

NR/L3/SIG/11231 Signal Maintenance Testing Handbook		
NR/SMTH/Part M04		
Index		
Issue No. 04	Issue Date: 06/09/14	Compliance Date: 07/03/15

Note: The issue status of each SMT is detailed in the NR/L3/SIG/11231 section and in the header of the individual SMT.

This section contains the missing signal maintenance test plans.

Subject	Number	Issue
Missing ATP Loop (Chilterns)	PartM04/AC01X	01
Missing ATP Beacon (GWML)	PartM04/AG01X	01
Missing ATP Loop (GWML)	PartM04/AG02X	01
Missing TPWS Plug in Module	PartM04/AP01X	01
Missing TPWS Transmitter Loop	PartM04/AP02X	01
Missing AWS Permanent Magnet	PartM04/AW01X	01
Missing AWS Electro Magnet	PartM04/AW02X	02
Missing Thales AzLM Axle Counter Rail Contact	PartM04/AX03X	01
Missing Thales AzLM Axle Counter EAK Board	PartM04/AX05X	01
Missing Thales AzLM Axle Counter Evaluator CPU Card	PartM04/AX06X	01
Replace a Thales AzLM Axle Counter Evaluator Serial/Parallel Card	PartM04/AX07X	01
Missing Siemens Axle Counter DEK 43 Wheel Detector or Trackside Connection Box	PartM04/AX26X	02
Missing Frauscher wheel sensor RSR123	PartM04/AX40X	02
Replace Missing a Platform Identification Beacon System	PartM04/BA02X	02
Missing Block Instrument	PartM04/BL01X	01
Missing Secondary Cell or Battery	PartM04/CE01X	01
Cambrian ERTMS: Replace a Missing Ansaldo Eurobalise	PartM04/IE11X	01
Cambrian ERTMS: Replace a Missing Reflective Board or Sign	PartM04/IE12X	01
Missing Barrelled or Clip In Component	PartM04/EL02X	01
Missing Filament Lamp	PartM04/EL04X	01
Missing Plug in Unit	PartM04/EL08X	01
Missing Lineside Disconnection Box	PartM04/EL25X	01
Missing Link	PartM04/EL26X	01
Missing Barrier Boom	PartM04/LD01X	01
Missing Level Crossing Filament Light Unit	PartM04/LD08X	01
Missing Point Hydraulic Power Pack	PartM04/PB02X	01
Missing Hose	PartM04/PB04X	01
Missing Point Detector/Mircoswitch	PartM04/PB05X	01
Missing HPSS Electrical Component	PartM04/PH01X	01
Missing HPSS Mechanical Component	PartM04/PH02X	01
Missing Lens	PartM04/SG02X	01
Missing Plug in Track Circuit Equipment	PartM04/TC01X	01
Missing Track Circuit Equipment	PartM04/TC02X	01

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Subject	Number	Issue
Missing Trackside Track Tuning Unit	PartM04/TC04X	01
Replace an Impedance Bond	PartM04/TC06X	01
Missing Silec Mechanical Treadle	PartM04/TQ01X	01

End

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NR/SMTH/Part M04/AC01X
Missing ATP Loop (Chilterns)
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Caution:



Where an incorrectly labelled cable core/wire is encountered and is causing a fault, see **DEFINED CHECK A6, Correct Labelling of Cables and Wires**, for how to proceed.

BEFORE REPLACEMENT

- 01 Remove the Modulator/Output Board.
- 02 Check for evidence on site and on the wiring diagrams that an ATP loop was previously fitted. If no evidence is present, consult the Signal and Telecom Maintenance Engineer.
- 03 Check replacement loop is Correct Type and is Not Damaged.
- 04 Check replacement loop is Correctly Labelled.
- 05 Check replacement loop has Safe Insulation.

AFTER REPLACEMENT

- 06 Check that loop has been Correctly Installed (correct length, one leg fixed to left hand rail in normal direction of travel, transpositions correct).
- 07 Check that loop is Correctly Labelled.
- 08 Check any joints are secure and sealed.
- 09 Refit the Modulation/Output Board.
- 10 Test loop transmission level [ATP Loop test (NR/SMS/Test/029)] and Record the test measurements on the appropriate NR/SMS record card, together with the reason for the test.
- 11 Carry out the Operational Checks [ATP Equipment (NR/SMS/AP12)].

End

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NR/SMTH/Part M04/AG01X
Missing ATP Beacon (GWML)
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Caution:



Where an incorrectly labelled cable core/wire is encountered and is causing a fault, see **DEFINED CHECK A6, Correct Labelling of Cables and Wires**, for how to proceed.

Includes: Beacon and beacon disconnection box.

BEFORE REPLACEMENT

- 01 Check supply is isolated.
- 02 Check for evidence on site and on the wiring diagrams that an ATP beacon was previously fitted. If no evidence is present, consult the Signal and Telecom Maintenance Engineer.
- 03 Check any existing wiring has Safe Insulation.
- 04 Check any existing wiring is Correctly Labelled.
- 05 INSULATION TEST existing cables if reused.
- 06 Check replacement unit is Not Damaged.

AFTER REPLACEMENT

- 07 Check replacement beacon has been Correctly Installed.
- 08 Check that the height of replacement beacon is 10mm +/- 1mm below the top surface of the running rails.
- 09 Check that the replacement beacon is mounted with the centre line of the beacon offset 150mm to the left of the track centre line looking towards the signal.
- 10 WIRE COUNT beacon disconnection box to wiring diagrams.
- 11 Reconnect beacon in ATP enclosure.
- 12 Check any links, and red dome nuts or equivalent, are correctly replaced and secure.
- *13 Check beacon operates correctly (LEDs on encoder flashing 50% duty cycle as follows: Signal Beacon A-H1, Infill or Additional Beacon B-H1).
- *14 Test Beacon signal level and check messages using ATP ground tester.

End

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Missing ATP Loop (GWML)
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Caution:



Where an incorrectly labelled cable core/wire is encountered and is causing a fault, see **DEFINED CHECK A6, Correct Labelling of Cables and Wires**, for how to proceed.

Includes: Loop Cable, TDA box and RDA box.

BEFORE REPLACEMENT

- 01 Check supply is Isolated.
- 02 Check for evidence on site and on the wiring diagrams that an ATP loop was previously fitted. If no evidence is present, consult the Signal and Telecom Maintenance Engineer.
- 03 Check replacement loop is Correct Type and is Not Damaged.
- 04 Check replacement loop is Correctly Labelled.
- 05 Check replacement loop has Safe Insulation.
- 06 Test resistance of loop from TDA box end (340 to 400 ohms).

AFTER REPLACEMENT

- 07 Check that loop has been Correctly Installed (correct length, one leg fixed to left hand rail in normal direction of travel, transpositions at approximately every 60m).
- 08 Check that loop is Correctly Labelled.
- 09 Test resistance of loop from TDA box end (340 to 400 ohms).
- 10 WIRE COUNT TDA box to wiring diagrams.
- 11 Reconnect loop in ATP enclosure.
- *12 Test loop signal level using ATP ground tester at intervals throughout the length of the cable.

End

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NR/SMTH/Part M04/AP01X
Missing TPWS Plug in Module
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

***** INDEPENDENCE EXEMPT *****

Includes:	Overspeed Sensor Modules, Train Stop Modules, Signalling Interface Modules.
Excludes:	TPWS Transmitter loops, Self-Powered OSS Modules (SPOSM).

BEFORE REPLACEMENT

- 01 Check replacement TPWS module is Correct Type (colour and pin code) and is Not Damaged and has no bent or misaligned spring contacts.
- 02 For a Train Stop or Overspeed Sensor module, Check by reference to other Train Stop or Overspeed Sensor modules located in the same apparatus case that the replacement TPWS module mod state is the same.
For a Signalling Interface module, Check by reference to other Signalling Interface modules located in the same apparatus case that the replacement TPWS module mod state is the same.
- 03 Check plugboard is free of contamination.
- 04 Check replacement TPWS Module is correctly sealed.
- 05 Check replacement TPWS module is Isolated from the supply.

AFTER REPLACEMENT

- 06 Check spades are locked in the plugboard.
- 07 Check replacement TPWS module is Correctly Installed and the retaining clip is in place.
- *08 Apply TPWS TRACKSIDE EQUIPMENT MAINTENANCE TEST to the equipment.
For the replacement of any TPWS module associated with an installation on concrete slab track, TPWS TRACKSIDE EQUIPMENT RENEWALS TEST shall be used.
- *09 Check or arrange for Correct Labelling of unit.

End

Caution: The arming loop is the first loop which the train runs over in the direction of travel for which the loops are provided, and the trigger loop is the second loop. In some cases there may be another loop between the arming and trigger loops, which forms part of a pair of loops provided for trains running in the opposite direction. Great care shall be exercised to ensure that each loop is connected to its correct module, as shown on the location wiring diagrams.



Caution: Where a not correctly labelled cable core/wire is encountered and is causing a fault, see DEFINED CHECK A6, Correct Labelling of Cables and Wires, for how to proceed.



Includes:	TPWS trigger or arming loops (including Buffer Stop Mini-Loops and loops on concrete slab track) associated with Train Stop or Overspeed Sensor Modules (including SPOSM) replaced following failure only.
Excludes:	ATP track loops.

BEFORE REPLACEMENT

- 01 Check supply is Isolated.
- 02 Check for evidence on site and on the wiring diagrams that the transmitter loop was previously fitted. If no evidence is present consult the Signal and Telecom Maintenance Engineer.

Caution:



It is very important that buffer stop mini-loops are not replaced with standard TPWS transmitter loops and vice versa.

- 03 Check replacement loop connection and plug coupler has Safe Insulation.
- 04 Check replacement loop is Correctly Labelled.
- 05 Test that replacement loop resistance is less than 10 ohms and that each core is Isolated from the screen. This shall only be done using a digital multi-meter (DMM) and not a high voltage insulation (Megger) tester.
- 06 Check replacement loop is Correct Type (mounting) and is Not Damaged.
- 07 Establish the correct transmitter loop position.

Note: This is likely to require re-measurement of the required distance (as shown on the location wiring diagram) from the associated signal to each loop.

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NR/SMTH/Part M04/AP02X
Missing TPWS Transmitter Loop
Issue No. 01
Issue Date: 05/03/11
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AFTER REPLACEMENT

- 08 Check replacement loop is Correctly Installed (no metallic debris, correct position, correct track).

Caution:



It is very important that the transmitter loops are installed at the correct height below rail level (see NR/SMS/Part/Z03).

- 09 Check security of the replacement loop (mountings).
- 10 Check the plug coupler to ensure that no metallic dust, moisture or other contaminants exists between the two halves before reconnecting.

Caution: It is vital that each loop is connected back to its correct terminations in the TPWS enclosure or apparatus case and in particular that arming loop and trigger loop tail / feeder cables are not crossed over, particularly if the disconnection box has been disturbed.



- *11 Apply TPWS TRACKSIDE EQUIPMENT MAINTENANCE TEST to the equipment.
For the replacement of any TPWS module associated with an installation on concrete slab track, TPWS TRACKSIDE EQUIPMENT RENEWALS TEST shall be used.
For the replacement of a Self Powered Overspeed Sensor Module TPWS SELF POWERED OSS (SPOSS) TRACKSIDE EQUIPMENT MAINTENANCE TEST shall be used.

End

NR/L3/SIG/11231 Signal Maintenance Testing Handbook
NR/SMTH/Part M04/AW01X
Missing AWS Permanent Magnet
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Includes:	AWS type depot test magnets.
Excludes:	Vortok depot test magnets.

BEFORE REPLACEMENT

- 01 Check for evidence on site and on the wiring diagrams that a magnet was previously fitted. If wiring diagrams show a suppressed magnet was fitted follow Missing Equipment Test Plan AW02M. If no evidence at all is present consult the Signal and Telecom Maintenance Engineer.
- 02 Check replacement magnet is Correct Type (Correct strength) and is Not Damaged. Refer to the strength of magnets on the same line. (Normally DC traction areas have high strength magnets.)

AFTER REPLACEMENT

- 03 Check replacement magnet is Correctly Installed.
- 04 Test lateral position and height of replacement magnet above or below rail level [Alignment, gauge (NR/SMS/AW11)].
- 05 Test replacement magnet [Strength and polarity (NR/SMS/Test/024)] and Record the test measurements on the appropriate NR/SMS record card, together with the reason for the test.

Note: For details of measuring depot test magnet strengths, see NR/GN/SIG/19040.

End

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NR/SMTH/Part M04/AW02X
Missing AWS Electro Magnet
Issue No. 02
Issue Date: 02/03/2013
Compliance Date: 07/09/2013



Where an incorrectly labelled cable core/wire is encountered and is causing a fault, see [DEFINED CHECK A6](#), Correct Labelling of Cables and Wires, for how to proceed.



Both Electro and Suppressed magnets can now be supplied with Mil 5015 plug coupled connection.

When testing a plug coupled unit, use a "Breakout box". **Under no circumstances use test equipment directly on the plug coupler pins and/or sockets.**

Includes:	All electro and suppressor inductors.
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BEFORE REPLACEMENT

- 01 [Check](#) supply is [Isolated](#).
- 02 [Check](#) for evidence on site and on the wiring diagrams that the inductor(s) were previously fitted. If no evidence is present consult the Signal and Telecom Maintenance Engineer.
- 03 [Check](#) any existing wiring has [Safe Insulation](#).
- 04 [Check](#) any existing wiring is [Correctly Labelled](#).
- 05 [INSULATION TEST](#) existing cable if reused.
- 06 [Check](#) diode or resistor is fitted where fed directly from a relay contact or where shown on the wiring diagram.
- 07 [Check](#) replacement inductor is [Correct Type](#) (Electro/suppressor, correct strength) and is [Not Damaged](#). Refer to the wiring diagrams for details of feed equipment to determine strength [General ([NR/SMS/Test/024](#))]. (Normally DC traction areas have extra strength inductors).
- 08 [INSULATION TEST](#) replacement inductor (minimum 2M ohms terminals to case).

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NR/SMTH/Part M04/AW02X
Missing AWS Electro Magnet
Issue No. 02
Issue Date: 02/03/2013
Compliance Date: 07/09/2013

AFTER REPLACEMENT

- 09 [Check](#) replacement inductor is [Correctly Installed](#).
- 10 [Check](#) wiring is replaced as labelled.
- 11 [WIRE COUNT](#) replacement inductor to the wiring diagram.
- 12 [Check](#) any links, and red dome nuts or equivalent, are correctly replaced and secure.
- 13 [EARTH TEST](#) supplies when replacement inductor energised.
- 14 [Test](#) lateral position and height of replacement inductor above or below rail level [Alignment, gauge ([NR/SMS/AW11](#))].
- 15 [Test](#) replacement inductor [Strength and polarity, diode (NR/SMS/Test/024)] and [Record](#) the test measurements on the appropriate NR/SMS record card, together with the reason for the test.

End

NR/L3/SIG/11231 Signal Maintenance Testing Handbook
NR/SMTH/Part M04/AX03X
Missing Thales AzLM Axle Counter Rail Contact
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Safety:



Prior to any work the following shall be undertaken:

- Take possession of the relevant axle counter section
- Disconnect the output of the evaluator to the signalling system.

Safety:



The output of the evaluator shall not be reconnected to the signalling system and possession given up unless the equipment has passed all tests and is fit for use.

Includes:	SK30H Rail Contacts connected to a EAK30H.
Excludes:	All other AzL rail contacts connected to other EAKs. Any Other Type of Axle Counter Rail Contact.

General

The EAK30H does not have to be powered down for this task.

New rail fixing nuts and bolts should be used when replacing a rail contact

Cables are supplied connected and sealed to the rail contact unit. A cable of any length (4m, 5.5m or 8m) can be used as long as there is sufficient to reach from the EAK

The signaller is responsible for resetting the axle counter.

BEFORE REPLACEMENT

- 01 Check that the affected section is correctly Isolated. Slip the disconnection links for all affected sections.
- 02 Check for evidence on site and on the diagrams that a rail contact was previously fitted. If no evidence is present, inform the Signal and Telecom Maintenance Engineer.
- 03 WIRE COUNT (including the screen) any existing cable from the missing rail contact to the wiring diagram.
- 04 Check that the replacement rail contact is of the Correct Type and is Not Damaged

Note: The length of the attached cable can vary (see notes in general section).

- 05 Check if protection or flux plates are required. The diagrams should tell you this, but, if you are in any doubt, ask your Section Manager (Signals).

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Missing Thales AzLM Axle Counter Rail Contact
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AFTER REPLACEMENT

- 06 Check that the orientation of the replacement rail contact is correct to the reference (normal) direction of travel (SK1-SK2) [Direction of travel (NR/SMS/AX15)].
- 07 Check the position of the replacement rail contact in respect of clearance points, joints, welds etc.
- 08 Check the replacement rail contact is Correctly Installed and secure [Rail contact, fittings (NR/SMS/AX00, NR/SMS/AX15)]. Check that new rail fixing nuts and bolts have been used.
- 09 Check (if provided) the protection plates and flux plates are Correctly Installed and secure.
- 10 WIRE COUNT (including the screen) the replacement rail contact to the wiring diagram.
- 11 Check the cable screen is clamped correctly.
- 12 Check that the cable cores from the cable clamp to the terminals in the EAK are twisted together.
- 13 Check that the cable is Correctly Labelled.
- 14 Check that the cable is secured and correctly routed.
- 15 Remove any litter and metallic objects near the replacement rail contact.
- 16 Test the replacement rail contact [Dummy wheel test (NR/SMS/Test/045)] and Record the test measurements on the appropriate NR/SMS record card, together with the reason for the test.
- 17 With the signaller's permission, reconnect the section disconnection link(s).
- 18 Check with the signaller that the section is successfully restored to normal operation. If possible, Observe a train through the section.

End

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NR/SMTH/Part M04/AX05X
Missing Thales AzLM Axle Counter EAK Board
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Safety:



Prior to any work the following shall be undertaken:

- Take possession of the relevant axle counter section
- Disconnect the output of the evaluator to the signalling system.

Safety:



The output of the evaluator shall not be reconnected to the signalling system and possession given up unless the equipment has passed all tests and is fit for use.

Caution:



The EAK30H shall be powered down for this task by disconnection of the power supply at the REB or the local supply. If the EAK is powered up with a board missing, there is a possibility of damage to other electronics in the system.

Caution:



Appropriate electrostatic precautions shall be taken when handling boards. Where provided electrostatic discharge points (ESD) shall be used.

Includes:	EAK30H Digital (evaluator) and Analogue (rail contact) Boards.
Excludes:	Any other board or card in other EAK units.

General

The digital board is 'plug and go' but replacement of the analogue board will require adjustment of the rail contacts.

The signaller is responsible for resetting the axle counter.

BEFORE REPLACEMENT

- 01 Check that the affected section is correctly Isolated. Slip the disconnection links for all affected sections.
- 02 Check that the EAK unit is correctly Isolated from the power supply.
- 03 Check that the board connector on the sub rack is Not Damaged.
- 04 Check the remaining board is Correctly Installed, secure and Not Damaged.
- 05 Check that the replacement board is of the Correct Type and is Not Damaged.

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Missing Thales AzLM Axle Counter EAK Board
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AFTER REPLACEMENT

- 06 Check the replacement unit is Correctly Installed and secure.
- 07 Restore the power to the EAK unit.
- 08 Test the operation of the replacement board [Dummy wheel test (NR/SMS/Test/045)] and Record the test measurements on the appropriate NR/SMS record card, together with the reason for the test.

Note: **If not operating, use the diagnostic software at the evaluator end of the system to assist in locating the problem.**
Replacement of the analogue board will require adjustment of the rail contacts.

- 09 With the signallers permission, reconnect the section disconnection link(s).
- 10 Check with the signaller that the section is successfully restored to normal operation. If possible, Observe a train through the section.

End

NR/L3/SIG/11231 Signal Maintenance Testing Handbook
NR/SMTH/Part M04/AX06X
Missing Thales AzLM Axle Counter Evaluator CPU Card
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Safety: Before any work is undertaken the following shall be undertaken:



- Possession of the relevant axle counter section (up to 32 different sections could be affected)
- Disconnection of the output of the evaluator to the signalling system.

Safety:



The output of the evaluator shall not be reconnected to the signalling system and possession given up unless the equipment has passed all tests and is fit for use.

Caution:



The evaluator shall be powered down for this task by disconnection of its power supply.

Caution:



Appropriate electrostatic precautions shall be taken when handling boards. Where provided electrostatic discharge points (ESD) shall be used.

Includes:	AzLM Evaluator CPU Card.
Excludes:	AzLM Evaluator Serial and Parallel Cards (see Test Plan AX07X), any other axle counter evaluator or their cards.

General

Some installations have a '2 out of 3' system where the removal of one CPU card will not affect the working of the other two. If you are in doubt about the installation, ask your SM(S).

CPU boards are uniquely identified to include the data version number, replacement boards shall be operating the same site specific version of geographic data as the one they are replacing otherwise the evaluator will shut down. The Status Record Index Sheet (SRIS) will tell you the status of the board hardware and software.

The signaller is responsible for resetting the axle counter.

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Missing Thales AzLM Axle Counter Evaluator CPU Card
Issue No. 01
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BEFORE REPLACEMENT

- 01 Check that the affected section(s) are correctly Isolated. Slip the disconnection links for all affected sections.
- 02 Check for evidence on site and on the diagrams that an evaluator with a CPU card was previously fitted. If no evidence is present, inform the Signal and Telecom Maintenance Engineer.
- 03 Check that the evaluator is correctly Isolated from the power supply.
- 04 Check that the replacement CPU card is of the Correct Type and is Not Damaged. Check that the replacement card status corresponds with the SRIS record.
- 05 Check using diagrams and/or site records that the jumper setting on the replacement CPU card are correct.

AFTER REPLACEMENT

- 06 Check using diagrams and/or site records that the replacement CPU card has identical jumper settings in the same slots as the original.
- 07 Check the replacement CPU card is Correctly Installed and secure.
- 08 Restore the power to the evaluator.
- 09 Check that the software version of the replacement CPU card corresponds with that of the original. Use the diagnostic software for this task.
- 10 Check that the affected axle counter sections are disturbed. Use the diagnostic software for this task.
- 11 Check that the correct serial and parallel I/O card LEDs are illuminated [LED indications (NR/SMS/AX15)].
- 12 With the signaller's permission, reconnect the section disconnection link(s).
- 13 Check with the signaller that the section(s) are successfully restored to normal operation. If possible, Observe a train through the section(s).

End

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NR/SMTH/Part M04/AX07X
Missing Thales AzLM Axle Counter Evaluator Serial/Parallel Card
Issue No. 01
Issue Date: 05/03/11
Compliance Date: 03/09/11

Safety: Prior to any work the following shall be undertaken:



- Take possession of the relevant axle counter section (the removal of a serial card will affect one or more sections depending on the detection points served by it, the removal of a parallel card will affect one section)
- Disconnect the output of the evaluator to the signalling system.

Safety:



The output of the evaluator shall not be reconnected to the signalling system and possession given up unless the equipment has passed all tests and is fit for use.

Caution:



Appropriate electrostatic precautions shall be taken when handling boards. Where provided electrostatic discharge points (ESD) shall be used.

Includes:	AzLM Evaluator I/O Serial and Parallel Cards.
Excludes:	AzLM Evaluator CPU Cards (see Test Plan AX06M), any other axle counter evaluator or their cards.

General

The evaluator does not require to be powered down for this task.

Serial and parallel cards are not site specific.

The signaller is responsible for resetting the axle counter.

BEFORE REPLACEMENT

- 01 Check that the affected section(s) are correctly Isolated. Slip the disconnection links for all affected sections.
- 02 Check for evidence on site and on the diagrams that an input/out serial/parallel card was previously fitted. If no evidence is present, inform the Signal and Telecom Maintenance Engineer.
- 03 Check that the replacement card is of the Correct Type and is Not Damaged. Check that the replacement card part number corresponds with the diagram.

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- 04 Check the replacement card is Correctly Installed and secure.
- 05 Check that the correct serial and parallel I/O card LEDs are illuminated [LED indications (NR/SMS AX15)].
Use the diagnostic software to locate any problems.
- 06 With the signaller's permission, reconnect the section disconnection link(s).
- 07 Check with the signaller that the section(s) are successfully restored to normal operation. If possible, Observe a train through the section(s).

End