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DC electrified lines

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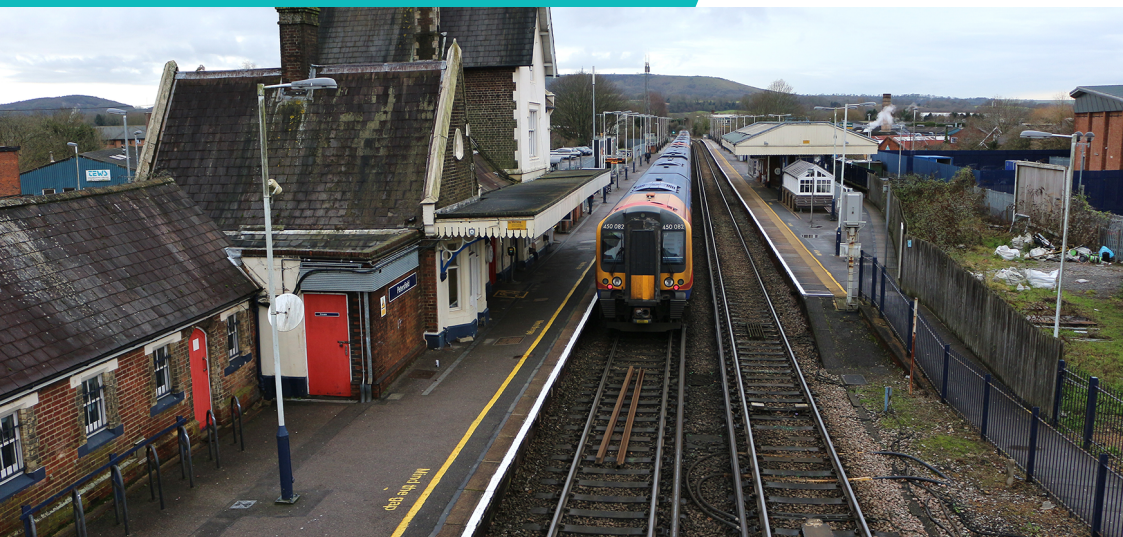

Conventions used in the Rule Book

	Example
A black line in the margin indicates a change to that rule since the last printed version. The Rule Book Briefing Leaflet contains more information about the changes.	
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.	
A rule printed inside a red box is considered to be critical and is therefore emphasised in this way.	

If you do not understand anything in the Rule Book, ask your manager or supervisor to explain it to you.

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

- train driver
- guard
- shunter
- designated person (DP)
- signaller
- crossing keeper

in DC electrified areas.

Section

Section

Section

1 Definitions

Authorised person

A person who has been appointed to issue and cancel a conductor rail permit.

Automatic power changeover (APCo)

A changeover from one form of traction power to another by a multi-mode train that is carried out by on-board or trackside equipment without any action by the driver.

Conductor rail equipment (CRE)

This refers to any conductor rails and any items connected to them.

Conductor rail permit

A permit that is signed and issued by the authorised person (AP) or the engineering supervisor (ES) and given to a designated person (DP), who is to carry out work on or near to the CRE.

This permit states exactly which 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.

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, and without first blocking the line to dc electric trains.

The ECO will switch off the electrical supply to:

- the electrical section or sections affected
- the abutting electrical section or sections either side.

Isolated

Electrical equipment is isolated when it is disconnected and separated from all sources of electricity supply in such a way that this disconnection and separation is secure.

Multi-mode train

A train that can either provide its own traction power or take this from the electrification system on a dc electrified line.

Self-powered mode

A self-powered train is one that can provide its own traction power and when doing so is referred to in this module as being in self-powered mode.

2 General

The people responsible: ***all concerned***

all concerned

You must not go on or near the line in an area with CRE unless your competence includes the track-safety rules that relate to lines electrified by the DC system as shown in this module.

Table A of the *Sectional Appendix* shows which lines of route are electrified by the DC system.

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

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

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

3 Dangers of the system

The people responsible: ***all concerned***

3.1 Treating the CRE, shoe gear and associated exposed live train-mounted equipment as being live

all concerned

CRE, shoe gear and under-floor mounted electrical equipment on trains are 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. You must treat CRE, shoe gear and associated exposed live train-mounted equipment as being live at all times unless one of the following applies.

- A conductor rail permit has been issued to the DP.
- You have been told that the CRE has been isolated as shown in local isolation instructions.
- In an emergency, the ECO has confirmed that the CRE is safe to approach but not to touch.
- In an emergency, the ECO has stated that the CRE has been switched off and local staff have told you that it is safe to approach but not to touch.

You must not: **all concerned**

- touch or step on CRE, shoe gear and associated exposed live train-mounted equipment
- step on guard boarding
- allow clothing, tools, equipment or any object you are carrying to touch CRE, shoe gear and associated exposed live train-mounted equipment 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, shoe gear and associated exposed live train-mounted equipment
- direct a jet of water or any other liquid onto the CRE, shoe gear and associated exposed live train-mounted equipment.

You must treat cables running alongside and crossing under lines as being live. You must not interfere with these cables or their protective covers. **all concerned**

Traction return current passing through the running rail is not normally dangerous. However, you must not touch broken running rails or bridge the gap between them.

If you have live line testing equipment or a short circuiting bar, you must use these before touching CRE.

3.2 Reporting damage, defects, snow fall and flood water

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

all concerned

You must then make sure that the following are reported to the ECO without delay.

- 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.

all concerned

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.

You must report either of the following to operations control:

- heavy snowfalls, or
- ice forming on the conductor rail surface which may cause difficulty operating electric trains.

4 Personal safety

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

4.1 Precautions that must be taken

all concerned

You must make sure, you and anything you are holding is no nearer than 1.5 metres (5 feet) from live CRE, shoe gear and associated exposed live train-mounted equipment unless both of the following conditions apply.

- The specific conditions in your company instructions have been met and the specified precautions required to manage danger from the CRE, shoe gear and associated exposed live train-mounted equipment are carried out.
- You carry out the specified precautions in your company instructions.

Where your company instructions allow work to be carried out with the CRE live and you or anything you are holding will be nearer than 300 mm (1 foot) to live CRE you must, if possible, place a conductor rail shield over the conductor rail before you carry out the activity.

If you are to manually operate or secure points and the conductor rail is live and 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 you carry out the activity.

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.

all concerned

If the emergency services need to go on or near the line, and you are the person in charge at the site, you must tell the officer in charge from each emergency service about the presence of the conductor rail and which parts have been switched off.

4.2 Moving materials or equipment

all concerned

You must apply the precautions specified in your company instructions to manage danger from live CRE, shoe gear and associated exposed live train-mounted equipment and take extreme care when:

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

You must make sure that precautions are carried out to prevent you or any materials or equipment coming into contact with live CRE shoe gear and associated exposed live train-mounted equipment.

You should avoid carrying materials or equipment over CRE.

You must not drag objects across, or drop them on, live CRE.

4.3 Attending to vehicles

all concerned

You must apply the precautions specified in your company instructions to manage danger from live CRE, shoe gear and associated exposed live train-mounted equipment and take extreme care.

all concerned

If possible, you must work on the side furthest away from live CRE when performing tasks such as:

- operating handbrakes
- coupling vehicles
- uncoupling vehicles
- passing beneath the buffer level of coupled vehicles
- going underneath vehicles
- examining vehicles.

If it is not possible to do this on the side furthest away from live CRE, other than when operating handbrakes, you must first place a conductor rail shield cover over the conductor rail.

Where severe arcing has taken place, you must confirm that the CRE is switched off before you examine a vehicle.

4.4 Conducting train crew over DC lines

driver, guard

If you are conducting another person on a route with CRE, you must tell that person about the danger of the CRE, shoe gear and associated exposed live train-mounted equipment and the precautions to apply if it is necessary to go on or near the line or use an authorised walking route.

5 Communicating with the ECO

The people responsible: ***all concerned***

5.1 Directly or by another person

all concerned

You can contact the ECO, or you can ask another person, such as the signaller, 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

all concerned

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

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

Note: An emergency switch-off of the CRE does not mean that train running has been stopped.

6.1 Immediate actions

6.1.1 Types of incident

all concerned

You must immediately contact the ECO (or arrange for this to be done) if you become aware of any incident or accident requiring, or likely to require, the electricity to be switched off. This can include:

- a derailment
- a lineside fire
- a fire on a vehicle or train
- a person in contact with or in danger of coming into contact with the CRE
- an emergency evacuation of passengers from a train.

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

all concerned

6.1.2 Reporting the emergency

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

You must tell the ECO:

- the reason why you want the electricity to be switched off
- whether any person is in danger from live 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 information from the ECO to the site and from the site to the ECO.

6.1.3 Additional instructions for train crew

driver, guard

If you are telling the signaller about an obstruction on a line other than the one your train is travelling on as shown in section 45 of module TW1 *Preparation and movement of trains,* you must also tell the signaller whether the electric traction current requires to be switched off.

6.1.4 Additional instructions for signallers

signaller

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

6.1.5 If you cannot contact the ECO

all concerned

If you cannot contact the ECO direct or through another person, a competent person may apply an approved short-circuiting bar to the section of conductor rail concerned as shown in section 6.3 of this module.

6.2 Further actions

all concerned

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, 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

all concerned

If it is not possible to use other ways to get the electricity switched off in an emergency, you may apply a short-circuiting bar but only if you are competent to do so and one of the following applies:

- a person is in danger through contact with the CRE
- passengers are alighting from a train which has been stopped by failure or accident
- a short circuit on a train cannot be isolated and there is severe arcing
- it is shown in a train operating company's instructions to train crew.

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.

all concerned

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.

all concerned

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 Detraining passengers

all concerned

If it is necessary to evacuate passengers from a train as shown in module M1 *Dealing with a train accident or train evacuation*, the electricity must be switched off as shown below.

a) Emergency evacuation

In an emergency the electricity should be switched off, as shown in section 6.1 of this module, on any line where passengers may walk.

b) Controlled evacuation

Before a controlled evacuation takes place, a temporary isolation must be taken when possible on any line where passengers may walk. If however it is not possible to take a temporary isolation of the complete area involved, alternative measures must be taken.

6.5 When the line stays open

signaller

When a line has been blocked to DC electric trains but is open for other trains, you must either:

- make sure any approaching train is not fitted with collector shoes
- get an assurance from the driver that the collector shoes are raised and are secured in this position.

signaller

If a train has stopped within the area of the emergency switch-off, before allowing it to proceed you must:

- make sure the train is not fitted with collector shoes, or
- get an assurance from the driver that the collector shoes are raised and are secured in this position.

6.6 Managing the emergency switch-off

PICEE

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

You must identify yourself to anyone arriving on site.

If the emergency services 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.

PICEE

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

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

As soon as the emergency is over and the affected section can be re-energised, 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.

PICEE

If the emergency will go on for a long time or it is necessary for work to be carried out on or close to CRE, a planned or temporary isolation must be taken as shown in Network Rail company instructions.

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

The people responsible: ***all concerned***

all concerned

You must make sure that the CRE is switched off before you attempt to rescue a person that is touching or within 300 mm (1 foot) of the CRE, unless you are sure about all of the following.

- The person is alive.
- You cannot get the CRE switched off at the time.
- You can pull the casualty clear with non-conducting gloves or other dry insulating material.

8 Types of isolation

The people responsible: ***all concerned, DP***

Note: Isolation of the traction current does not mean that train running has been stopped.

8.1 Planned isolation

DP

You must not allow work that requires an isolation to start until you have received a conductor rail permit (CRP).

You must explain the limits of the isolation and any hazards or conditions specified on the CRP to anyone you are responsible for, before allowing them to start work.

You must keep the CRP until your group has finished working. You must then immediately return it to the person who issued it.

You must immediately tell the AP if you have lost your CRP. The AP will arrange to issue you with another CRP, endorsed ‘Duplicate’.

If another DP is to take over from you before the work is completed, you must explain the limits of the isolation to the new DP. You must then give your CRP to the new DP.

If you are the new DP, you must make sure that you understand the limits of the isolation before taking 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

all concerned

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.

all concerned

9 Protecting isolated sidings where there is no local instruction

The person responsible: ***signaller***

signaller

The person in charge of a siding possession (PICOS) must arrange for points to be placed and kept in 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
- securing them if they are hand points.

You must place and keep any points leading to the siding to be isolated in a position to prevent trains entering the siding. You must use appropriate reminder appliances.

You must then make an entry in the Train Register.

10 Track isolating switches and hook switches

The people responsible: ***all concerned***

all concerned

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 instructions to the person operating track isolating switches or hook switches on whether they 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 any switches.

You must replace the hook switch sleeve on 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

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

11.1 Finding out the cause of a short circuit

signaller

The ECO will tell you if it is not possible to restore the electricity supply following a short circuit. You must then agree what arrangements are to be made to find out what has caused the short circuit.

This must include arrangements to examine any train in the electrical section. Unless you are sure that the fault is with a train, you must also make arrangements for the section of line to be examined.

11.2 Examining the conductor rail

all concerned

You must treat the conductor rail as being live at all times when it is being examined as the ECO may continue to try to restore the electricity supply.

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:

- a line blockage is in place for your own protection
- you have told the ECO that you are about to enter the tunnel.

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.

11.3 When the cause of the short circuit has been removed

signaller

You must tell the driver of each train to proceed at caution over the location of the short circuit, until you have been told by a competent person that it is safe for normal working to be resumed.

driver

You must proceed at caution over any portion of line where the signaller tells you that there has been a short circuit.

12 Moving electric and multi-mode trains between live and isolated sections

The people responsible: ***driver, person authorising the movement, signaller***

12.1 Moving an electric train towards an isolated section

signaller

You can authorise a movement of an electric train or a multi-mode train operating in electric mode if it becomes necessary to:

- go beyond the signal or block marker protecting an isolated section or sub-section towards an isolated section
- make an unsignalled movement towards an isolated section.

You must make sure that the driver fully understands what is to happen, and make sure that the approach to the isolated section is marked by a possession limit board (PLB) at the limiting point.

driver

You must clearly understand what is to happen and how far the movement can go.

You must drive these movements from the leading cab. The movement must not be propelled.

driver

12.2 Electric or multi-mode train entering or leaving an isolated section

person authorising the movement

Before authorising the movement of 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.

You must also get this confirmation before you authorise a multi-mode train to enter or leave a portion of line where an emergency switch-off is in place.

You must not allow a train that has collector shoes to enter or leave an isolated section unless they can be retracted..

driver

Before you move a train that has collector shoes to or from an isolated section, you must make sure all collector shoes are secured in the raised position clear of any conductor rail.

You must also do this before a multi-mode train that has collector shoes moves to or from a portion of line where an emergency switch-off is in place.

You must not move a train that has collector shoes to or from an isolated section or a portion of line where an emergency switch-off is in place unless they can be retracted.

12.3 Taking a possession around a train

signaller

If a possession is to be taken around a train that has collector shoes, you must not grant the possession until you have told the driver to secure the collector shoes in the raised position and the driver has told you that this has been done.

You must not allow possession to be taken around a train that has collector shoes unless they can be retracted.

These instructions do not apply to trains that have been previously stabled within the limits of a possession.

12.4 Train entering a possession

signaller

Before authorising a movement to proceed towards the detonator protection, or the points at an intermediate point leading to a possession in which the electricity has been isolated, you must get confirmation from the driver that all collector shoes are raised and are secured clear of any conductor rail.

If you do not know if the train has collector shoes, you must ask the driver.

You must not allow a train with collector shoes to enter a possession unless they can be retracted.

driver

When the signaller tells you to do so, you must visually check that all collector shoes are secured in the raised position. You must then tell the signaller that you have done this.

You must keep the collector shoes in the raised position while you are in the possession.

You must not allow a train with collector shoes to enter a possession unless they can be retracted.

13 Multi-mode trains moving to or from non-electrified lines

The person responsible: ***driver***

13.1 Moving to or from non-electrified lines

driver

If you are driving a multi-mode train that is to continue using ac electric traction you must make sure that you change to ac electric traction when the train reaches reach the 'changeover to overhead electric traction' sign. If the collector shoes can be retracted, you must make sure that they have been.

If you are driving a multi-mode train that is to continue using the train's own traction power, you must make sure that you change to the train's own self-powered mode when you reach the 'changeover to self-powered' sign. If the collector shoes can be retracted, you must make sure that they have been.

13.2 Wrong-direction movements by a multi-mode train

driver

If it is necessary for a multi-mode train to make a wrong direction movement past a location where power changeover is necessary, you must make sure that the automatic power changeover (APCo) equipment is disabled so that it will not operate throughout the movement.

If the train begins the movement in electric mode, you must retract all the collector shoes, if they can be, before reaching the end of the CRE.

If the train begins the movement using its own traction power, you must not lower any collector shoes, if they can be retracted, until you are sure that all collector shoes are beyond the start of the CRE.

driver

You must carry out the same instructions if the train reaches another power changeover location before the wrong-direction movement is completed.

14 Power changeover (PCO)

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

14.1 When PCO is required

driver

If you are driving a multi-mode train that is required to carry out PCO during the journey, your train operating company instructions will explain:

- where the PCO is planned to take place
- whether the PCO will be carried out automatically or manually
- whether the PCO will take place while the train is moving or at a stand at a specified location
- what actions you must take in connection with the PCO.

14.2 Approaching a PCO location

driver

If your train is approaching a PCO location where PCO will be carried out whilst the train is moving, a sign will be provided.

Warning of PCO ahead

There may also be signs to show that PCO only applies to:

- some types of multi-mode train but not to all multi-mode trains
- multi-mode trains that are to proceed on routes diverging from the straight route
- multi-mode trains that are proceeding towards a named route.

This sign can also be provided on the approach to a location where PCO is carried out whilst the train is at a stand.

driver

When your train passes the sign, you can carry out any actions shown in your train operating company instructions that are necessary before the PCO is carried out.

14.3 Passing a PCO location

driver

If your train is to carry out PCO from the dc conductor rail system to another form of power, a sign may be provided at the location where PCO can be started,

PCO location sign

When your train passes this sign you can carry out any actions shown in your train operating company instructions to allow PCO to take place.

At the end of the location where PCO takes place from the dc conductor rail system, one of the following signs may be provided.

If your train is to carry out PCO to the ac overhead system.

Raise pantograph

If your train is to carry out PCO to or from a self-powered mode. **driver**

Changeover to or from self-powered mode

If the overhead line equipment is not suitable for a pantograph to be raised beyond a certain point, this sign will be provided.

You must not try to raise the pantograph if this has not already been done when you reach the sign.

Do not raise pantograph

14.4 When PCO does not take place on all routes at a junction

When PCO does not take place on all routes at a junction, the following signs will be provided. Signs may also be provided to show that PCO applies only to certain trains. **driver**

PCO applies on one or more routes diverging to the left

PCO applies on one or more routes diverging to the right

driver

PCO applies on one or more routes diverging in both directions

PCO applies on the route towards the location named

You must make sure that PCO is carried out correctly if your train is to proceed over any of the routes indicated.

PCO does not apply on the route towards the location named

You must make sure that PCO is carried out correctly if your train is required to do so over any other route at the location.

14.5 When PCO takes place when at a stand at a specified location

driver

If PCO is carried out whilst your train is at a stand, a sign will be provided at that location.

PCO location sign

You must carry out any actions necessary for PCO when the train is at a stand at that location.

One of these signs may be provided after that location. If you have not already carried out the PCO, you must do so when your train passes the sign. **driver**

Lower pantograph

Raise pantograph

Changeover to self-powered mode

14.6 When PCO is not planned

You will be told if your train is to carry out PCO at a location where it is not planned to do so. **driver**

You must make sure you understand:

- where PCO is to take place
- what form of traction power your train must change to
- how PCO is to be carried out.

If a train is to carry out PCO at a location where it is not planned to do so, you must make sure that the driver knows what is happening. **signaller**

You do not need to do this if you have been told that the driver is already aware.

14.7 Defective APCo balise

all concerned

You must make sure that a damaged, loose or malfunctioning balise, at an APCo site, which would prevent power changeover taking place automatically, is reported to the signaller.

signaller

If you have been told about a defective, loose or malfunctioning APCo balise you must:

- tell the driver of the next approaching multi-mode train that is required to carry out PCO what has been reported
- ask the driver to tell you whether APCo takes place correctly.

If the driver tells you that APCo did take place correctly, you can allow following trains to proceed normally.

If the driver tells you that APCo did not take place correctly you must:

- tell the driver of each train that will be affected about the defective APCo balise
- tell the driver that it will be necessary to carry out PCO manually.

You must continue with this method of working until you are told that the defective balise is again working normally.

driver

When you have been told about a defective APCo balise, you must make sure that you change to the correct traction mode as follows:

- if the changeover is to the ac overhead system, at the 'raise pantograph' sign
- if the changeover is to self-powered mode, at the 'Changeover to self-powered' sign.

14.8 Missing, damaged or obscured PCO signs

all concerned

You must make sure that a missing, damaged, or obscured sign associated with a PCO location is reported to the signaller.

signaller

If you are told about, a missing, damaged or obscured sign associated with a PCO location, you must:

- tell the driver of the next approaching multi-mode train that is required to carry out PCO what has been reported
- ask the driver to tell you the state of the sign and whether it is difficult to see.

If the driver tells you that the sign is not difficult to see, you can allow following trains to proceed normally.

If the driver tells you that the sign is difficult to see, you must tell the dreiver of each train that will be affectred about the defective sign.

You must continue with this method of working until you are told that the sign is again being displayed normally.

driver

When you have been told about a missing, damaged or obscured PCO sign, you must make sure that you change to the correct traction mode.

Uncontrolled when printed
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