

MAINTENANCE

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SMITHS AVIATION DIVISION

Maintenance Manual

DSGAviation
www.dsgaviation.co.uk
mail@dsgaviation.co.uk

FLEXIBLE DRIVES

SALES AND SERVICE · WEMBLEY · MIDDLESEX

RECORD OF REVISIONS

ENGINE SPEED INDICATING SYSTEM

ASSIGNED TO

FLEXIBLE DRIVES

REV. NO.	INSERTION DATE	BY	REV. NO.	INSERTION DATE	BY	REV. NO.	INSERTION DATE	BY
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		
16			36			56		
17			37			57		
18			38			58		
19			39			59		
20			40			60		

ON RECEIPT OF REVISIONS, INSERT REVISED PAGES IN THE MANUAL, AND ENTER REV. NO., DATE INSERTED & INITIALS

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ENGINE SPEED INDICATING SYSTEM

FLEXIBLE DRIVES

List of Effective Pages

This subject consists of the following pages:-

<u>Page</u>	<u>Date of latest revision</u>
1	April 60
2	April 60
3	April 60
5	April 60
6	April 60
7	April 60
8	April 60
9	April 60

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FLEXIBLE DRIVES

DESCRIPTION AND OPERATION.

1. DESCRIPTION

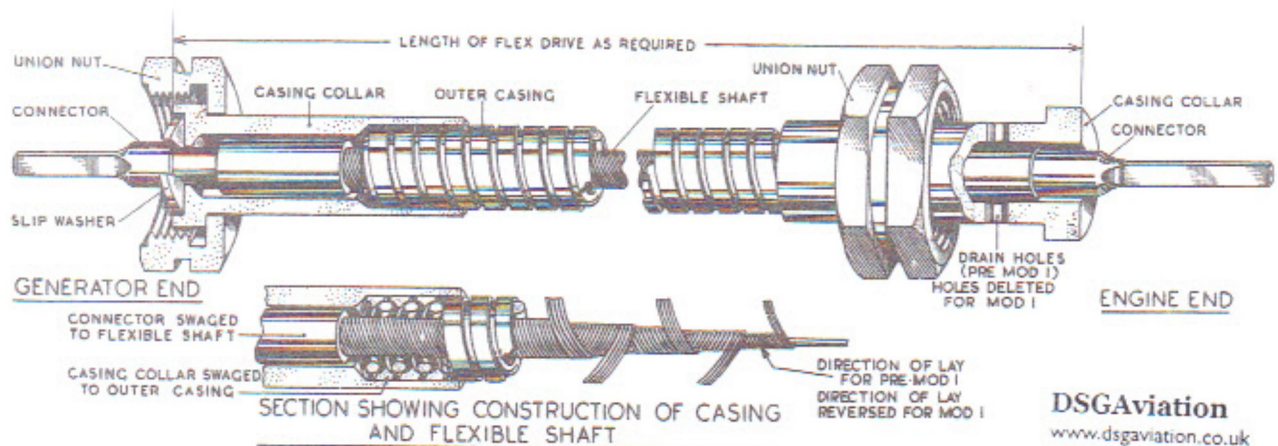
Flexible drives, used to connect a base mounting type engine speed indicator generator via suitable reduction gearing to the aircraft engine, consist of a flexible inner shaft freely rotating within a stationary outer casing.

This inner shaft is made up of a central core of hardened steel wire with five layers of finer gauge wire wound over it, alternate layers being wound in opposite directions. Connectors with square section are swaged on to each end of the shaft to engage with the engine drive and generator shaft.

The outer casing consists of a continuous winding of two specially formed wires. It is flexible, oil-tight and waterproof.

Flanged collars are swaged to each end of the casing and, when secured to locknuts, can be connected to the aircraft engine drive and to the generator shaft.

Fig. 1 shows a flexible drive in section.



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Fig. 1. Flexible Drive

2. OPERATION

When connected to the engine drive and to a generator shaft, the flexible drive will transmit (via a suitable gear reduction arrangement if necessary) the engine revolutions to the generator.

NOTE: Flexible drives are designed to operate up to a maximum speed of 1,500 r. p. m.

3. DATA

Modifications.

The following changes have been effected in the component parts of flexible drives (refer to Fig. 1).

- Mod. No. 1. (1) Inner shaft. The direction of lay of the outermost multiwire layer of the shaft has been changed from right-hand to left-hand.
- (2) Outer casing collar. The breather holes provided for draining off surplus oil in earlier design, at the aircraft engine end of the drive, have now been omitted.

UNPACKING

The drive is normally packed by being wrapped in waterproof paper followed by a strip label impregnated with Vapour Phase Inhibitor. The strip label also serves as an inspection record. The whole is then heat-sealed in a polythene bag. This storage pack is suitable for use in both temperate and tropical climates.

The drive should not be removed from its storage pack unless required for installation or periodic inspection.

After check inspections, the polythene bag should be re-sealed with a heat-sealing device; if such a device is not available, adhesive polythene tape may be used. As much air as possible should be eliminated from the bag before sealing.

The strip label mentioned above is not intended to displace any requirement for Release Notes or other similar certificates which may be required by the appropriate Airworthiness Authority; such certificates will always be forwarded.

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ACCEPTANCE CHECKS

It is not recommended that the drive be unpacked for acceptance checks, as its robust construction renders damage in transit unlikely.

If damage is evident, however, it should be unpacked and a thorough visual examination made.

If doubt exists as to serviceability, the drive should be subjected to the examination described in BENCH CHECKS.

STORAGE CONDITIONS

The drive must remain in its storage pack in a clean, dry position away from any injurious fumes likely to attack the polythene bag and set up corrosion.

STORAGE LIMITING PERIOD

Provided the storage conditions are fulfilled, the storage life of the drive is 24 months. On completion of this period, the drive should be despatched to an approved base or to the manufacturer for cleaning, examination and re-lubrication.

CHECKS/TESTS BEFORE INSTALLATION

Provided that the drive has been stored correctly and if it can be established by visual examination that there is no damage or deterioration, the following test should be carried out:-

- (1) Check that the inner shaft revolves freely in the outer casing and that there is a shaft end float of approximately 0.25 ins.
- (2) For pre-Mod. No. 1 types only (see Modification state), check that the two oil breather holes at the engine end of the drive are clear and unrestricted.

INSTALLATION

With the correct type engine speed indicator generator secured in its mounting position, insert the short connector end of the drive into the generator coupling connection, and the long connector end into the aircraft engine drive.

Push both connectors firmly home, tighten the union nuts and secure them by wire-locking.

CHECKS/TESTS AFTER INSTALLATION

With the aircraft engine running at varying speeds, check, by means of the engine speed indicator, that the drive is correctly coupled between engine and generator.

OPERATING INSTRUCTIONS

Not applicable.

MAINTENANCE SCHEDULE

A routine check to ensure that the engine speed indicator pointer is moving freely over the dial face at time of engine run-up, will verify that the flexible drive is functioning correctly.

If the pointer does not move freely or should there be any unusual flicker, and it is known that both the generator and the indicator are faultless, the flexible drive should be removed for examination.

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At Certificate of Maintenance release or similar document time; or at time of engine ground run.

Check operation of drive.

At engine minor inspection periods. Casing, shaft, connectors and lubrication.

Examine for cleanliness, distortion, breaks, corrosion, security and wear. Re-lubricate.

FAULTS, CAUSES AND RECTIFICATION (TROUBLE SHOOTING)

The most likely causes of failure are:-

1. Broken or frayed strand of inner cable.
2. Loose union nuts.
3. Distorted outer casing.
4. Fracture of swaged end connectors.
5. Insufficient or incorrect lubrication.

In all cases, except 2., the drive must be removed for examination and repair.

REMOVAL

Unscrew the union locknuts from the engine and generator ends of the drive, withdraw the two ends of the flexible drive and remove from the engine.

BENCH CHECK

If the drive is suspect, proceed as follows:-

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1. Remove the flexible shaft (refer Fig. 1).
 - A. Pull out the generator end of the shaft as far as possible.
 - B. Using two pairs of flat-nosed pliers, bend the slip-washer and remove it.
 - C. Withdraw the flexible shaft from the outer casing.
2. Thoroughly clean all parts.
3. Check carefully that there are no loose or fractured strands in the flexible shaft.
4. Check that end connectors are secure.
5. Check outer casing for general condition and security.

NOTE: If the flexible shaft is rejected because of loose or frayed strands, it is recommended that the complete flexible drive be renewed, since the faulty inner shaft will almost certainly have caused some damage to the outer casing.

6. Check oil drain holes at engine end of drive (pre-Mod. 1 drives only).
7. Coat the flexible shaft liberally with grease, DTD 825.
8. Insert the shaft into the outer casing, ensuring that the short squared connector is at the generator end, fit the slip-washer on the reduced diameter of the generator end connector, and, with two pairs of flat nosed pliers, straighten the slip washer so that it remains securely in position on the shaft.

OVERHAUL PERIOD

The drive can remain in service for as long as it continues to function satisfactorily.

RETURN TO MANUFACTURER OR BASE

Pack the drive in its storage pack as originally received. Include in the pack documentation giving a brief history of service, if required, together with the reason for return.

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