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	NETWORK RAIL - SIGNAL ENGINEERING LED SL35 Replacements Units	
Relevant Standard	NR/L2/SIG/30014/G110	

Purpose

This TI mandates the process to be applied when installing LED SL35 modules and associated dummy ER units. It provides the briefing material for installation, the installation instructions and the testing procedure that shall be used.

Scope

This TI applies to the replacement of conventional SL35 or SL18 lamps and ER with an LED SL35 module and dummy ER by staff holding Signal Maintenance Testing competence.

Staff to be Briefed

Before commencing installation work all staff shall have been briefed on the contents of this Technical Instruction.

Role	Responsible for Briefing
Head of Asset Management [S&T]	Author
Route Asset Managers [Signalling]	Head of Asset Management [S&T]
Signal & Telecoms Maintenance Engineer	Route Asset Managers [Signalling]
Section Manager (Signals)	Signal & Telecoms Maintenance Engineer
Works Delivery Manager	Signal & Telecoms Maintenance Engineer
Signal Technicians Signalling Technical Support Staff	Section Manager (Signals)
Senior Programme Engineering Manager	Author

Compliance requirements

The requirements of this TI shall be complied with immediately.

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Background

Howells Railway Products Ltd has developed an LED SL35 module (sometimes referred to as a Light Engine) as a replacement for the conventional SL35 and SL18 lamp. The development of the product has taken the opportunity to remove a number of failure modes associated with the lamp lighting circuit of a conventional signal head.

Installation

To overcome 'lamp' failures due to the poor electrical contact of the lamp springs, flying leads are now utilised so the lamp springs only provide mechanical security. It is important these installation instructions are followed carefully, and thus the LED SL35 module is correctly positioned & secured in the lamp holder. Unlike a filament lamp the LED SL35 module will still illuminate and satisfy current proving when not correctly installed in the lamp holder. When installing to a Westinghouse lamp holder type make certain you have the correct version that is compatible with the lamp holder as it has a cut-away section to provide clearance for the common terminal as shown in figure 1.

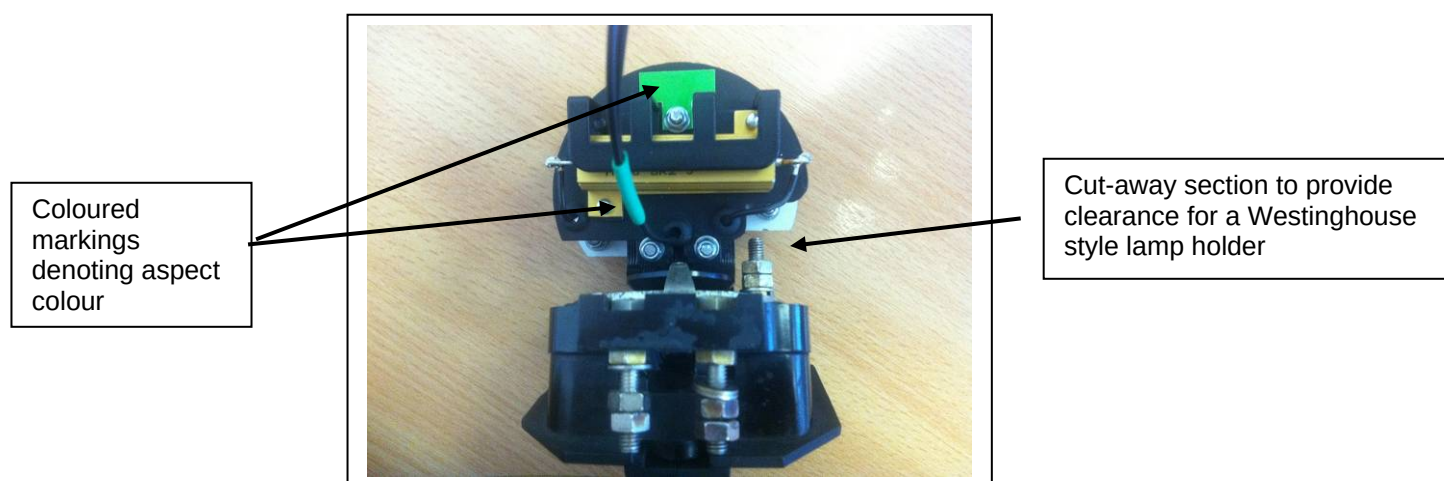


Figure 1 – Westinghouse Lamp Holder & Green LED Module

IMPORTANT – The LED SL35 modules are designed to replace SL35 & SL18 filament lamps; however the LED SL35 modules are coloured (Red, Yellow, Green & White) to match the aspect and shall be fitted in the correct colour of aspect in order to maintain the optical performance of the signal. The LED SL35 module colour is indicated by a coloured sleeve fitted to the Main and Common wires extending from the unit and a coloured marking on the rear of the unit. Green SHALL ONLY be fitted to a Green Aspect, Red to a Red Aspect and Yellow to a Yellow Aspect. On no account should a white LED unit be fitted to anything other than a White Aspect in a Position Light Junction Indicator. DO NOT REMOVE THE INNER COLOURED LENS AS THIS IS STILL REQUIRED. Lamp proving is achieved by the current drawn by the ballast resistor fitted to the rear of the unit. Should light output degrade or individual LEDs fail then the module will detect this and reduce the current drawn from the supply resulting in lamp proving failure.

The Filament Changeover Relay is also replaced as part of the installation with a separate unit that connects pins 1 to 3, 6 to 8 and 2 to 7 to prevent first filament alarms being falsely

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indicated. This replacement unit shall only be fitted after the LED Light Engine has been installed and shall not be used with a filament lamp.

For signals that are capable of displaying Flashing Aspects TI100 Issue 2 shall be applied, otherwise the aspect will not flash when required.

Installation instructions

1. Before commencing work obtain permission from the signaller,
2. Remove the existing Filament lamp from its lamp holder,
3. Fit the Light Engine in its place using the same push and turn technique, checking that the unit is located & secure and that the front face is parallel to the inner lens,
4. Disconnect 'Fast-On' plug on signal wiring loom from position **M**,
5. Using Spanners provided remove locking nuts from positions **M** and **C**. It may be necessary to hold the lower nut while removing lock nuts,
6. Remove second nut from position **M** taking care to maintain 'Fast-On' tab in place, Place supplied 'Fast-On' tab onto position **M** and replace nut and washer. Using spanners provided retighten lock-nuts,
7. Repeat for position **C**,
8. Reconnect 'Fast-On' plug on signal wiring loom from position **M**,

Note: Terminal A shall not be used for Light Engine Flying Leads.

9. Connect the leads from the Light Engine to the **M** and **C** terminals of the lamp holder,
10. Remove existing ER relay,
11. Install replacement dummy ER unit.

Replacement is now complete. Please note that the Light Engine becomes hot during operation, this is normal and care should be taken if the unit needs to be removed for any reason – a cooling period should be allowed if possible before handling the unit.

Test Plan



Documents
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Includes:

Howells LED SL35 Replacement Module and Dummy Filament Changeover Unit (Complete Signal Head Conversion only)

Excludes:

Conventional SL35

Caution



Check that when changing LED units the correct colour LED unit is placed in the correct aspect aperture. Each LED unit is designed to fit in place of an SL35 or SL18 filament lamp but shall be fitted in the correct colour of aspect. The LED colours are indicated by a coloured sleeve fitted to the Main and Common wires extending from the unit. Green SHALL ONLY be fitted to a Green Aspect, Red to a Red Aspect and Yellow to a Yellow Aspect. On no account shall a white LED unit be fitted to anything other than a White Aspect. DO NOT REMOVE THE INNER COLOURED LENS AS THIS IS STILL REQUIRED.

Note: Replacement of the ER with a Dummy Filament Changeover will result in an increase of voltage of approximately 0.5 - 1v.

BEFORE INSTALLATION WORK

- 01 [Check](#) LED SL35 replacement module is [Not Damaged](#), is [Correct Type](#), free of contamination and the colour of the module corresponds to the colour of the aspect it is being fitted to (Colour coding of the module is denoted by the colour of the sleeve on the Main (M) and Common (C) unit wiring).
- 02 [Check](#) replacement dummy filament changeover unit is [Not Damaged](#) and free of contamination.
- 03 [Check](#) signal head is sealed (Door seal intact, no case damage, no extraneous light enters and cable entry sealed).
- 04 [Check](#) existing wiring has [Safe Insulation](#).
- 05 [Check](#) existing wiring is [Correctly Labelled](#).
- 06 [Check](#) lamp holder is [Not Damaged](#)
- 07 [Check](#) filament changeover plug board is free of contamination
- 08 [Check](#) that the signal head is [Isolated](#) from the supply.

Note: [Install](#) LED SL35 replacement module to the attached diagram and insert Dummy ER. Insert LED SL35 replacement module diagram inside the signal head and location diagrams