the signaller to advise any subsequent drivers of the defective equipment at a specific location and enables defective on-train equipment to be investigated without delay.

The signaller is required to carry out appropriate instructions when any failure of TPWS occurs.

**List of fault codes to be reported**

<b>Required Indication</b>	<b>Actual Indication</b>	<b>Fault Code</b>
<b>Clear (Bell)</b>	Horn & Bell	1
	Horn instead of Bell	2
	None	3
<b>Warning (Horn)</b>	Bell & Horn	4
	Bell instead of Horn	5
	Brake without Horn	6
	None	7
	Indicator did not change to Yellow and Black <i>(this is not a fault if it occurs after cancelling the AWS indication received when setting a driving cab into service)</i>	7a
<b>None</b>	Horn	8
	Bell	9
	Unable to cancel	10
	Indicator did not change to all black	11
	AWS failed to arm	12
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## Notes



**Published by**





# Handbook RS523



## GSM-R Handbook

### Issue 1.2



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# **GSM-R Handbook**

# **Handbook RS523**



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

- driver
- operations controller
- signaller
- train operator's controller.

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## **Purpose of this handbook**

This handbook is intended as guidance to users of the GSM-R system used on the GB mainline railway.

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 train radio and fixed terminal information typically found on the Great Britain mainline railway. Other equipment may differ in functionality.

## 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:** Used 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 the 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 has been received and understood.



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



**Railway emergency group call (REC):** 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.



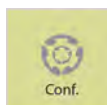
**Incoming message:** To acknowledge a message.



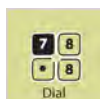
**Hold:** Used to place a call on hold.



**Forward:** Allows a call to be forwarded to a third party.



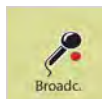
**Conference:** Allows third parties to be dialled in to a call.



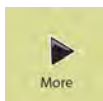
**Dial pad:** Used to dial telephone numbers.



**Phonebook:** Makes the phonebook entries visible.



**Record and broadcast:** To record and broadcast messages.



**More:** To display more functions.



**Less:** To display less functions.



**Settings:** To adjust the brightness of the display and volume controls.



**Roles:** To change signaller roles.



**SMS:** To compose and send a message.



**NR about:** Displays the software version of the fixed terminal.



**Emergency dial pad:** Displays 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.

## 4.1 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 Registration

## 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.

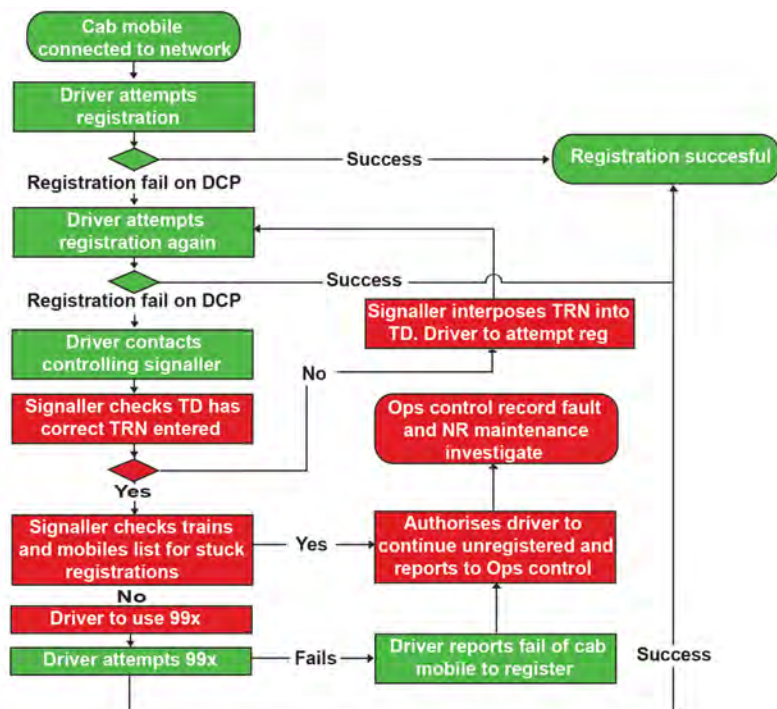
Two attempts should be made at registration using the details provided before contacting the signaller. The call to the signaller will need to be made using the phonebook. This step also confirms that the train radio is correctly connected to the network and calls can be made.

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**

### Abbreviations

DCP Drivers control panel

NR Network Rail

TD Train describer

TRN Train reporting number (headcode)



### 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 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 Network Rail 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**.

## 5.1 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 allotted 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 with the exception of 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 a 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 an 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 key pad. 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 Network Rail 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 normal communication 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 Network Rail 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 profile sets the limits of a signaller's area of responsibility for receiving GSM-R messages.

If appropriately configured, a single role profile 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

Signallers 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.

## 6.1 DSD alarm calls

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

- the master switch is in 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 or the issuing of a new movement authority.

## **7.5 Acknowledge message**

The driver can acknowledge a broadcast call 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.

## 8.1 Types of broadcast calls

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

These calls are answered automatically by the train radio 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.”**

In this situation acknowledgement of the broadcast is not required.

## 8.3 Advisory broadcast calls

An advisory broadcast 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 message 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).
- Defective Emergency Indicators.
- Missing or obscured Temporary Speed Restriction (TSR) board.
- 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 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 if you have fully understood this message. To acknowledge, press the **ST** button. End of safety broadcast."

\*Delete as appropriate.



## Defective Emergency Indicators

"This is a safety broadcast from the signaller at \_\_\_\_\_. There is a defective emergency indicator for a \_\_\_\_\_ mph emergency speed restriction at \_\_\_\_\_. Only acknowledge if you have fully understood this message. To acknowledge, press the **ST** button. End of safety broadcast."

## Missing or obscured TSR board

"This is a safety broadcast from the signaller at \_\_\_\_\_. There is a missing/obscured\* warning board or speed indicator\* for the \_\_\_\_\_ mph temporary speed restriction at \_\_\_\_\_. Only acknowledge if you have fully understood this message. To acknowledge, press the **ST** button. End of safety broadcast."

\*Delete as appropriate

\*\* Insert name or location.

Note: If more than one TSR board is missing or obscured for a speed restriction then a GSM-R berth-triggered broadcast message cannot be used for this purpose.

## 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 in the main body of the broadcast.

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

## **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 signallers 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.

## **10.1 GSM-R 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 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 failures**

If the train radio fails the power-up 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 Rule Book GERT8000 module TW5 *Preparation and movement of trains 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 Network Rail 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 Rule Book GERT8000 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 network and will result in the train radio displaying '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 Network Rail company 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 methods 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 the driver.

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

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

In the event of the loss the fixed terminal, the procedures concerning role transfer and role rescue should be followed.

Please refer to section 5.9.

## **10.7 Loss of a 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.

Rule Book GERT8000 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.

Rule Book GERT8000 module *TW5 Preparation and movement of trains Defective or isolated vehicles and on-train equipment* includes information regarding the use of transportable devices.





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# Glossary of Railway Terminology

## Issue 5

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## Introduction

To meet the requirements of the European Rail Agency, the glossary is now presented by two methods - by subject matter and by alphabetical listing.

<b>Terms by subject matter</b>	<b>Page 2 to 16</b>
<b>Terms in alphabetical order</b>	<b>Page 17 to 30</b>

Conventions used in this Glossary	Example
A black line in the margin indicates a change to that term and is shown when published in the glossary for the first time	

## Terms by subject matter

### Electrified Lines

<b>Conductor rail</b>	A rail through which electricity is supplied to electric-powered trains.
<b>Earthed</b>	The term 'earthed' when applied to the overhead line equipment which is normally live, means connected to the traction return running rail either directly or to a structure which is itself connected thereto.
<b>Electrified line</b>	A line that is electrified either by 25,000 volts AC overhead lines or by 750 volts DC conductor rails. Local instructions are issued for certain sections of route electrified by 1500 volts DC overhead lines.
<b>Isolated</b>	Electrical equipment is isolated when it is disconnected from all sources of electricity supply in a secure way.
<b>Isolation</b>	Isolation is the action of causing electrical sections or sub-sections of the OLE or CRE to be isolated. For AC it includes the entire process of switching off, securing, testing and earthing and issue of the overhead line permit. For DC it includes the entire process of switching off, securing and testing and issue of the conductor rail permit.
<b>Live</b>	Connected to an electrical supply.
<b>Overhead line equipment</b>	Wires and associated equipment, suspended over or adjacent to the railway line for supplying electricity to electric trains.
<b>Switched off</b>	Electrical equipment that is disconnected and separated from all sources of supply.



## Engineering Work

**Affect the normal passage of trains** Any activity or event that allows train working to continue but causes diversion, inability to call at a planned destination or introduction of degraded-mode operations such as passing signals at danger, handsignalling, manual route setting or single line working arrangements.

**Affect the safety of train working** Any activity or event that may, during its course, render a movement control or interlocking system unusable for the signaling of trains.

**Engineering train** Includes an on-track machine.

**Engineering Possession Reminder (EPR)** A reminder applied by the signaller to one or more axle counter sections in advance of pre-planned engineering works in order to indicate the area affected. When removed from an axle counter section indicating occupied, this initiates an unconditional reset/restoration of the axle counter without aspect restriction.

**Intermediate point to a possession** A location other than the limits at the ends of the possession where an engineering train can enter or leave the possession to:

- an open line
- a siding not under possession.

**On-track plant** A road-rail vehicle (RRV) or rail mounted maintenance machine (RMMM) also known as 'in possession only' vehicles.

**Possession Limit Board (PLB)** A double-sided board, red on both sides, with a red light (which may be steady or flashing). The board also has the word STOP printed on both sides.

## Terms by subject matter

<b>Track circuit operating device (T-COD)</b>	A special device that can be placed on the line to provide protection by operating the track circuit, to hold a signal at danger.
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## Incidents & Emergencies

<b>Controlled evacuation</b>	The evacuation of passengers from a train after the signaller has confirmed that all lines have been protected.
<b>Detonator</b>	A small disc-shaped warning device, designed to be placed on the railhead for protection and emergency purposes. It explodes when a train passes over it.
<b>Detonator Protection</b>	Detonator protection consists of three detonators placed 20 metres (approx 20 yards) apart on the same rail with a possession limit board at the first detonator in the direction of travel.
<b>Emergency evacuation</b>	The evacuation of passengers from a train if the signaller states that protection cannot be given or the signaller cannot be contacted.
<b>Emergency protection</b>	The means of protecting a train by track circuit operating clips, hand danger signals and detonators when: <ul style="list-style-type: none"> <li>• a driver or guard cannot contact the signaller, or</li> <li>• the signaller cannot provide signal protection.</li> </ul>
<b>Protection</b>	Ways of making sure that a line is protected. This includes keeping signals at danger, placing detonators on the line, using a track circuit operating clip and showing a hand danger signal.
<b>Track circuit operating clip</b>	A device which, in an emergency can be placed on top of each running rail to operate the track circuit and protect an obstruction.

**Uncontrolled evacuation**

The self evacuation of passengers from a train, which is not initiated by the driver or guard.

## Level crossings

**Automatic level crossing**

Any of the following level crossings:

- Automatic half-barrier (AHBC)
- Automatic barrier crossing, locally monitored (ABCL)
- Automatic open crossing, locally monitored (AOCL)
- Crossing with red and green warning lights (R/G).

**Barrow crossing**

A crossing (often at the end of a platform) for railway personnel to use. Some barrow crossings have white-light indicators which, when lit, indicate to the user that it is safe to cross.

**Controlled crossing**

Any of the following level crossings.

- Manned crossing with barriers (MCB).
- Manned crossing with gates (MG).
- Remotely controlled crossing with barriers (RC).
- Barrier crossing with closed-circuit television (CCTV).
- Barrier crossing with obstacle detection (OD).

**Level crossing**

Any manned, automatic, controlled, or open crossing shown in Table A of the Sectional Appendix.

**Manned level crossing**

A level crossing that is operated locally by a signaller or crossing keeper (MCB or LC).

## Terms by subject matter

<b>Open level crossing</b>	An unmanned level crossing that has no barriers, gates or road traffic signals. It has a 'Give Way' sign on each road approach.
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## Lines, Stations and Depots

<b>Adjacent line</b>	A line or siding next to the line you are on.
<b>Bi-directional line</b>	A line on which the signalling allows trains to run in both directions.
<b>Goods line</b>	A line that has not been signalled to the standard required for running passenger trains.
<b>Maintenance depot</b>	A location defined in a train operator's Contingency Plan with the facilities to repair or replace specified items of defective on-train equipment.
<b>No-block line</b>	A line on which the signaller does not monitor the condition of the block section.
<b>Running line</b>	A line as shown in Table A of the Sectional Appendix as a passenger line or as a non-passenger line.
<b>Siding</b>	A line on which vehicles are marshalled, stabled, loaded, unloaded or serviced clear of a running line.
<b>Single line</b>	One line is available for movements in both directions.
<b>Station</b>	Terminal, depot, yard or halt.

## Lineside Equipment

<b>Aspect</b>	The indication of a colour light signal that the driver sees.
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## **ATWS**

Automatic track warning system.

An individual or lineside warning system that can be installed at a site of work to:

- detect an approaching train
- alert personnel who are on or near the line.

It may be installed temporarily for the period of work or it may be installed permanently at a location. This definition does not include TOWS or LOWS

## **Automatic Signal**

A signal operated by the passage of trains. The signaller or a person operating a signal post replacement switch can place some automatic signals to danger.

## **Axle counter**

A method of detecting the presence of a train or vehicle on a line. Track-mounted equipment, at each end of a portion of line, counts the number of axles passing over. This is used to identify when a portion of line is occupied or clear.

## **Axle counter head**

A device that detects the passage of a wheel passing over a running rail.

## **Block marker**

Reflective board that serves as a physical indication of signalling sections within ERTMS. Used when degraded working is required.

## **Home signal**

The first stop signal on the approach to a signal box on a line not signalled by the track circuit block system of signalling.

## **Interlocking**

A general term applied to equipment that controls setting and releasing signals and points to prevent an unsafe condition of the signalling system arising during the passage of trains.

## Terms by subject matter

<b>Intermediate block home signal</b>	A stop signal that controls the exit from an intermediate block section. (Although an intermediate block home signal controls the entrance to an absolute block section, it is referred to as the intermediate block home signal).
<b>Junction signal</b>	A signal that controls more than one running route and can display an indication of route.
<b>LOWS</b>	Lookout operated warning system. A lineside warning system, used to warn personnel on or near the line about an approaching train. It is operated by a lookout.
<b>Main aspect</b>	The following aspects of a colour light signal: <ul style="list-style-type: none"> <li>• red</li> <li>• yellow</li> <li>• two yellows</li> <li>• flashing yellow</li> <li>• two flashing yellows</li> <li>• green.</li> </ul>
<b>PoSA</b>	Proceed-on-sight authority. A signal used for controlling movements into a section affected by a failure of signalling equipment.
<b>Right-side failure</b>	A failure that does not reduce the protection given by signalling equipment.
<b>Section signal</b>	A stop signal that controls the entrance to a block section or intermediate block section ahead.
<b>Semi-automatic signal</b>	A signal normally operated by the passage of trains, but can also be controlled from the signal box or from a ground frame, or by a person operating a signal post replacement switch.

<b>Shunt entry board</b>	A lineside indicator board that indicates the entry of a shunt route on ERTMS cab signalled lines where lineside signals are not provided.
<b>Shunting signal</b>	A signal that is provided for shunting purposes only.
<b>Signal post replacement key</b>	The key used to operate a signal post replacement switch.
<b>Signal post replacement switch</b>	A switch on the post of an automatic or semi-automatic colour light signal that can be operated by a key to turn it to, and keep it at, danger.
<b>Stop signal</b>	A signal that can show a stop aspect or indication.
<b>Subsidiary signal</b>	A semaphore signal used for controlling shunting movements and movements onto occupied tracks. It is always positioned below the main semaphore arm with which it is associated.
<b>TOWS</b>	Train operated warning system. An audible warning system at locations listed in the Sectional Appendix. When switched on, it is used to warn personnel on or near the line about an approaching train.
<b>TPWS</b>	Train protection and warning system. A system by which a train is stopped by an automatic application of the brakes when activated by lineside equipment.
<b>Wrong-side failure</b>	A failure that reduces or removes the protection given by signalling equipment.

## Terms by subject matter

### Points

<b>Catch points</b>	Points designed to derail vehicles running back on a gradient in the wrong direction. These points may be unworked if trains normally pass over them in one direction only.
<b>Derailer</b>	A device at an exit from a siding or bay platform that derails an unauthorised movement.
<b>Detection</b>	An electrical or mechanical indication that points are set in the correct position.
<b>Facing point lock</b>	Equipment that physically locks facing points so that they cannot move.
<b>Facing points</b>	Points where two routes diverge.
<b>Ground frame</b>	A control point containing levers or switches to allow points in running lines and sidings, and any associated signals, to be operated locally. This local operation is only possible when the signaller at the controlling signal box gives a release. Also includes a ground-switch panel.
<b>Hand points</b>	Points that are worked manually by lever independent of any other signalling controls.
<b>Mechanical points</b>	Points that are mechanically operated without any other form of power operation.
<b>Power-operated points</b>	Points that are operated by means other than mechanically.
<b>Run through (of points)</b>	An incident where a movement runs through a trailing set of points that are not set in the correct position for the movement.
<b>Token</b>	Any single line token, staff or tablet.



<b>Track circuit</b>	A method of detecting the presence of a train or vehicle on a line. An electrical device, using the rails as an electrical circuit, detects the absence of a train or vehicle. If these rules refer to track circuits, this also includes detection by axle counters unless specially excluded.
<b>Trailing points</b>	Points where two routes converge.
<b>Train-operated points</b>	Points that are continuously driven to one position such that facing movements always pass through them in the same direction. Trains themselves operate the points in the trailing reverse direction.
<b>Trap points</b>	Facing points at an exit from a siding or converging route that derail an unauthorised movement, so protecting the adjacent line.
<b>Unworked points</b>	Points that are not operated from a signal box or ground frame.
<b>Worked points</b>	Points that are operated from a signal box or ground frame.

## Train Signalling Regulations

<b>Absolute block</b>	A signalling system that allows only one train to be in a block section at the same time. The block indicator is used to indicate whether the line between adjacent signal boxes is clear or occupied.
<b>Block section</b>	The section of the line between the section signal of one signal box and the home signal of the next signal box ahead.
<b>ERTMS</b>	European rail traffic management system. A signalling system that uses in cab indications as opposed to external track borne signals.

## Terms by subject matter

<b>Intermediate block section</b>	The line between the section signal and the intermediate block home signal worked by the same signal box in the same direction of travel.
<b>Overlap</b>	The distance beyond a stop signal up to which the line must be clear before the previous signal can show a proceed aspect.
<b>Route setting position</b>	Location on a signalling control panel or workstation from which a route can be set or closed.
<b>Station limits</b>	The line between the home signal and the section signal worked by the same signal box and in the same direction of travel. This does not apply on a track circuit block line.
<b>Track circuit block</b>	A method of signalling trains in a section of line using track circuits or other means of automatic train absence detection and without using block instruments.
<b>Train signalling regulations</b>	Instructions for use by the signaller that give details of the rules, regulations and instructions relating to each different kind of signalling system.
<b>Transition</b>	The process of the onboard ERTMS signaling system transferring from one signalling system to another. This process has to be acknowledged by the driver.

## Train Working

<b>Braking distance</b>	The distance a train needs in which to stop or reduce speed, from travelling at a given speed.
<b>Coupled in multiple</b>	Traction units coupled to allow through controls by one driver.
<b>Coupled in tandem</b>	Each traction unit is separately controlled by its own driver, with through control of the automatic brake only.

<b>Driver only (or DO) train</b>	A train that is worked only by a driver and does not have a guard.
<b>In service</b>	A train is in service from the time it is ready to start its journey until the time it completes its journey. A vehicle is in service when it forms part of a train which is in service.
<b>End of authority</b>	The location to which a train is permitted to proceed. The boundary of a movement authority.
<b>Full supervision</b>	The normal movement used by ERTMS, an authority that gives comprehensive protection to all trains.
<b>Journey</b>	<p>The route from the starting point of a train (siding, platform line or other place) to its planned destination (siding, platform line or other place), or where:</p> <ul style="list-style-type: none"><li>• is required to reverse before continuing to its destination</li><li>• vehicles are attached or detached</li><li>• it is terminated short of its destination</li></ul> <p>Any light locomotive movement, empty coaching stock movement or short distance shunting movement is a separate journey from the associated train movement.</p>
<b>Movement authority</b>	Permission for a train to run to a specific location as a signalled move.
<b>On sight</b>	A type of movement authority used by ERTMS that allows entry into an occupied section. The driver will be presented with a maximum speed and must ensure that the train is stopped short of any obstruction.
<b>One-train working</b>	Method of signalling on a single line, with or without a train staff, where only one train at a time is permitted.

## Terms by subject matter

### **Out of service (train)**

A train is out of service between the time that it completes its journey and the time it is ready to start another journey.

### **Out of service (vehicle)**

A vehicle is out of service when it forms part of a train that is out of service, or when it has been detached from a train in a depot, siding, platform line or other authorised place. The detraining of passengers does not in itself mean a train has been taken out of service.

### **Passenger service**

A train that is in service carrying passengers.

### **Permissible speed**

The maximum permitted speed as shown in the Sectional Appendix.

### **Shunting movement**

Any movement of a train or vehicle other than a train passing normally along a running line.

### **Tail lamp**

Includes an illuminated built-in red light or blind.

## **Trains**

### **Brake van**

Any vehicle with a brake compartment.

### **Cant rail**

The point on the side of a locomotive or coach where the bodyside meets the roof (sometimes marked by an orange stripe).

### **Central door-locking**

A secondary locking system fitted to certain slam-door passenger vehicles and controlled by the guard that prevents passengers from opening the doors.

### **Defective on-train equipment**

On-train equipment that:

- is not performing its intended safetyfunction, either fully or partly
- is isolated
- is missing.

<b>Driver machine interface (DMI)</b>	The device used by a driver to interact with ERTMS onboard equipment. Typically a computer screen located in the driving cab.
<b>Driver's reminder appliance (DRA)</b>	A device in a driving cab that allows the driver to set a reminder that the signal ahead is at danger. While the DRA is set, the driver cannot take power.
<b>Power-operated doors</b>	Doors on a train where the opening and closing are controlled by the driver or guard.
<b>TASS</b>	Tilt authorisation and speed supervision. A system on tilting trains that controls: <ul style="list-style-type: none"><li>• the operation of the tilt system</li><li>• the speed of the train on routes where enhanced permissible speeds apply on TASS fitted lines.</li></ul>
<b>TPWS</b>	Train protection and warning system. A system by which a train is stopped by an automatic application of the brakes when activated by lineside equipment.
<b>Track circuit actuator</b>	Equipment provided on certain trains to improve the operation of track circuits.
<b>Traction unit</b>	Locomotive, multiple unit, self-propelled rail vehicle or road-rail vehicle operating in rail mode.
<b>Train</b>	This includes light locomotive, self-propelled rail vehicle or road-rail vehicle in rail mode.

## Workforce

<b>Competent person</b>	A person who is passed as being qualified and has the required knowledge and skills to carry out a particular rule, regulation, instruction or procedure.
<b>Operations control</b>	The term used for Network Rail Operations Control Offices.

## Terms by subject matter

<b>Pilotman</b>	A person who has been appointed to manage the passage of trains over a single line during a failure of equipment, during repairs or due to an obstruction.
<b>Rolling stock technician</b>	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.
<b>Traincrew</b>	Driver and guard.
<b>Train operator</b>	The company responsible for operating a train.
<b>Your employer</b>	The company, or subsidiary of a larger organisation for whom you work.

## A

<b>Absolute block</b>	A signalling system that allows only one train to be in a block section at the same time. The block indicator is used to indicate whether the line between adjacent signal boxes is clear or occupied.
<b>Adjacent line</b>	A line or siding next to the line you are on.
<b>Affect the normal passage of trains</b>	Any activity or event that allows train working to continue but causes diversion, inability to call at a planned destination or introduction of degraded-mode operations such as passing signals at danger, handsignalling, manual route setting or single line working arrangements.
<b>Affect the safety of the line</b>	Any activity or event that may, during its course, render the track, the formation or a structure unsafe for the passage of trains, or unsafe for the passage of trains at normal speed.
<b>Affect the safety of train working</b>	Any activity or event that may, during its course, render a movement control or interlocking system unusable for the signaling of trains.
<b>Aspect</b>	The indication of a colour light signal that the driver sees.

## Terms by alphabetical order

### **ATWS**

Automatic track warning system.

An individual or lineside warning system that can be installed at a site of work to:

- detect an approaching train
- alert personnel who are on or near the line.

It may be installed temporarily for the period of work or it may be installed permanently at a location. This definition does not include TOWS or LOWS

**Automatic level crossing** Any of the following level crossings:

- Automatic half-barrier (AHBC)
- Automatic barrier crossing, locally monitored (ABCL)
- Automatic open crossing, locally monitored (AOCL)
- Crossing with red and green warning lights (R/G).

### **Automatic Signal**

A signal operated by the passage of trains. The signaller or a person operating a signal post replacement switch can place some automatic signals to danger.

### **Axle counter**

A method of detecting the presence of a train or vehicle on a line. Track-mounted equipment, at each end of a portion of line, counts the number of axles passing over. This is used to identify when a portion of line is occupied or clear.

### **Axle counter head**

A device that detects the passage of a wheel passing over a running rail.



## B

### **Barrow crossing**

A crossing (often at the end of a platform) for railway personnel to use. Some barrow crossings have white-light indicators which, when lit, indicate to the user that it is safe to cross.

### **Bi-directional line**

A line on which the signalling allows trains to run in both directions.

### **Block marker**

Reflective board that serves as a physical indication of signalling sections within ERTMS. Used when degraded working is required.

### **Block section**

The section of the line between the section signal of one signal box and the home signal of the next signal box ahead.

### **Brake van**

Any vehicle with a brake compartment.

### **Braking distance**

The distance a train needs in which to stop or reduce speed, from travelling at a given speed.

## C

### **Catch points**

Points designed to derail vehicles running back on a gradient in the wrong direction. These points may be unworked if trains normally pass over them in one direction only.

### **Cant rail**

The point on the side of a locomotive or coach where the bodyside meets the roof (sometimes marked by an orange stripe).

### **Central door-locking**

A secondary locking system fitted to certain slam-door passenger vehicles and controlled by the guard that prevents passengers from opening the doors.

## Terms by alphabetical order

<b>Competent person</b>	A person who is passed as being qualified and has the required knowledge and skills to carry out a particular rule, regulation, instruction or procedure.
<b>Conductor rail</b>	A rail through which electricity is supplied to electric-powered trains.
<b>Controlled crossing</b>	Any of the following level crossings. <ul style="list-style-type: none"> <li>• Manned crossing with barriers (MCB).</li> <li>• Manned crossing with gates (MG).</li> <li>• Remotely controlled crossing with barriers (RC).</li> <li>• Barrier crossing with closed-circuit television (CCTV).</li> <li>• Barrier crossing with obstacle detection (OD).</li> </ul>
<b>Controlled evacuation</b>	The evacuation of passengers from a train after the signaller has confirmed that all lines have been protected.
<b>Coupled in multiple</b>	Traction units coupled to allow through controls by one driver.
<b>Coupled in tandem</b>	Each traction unit is separately controlled by its own driver, with through control of the automatic brake only.

## D

<b>Defective on-train equipment</b>	On-train equipment that: <ul style="list-style-type: none"> <li>• is not performing its intended safetyfunction, either fully or partly</li> <li>• is isolated</li> <li>• is missing.</li> </ul>
<b>Derailer</b>	A device at an exit from a siding or bay platform that derails an unauthorised movement.

<b>Detection</b>	An electrical or mechanical indication that points are set in the correct position.
<b>Detonator</b>	A small disc-shaped warning device, designed to be placed on the railhead for protection and emergency purposes. It explodes when a train passes over it.
<b>Detonator Protection</b>	Detonator protection consists of three detonators placed 20 metres (approx 20 yards) apart on the same rail with a possession limit board at the first detonator in the direction of travel.
<b>Driver only (or DO) train</b>	A train that is worked only by a driver and does not have a guard.
<b>Driver machine interface (DMI)</b>	The device used by a driver to interact with ERTMS onboard equipment. Typically a computer screen located in the driving cab.
<b>Driver's reminder appliance (DRA)</b>	A device in a driving cab that allows the driver to set a reminder that the signal ahead is at danger. While the DRA is set, the driver cannot take power.

## E

<b>Earthed</b>	The term 'earthed' when applied to the overhead line equipment which is normally live, means connected to the traction return running rail either directly or to a structure which is itself connected thereto.
<b>Electrified line</b>	A line that is electrified either by 25,000 volts AC overhead lines or by 750 volts DC conductor rails. Local instructions are issued for certain sections of route electrified by 1500 volts DC overhead lines.
<b>Emergency evacuation</b>	The evacuation of passengers from a train if the signaller states that protection cannot be given or the signaller cannot be contacted.

## Terms by alphabetical order

<b>Emergency protection</b>	<p>The means of protecting a train by track circuit operating clips, hand danger signals and detonators when:</p> <ul style="list-style-type: none"> <li>• a driver or guard cannot contact the signaller, or</li> <li>• the signaller cannot provide signal protection.</li> </ul>
<b>End of authority</b>	The location to which a train is permitted to proceed. The boundary of a movement authority.
<b>Engineering Possession Reminder (EPR)</b>	A reminder applied by the signaller to one or more axle counter sections in advance of pre-planned engineering works in order to indicate the area affected. When removed from an axle counter section indicating occupied, this initiates an unconditional reset/restoration of the axle counter without aspect restriction.
<b>Engineering train</b>	Includes an on-track machine.
<b>ERTMS</b>	European rail traffic management system. A signalling system that uses in cab indications as opposed to external track borne signals.
<b>F</b>	
<b>Facing point lock</b>	Equipment that physically locks facing points so that they cannot move.
<b>Facing points</b>	Points where two routes diverge.
<b>Full supervision</b>	The normal movement used by ERTMS, an authority that gives comprehensive protection to all trains.

## G

<b>Goods line</b>	A line that has not been signalled to the standard required for running passenger trains.
<b>Ground frame</b>	A control point containing levers or switches to allow points in running lines and sidings, and any associated signals, to be operated locally. This local operation is only possible when the signaller at the controlling signal box gives a release. Also includes a ground-switch panel.

## H

<b>Hand points</b>	Points that are worked manually by lever independent of any other signalling controls.
<b>Home signal</b>	The first stop signal on the approach to a signal box on a line not signalled by the track circuit block system of signalling.

## I

<b>In service</b>	A train is in service from the time it is ready to start its journey until the time it completes its journey. A vehicle is in service when it forms part of a train which is in service.
<b>Interlocking</b>	A general term applied to equipment that controls setting and releasing signals and points to prevent an unsafe condition of the signalling system arising during the passage of trains.
<b>Intermediate block home signal</b>	A stop signal that controls the exit from an intermediate block section. (Although an intermediate block home signal controls the entrance to an absolute block section, it is referred to as the intermediate block home signal).

## Terms by alphabetical order

### Intermediate block section

The line between the section signal and the intermediate block home signal worked by the same signal box in the same direction of travel.

### Intermediate point to a possession

A location other than the limits at the ends of the possession where an engineering train can enter or leave the possession to:

- an open line
- a siding not under possession.

### Isolated

Electrical equipment is isolated when it is disconnected from all sources of electricity supply in a secure way.

### Isolation

Isolation is the action of causing electrical sections or sub-sections of the OLE or CRE to be isolated. For AC it includes the entire process of switching off, securing, testing and earthing and issue of the overhead line permit. For DC it includes the entire process of switching off, securing and testing and issue of the conductor rail permit.

## J

### Journey

The route from the starting point of a train (siding, platform line or other place) to its planned destination (siding, platform line or other place), or where:

- is required to reverse before continuing to its destination
- vehicles are attached or detached
- it is terminated short of its destination

Any light locomotive movement, empty coaching stock movement or short distance shunting movement is a separate journey from the associated train movement.

**Junction signal** A signal that controls more than one running route and can display an indication of route.

## L

**Level crossing** Any manned, automatic, controlled, or open crossing shown in Table A of the Sectional Appendix.

**Lever** Includes a switch, button or workstation control.

**Live** Connected to an electrical supply.

**LOWS** Lookout operated warning system. A lineside warning system, used to warn personnel on or near the line about an approaching train. It is operated by a lookout.

## M

**Main aspect** The following aspects of a colour light signal:

- red
- yellow
- two yellows
- flashing yellow
- two flashing yellows
- green.

**Maintenance depot** A location defined in a train operator's Contingency Plan with the facilities to repair or replace specified items of defective on-train equipment.

**Manned level crossing** A level crossing that is operated locally by a signaller or crossing keeper (MCB or LC).

**Mechanical points** Points that are mechanically operated without any other form of power operation.

**Movement authority** Permission for a train to run to a specific location as a signalled move.

## Terms by alphabetical order

### N

**No-block line** A line on which the signaller does not monitor the condition of the block section.

### O

**On sight** A type of movement authority used by ERTMS that allows entry into an occupied section. The driver will be presented with a maximum speed and must ensure that the train is stopped short of any obstruction.

**One-train working** Method of signalling on a single line, with or without a train staff, where only one train at a time is permitted.

**On-track plant** A road-rail vehicle (RRV) or rail mounted maintenance machine (RMMM) also known as 'in possession only' vehicles.

**Open level crossing** An unmanned level crossing that has no barriers, gates or road traffic signals. It has a 'Give Way' sign on each road approach.

**Operations control** The term used for Network Rail Operations Control Offices.

**Out of service (train)** A train is out of service between the time that it completes its journey and the time it is ready to start another journey.

**Out of service (vehicle)** A vehicle is out of service when it forms part of a train that is out of service, or when it has been detached from a train in a depot, siding, platform line or other authorised place. The detraining of passengers does not in itself mean a train has been taken out of service.

**Overhead line equipment** Wires and associated equipment, suspended over or adjacent to the railway line for supplying electricity to electric trains.



## **Overlap**

The distance beyond a stop signal up to which the line must be clear before the previous signal can show a proceed aspect.

## **P**

### **Passenger service**

A train that is in service carrying passengers.

### **Permissible speed**

The maximum permitted speed as shown in the Sectional Appendix.

### **Pilotman**

A person who has been appointed to manage the passage of trains over a single line during a failure of equipment, during repairs or due to an obstruction.

### **PoSA**

Proceed-on-sight authority. A signal used for controlling movements into a section affected by a failure of signalling equipment.

### **Possession Limit Board (PLB)**

A double-sided board, red on both sides, with a red light (which may be steady or flashing). The board also has the word STOP printed on both sides.

### **Power-operated doors**

Doors on a train where the opening and closing are controlled by the driver or guard.

### **Power-operated points**

Points that are operated by means other than mechanically.

### **Protection**

Ways of making sure that a line is protected. This includes keeping signals at danger, placing detonators on the line, using a track circuit operating clip and showing a hand danger signal.

## **R**

### **Reminder appliance**

A device or control used to remind the signaller that a particular lever, button or switch must not be operated at all, or used only under certain conditions.

## Terms by alphabetical order

<b>Repeater (in a signal box)</b>	A dial or indicator in a manual signal box that shows the position of a signal arm and whether the signal lamp is lit.
<b>Right-side failure</b>	A failure that does not reduce the protection given by signalling equipment.
<b>Rolling stock technician</b>	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.
<b>Route setting position</b>	Location on a signalling control panel or workstation from which a route can be set or closed.
<b>Running line</b>	A line as shown in Table A of the Sectional Appendix as a passenger line or as a non-passenger line.
<b>Run through (of points)</b>	An incident where a movement runs through a trailing set of points that are not set in the correct position for the movement.

## S

<b>Section signal</b>	A stop signal that controls the entrance to a block section or intermediate block section ahead.
<b>Semi-automatic signal</b>	A signal normally operated by the passage of trains, but can also be controlled from the signal box or from a ground frame, or by a person operating a signal post replacement switch.
<b>Shunt entry board</b>	A lineside indicator board that indicates the entry of a shunt route on ERTMS cab signalled lines where lineside signals are not provided.
<b>Shunting movement</b>	Any movement of a train or vehicle other than a train passing normally along a running line.

<b>Shunting signal</b>	A signal that is provided for shunting purposes only.
<b>Siding</b>	A line on which vehicles are marshalled, stabled, loaded, unloaded or serviced clear of a running line.
<b>Signal post replacement key</b>	The key used to operate a signal post replacement switch.
<b>Signal post replacement switch</b>	A switch on the post of an automatic or semi-automatic colour light signal that can be operated by a key to turn it to, and keep it at, danger.
<b>Single line</b>	One line is available for movements in both directions.
<b>Station</b>	Terminal, depot, yard or halt.
<b>Station limits</b>	The line between the home signal and the section signal worked by the same signal box and in the same direction of travel. This does not apply on a track circuit block line.
<b>Stop signal</b>	A signal that can show a stop aspect or indication.
<b>Subsidiary signal</b>	A semaphore signal used for controlling shunting movements and movements onto occupied tracks. It is always positioned below the main semaphore arm with which it is associated.
<b>Switched off</b>	Electrical equipment that is disconnected and separated from all sources of supply.

## T

<b>Tail lamp</b>	Includes an illuminated built-in red light or blind.
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## Terms by alphabetical order

<b>TASS</b>	<p>Tilt authorisation and speed supervision. A system on tilting trains that controls:</p> <ul style="list-style-type: none"> <li>• the operation of the tilt system</li> <li>• the speed of the train on routes where enhanced permissible speeds apply on TASS fitted lines.</li> </ul>
<b>Token</b>	Any single line token, staff or tablet.
<b>TOWS</b>	Train operated warning system. An audible warning system at locations listed in the Sectional Appendix. When switched on, it is used to warn personnel on or near the line about an approaching train.
<b>TPWS</b>	Train protection and warning system. A system by which a train is stopped by an automatic application of the brakes when activated by lineside equipment.
<b>Track circuit</b>	A method of detecting the presence of a train or vehicle on a line. An electrical device, using the rails as an electrical circuit, detects the absence of a train or vehicle. If these rules refer to track circuits, this also includes detection by axle counters unless specially excluded.
<b>Track circuit actuator</b>	Equipment provided on certain trains to improve the operation of track circuits.
<b>Track circuit block</b>	A method of signalling trains in a section of line using track circuits or other means of automatic train absence detection and without using block instruments.
<b>Track circuit operating clip</b>	A device which, in an emergency can be placed on top of each running rail to operate the track circuit and protect an obstruction.
<b>Track circuit operating device (T-COD)</b>	A special device that can be placed on the line to provide protection by operating the track circuit, to hold a signal at danger.

<b>Traction unit</b>	Locomotive, multiple unit, self-propelled rail vehicle or road-rail vehicle operating in rail mode.
<b>Trailing points</b>	Points where two routes converge.
<b>Train</b>	This includes light locomotive, self-propelled rail vehicle or road-rail vehicle in rail mode.
<b>Traincrew</b>	Driver and guard.
<b>Train-operated points</b>	Points that are continuously driven to one position such that facing movements always pass through them in the same direction. Trains themselves operate the points in the trailing reverse direction.
<b>Train operator</b>	The company responsible for operating a train.
<b>Train signalling regulations</b>	Instructions for use by the signaller that give details of the rules, regulations and instructions relating to each different kind of signalling system.
<b>Transition</b>	The process of the onboard ERTMS signaling system transferring from one signalling system to another. This process has to be acknowledged by the driver.
<b>Trap points</b>	Facing points at an exit from a siding or converging route that derail an unauthorised movement, so protecting the adjacent line.

## U

<b>Uncontrolled evacuation</b>	The self evacuation of passengers from a train, which is not initiated by the driver or guard.
<b>Unworked points</b>	Points that are not operated from a signal box or ground frame.

## Terms by alphabetical order

### W

**Worked points** Points that are operated from a signal box or ground frame.

**Wrong-side failure** A failure that reduces or removes the protection given by signalling equipment.

### Y

**Your employer** The company, or subsidiary of a larger organisation for whom you work.





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