



# **ROTARY TORQUE TRANSDUCER AND AMPLIFIER**

FOR USE WITH ELECTRONIC TRANSDUCER SYSTEM (E.T.S)

**OPERATORS HANDBOOK (PART NO. 34146)**

ISSUE 5

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# ROTARY TORQUE TRANSDUCER AND AMPLIFIER

## INTRODUCTION

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The ETS Rotary Torque Transducer comes with its own matching amplifier module and share the same serial and model number. Transducers can be calibrated in either Nm, lbf ft or lbf ins as standard, but other units of Torque are available i.e cNm, dNm, Kgf cm and Kgf m.

The transducer shaft is made from heat treated stainless steel on to which are bonded strain gauges which are wired to form a wheatstone bridge. The strain gauges vary their resistance in direct proportion to the Torque applied. The small change in resistance causes a change in voltage across the bridge that is then amplified by the amplifier module.

The amplifier module is calibrated to each transducer and at its heart is an Instrumentation Amplifier. Housed within the amplifier module are the bridge balance potentiometers, gain setting potentiometer and bridge test potentiometer along with the range and decimal point coding resistors. The whole is potted in silicon rubber within a plastic shell.

The amplifier operates from supplies of a +/- 10v and a constant current of 20mA which is delivered to the bridge via the zero network. The output voltage from the amplifier is fed to the internal circuitry of the ETS.

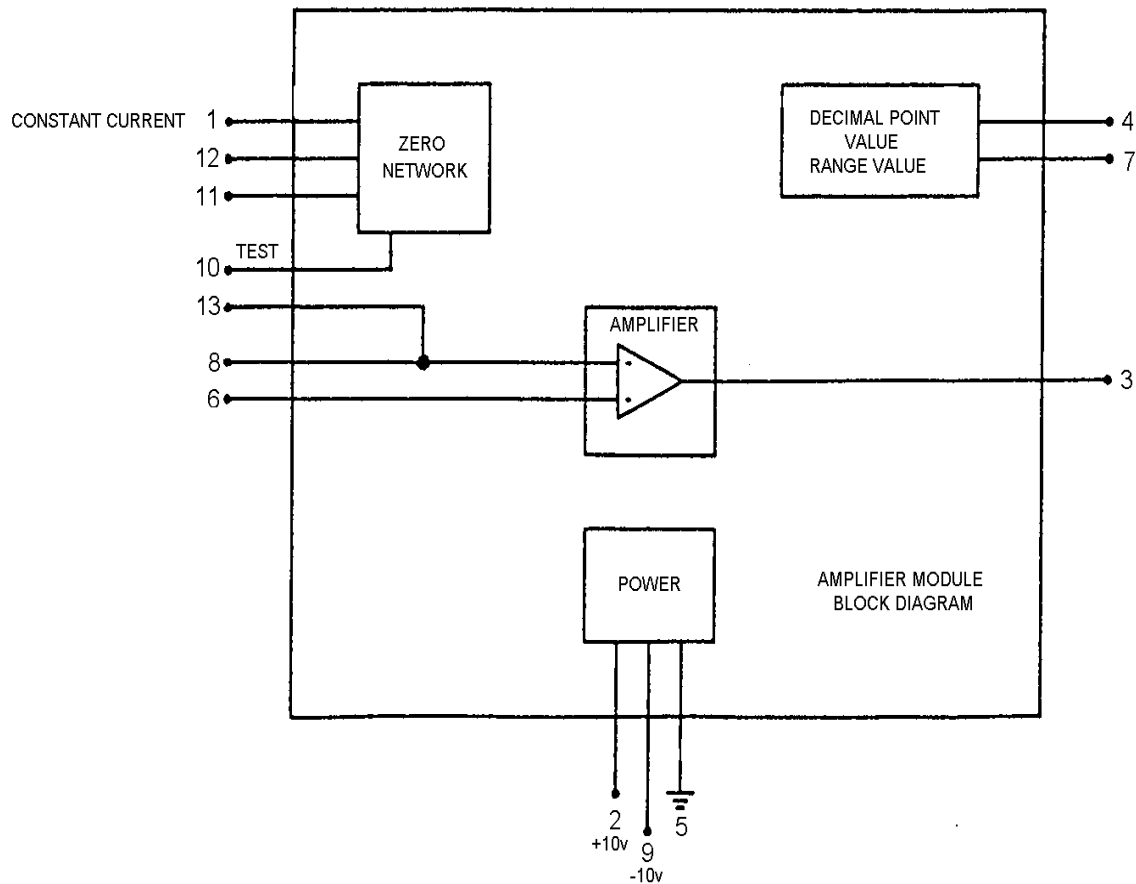
## SPECIFICATION

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Accuracy	See calibration cetificate supplied with transducer.
Amplifier Output	1.0000 volts Full Scale Defection for Nm, dNm and cNm. 1.3558 volts Full Scale Defection for lbf ft. 1.1299 volts Full Scale Defection for lbf ins. 0.9807 volts Full Scale Defection for Kgf cm and Kgf m
Amplifier Power Requirement	+/- 10v D.C. Regulated..
Constant Current	20mA +/- .01 mA
Operating Temperature Range	-10°C - +50°C
Storage Temperature Range	-20°C - +70°C
Temperature Co-efficient	<+/- 0.01%/°C. Full Scale Defection on zero <+/- 0.03%/°C. Full Scale Defection on span
Maximum working overload	120% of rated capacity
Absolute maximum torsion	150% of rated capacity
Maximum rotational speed	5000 rpm

## AMPLIFIER AND TRANSDUCER CONNECTIONS

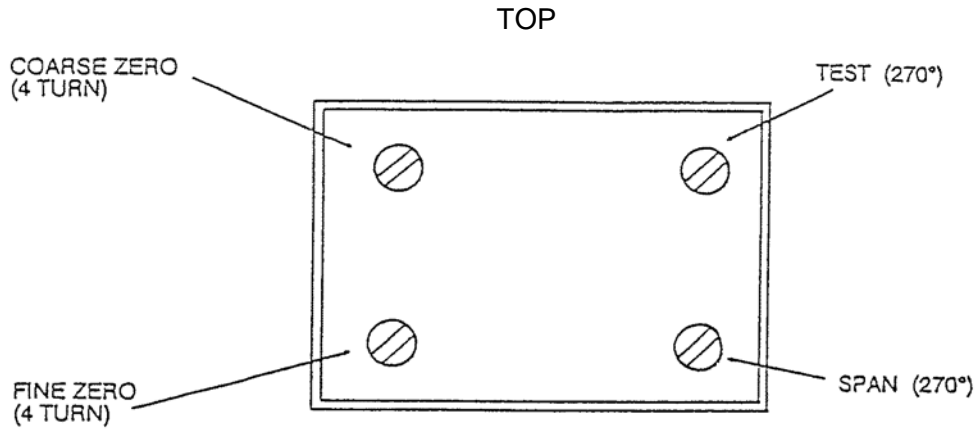
### AMPLIFIER



- Pin 1      Constant current 20mA.input to amplifier
- Pin 2      +10 volt supply
- Pin 3      Amplifier output
- Pin 4      Select decimal point output to ETS.
- Pin 5      0v common, (Connected to Pin F of Transducer via Transducer lead).
- Pin 6      Input from Strain Gauge Bridge, (Connected to Pin A of Transducer via Transducer lead).
- Pin 7      Select Range output to ETS.
- Pin 8      Input from Strain Gauge Bridge, (Connected to Pin B of Transducer via Transducer lead).
- Pin 9      -10 volt supply
- Pin 10     Test switch input, Shorted to Pin 11 when Test button pressed.
- Pin 11     Supply to Bridge from amplifier, (Connected to Pin D of Transducer via Transducer lead).
- Pin 12     Not Used
- Pin 13     Bridge Balance, (Connected to Pin A of Transducer via Transducer lead).

**AMPLIFIER CONTROLS**

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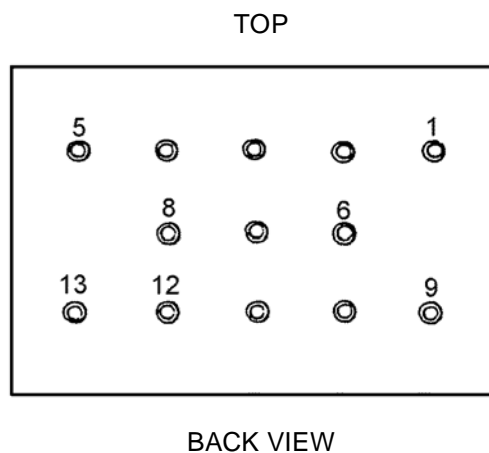


The adjustments available are as follows:-

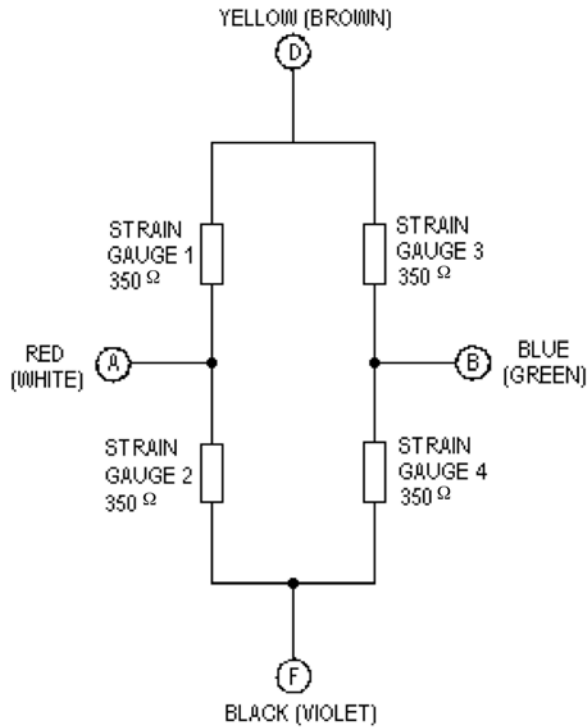
- Fine Zero            To remove any temperature drift effect or non zero reading.
- Coarse Zero        Used for initial bridge balancing, this potentiometer is covered by the label and should not need adjustment.
- Test                 When the TEST switch on the ETS back panel is pushed and held in, the ETS display should read the full scale capacity to which the transducer has been calibrated. This is only for indication purposes only and not a calibration check. This potentiometer is covered by the label and should only need adjustment if the span potentiometer is adjusted.
- Span                 This potentiometer is used to calibrate the amplifier to the transducer when the full scale Torque is applied to the transducer. This potentiometer is covered by a green tamper proof label and should only need adjustment if recalibrating the transducer.

**AMPLIFIER PIN LAYOUT**

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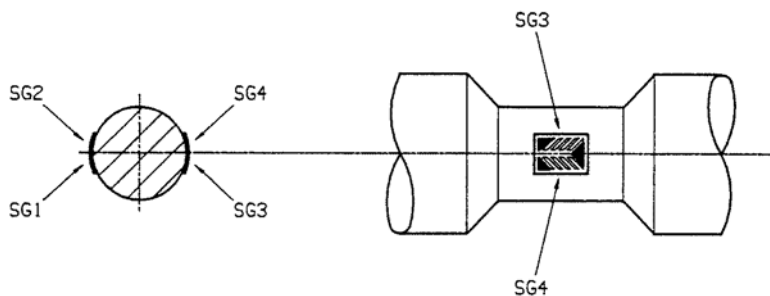
**ROTARY TORQUE TRANSDUCER WIRING DIAGRAM**



NOTE: Colours in brackets refer to transducers pre August 2000.

RESISTANCE BETWEEN TERMINALS	
A TO F	263 OHMS
B TO F	263 OHMS
D TO F	350 OHMS
A TO B	350 OHMS

BRIDGE SIGNALS	
A	SIGNAL OUT
B	SIGNAL OUT
D	POSITIVE EXCITATION
F	NEGATIVE EXCITATION

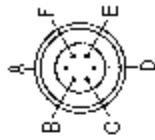


**TRANSDUCER LEAD FOR ETS (not included)**

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NOTE: COLOURS IN BRACKETS  
REFER TO TRANSDUCER  
LEADS PRE AUGUST 2000.

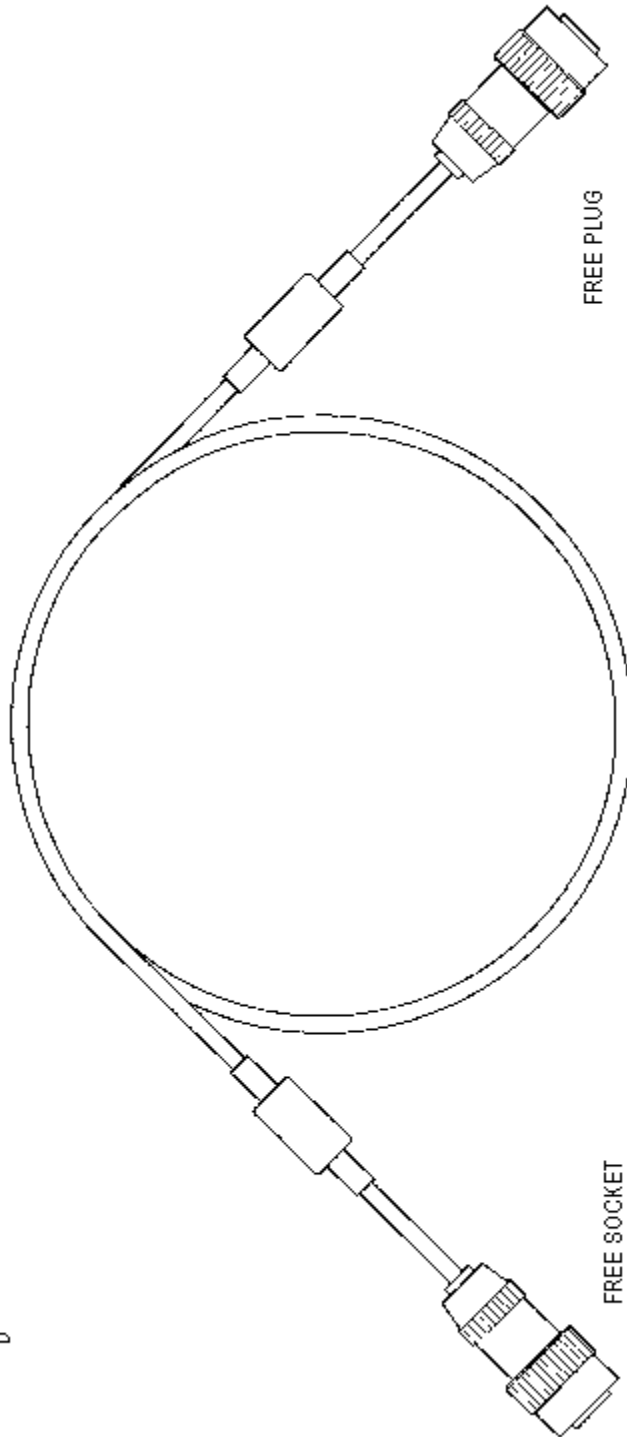
CABLE CONNECTORS	
A - RED (WHITE)	
B - BLUE (GREEN)	
C - GREEN (RED)	
D - YELLOW	
E -	
F - BLACK (BLUE)	



FREE PLUG VIEWED  
FROM CABLE END



FREE SOCKET VIEWED  
FROM CABLE END



FREE PLUG

FREE SOCKET