

# TECHNICAL INSTRUCTION

TI 161  
Issue 1  
24/05/2011  
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NETWORK RAIL - SIGNAL ENGINEERING

## GETS Electronic Treadle Unit (ETU), Final Function Test of Output Relay

**Relevant Standard:** NR/L3/SIG/10663

### Purpose

The purpose of this Technical Instruction is to introduce a mandatory final function test for the output relay where used in conjunction with the GETS Electronic Treadle System.

### Scope

The Scope defines:

- The functional testing required as a final test.
- The TI will apply to Testing and Commissioning of all current and future GETS ETS projects
- The TI will apply to Maintenance and Faulting Teams when any intervention of the ETU is required as a result of routine testing or failure management.

### Background

During the Testing and Commissioning of the GETS Electronic Treadle Unit for a project in Scotland, a potential WSF was discovered. The treadle failed in a state that meant the QNR relay remained energised regardless of whether a wheel was sensed or not (or even whether the ETU-A was powered). Atkins TIC were asked to investigate and concluded that the failure was caused by a short circuit in the four solid-state opto isolating output relays. They believe that it was caused by over current due to a meter configured for current being accidentally put across the relay coil or some other form of short circuit being applied to the ETU output, causing high current through the treadle solid-state contacts, resulting in a permanent feed to the QNR relay.

### Abbreviations & Definitions

ETS – Electronic Treadle System  
ETU- Electronic Treadle Unit  
GETS – GE Transportation Systems  
QNR – Treadle Normal Relay  
TI – Technical Instruction  
TIC – Technical Investigation Centre  
WSF – Wrong Side Failure

### Final Function Test

As a final function test of the ETS the output relay shall be proven to be operating correctly in conjunction with the operation of the treadle by following these steps:

- *Swipe* the electronic treadle with the test block for the normal direction of travel
- *Check* that the ETU indication shows occupied
- *Check* that the relevant relay driven by the ETU output (QNR or other) de-energises
- *Check* that the ETU indication reverts to not occupied after the relevant time expires
- *Check* that the relevant relay driven by the ETU output (QNR or other) energises

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**PUBLISHED UNDER NR/L2/SIG/11120**

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**Fig 1 Indication arrangement on the ETU**

## **Compliance Requirements**

This TI is mandatory and shall be complied with by Network Rail and its contractors from 24/05/2011.

## **Action Required**

Testing and Commissioning Engineers, Faulting and Maintenance staff shall comply with this Technical Instruction as a final function test after any work on the ETS involving intervention, including routine maintenance where voltage measurements are taken.

## **Staff to be Briefed**

| Role                                                     | Responsible for Briefing               |
|----------------------------------------------------------|----------------------------------------|
| Head of Asset Management [S&T]                           | Author                                 |
| Route Asset Managers [S&T]                               | Head of Asset Management [S&T]         |
| Signal & Telecoms Maintenance Engineer                   | Route Asset Managers [S&T]             |
| Section Manager (Signals)                                | Signal & Telecoms Maintenance Engineer |
| Signal Technicians<br>Signalling Technical Support Staff | Section Manager (Signals)              |
| Senior Project Engineer [SPC]                            | Author                                 |
| Senior Programme Engineering Manager                     | Senior Project Engineer [SPC]          |
| Senior Programme Managers                                | Senior Programme Engineering Manager   |
| Senior Project Engineers                                 | Senior Programme Managers              |
| Project Engineers                                        | Senior Programme Managers              |
| Contractors                                              | Senior Programme Managers              |

End