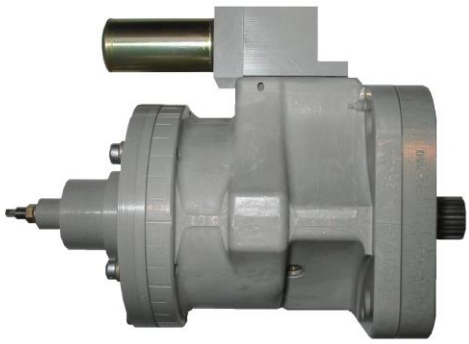
AVIA PROPELLER

E-1625

Operation and Installation Manual

Hydraulic Overspeed Governor

P-8S( )-( )



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No.	Date of Issue	Pages	Remark
1	2009-03-10	all	Initial Issue
2	2012-10-17	0, 2, 3, 4, 5, 6	Change in designation to P-8S( )-( )
3	2009-03-10	0, 2, 3, 5, 6, 7	Designation updated, operation description modified
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1.0 GENERAL

The P-8S( )-( ) hydraulic overspeed propeller governors are single acting governors developed for hydraulically variable pitch propellers to protect propellers against overspeeding, produced by AVIA Propeller.

1.0.1 Statement of purpose

This publication provides operation, installation and line maintenance information for the Avia Propeller governors.

Installation, removal, operation and trouble shooting data is included in this publication. However, the airplane manufacturer's manuals and applicable propeller manuals should be used in addition to this information.

1.1 DEFINITION OF COMPONENT LIFE AND SERVICE

1.1.1 Overhaul

Overhaul is a periodic process and contains the following items:
- disassembly
- inspection of parts
- reconditioning of parts
- reassembly

The overhaul interval is based on hours of service (operating time) or on calendar time.

At such specified periods, the overspeed governors should be completely disassembled and inspected for cracks, wear, corrosion and other unusual or abnormal conditions. As specified, certain parts should be refinished, and certain other parts should be replaced.

For overhaul interval for the overspeed governors please refer to Service Bulletin 1.

1.1.2 Repair

Repair is correction of minor damage caused during normal operation. It is done on an irregular basis, as required.

1.1.2.1 A repair does not include an overhaul.

1.1.2.2 Amount, degree and extent of damage determines whether or not a governor can be repaired without overhaul.

1.1.3 Component Life

Component life is expressed in terms of total hours of service (TT, or Total Time) and in terms of hours of service since overhaul (TSO, or Time Since Overhaul).

Both references are necessary in defining the life of the component. Occasionally a part may be "life limited", which means that it must be replaced after a specified period of use.

Overhaul returns the component or assembly to zero hours TSO (Time Since Overhaul), but not to zero hours TT (Total Time).

No life limit is established for the overspeed governors P-8S( )-( ).

2.0 MODEL DESIGNATION

P - 8 S 1- 1

1 2 3 4

Legend:

1 P = Propeller Governor / Overspeed Governor manufactured by AP

2 8S = Overspeed Governor

3 1 = Solenoid valve for resetting, AND 20010 drive pad modified (TP-100)
2 = Solenoid valve for resetting ~~and feathering~~, AND 20010 drive pad
3 = Solenoid valve for resetting and feathering, AND 20010 drive pad
4 = reserved

4 = Application Number, Settings of rpm setting, voltage etc.

S/No. 09 S 003
a b c

a = Year of Manufacture
b = Overspeed Governor (overSpeed)
c = Consecutive Number

3.0 PERFORMANCE DATA

Range of acceptable operation temperature from -16°C (+3.2°F) to +150°C(+302°F)

The break away torque with engine oil SAE No. 40 at 4.5°C (+40°F) is 40 Nm (30 ft lbs)
The torque required at 220 psi and 2700 rpm is 0,1 Nm (0,8 inch lbs)

3.1 Dimensions

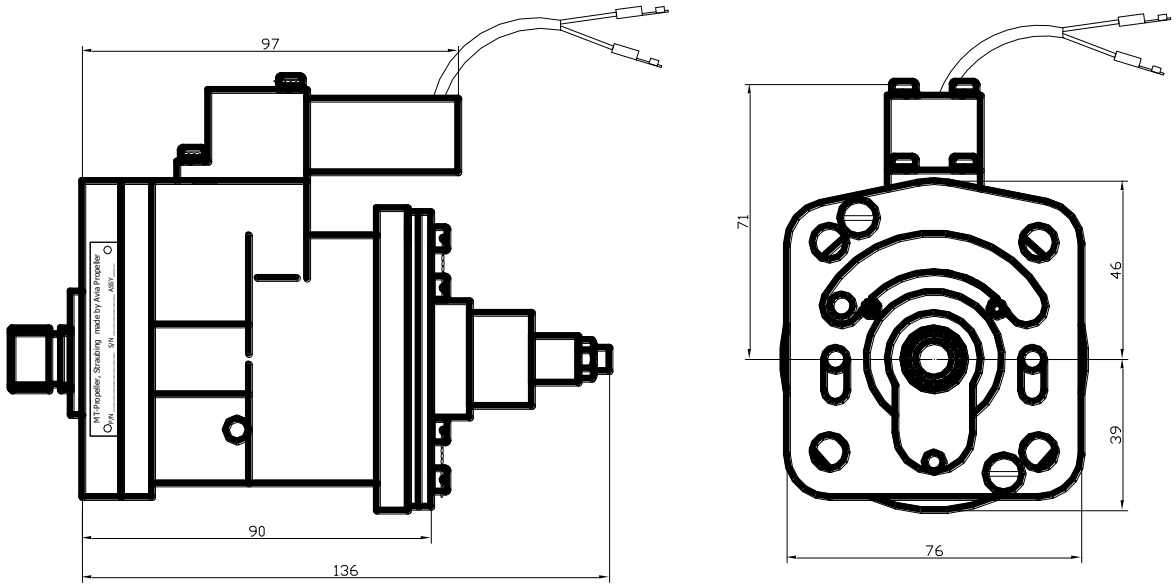

Fig. 1
Weight =1,15 kg (2,36 lbs) in basic configuration

4.0 DESIGN AND OPERATION INFORMATION

The **Avia Propeller** aircraft overspeed governors **P-8S( )-( )** are base mounted centrifugal overspeed governors for use with single acting constant speed propeller control systems on turboprop engines.

The propeller overspeed governor is located on the reduction gearbox. It limits propeller RPM should the primary propeller governor fail. Constructed in the same manner as the primary governor with speeder spring, flyweight assembly, and pilot valve, and driven by gears from the propeller shaft, the overspeed governor constantly monitors propeller RPM. Should the primary propeller governor fail and the prop begin to overspeed, the overspeed governor will ACTIVATE at given speed setting by detouring high pressure oil back to the reduction gearbox. The overspeed governor should then govern the propeller at given speed. Ground test of the overspeed governor is provided by a test valve actuated by a 28-VDC solenoid. A pushbutton, located on the TEST panel at the bottom of the instrument panel in the cockpit, activates the solenoid and opens the test valve, allowing high pressure oil to reset the normal overspeed setting to given percentage below normal. A properly functioning overspeed governor is indicated during ground test by the propeller RPM stabilizing at adjusted lower propeller speed. Releasing the TEST button resets the overspeed governor to normal operation and the propeller RPM rises toward the normal governing RPM.

UNDERSPEED:

If the primary propeller governor works properly, the overspeed governor is in underspeed condition. Propeller speed setting of the overspeed governor is over the primary propeller governor speed setting.
Underspeed condition means, that the force of the preloaded speeder spring (representing requested speed) is higher than the force from rotating flyweights (representing actual speed) and thus the pilot valve is forced down (see diagram) covering the control ports in the drive shaft. It avoids pressure oil to flow from the pitch changing mechanism. The overspeed governor doesn´t enter in control loop of the primary propeller governor.

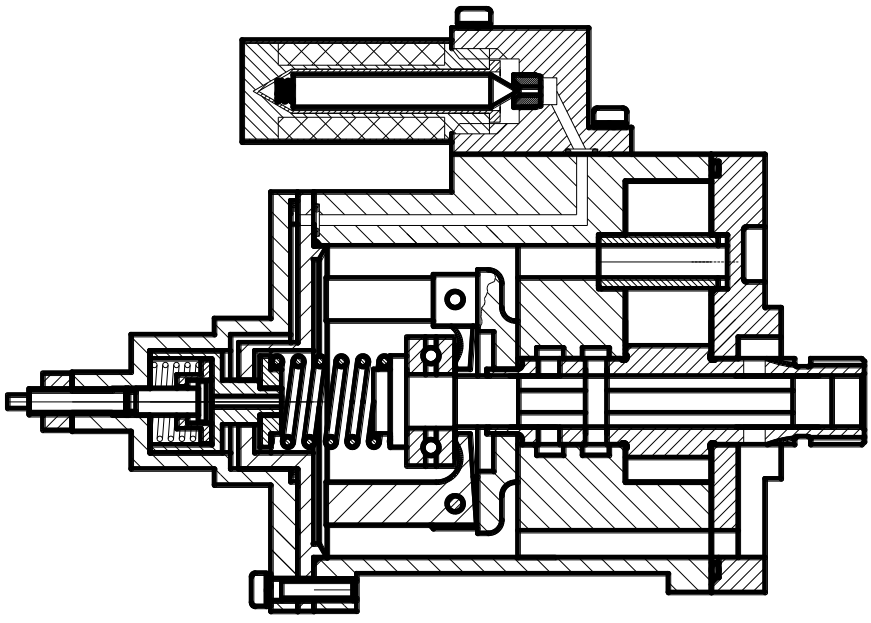

Fig. 2 – Overspeed governor in test status and on-speed

ON SPEED:

If the primary propeller governor is in failure mode or the overspeed governor is in reset condition, the overspeed governor controls the propeller speed, if other circumstances (engine power, velocity, …) enable propeller to reach speed setting. In this condition the forces action on the engine-overspeed governor-propeller combination are in a state of balance. The propeller blades are at the correct pitch to absorb the power developed by the engine. The centrifugal force of the rotating flyweights exactly balances the force of the speeder spring. The pilot valve located in the drive-gear shaft is in such position, that the control ports between the oil pump and the propeller pitch changing servo are covered such a way, that propeller blades stay in appropriate position.

OVERSPEED:

This condition occurs when engine rpm increases above the on-speed value - set by the speeder spring preload. The rotating flyweights pivot outward as their increase centrifugal force overcomes force exerted by the speeder spring.

The flyweight toes raise the pilot valve plunger, uncovering ports in the driver gear shaft that permit pressure oil to flow from the propeller pitch changing mechanism. This allows propeller counterweights to take the propeller blades toward a higher pitch. The load on the engine is increased and engine speed is reduced.

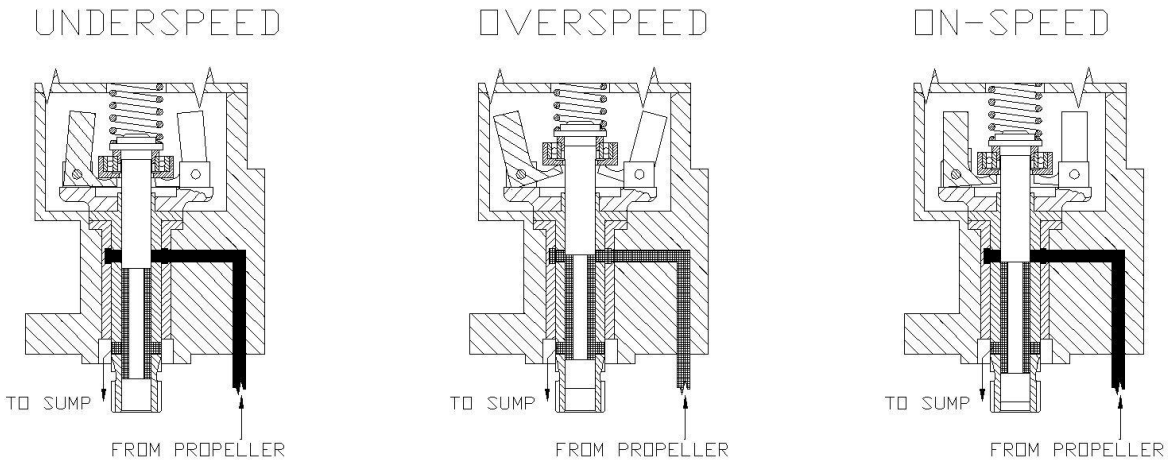

Fig. 3 – Functional diagram

5.0 INSTALLATION AND OPERATION INSTRUCTION

5.1 **a)** If applicable: Remove old overspeed governor per aircraft service instructions.

Prepare new mounting gasket, **P/N B-20024. Coat gasket with engine oil or equivalent before installation.**

b) Check that mounting studs project a minimum of 31,75 mm (1.250 in) from face of engine pad.

c) Clean engine pad, studs and mounting hardware before installing new mounting gasket. Insure overspeed governor drive spline mate correctly with engine accessory drive spline.

d) Attach mounting hardware and torque the (4) mounting nuts to 20-24 Nm (180-220 inlbs).

e) Reconnect cable connector.

f) Ground test check will verify proper RPM setting by pressing the test button. Record RPM. Tests should be done in smooth air.

g) Also check for oil leaks - none permitted.

5.2 Governor removal

a) Disconnect electric cable from the overspeed governor.

b) Remove mounting nuts and washers.

c) Pat on the overspeed governor to release it and then remove governor from engine pad.

Governor drive and engine pad must be without impurities. (metal chips etc.)

d) If it is necessary clean governor drive and engine pad by appropriate means.

e) Apply the gasket and transport cover to governor base.

f) Record the removal in governor installation record.

g) Perform preservation in accordance with section 8.0 to prepare for long- term storage.

h) Storage in accordance with section 8.0

6.0 INSPECTIONS

Check for oil leakage.

Check oil leakage immediately after engine stop.

Check oil leakage at governor's surface and at mounting pad.

If oil leakage is detected check stop nuts at the governor housing and the mounting nuts. Torque if necessary. If oil leakage is detected repeatedly contact service center or governor's manufacturer.

WARNING: NO OIL LEAKAGE IS PERMITTED

7.0 TROUBLE SHOOTING

Propeller speed is not reduced by pressing TEST button - Possible Causes:

a) The solenoid is not energized
Check voltage on the connector after pressing the TEST button. If no voltage appears, check aircraft electric circuits.

b) The solenoid is burned
Check solenoid resistance – if it is out range, replace the overspeed governor.

c) The overspeed governor doesn't keep lowered speed
The overspeed governor is failed – exchange it.

8.0 SHIPPING AND STORAGE

Conservation

Inner conservation is automatically done by engine oil. Attach cover cap.

After installing the overspeed governor the conservation is done together with engine in accordance with the instruction of the engine manufacturer.

Outside conservation isn't required.

Pack the overspeed governor in two layers of wax-cloth and put it in a plastic bag. The plastic bag should be vacuumed and after that welded.

Make a note in the governor's installation record.

Deconservation isn't needed.

Storage

Overspeed governors have to be packed in carton box with accessory documentation.

Store governors in temperature from +10°C (+50°F) to +30°C (+86 °F) and relative humidity from 40 % to 80 %. Keep stock room free of gases with deleterious effect.

9. OVERSPEED GOVERNOR INSTALLATION RECORD

Date installed	Notes	Authorized Signature	Date Removed

Warranty Registration Card

1) To be eligible for warranty, this registration card must be returned completed and signed by the end user to the authorized Avia Propeller distributor of the area in which the governor is firstly operated or to Avia Propeller itself within 30 days after date from starting operation.

2) No other warranties and/or guarantees than defined in the actual warranty conditions are made.

3) Overspeed Governor Type:

P	-	A			-			

S/N:

Date of purchase (day/monthlyear):_/_/_

Date of De-conservation (day/monthlyear):_/_/_

Owner's name: .....

Company: .....

Address:.....

City/State/Postal code .....

Country: .....

Telephone:..... Telefax:.....

E-mail: .....

Sold by: .....

I have read and understood the Operator’s Manual in its entirety and will observe the instructions therein.

Date:..... Signature:.....