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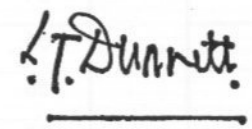
TURBINE VIBRATION INDICATOR, VIBRATION PICK-UP AND CABLE ASSEMBLY

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL



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AMENDMENT RECORD SHEET

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LIST OF CHAPTERS

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Chapter 1

DESCRIPTION AND OPERATION

LEADING PARTICULARS

Unit	*TVI vibration pick-up* (*Part No.* 19322-0) *TVI cable assembly* (*Part No.* 7487-462)
Dimensions	2·578 *in* (*length*) × 1·5 *in* (*dia*) 1·5 *ft* (*length*)
Weight	0·47 *lb* (0·213 *Kg*)

Introduction

1. The TVI vibration pick-up is an electro-magnetic transducer which serves as the sensing element for the Sperry turbine engine vibration indicator. The TVI cable assembly connects the output from the TVI vibration pick-up to the Sperry turbine engine vibration indicator.

2. The TVI vibration pick-up and cable assembly will operate within a temperature range of −54°C to +427°C (−65°F to +800°F).

TVI VIBRATION PICK-UP (fig. 1)

Description

3. The TVI vibration pick-up consists of a spring supported magnet assembly and a coil assembly, enclosed in a stainless steel housing. A flange on one end of the housing is used to mount the pick-up on the turbine engine. At the other end of the housing a special socket provides for the output of the pick-up to be connected to the TVI cable assembly.

Operation

4. The spring-supported magnet assembly, which has a low natural frequency of vibration, moves relative to the fixed coil assembly. The field of the magnet assembly moving in accordance with any forcing vibration, cuts the turns of the coil and produces a voltage proportional to the velocity of vibration. The induced voltage is fed via the TVI cable assembly to the input of the Sperry turbine engine vibration indicator.

CABLE ASSEMBLY (fig. 2)

Description

5. The TVI cable assembly is constructed from high temperature cable. It consists of a length of dual conductor wire. One end is fitted with a special two-wire connector and a nut for securing the cable assembly to the TVI vibration pick-up. The other end is wired to the socket mating with the 19-way Cannon electrical connector on the Sperry turbine engine vibration indicator.

Operation

6. The TVI cable assembly carries the induced voltage from the TVI vibration pick-up to the Sperry turbine engine vibration indicator via the conductor, colour-coded white. The other conductor, colour coded black is grounded.

PACKAGING AND TRANSPORTATION DATA

TVI vibration pick-up

7. These instructions are applicable to temperate and tropical climates.

(1) Packaging for storage.

(a) Wrap the instrument in PVC sheet BS1763 secured with waterproof adhesive fabric tape CS2191.

(b) Secure a two-ounce (56gm) bag of silica gel BS2540 to the rear of the instrument.

(c) Place the instrument in a polythene bag CS2596 4·5 in × 4.5 in × 0·020 in thick. (11.4 cm × 11·4 cm × 0·4 mm thick) extract excess air and heat seal.

(d) Cushion the package in the primary container with cellulose wadding DEF1248 ensuring a close fit.

(e) Secure the lid of the primary container with gummed Kraft paper tape DEF1299 two inches wide.

(f) Attach a label to the container with transparent adhesive tape. The label should

indicate the reference number and serial number of the instrument, the modification state and date of last overhaul.

(2) Packaging for transport.

(a) Make a copy of the label attached to the primary container.

(b) Cushion the primary container with cellulose wadding in the outer container, ensuring a close fit.

(c) Secure the lid of the outer container with gummed Kraft paper tape.

(d) Attach the label, heat sealed in a polythene envelope to the outer container with transparent adhesive tape.

TVI cable assembly

8. These instructions are applicable to temperate and tropical climates.

(1) Packaging for storage.

(a) Roll the TVI cable assembly into a coil about 9 in (23 cm) diameter and secure.

(b) Wrap the coil in PVC sheet BS1763 secured with waterproof adhesive fabric tape CS2191.

(c) Secure a two ounce (56 gm) bag of silica gel BS2540 to the package.

(d) Place the package in a polythene bag CS2596 12 in × 12 in × 0·020 in thick (30·5 cm × 30·5 cm × 0·5 mm thick), extract excess air and heat seal.

(e) Cushion the package in the primary container with cellulose wadding DEF1248 ensuring a close fit.

(f) Secure the lid of the primary container with gummed Kraft paper tape DEF1299 two inches wide.

(g) Attach a label to the container with transparent adhesive tape. The label should indicate the reference number of the cable and the date of last overhaul.

(2) Packaging for transport.

(a) Make a copy of the label attached to the primary container.

(b) Cushion the primary container with cellulose wadding in the outer container ensuring a close fit.

(c) Secure the lid of the outer container with gummed Kraft paper tape.

(d) Attach a copy of the label, heat sealed in a polythene envelope, to the outer container with transparent adhesive tape.

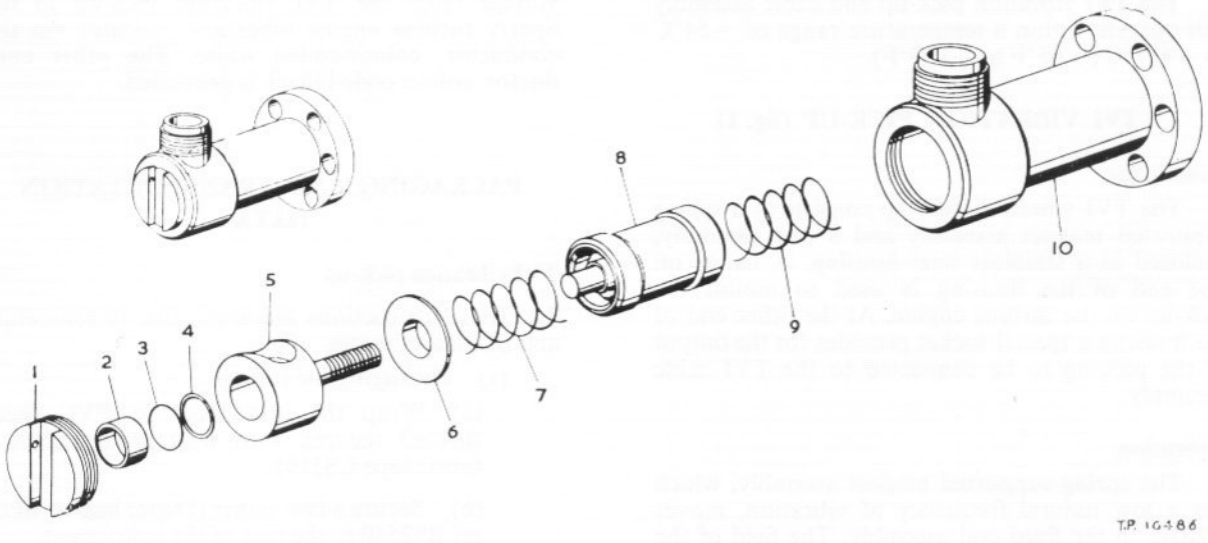

Fig. 1. TVI vibration pick-up

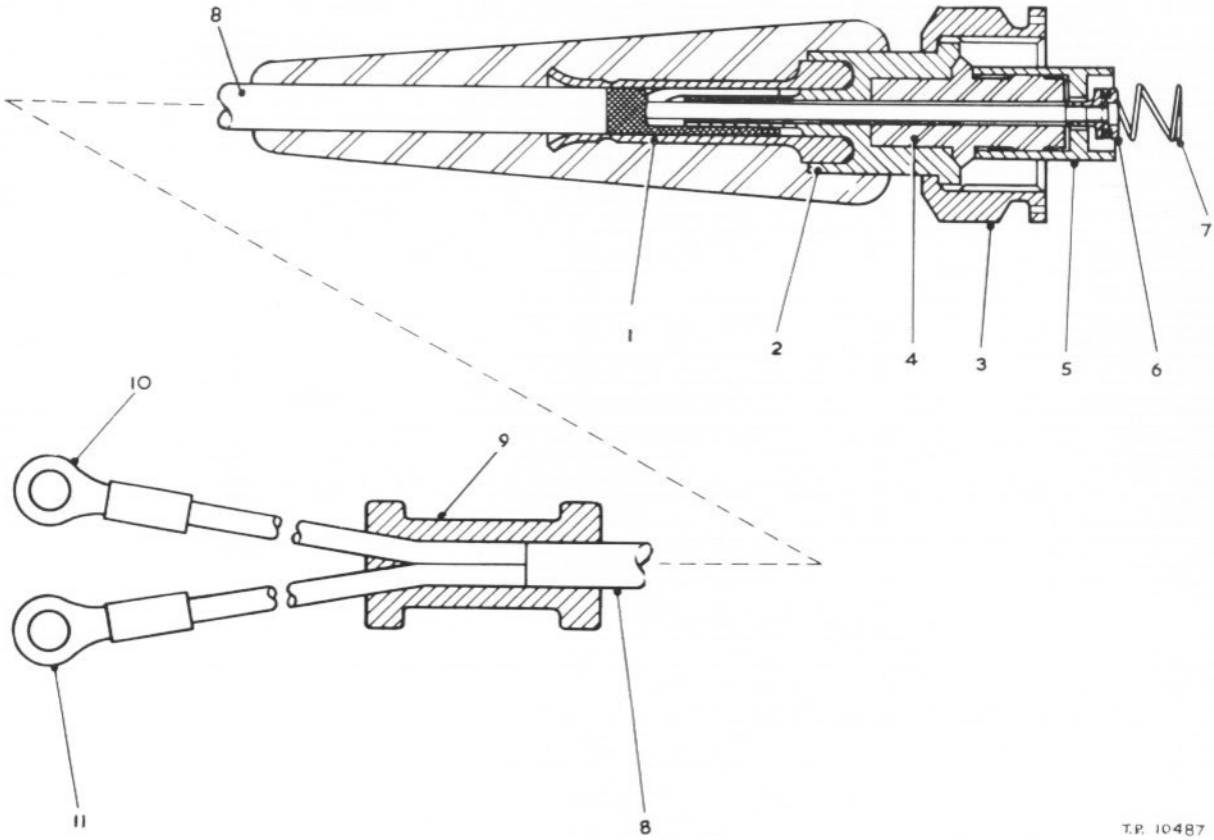

Fig. 2. TVI cable assembly

Chapter 2

STANDARD SERVICEABILITY TEST

Introduction

1. The tests contained in this chapter must be applied to the TVI vibration pick-up and cable assembly prior to its installation in an aircraft and at anytime its serviceability is suspect. The tests must also be applied during inspections made at equipment depots.

Conditions of test

2. All tests must be conducted at a room temperature of 15°C to 25°C.

Test equipment

3. The test equipment required to perform the standard serviceability test is given in Table 1.

TABLE 1

Test equipment

Ref. No.	Description	Qty.
5G/152	Insulation Tester (500V)	1
5QP/17447	Multimeter	1

Power supplies

4. No power supplies are required for the standard serviceability test.

Test procedure

5. Apply the tests given in Table 2. If the result required from any test is not obtained refer to the servicing information in Chap. 3.

TABLE 2

Test procedure

Test	Result
TVI VIBRATION PICK-UP	
Visual inspection.	
1. Inspect the unit for physical damage.	If the unit shows signs of damage it must be overhauled.
2. Hold the unit in the hand and slightly flick the wrist.	An audible click should be heard as the magnet moves within the housing.
Coil resistance.	
3. Using the multimeter, set to ohms range, check coil resistance.	The resistance of the coil must be between 37 and 50 ohms.
TVI CABLE ASSEMBLY	
Continuity checks	
1. Connect the multimeter set to ohms range, between the centre contact and the free end of the conductor colour-coded white.	Continuity shall exist.
2. Connect the multimeter set to ohms range between the crimp carrier and the free end of the conductor colour-coded black.	Continuity shall exist.
Insulation chacks	
3. Connect the insulation tester between the crimp carrier and the white conductor.	The insulation resistance must exceed 50 megohms.

Chapter 3

SERVICING

Introduction

1. This chapter describes the procedure for the second line servicing of the TVI vibration pick-up and cable assembly. The instrument must be subjected to the standard serviceability test before servicing and after faulty components have been renewed.

Inspection

2. Check that the TVI vibration pick-up and cable assembly is mechanically sound and shows no sign of damage. Unserviceable items must be dealt with in accordance with current servicing instructions. Pay particular attention to the following:—

(1) Security of attachment of removeable parts.

(2) Condition of the electrical connector.

Materials and test equipment

3. The items in Table 1 will be required.

TABLE 1
Materials and test equipment

Ref. No.	Description	Qty.
5G/1621	Insulation tester (500V)	1
5QP/17447	Multimeter CT498	1
14N/3371	Trichlorethane	
	Crocus paper, grade 0000	
	Lint-free linen	

Power supplies

4. No power supplies are required for servicing.

Fault diagnosis

5. This diagnosis is cross-referenced to the tests given in the standard serviceability test in Chapter 2.

TABLE 2

Fault diagnosis

Test	Action
VIBRATION PICK-UP	
Visual inspection	
1. Unit damaged.	1. Return unit to base.
2. Click not audible.	2. Corroded magnet assembly return unit to repair depot.
Coil resistance	
3. Coil resistance not within 37 and 50 ohms.	3. Coil assembly faulty: return unit to repair depot.
CABLE ASSEMBLY	
Continuity checks	
1. Continuity not established between centre contact and free end of conductor colour-coded white.	1. If centre contact corroded use crocus paper and wipe with lint-free linen. If still unserviceable return assembly to repair depot.

TABLE 2—(*contd.*)

Fault diagnosis

Test	Action
CABLE ASSEMBLY—(*contd.*)	
2. Continuity not established between crimp carrier and the free end of the conductor, colour coded black.	2. Remove all traces of grease or dust from the connector using cleaning agent with light camel hair brush. Thoroughly dry with lint-free linen. If still unserviceable return assembly to repair depot.
Insulation check	
3. Insulation resistance less than 50 megohms.	3. Clean connector thoroughly with trichlorethane and thoroughly dry with lint-free linen. If still unserviceable, return assembly to repair depot.

Renewal of components

6. It is recommended that no disassembly be made to the TVI vibration pick-up and no repair can be undertaken on the TVI cable assembly.

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