



# AVIA PROPELLER

E-1778

**Operation and Installation Manual**

**Feathering Pump / Unfeathering Pump**

AFP-( )-( )



EASA CZ.21G.0011  
EASA.21J.072

**Issue 5: February 19, 2014**

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**List of Inserted Revisions**

| No. | Date of Issue | Pages   | Remark                                |
|-----|---------------|---------|---------------------------------------|
| 1   | 2011-08-05    | all     | Initial Issue                         |
| 2   | 2011-09-29    | 2, 6    | pressure switch adjustment            |
| 3   | 2011-12-15    | 2, 4    | temperature range update              |
| 4   | 2012-05-04    | 2, 6, 7 | pressure switch exchange              |
| 5   | 2014-02-19    | 2, 6, 7 | unfeathering pump,<br>brushless motor |
| 6   |               |         |                                       |
| 7   |               |         |                                       |

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| 1    | 2011-08-05    |
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## 1.0 GENERAL

The AFP-( )-( ) feathering pump is a pump for use with dual-acting propellers, mainly produced by AVIA Propeller or it is used as an unfeathering pump for single acting propellers.

### 1.0.1 Statement of purpose

This publication provides operation, installation and line maintenance information for the Avia Propeller feathering/unfeathering pumps.

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 feathering pump 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 feathering/unfeathering pump please refer to Avia Propeller's 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 AFP-( )-( ) feathering/unfeathering pump.

## 2.0 MODEL DESIGNATION

**AFP - 28 - 1 A**

**1      2      3 4**

### Legend:

- 1** AFP = Feathering/Unfeathering Pump manufactured by AP
- 2** 28 = nominal voltage
- 3** = application number, settings of pressures etc.
  - 1 = SAE fitting
  - 2 = ONL fitting
  - 3 = ONL fitting + flange for L-410 airplane
  - 4 = SAE fitting, AeroVolga unfeathering pump
- 4** A = version with DC brushless motor

**S/No.    09 P 003**

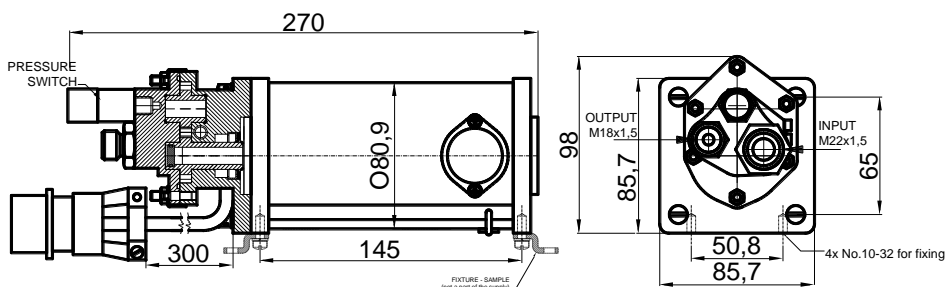
    a    b    c

- a = Year of Manufacture
- b = Feathering Pump
- c = Consecutive Number

## 3.0 PERFORMANCE DATA

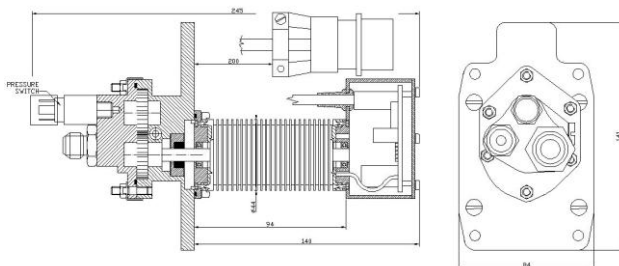
Surrounding operation temperature from -60°C (-76°F) to +85°C(+185°F)  
 Nominal Voltage: 28 VDC  
 Maximum Current: 35 A  
 Output Pressure Max.: 2,0 + 0,1 MPa  
 Maximum Switch-on Time: 16 s  
 Pump Capacity at 1,5 MPa Output Pressure: 6,8 l/min

## 3.1 Dimensions



*Fig. 1*

Weight = 4,08 kg in basic configuration



*Fig. 2*

Weight = 1,70 kg in basic configuration

#### 4.0 DESIGN AND OPERATION INFORMATION

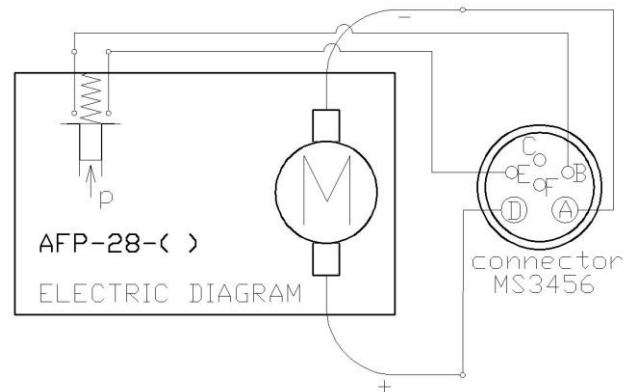
The **Avia Propeller's** feathering pumps **AFP-( )-( )** are motor driven gear pumps, which can fully replace feathering pump LUN 7840.

The AFP-( )-( ) pump consists of electric motor and gear pump.

The motor is equipped with cable and connector for connection to aircraft system – see electric wiring.

Connector used on the feathering pump: MS3456W20-08P

Recommended counter-part: MS3450W20-08S



The gear pump consists of gears, relief valve, pressure switch and bypass.

One gear is motor driven, and it drives idler. Both gears together generates pressurized oil.

Oil pressure is controlled by relief valve, which is adjusted by manufacturer.

The pressure switch is activated by pressure when the feathering pump works – it means when it generates pressure. The switch is adjusted by feathering pump manufacturer.

Bypass allows small amount of oil to flow through the gear pump and to heat it up when the pump is not in operation.

#### 5.0 INSTALLATION AND OPERATION INSTRUCTION

- install the feathering pump according to the aircraft operation manual
- connect hoses to the pump
- connect receptacle
- lockwire
- switch on the pump for 3-5 seconds according to the aircraft manual to check its operation (the propeller starts to move and feathering lamp is illuminated)
- check for oil leak – no oil leakage

#### 6.0 INSPECTIONS

Check for oil leakage.

Check oil leakage immediately after engine stop.

Check oil leakage at pump surface and at fittings.

If oil leakage is detected, check whether everything is torqued sufficiently. If not, torque. If oil leakage is detected repeatedly contact service center.

**WARNING: NO OIL LEAKAGE IS PERMITTED**

## 7.0 TROUBLESHOOTING

| Symptom  | Probable cause                     | Solution   |
|--|------------------------------------|--|
| the feathering pump doesn't work   | no electricity                     | check breaker, switch on<br>disconnect the pump, check whether it is energized. If not, check airframe circuits.   |
|  | motor burnt                        | exchange the feathering pump   |
|  | relief valve open                  | exchange the feathering pump   |
| the feathering pump works but no signalization                           | burnt lamp                         | replace the lamp   |
|  | failed airframe circuit            | check the airframe circuit, fix it   |
|  | failed pressure switch             | disconnect receptacle, energize motor and check the pressure switch; if it is not closed after the pump has been energized, it is failed. Exchange the feathering pump |
| the feathering pump works but the propeller doesn't move as required     | wrong setting, failed EHO          | check setting of the levers and EHO functionality. Set appropriately   |
| the feathering lamp illuminated but the feathering pump is not energized | low setting of the pressure switch | re-set the pressure switch by ½ turns CW (maximum 4 turns) with its adjusting element – see 7.1. If it doesn't help, exchange the pressure switch – see 7.2.           |

### 7.1 Pressure switch adjustment

- Remove pressure switch cap
- Use a flat screwdriver to adjust : CW to increase, CCW to decrease.
- Secure the adjusting screw with a locking liquid (paint)
- Re-install the cap.

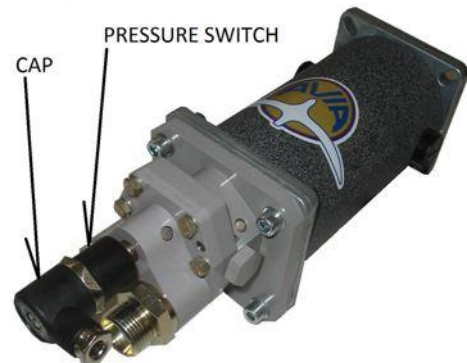


### 7.2 Pressure switch exchange

- Remove pressure switch cap
- Disconnect 2 signal wires from the switch
- Remove the pressure switch using "24mm" wrench
- clean NPT 1/8 thread in pump body with a clean cloth
- apply a small amount of Loctite 262 Threadlocker or equivalent onto the new switch thread
- install the switch and tighten
- reconnect 2 signal wires
- check functionality

NOTE: The pressure switch is set to 7 bars. Depending on the propeller governor heating orifice condition, it can be necessary to increase setting, see 7.1.

- Install the pressure switch cap.



**8.0 SHIPPING AND STORAGE**

Conservation

Inner conservation is automatically done by engine oil. Attach cover cap.  
After installing, the conservation is done together with engine in accordance with the instruction of the engine manufacturer.

Outside conservation isn't required.  
Pack the feathering pump to a plastic bag. The plastic bag should be vacuumed and after that welded.

Make a note in the pump's installation record.  
Deconservation isn't needed.

Storage

Pumps have to be packed in carton box with accessory documentation.

Store the pumps 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.

**FEATHERING PUMP INSTALLATION RECORD**

P/N: ..... S/N: .....

Note: .....

| <b>Date installed</b> | <b>Notes</b> | <b>Authorized Signature</b> | <b>Date Removed</b> |
|-----------------------|--------------|-----------------------------|---------------------|
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