

GE/RT8000 - AC3
Rule Book

Module AC3

AC electrified lines

Working of trains

Issue 1

June 2003

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1	June 2003	Initial issue	6 December 2003



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

- driver
- signaller
- operations controller

in AC electrified line areas.

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

The person responsible: driver

Avoiding damage to trains and the OLE

You must make sure that all pantographs are lowered before moving an electric train:

driver

- to or from a non-electrified line
- through a non-electrified crossover.

If it is necessary for your electric train to be assisted to, through or from a section of line blocked to electric trains, you must:

- lower the pantograph
- tell the driver of the assisting train when this has been done
- keep the pantograph in the lowered position throughout the movement.

2 Driver's instructions following the loss of line light or damage to the OLE

The person responsible: driver

2.1 When the train can continue normally

driver

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

- the ADD is working but has not operated
- the behaviour of the OLE is normal and there are no unusual noises
- you can reset, or the line light is restored
- you can regain power.

2.2 When the train can coast to a stand

driver

If the line light goes out you can, if possible, coast to a suitable location to report the incident to the signaller.

You may do this if:

- there is only one pantograph on the train and you are driving from the locomotive or single unit that it is fitted to
- the ADD is working but has not operated
- the behaviour of the OLE is normal and there are no unusual noises
- you cannot reset
- you cannot regain power.

2.3 When the train must be stopped as soon as possible

If any of the circumstances shown in 2.3 a), b) or c) of this module apply, you must:

driver

- operate the pantograph down button
- stop the train as soon as possible
- report the incident to the signaller.

a) Damage to the OLE

You observe any damage to, or anything irregular with, the OLE.

b) ADD operation

The ADD on your train has operated.

c) The line light goes out

If the line light goes out and one of the following applies:

- You are driving from a driving van trailer (DVT) or there is more than one pantograph raised on the train and there is no working ADD.
- You are driving from a DVT or there is more than one pantograph raised on the train, the ADD is working but has not operated and you cannot reset.
- There is only one pantograph on the train and you are driving from the locomotive or the single unit that it is fitted to and the OLE is not behaving correctly or there are unusual noises.

2.4 Examining the train

a) Examining pantographs

driver

If you have stopped your train because the line light has gone out, the ADD has operated, or you have observed damage to the OLE, you must visually examine all the pantographs and tell the signaller whether there appears to be any damage to any of them.

You must also carry out the driver's instructions for the type of traction unit you are driving.

b) Equipment failure other than damage to a pantograph

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

This does not apply if there is any damage to a pantograph.

2.5 Telling the signaller about problems or incidents with the OLE

driver

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

- what has happened
- where the incident happened
- the location where the train has stopped
- the nearest overhead line structure number
- the extent of any damage to the OLE
- if there is any damage to a pantograph
- whether the primary means of support of the OLE is by headspan or not.

2.6 If sequential tripping has occurred

If your train has caused sequential tripping, the signaller will:

driver

- arrange for your train to be stopped
- ask you to visually examine all the pantographs on your train and the OLE for signs of damage.

If there is evidence that something other than a pantograph has been in contact with the OLE or a pantograph is damaged, the signaller will instruct you to visually examine the OLE immediately behind the train.

After you have done this, you must tell the signaller whether there appears to be any damage to the OLE.



Sequential tripping is the when circuit breakers of electrical sections along a route trip in sequence. This is normally due to the fault of a moving train.

3

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

*The person responsible: **signaller***

3.1 What the ECO will do if a tripping of the OLE occurs

signaller

When the ECO becomes aware of a tripping of the traction supply the ECO will:

- carry out the electrical control room instructions for the type of occurrence
- tell you the type of tripping and its location
- confirm if there is more than one electrical section involved, or if it is a sequential tripping **i**
- agree with you what action is to be taken (if any) to find out the cause of the tripping
- agree with you whether the tripping has damaged the OLE or a pantograph on a train.



Sequential tripping is the when circuit breakers of electrical sections along a route trip in sequence. This is normally due to the fault of a moving train.

3.2 If sequential tripping has occurred

If the ECO tells you that sequential tripping has occurred, you must:

signaller

- stop the train involved (or arrange for this to be done if the train is no longer in your area of control)
- tell the driver to examine the train for evidence of contact with the OLE or damage to a pantograph.

If there is evidence that something other than a pantograph has been in contact with the OLE or a pantograph is damaged, you must instruct the driver to:

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

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

3.3 If a driver reports a loss of line light or ADD operation or damage to the OLE is suspected

If a driver reports a loss of line light or ADD operation, or possible damage to the OLE is reported to you, you must:

signaller

- stop the passage of trains
- protect the line as shown in the Train Signalling Regulations modules
- report the incident to Operations Control
- come to a clear understanding with the ECO about which line or lines are to be examined and the type of examination that is to take place. (See section 4 of this module.)

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3.4 If the driver reports a fault on the train

signaller

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

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

3.5 Resuming normal working

signaller

If a tripping of the OLE occurs or a driver stops to report a loss of line light, you can resume normal working if the ECO can identify the cause of the tripping and tells you that no further action is required.

However, if the ECO cannot identify the cause of the tripping, you must:

- protect the lines as shown in the Train Signalling Regulations modules
- come to a clear understanding with the ECO about which lines are to be examined and the type of examination to be carried out **i**
- arrange for the line to be examined as shown in section 4 of this module.



This examination may be carried out by using a train or on foot. If the ECO gives authority, personnel who are not the infrastructure maintainer's may carry out the examination.

4

Signaller's instructions for examining the line

*The person responsible: **signaller***

4.1 Deciding which lines must be examined

a) If the area to be examined is where the primary means of supporting the OLE is by headspan

You must arrange for all lines to be examined from the point of ADD operation or loss of line light to the location where the train stopped or where the damage has been reported.

signaller

b) If the area to be examined is where the primary means of supporting the OLE is by other than headspan

You must arrange for the line on which the incident occurred to be examined from the point of ADD operation or loss of line light to the location where the train stopped or where the damage has been reported.

4.2 Examining the line or lines by train

a) Before the line or lines are examined

signaller

Before you allow a train to examine the line or lines, you must:

- carry out the instructions in the Train Signalling Regulations modules (the driver must be accompanied during darkness, fog or falling snow or if there is a tunnel in the section)
- if possible, examine the line or lines from a line other than that on which the defect has been reported
- if possible, arrange for a diesel train to carry out the examination
- instruct the driver of the examining train to proceed at caution, not to exceed 20 mph and to look for any damage or any other problems with the OLE.

b) If no defect is found with the OLE

If after the examination it is reported there is no apparent damage to the OLE, you may allow trains to pass through the affected area. You must stop each train and instruct the driver to proceed at caution and not to exceed 20 mph.

4.3 Infrastructure maintainer's personnel examining the OLE

Unless it has been found that a fault on the train had occurred, and this has not affected the OLE in any way, the ECO will then arrange for the OLE on the line or lines concerned to be examined by infrastructure maintainer's personnel.

signaller

When the OLE is being examined by infrastructure maintainer's personnel, you must not resume normal working until:

- the examination has been completed, and
- you have been told there is no defect with the OLE.

5

Isolating the ADD

The people responsible: driver, signaller, operations controller

driver

If the ADD has operated and you have brought your train to a stand, you must:

- visually check the pantograph and pantograph head
- if you cannot see any obvious damage, isolate the ADD as shown in the instructions for the type of traction concerned
- tell the signaller
- carry out the instructions you are given.

When the train is to proceed, you must **not exceed 100 mph** until the pantograph has been examined and the ADD reset.

signaller

When you have been told an ADD has operated and has been isolated, you must tell Operations Control.

operations controller

When the signaller tells you that the ADD has been isolated on a train, you must arrange for the pantograph to be examined as soon as possible by a competent person.

6

Movement of trains after an incident

The people responsible: driver, signaller

6.1 If the train is to be assisted

If, after you have lowered the pantograph, it cannot be used because of damage, the train may be assisted forward at reduced speed to the first location where it can be dealt with. However, before you do this, you must give the signaller an assurance that the pantograph is:

- electrically disconnected from the on-train electrical equipment
- clear of any possible contact with the OLE.

Before you tell the signaller this, you must consider reduced clearances through bridges or other places where the overhead wires may be lower than normal on the route to be used.

6.2 If the pantograph is not damaged

If the train has an undamaged pantograph, you may allow the train to proceed after any damaged pantographs have been secured.

driver

signaller

6.3 If the pantograph is damaged

signaller

If the train has a damaged pantograph or you have been told that part of the train or its load has been in contact with the OLE, you must only allow the train to move if one of the following applies:

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

6.4 Carrying out repairs

driver

You must **not** move the train until a competent person has carried out the necessary repairs if:

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

7

Excessive flashing of electrical equipment

The person responsible: driver

7.1 Preventing damage or danger from on-train equipment overheating

If you become aware of any serious defect or the electrical equipment overheating, including the train heating system, you must:

driver

- **immediately** lower the pantograph
- stop the train
- remove the train line key (if appropriate).

If lowering the pantograph cures the fault, you must:

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

7.2 If the pantograph will not lower

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

driver

8

Traction unit stopped in a neutral section

The people responsible: driver, signaller

driver

If your traction unit stops with the pantograph in a neutral section and it cannot proceed, you must **immediately** arrange with the signaller for assistance to be provided and the ECO to be told.

signaller

When the driver tells you that the train has stopped with the pantograph in a neutral section, you must tell Operations Control and the ECO.

9

Traction units driven off the contact wire

The person responsible: driver

If a traction unit has been driven off the contact wire with the pantograph raised, you must make sure the incident is reported to the ECO.

driver

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

10

PANCHEX monitoring system

The person responsible: driver

10.1 When a PANCHEX alarm is received

If a PANCHEX uplift exceedence alarm is received at a remote reporting location, the responsible person there will tell the train operator to which the train belongs:

- that an exceedence alarm has been received
- the location of the PANCHEX site concerned
- which locomotive or multiple-unit is involved.

driver

When the train operator's control has been told all of the above, they will:

- identify the train being worked by the locomotive or multiple-unit concerned
- identify the most convenient location for the pantograph to be checked
- arrange for a competent person to check the pantograph
- arrange for you to be told what has happened and what arrangements have been made for the pantograph to be checked.

10.2 Driver's actions

You may proceed normally to the location where the train is to be examined provided:

driver

- there are no unusual noises
- the OLE is behaving correctly
- the ADD does not operate
- there is no loss of line light.

If any of these do occur, you must:

- operate the pantograph down button
- immediately stop the train
- carry out the instructions in section 2 of this module (whichever is appropriate).

11

Defective automatic power control (APC) track inductor

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

11.1 Signaller's actions

signaller

If you have seen, or are told about, a loose, defective or broken APC track inductor, you must immediately report it to the ECO, who will make arrangements for it to be repaired or replaced.

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

11.2 Driver's actions

driver

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

12

Precautions to be taken when working on steam locomotives

The people responsible: person working on steam locomotives, driver

12.1 Climbing above floor level of driving cab

Except as shown below, you must never climb on engines or tenders above the floor level of the driving cab.

person
working on
steam
locomotives

You may only do this:

- on an unwired line if there is no OLE above or adjacent to the locomotive, or
- on a wired line if the OLE has been isolated and earthed and an Overhead Line Permit has been issued.

12.2 Using fire-irons or the slaker pipe

Except as shown below, you must never use any form of fire-iron or the slaker pipe when on or adjacent to electrified lines.

person
working on
locomotives

You may only use the slaker pipe in the firebox in an emergency. However, you must take care to direct the jet away from the OLE.

12.3 Driving in electrified areas

driver

Before entering an electrified area, you must make sure:

- the coal is not stacked higher than the driving cab top
- fire-irons are safely stored and do not extend above the top level of the cab.

To avoid damaging the electrical equipment, if possible, you must avoid stopping with the chimney below insulators or overhead structures.

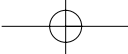
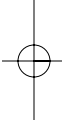
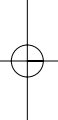
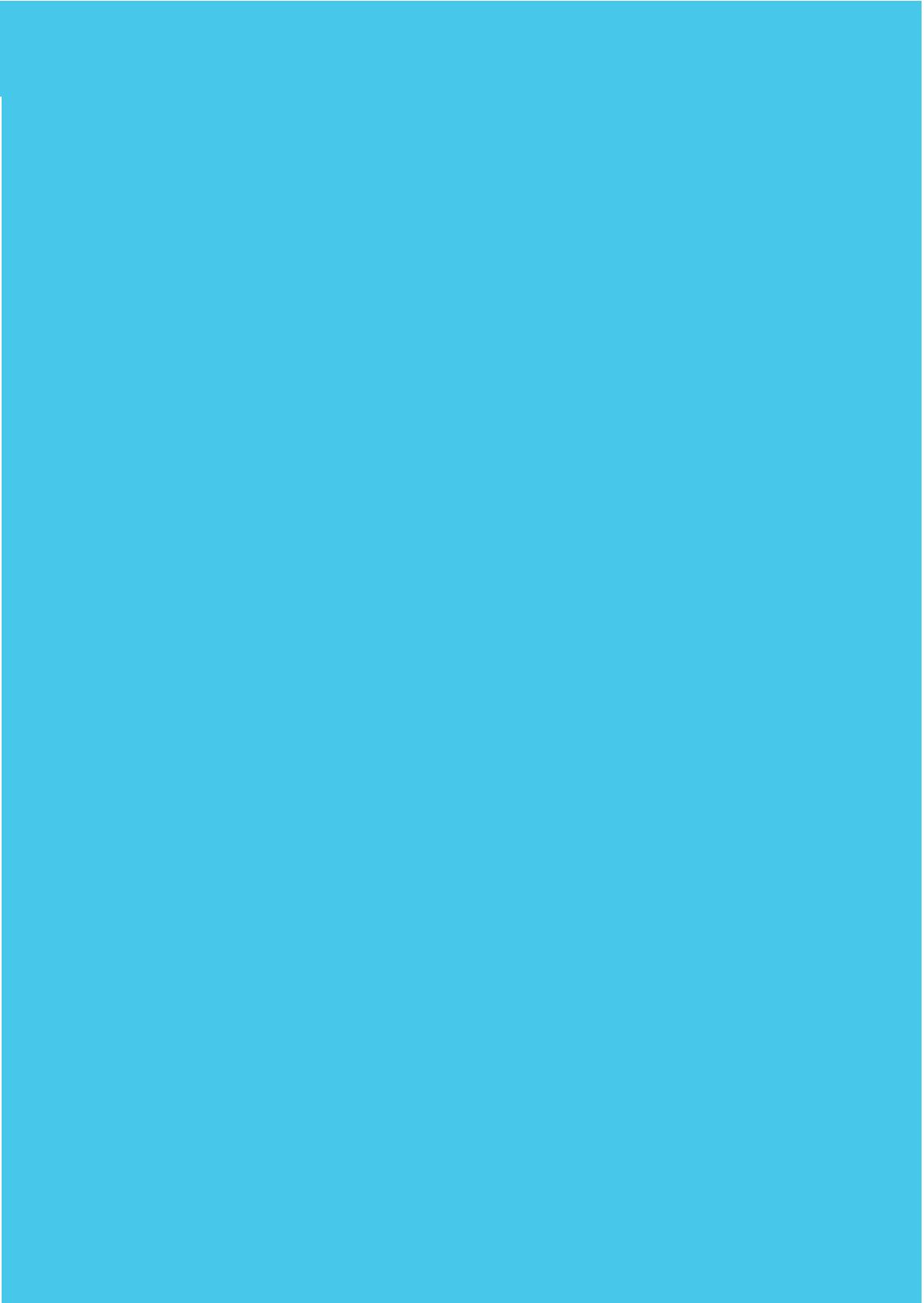


Additional instructions will be published in the *Special Notice* about each journey a steam locomotive is to make.

Glossary of terms and abbreviations

The term	Includes or means:
Competent person	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.
Operations Control	The general term used for Network Rail Operations Control offices.
Traction unit	Locomotive, multiple unit, self-propelled rail vehicle or road/rail vehicle operating in rail mode.
Train	Light locomotive, self-propelled rail vehicle or road-rail vehicle in rail mode.
Train operator	The company responsible for operating a train.
Train signalling regulations	Instructions for use by the signaller that give details of the rules, regulations and instructions relating to each different kind of signalling system.
Your employer	The company, or subsidiary of a larger organisation for whom you work.

Notes





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