



OPERATION AND INSTALLATION MANUAL
FOR
CONSTANT SPEED
PROPELLER GOVERNORS
P-AB5-X/E12
WITH ELECTRIC ACTUATOR
FOR
FLYBOX APR1-M-LC-J12 CONTROLLER

P-ROV-1970/22

CAUTION

Any Governor installed on an engine that is involved in a sudden stoppage incident must be overhauled or exchanged. Due to the abnormally high loads imposed by sudden stoppage, the subject Governor must be tagged that it was involved in such an incident for the information of the overhauling agency.

WARNING

Failure to follow instructions herein can cause personal injury and/or property damage.

WARNING

This manual must remain with the Governor in case of sale. This document, technical data and the information contained therein are property of JIHOSTROJ a.s. and must not be reproduced, neither in entirety nor partially, and passed on to third parties without previous consent in writing by JIHOSTROJ a.s. This text must be written on every complete or partial reproduction.

WARNING!

Installation of P-AB5-X/E12 Governor on aircraft has to be approved with designated OEM manufacturer or designated service center!

Inadequate installation can cause personal injury and/or property damage.

NOTE

The operating instructions detailed in this manual do not alter or supersede the recommendations of the aircraft or engine manufacturer unless they are part of the flight manual supplement required by a supplemental type certificate.

NOTE

Record all works performed with Governor. To do so helps you and your service center to maintain, repair and overhaul your Governor. When asking help at your service center submit always completed information about operation of your Governor.

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1 GENERAL

The P-AB5-X/E12 propeller governor (hereinafter referred as “Governor”) are single acting Governors developed for hydraulics variable pitch propellers with Speeder Spring Preload Actuator (hereinafter referred as “Actuator”).

1.1 APPLICATION

This document provides information of the operation, installation, removal, and troubleshooting of Governors P-AB5-X/E12.

However, the aircraft manufacturer’s manuals should be used along with this information.

Governors P-AB5-X/E12 shall be used with Flybox APR1-M-LC-J12 Controller (hereinafter referred as “Controller”).

Installation of P-AB5-X/E12 Governor on aircraft has to be approved with designated OEM manufacturer or designated service center!

WARNING!

Inadequate installation can cause personal injury and/or property damage.

1.2 DEFINITION OF PRODUCT LIFE AND MAINTENANCE

1.2.1 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 Governor should be completely disassembled and inspected for cracks, wear, corrosion and other unusual or abnormal conditions. As specified, certain parts should be refinished and other parts should be replaced.

The overhaul interval (TBO)¹⁾ for the Governor is 2000 hours or 7 years if not altered by Governor, engine or aircraft manufacturer.

¹⁾ *This period includes both storage period and operation period*

1.2.2 REPAIR

Repair is correction of minor damage caused during normal operation. It is done as required.

A repair does not include an overhaul.

Amount, degree and extend of damage determines whether or not a Governor can be repaired without overhaul.

1.2.3 PRODUCT 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 components. 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 Governor.

2 GOVERNOR DESIGNATION

2.1 MODEL DESIGNATION

P	-	A	B	C	-	X	/	Y
P	-	1	1	5	-	010	/	E12
1		2	3	4		5		6

- 1 P = Propeller Governor
- 2 A = Internal Jihostroj marking
- 3 B = Basic design arrangement:
 - 1 = I, CW (pressure to increase pitch, CW rotation facing Governor base)
 - 2 = I, CCW (pressure to increase pitch, CCW rotation facing Governor base)
 - 3 = D, CW (pressure to decrease pitch, CW rotation facing Governor base)
 - 4 = D, CCW (pressure to decrease pitch, CCW rotation facing Governor base)
- 4 C = Special design arrangement:
 - 0 = Standard
 - 4 = Fitting for accumulator
 - 5 = Electric Actuator
 - 6 = Solenoid feathering
 - 7 = Electric actuator + feathering solenoid
- 5 X = Application number defining settings of Governor – relief valve pressure, max. RPM....
- 6 Y = Control head model:
 - E12 = Electric Actuator with 12 VDC electric motor
 - E24 = Electric Actuator with 24 VDC electric motor

2.2 SERIAL NUMBER

S/N	01	1	006
	1	2	3

- 1 Year of Manufacture
- 2 Quarter of the year
- 3 Consecutive Number

2.3 PART NUMBER

Each Governor model has its particular P/N. For P/N see particular Governor Assembly Drawing (hereinafter referred to as the "GAD").

3 SPECIFICATION

3.1 PERFORMANCE DATA

Performance data	see particular GAD
Range of acceptable operation temperature	from -25°C (-13°F) to +125°C (+257°F)
Range of acceptable operation fluid temperature at the Governor inlet	from -25°C (-13°F) at engine start <i>The breakaway torque at this temperature must not exceed 40 Nm and the engine oil must be liquid.</i>
Range of altitude	from -300 m (FL -10) to 10 700 m (FL 350)
Operation fluid	AEROSHELL W100 engine oil or equivalent
Oil pressure at the inlet Governor channel	from 0.2 MPa (29 PSI) to 0.5 MPa (73 PSI)
Engine oil filtration	30 µm and better
Weight	1.35 kg (2,98 lb) P-115-X/E12

The weight is only informative value of basic model without another installation hardware, exact value is specified at GAD.

3.2 DIMENSIONS

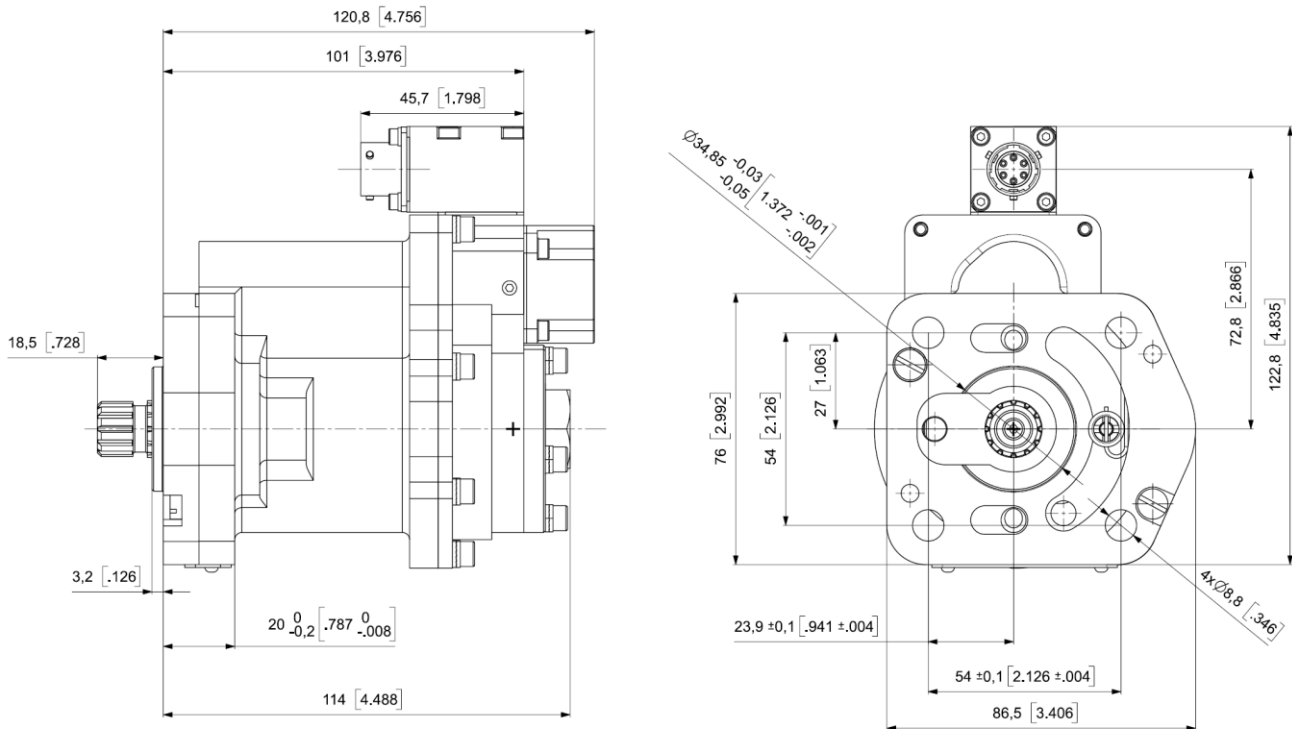


Figure 301 - P-AB5-X/E12 outline dimensions (dimensions in brackets are in inches), exact dimensions are specified at GAD

3.3 ELECTRICAL WIRING DIAGRAM

Electrical wiring diagram is depicted at Figure 302.

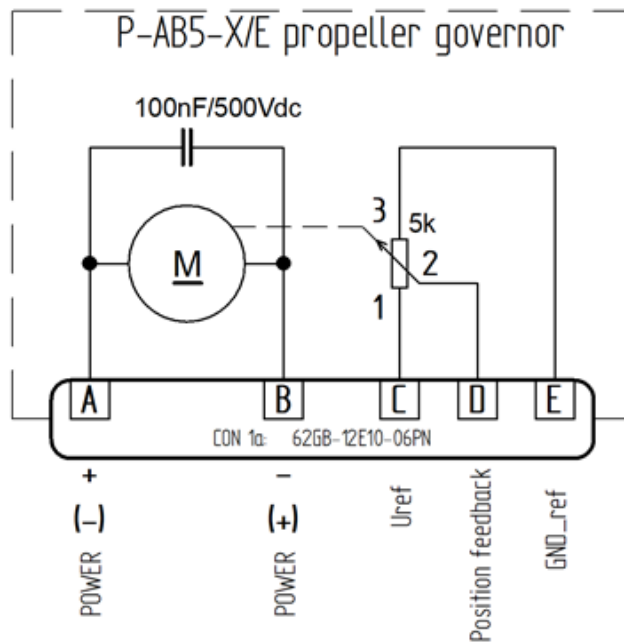


Figure 302 – Electrical wiring diagram

3.4 ELECTRICAL INTERFACE

Electrical interface is shown at Table 303.

Harness connector model: 62GB-12E10-06PN

Connector pin assignment			
Signal name	PIN	Power/Signal	
Power A	A	Power (+)	Increase RPM
		Power (-)	Decrease RPM
Power B	B	Power (-)	Increase RPM
		Power (+)	Decrease RPM
Position sensor	C	U _{ref}	
Position sensor	D	U _{feedback}	
Position sensor	E	GND _{ref}	
Not connected	F		

Table 303 – Electrical wiring diagram description

4 DESIGN AND OPERATION

4.1 GOVERNOR DESIGN DESCRIPTION

The principal parts of each Governor are a gear type oil pump with pressure relief valve, flyweights pivoted on a rotating flyweight head, a spring-loaded pilot valve positioned by the flyweights and a DC-Micromotor that varies the speeder spring preload acting on a pilot valve. The Actuator includes mechanical stops at maximum and minimum RPM position. The RPM Actuator absolute position is sensing by the position sensor. The actual value of maximum RPM can be readjusted with adjusting screw.

Governor provides Actuator position feedback signal.

The body, cover and base are made of aluminum. The body contains the necessary passage to channel oil to the propeller pitch changing mechanism, and the base is designed to fit the standard AND20010 engine pad.

4.2 CONSTANT SPEED OPERATION

The sensing element of the Governor is a set of pivoted flyweights mounted on a rotating flyweight head and linked mechanically to the engine gears, through a hollow drive gear shaft.

Flyweights, actuated by the centrifugal force developed by the speed of the rotation, position a pilot valve so as to cover or uncover ports in the drive gear shaft and regulate the flow of oil to and from the pitch changing mechanism of the propeller. The centrifugal force exerted by the flyweights is opposed by the force of an adjustable speeder spring. The load exerted by the speeder spring determines the engine RPM required to develop sufficient centrifugal force in the flyweights to center the pilot valve. Oil to operate the propeller's pitch changing mechanism is supplied by a gear-type oil pump at a pressure value limited by a relief valve.

Speeder spring force of Governor flyweight assembly is preset with the Actuator. RPM control of propeller is assured with flyweight assembly all the time!

The Actuator consists of a DC-Micromotor with selected voltage level and a gear set with mechanical stops at both end positions - designs is jamming-proof. The DC-Micromotor is voltage-controlled and the direction of rotation is reversed with the change of polarity at connector terminals.

The speed and direction of Actuator stroke is determined by voltage level and polarity applied to connector terminals. At level of Controller, it has to be assured that the power supply of DC-Micromotor is disconnected when the Actuator reaches mechanical stops.

The more time the Actuator spends on mechanical stop with energized DC-Micromotor, the shorter lifetime of Actuator will be. Reaching the mechanical stop must clearly detects the Controller.

The Actuator is equipped with a Position Sensor, which returns electric proportional feedback to the Controller.

Simplified scheme of Governor architecture is depicted at Figure 402.

Note: In case of Actuator malfunction (Actuator doesn't move from various reasons) preset RPM are frozen in the last setting and governor flyweight assembly maintains constant speed RPM for this last preset RPM level.

ON SPEED

In this condition the forces action on the engine-Governor-propeller combination are in a state of balance. The Actuator has been set with Controller to obtain the desired engine RPM.

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 with the flyweights in the vertical position. The pilot valve is positioned in the drive gear shaft, so that the control ports between the oil pump and the propeller pitch changing servo are covered. Pressure oil from the gear pump is circulated through open Governor relief valve back to the inlet channel of the pump. See Figure 401.

OVERSPEED

This condition occurs when airspeed or horsepower is increased and engine RPM increases above the rate called for by the setting of the speed actuator mechanism. The rotating flyweights pivot outward as their increased 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 to the propeller pitch changing mechanism. This moves the propeller blades to a higher pitch and load on the engine is increase and engine speed is reduced.

This, in turn, lessens centrifugal force exerted by the flyweights in opposition to the force of the speeder spring. The flyweights return to a vertical position and the pilot valve plunger once more covers ports in the drive gear shaft, blocking flow of pressure oil to or from the pitch changing mechanism of the propeller. See Figure 401.

UNDERSPEED

An underspeed condition occurs when the airspeed or horsepower is decreased and engine RPM falls below the rate established by the setting of the Actuator. The decrease in the centrifugal force of the rotating flyweights causes them to pivot inward under the force exerted by the speeder spring.

The pilot valve plunger is forced downward, uncovering the ports in the driver gear shaft, thus allowing oil to flow from the pitch changing mechanism of the propeller to sump. This permits the centrifugal twisting moment of the blades to decrease propeller pitch.

This reduces the load on the engine, thereby increasing engine speed and the centrifugal force developed by the rotating flyweights. The flyweight toes lift the pilot valve plunger to cover the control ports. At this point the forces acting on the engine-Governor-propeller combination are again balanced at the engine is back to the speed called for by the Governor setting. See Figure 401.

NOTE:

LOSS OF OIL FROM THE PROPELLER PITCH CHANGING MECHANISM DUE TO ENGINE TRANSFER RING LEAKAGE WILL RESULT IN CHANGED SPEED SETTINGS.

PRESSURE TO INCREASE PITCH TYPE PILOT VALVE

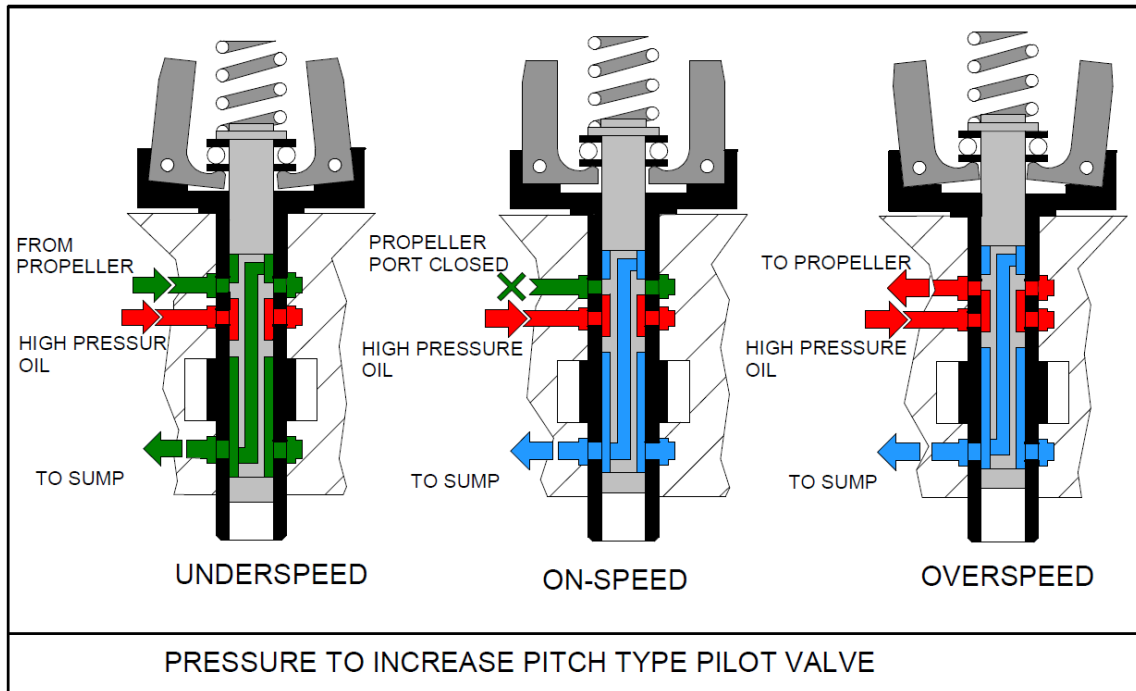


Figure 401 – Constant speed operation

4.3 ACTUATOR OPERATION

The Actuator presets speeder spring force of Governor flyweight assembly only. RPM control of propeller is assured with flyweight assembly all the time! RPM control procedure is described in the chapter 4.2.

The Actuator consists of a DC-Micromotor with selected voltage level and a gear set with mechanical stops at both end positions - designs is jamming-proof. The DC-Micromotor is voltage-controlled and the direction of rotation is reversed by the change of polarity at connector terminals.

The speed and direction Actuator stroke is determined by voltage level and polarity applied to connector terminals. At level of the Controller, it has to be assured that the power supply of DC-Micromotor is disconnected when the Actuator reaches mechanical stops. Time to disconnect the power supply of the DC-Micromotor on mechanical stop is 300ms maximum!

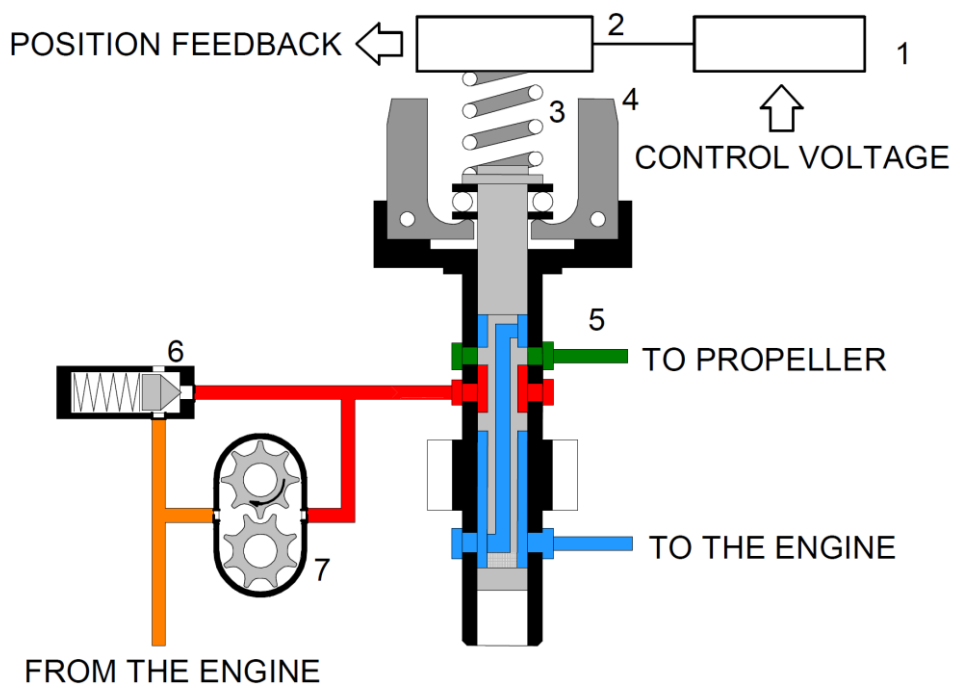
The more time the Actuator spends on mechanical stop with energized DC-Micromotor, the shorter lifetime of Actuator will be. Reaching the mechanical stop detects the Controller.

The Actuator is equipped with a position sensor, which returns electric proportional feedback to Controller.

WARNING!

In a case of Actuator malfunction (Actuator doesn't move from various reasons) preset RPM are frozen in the last setting and governor flyweight assembly maintains constant speed RPM for this last preset RPM level.

SPEED IS PRESET WITH AN ACTUATOR



- 1. DC-Micromotor
- 2. Actuator mechanism
- 3. Speeder spring
- 4. Flyweight
- 5. Pilot valve
- 6. Relief valve
- 7. Gear-type oil pump

Figure 402 – Speeder spring actuation

5 INSTALLATION AND OPERATION INSTRUCTION

5.1 INSTALLATION

Prepare new mounting gasket MS9144-01. Coat gasket with engine oil or equivalent before installation.

- a) If applicable: check that mounting studs project a minimum of 31.75 mm (1.250 in.) from face of engine pad.
- b) For installation at ROTAX engines is recommended to use M8x35 screws, Rotax P/N 440867 with washers M8 DIN 127B.
- c) Clean engine pad, studs and mounting hardware before installing new mounting gasket. Ensure Governor drive spline mate correctly with engine accessory drive spline.
- d) Attach mounting hardware and torque the (4) mounting nuts/screws to 11-15 Nm (97-133 in.Lbs).
- e) Reconnect connector of electric control to the Governor and make other steps per aircraft service information.

WARNING:

SUPPLY OIL AT THE GOVERNOR INLET MUST BE FREE OF AIR WITHIN A PRESSURE RANGE SPECIFIED IN SECTION 3.1. AIR IN ENGINE OIL WILL CAUSE PRESSURE PULSATION AT PUMP OUTLET WHICH COULD DAMAGE EITHER SOME OF GOVERNOR’S PARTS OR TO CUT DOWN GOVERNOR’S OPERATION LIFE SUBSTANTIALLY.

5.2 CONTROLLER CALIBRATION

For proper operation of the governor, it is necessary to calibrate the Controller. A detailed description is given in the user manual from the Controller manufacturer.

5.3 PERFORM STATIC RUN-UP

ATTENTION:

PERFORM THE STATIC RUN-UP ON A CLEAN AREA NOT TO DAMAGE THE PROPELLER BLADES DUE TO STONES ETC.

Lock aircraft brakes. Switch Controller to manual mode and set Governor Actuator to Maximum RPM stop. Controller display is shown at Figure 501.



Figure 501 –Controller display

Advance throttle slowly to maximum permitted engine manifold pressure limits. Record propeller RPM. Record position of Actuator – should be on Maximum RPM stop (MIN PITCH), see Figure 501. If local wind conditions are over 2.5 m/s (5 knots) repeat check with aircraft pointed to opposite direction and average two numbers. As a general rule, the propeller should limit the static RPM to 25-100 RPM below the red line limit.

In order to find out, whether propeller or governor is limiting static rpm, move Governor Actuator to Minimum RPM (MAX PITCH). If RPM drops immediately, the governor is limiting RPM. If control can be moved without immediate RPM change, propeller is limiting RPM.

SET THE GOVERNOR ELECTRIC ACTUATOR WITH MANUAL RPM CONTROL FROM THE MAXIMUM RPM POSITION TO MINIMUM RPM POSITION, REPEAT 3 TO 5 TIMES TO REMOVE AIR IN THE SYSTEM. CHECK PERMITTED ENGINE MANIFOLD PRESSURE LIMITS DURING THIS TEST!

5.4 PROPELLER VENTING

Set the governor to the maximum RPM position. Set the engine speed to a value between the maximum and minimum RPM of the governor. Use the Controller to reduce the speed of the governor so that the governor starts to function. After determining the function of the governor, increase the RPM using the Controller. Repeat the procedure several times.

5.5 PERFORM FLIGHT TEST

Perform flight test with Controller switched to manual mode and set Governor Actuator to Maximum RPM stop. During take-off acceleration, record maximum propeller RPM. When sufficient altitude is reached, level out aircraft, leaving propeller control in full RPM position. Maintain this setting for 3 to 5 minutes while monitoring propeller RPM. Following this check, two conditions may exist which require adjustment:

- a) If the propeller RPM is exceeding the red line limit, reduce it manually with propeller control. Land the aircraft and shutdown. Remove cowling, note position of RPM Adjustment Screw. Continue according chapter 5.7.2. Then perform another flight to confirm if adjustment were sufficient.
- b) If the propeller RPM is below red line limit with max RPM setting on the propeller control, note RPM and land. Remove engine cowling and note position of RPM Adjustment Screw. Continue according chapter 5.7.2. Perform another flight to confirm if adjustment were sufficient.

Remove engine cowling and check for the oil leaks. Oil leaks aren't permitted.

5.6 GENERAL

Static Run-up

There has been some confusion in the field concerning propeller low blade angle setting, the Governor setting and how it relates to static run-up and take-off RPM.

As a general rule, engine redline RPM cannot be reached during a full power static run-up.

Contrary to popular belief, the Governor is not controlling the propeller at this time, the propeller is against its low pitch stop. Attempting to increase propeller static run-up RPM by adjusting

the Governor Adjustment Screw will have no effect and will probably result in a propeller overspeed during the take-off roll.

5.7 CALIBRATION PROCEDURE

Tools: flat wrench or socket wrench 22 mm [7/8"],

hex key size 3 mm

hex key size 2,5 mm

5.7.1 POSITIONING OF CONNECTOR (SEE FIGURE 5022)

- Unscrew 4 screws from connector body.
- Turn connector body to appropriate position. (4 position at 90°).
- Screw in 4 screws, tightening torque 1,6-1,8 Nm.

Note: Make only if necessary, due to the installation reasons

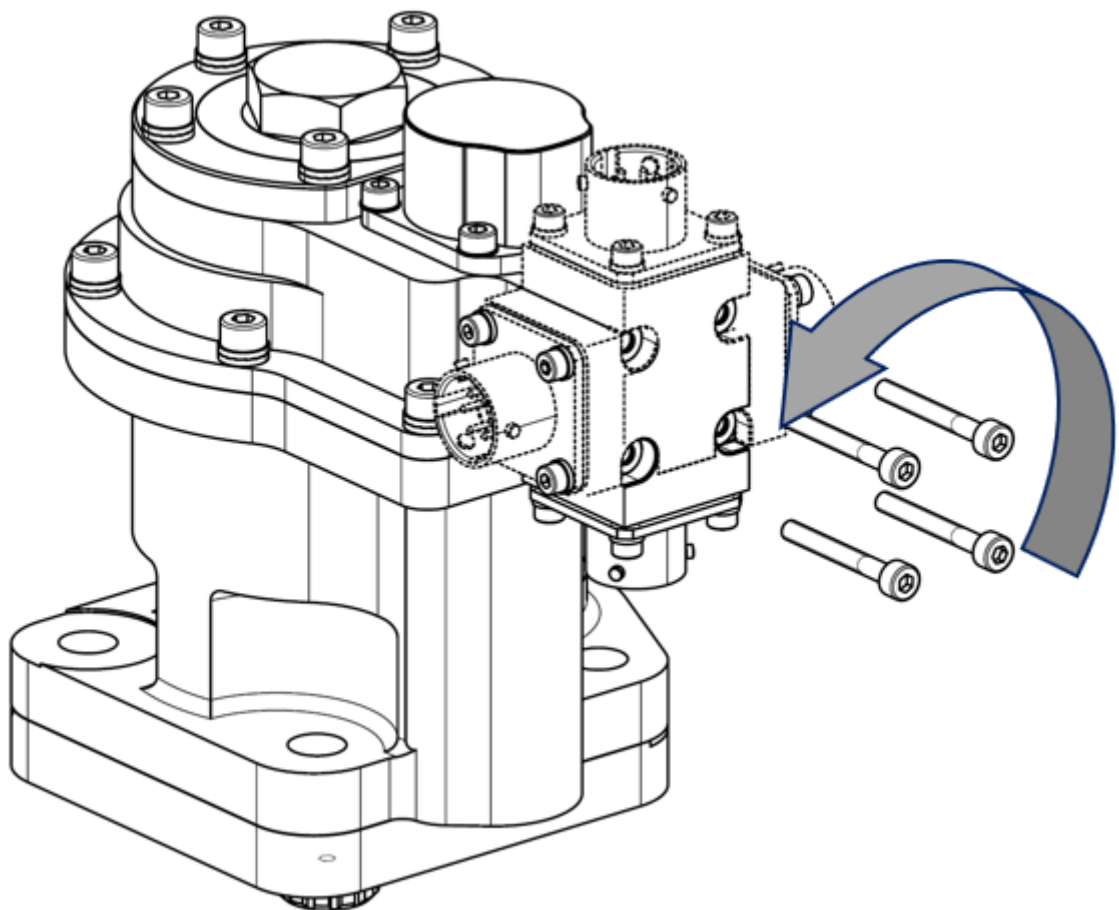


Figure 502 – Connector repositioning

WARNING!

DO NOT ROTATE CONNECTOR HOUSING MORE THEN 180°!

5.7.2 ADJUSTING MAXIMUM PROPELLER RPM (SEE FIG. 503, 504)

Set Governor Actuator to the maximum RPM stop – use Controller in manual mode. Loose five screws of the cover clamp.

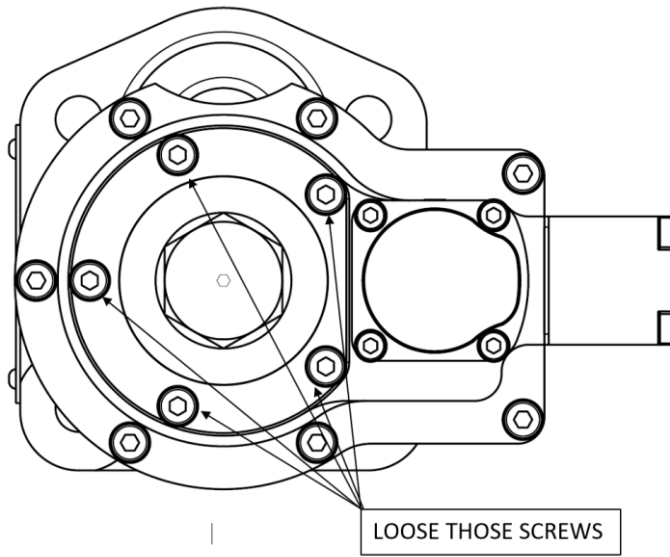


Figure 503

Set maximum propeller's RPM by turning the RPM Adjustment Screw. Rotation by angle of 5° will change RPM by approximately 12-15 RPM. Clockwise rotation increases maximum Governor RPM, counter clockwise rotation decreases maximum Governor RPM. Before adjusting the speed, switch the Controller to the manual control position and move the governor Actuator to the minimum speed position for manipulation in the direction of speed increase, to the maximum speed position for manipulation in the direction of speed decrease.

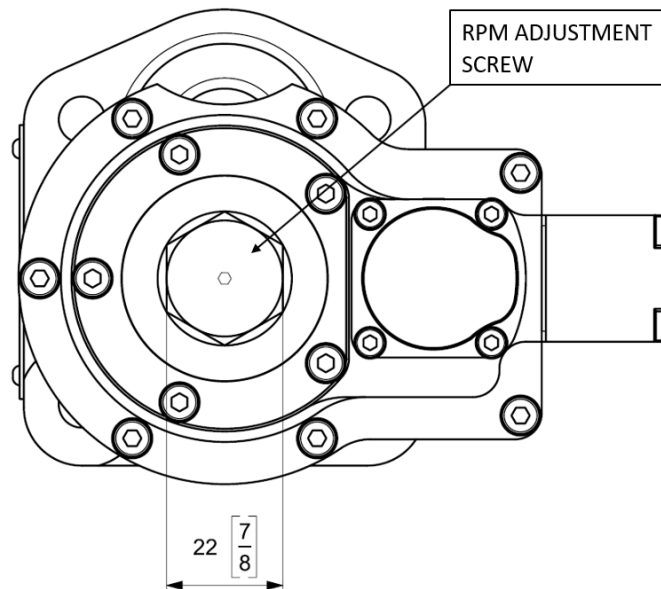


Figure 504

After adjustment, torque five screws by torque 1,6-1,8 Nm (14.2-15.9 lbf.in).

In case of any doubt, contact service center or Governor manufacturer.

5.7.3 ADJUSTING MINIMUM PROPELLER RPM

The minimum propeller RPM cannot be adjusted. When adjusting maximum RPM, the difference between maximum and minimum RPM became almost the same.

5.7.4 GOVERNOR REMOVAL

Disconnect connector of electric control.

- Remove mounting nuts/screws and washers.
- Pat on the Governor to release it and then remove Governor from engine pad.
- If it is necessary clean Governor drive and engine pad by appropriate means.

Perform preservation in accordance with section 9.0 to prepare Governor for long term storage.

Storage Governor in accordance with section 9.0.

6 INSPECTIONS

Check for oil leakage at Governor's surface and a mounting pad.

If oil leakage is detected check screws at the Governor housing and 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 TROUBLE SHOOTING

7.1 MALFUNCTION

If a malfunction is suspected, make a log using the Controller. Connect a blank USB drive with a maximum size of 2GB. To activate the Logger choose “Yes” from the Main Menu > Logger.

A detailed description is given in the User Manual from the Controller manufacturer.

7.2 INCORRECT RPM

There are several ways how to adjust pitch and RPM on propeller and Governor. Before any adjustments you shall calibrate tachometer. There are usually three types of problems:

- RPM in flight is too high
- RPM in flight is too low
- Static RPM is too low

7.3 RPM IN FLIGHT TOO HIGH

If the static RPM is within limits, only the Governor allows overspeed.

Solution:

Decrease Governor RPM (see chapter 5.7.2).

7.4 RPM IN FLIGHT TOO LOW

Engine RPM is too low in flight.

Solution:

Increase Governor RPM (see chapter 5.7.2).

7.5 STATIC RPM TOO LOW

To find out whether the Governor or the propeller limit the RPM, proceed as follows:

- Set Actuator to the maximum RPM stop – use Controller in manual mode
- Power lever to maximum power.
- Decrease RPM with Controller in manual mode until RPM drops approx. 25 RPM.
- If there is a long way necessary to get the RPM drop, the pitch stop of the propeller will limit the static RPM.

Solution:

Follow the propeller manufacturer’s manual.

If the RPM drops immediately after a small RPM decrease with Controller in manual mode, the Governor will limit the static RPM.

Solution:

Increase Governor RPM (see chapter 5.5.2).

Important:

Be sure that Controller is in manual mode during the test.

7.6 SLUGGISH RPM CHANGE

- Oil is cold
- Excessive friction at propeller pitch change mechanism.

Solution:

- Run the engine until the green light of the oil temperature is reached.
- Move blades by turning them with hands within angular play. If excessive friction exists, the blade retention system has to be inspected. Contact propeller manufacturer.

7.7 SURGING RPM

- Trapped air in propeller piston.
- Sludge deposit.
- Wrong speeder spring in the Governor.
- Wrong pitch stops in the propeller.
- Electronic malfunction.
- Wrong carburetor or engine management setting.
- Oscillating tachometer or RPM sensor.

Solution:

- To Remove the air from oil system, proceed as follows:
 - o The exact procedure for removing air from the oil is defined by the aircraft manufacturer, use the procedure in chapter 5.4
- Clean oil tubes in the motor, in the propeller piston and eventually in the Governor (only possible at the Service Center).
- Check that the Governor part number corresponds to the aircraft data sheet. If the RPM does not stabilize after 5 periods this is an indication for wrong speeder spring, contact service center or manufacturer.
- Compare propeller pitch values to those of the data sheet. Note static rotational speed.
- Contact service center or manufacturer.
- Correct as specified in the engine manual.
- Check tachometer/rpm sensor and drive.

7.8 MAXIMUM RPM INCREASE DURING NORMAL OPERATION WITH G GOVERNOR ACTUATOR SET TO MAX RPM STOP

- Oil leakage or hot oil.
- Worn oil transfer system causes a decrease in blade angle of attack.
- Internal leakage in the propeller.
- Governor drive failure or broken relief valve spring.

Solution:

- Finish the flight in accordance with aircraft service instructions.
- Check for oil leaks, replace gaskets, decrease oil temperature with higher airspeeds.
- If the system works with cold oil and fails at high oil temperature, this will indicate high leakage in the oil transfer system on the propeller shaft. Repair engine.
- Contact manufacturer.
- Check Governor drive and Governor on the test bench (service center or manufacturer only).

Attention:

If sudden oil leakage occurs on a non-counterweighted propeller system (pressure to increase type propeller), move power lever back until the RPM will decrease.

In this condition the propeller goes back to the low pitch stop automatically and no oil pressure is needed.

Adjust the propeller control for take-off position with Controller in manual mode.

Apply power again, no more than required to remain about 100 RPM below take-off RPM.

Note that the propeller RPM should be always lower than adjusted with the propeller control. This will hold the Governor in the underspeed condition and no oil pressure will be transferred from the Governor to the propeller.

7.9 RPM DECREASE DURING NORMAL OPERATION WITHOUT CHANGE OF GOVERNOR ACTUATOR POSITION

- Speeder spring in the Governor broken or sticking pilot valve.
- Dirt in the fuel system or carburetor.

Solution:

- Finish the flight in accordance with aircraft service instructions.
- Check Governor on the test bench (service center or manufacturer only).
- Clean or repair.

Attention:

If the cause cannot be found in the fuel system the flight can be continued when throttle setting is reduced, avoiding excessive manifold pressure and overheating of the engine. The RPM will remain low because the propeller pitch is on the high pitch stop.

7.10 EXTREMELY SLOW PITCH CHANGE OR NO PITCH CHANGE ON GROUND (RPM CHANGES WITH AIRSPEED LIKE A FIXED PITCH PROPELLER)

- Blocked oil line.
- Sludge deposit in propeller piston.
- Damaged pitch change mechanism.
- Corrosion in the blade bearings.

Solution:

- Finish the flight in accordance with aircraft service instructions.
- Check engine.
- Clean propeller and crankshaft.
- Contact manufacturer. This error may appear suddenly.
- Repair propeller.

7.11 GOVERNOR HAS BEEN SUCCESSFULLY CALIBRATED BEFORE BUT RPM DURING START ARE LOW (RPM ARE NOT INCREASING DURING AIRCRAFT ACCELERATION)

- Controller failure.
- Governor failure

Solution:

- Finish the flight in accordance with aircraft service instructions.
- Contact manufacturer.

Attention:

If the maximum RPM and thus maximum engine power cannot be reached in the flight, finish the flight with Controller switched to manual mode and set Governor Actuator to Maximum RPM stop (MIN PITCH).

7.12 OIL LEAKAGE

Damaged gasket

Solution:

Replace gaskets or repair propeller.

7.13 DIRTY ENGINE OIL

Contaminants in dirty engine oil can cause blockage of close tolerance passages in Governor leading to erratic operation.

Solution:

Timely engine oil changes should eliminate this problem.

7.14 EXCESSIVE TRANSFER BEARING LEAKAGE

Engines with excessive transfer bearing leakage can experience propeller surging since the Governor may not be able to get enough oil pressure to the propeller.

Solution:

Perform a transfer bearing leakage test per engine manufacturer's instructions. If the test indicates a high rate of leakage (even though it may still be on the high side of "acceptable" tolerance), this may be the cause. Install the suspect Governor on a known "good" aircraft. If problem disappears, engine work may be indicated.

8 ORDERING

When ordering the Governor or spare parts, following information shall be specified:

- Governor model designation
- P/N
- Quantity
- Other special requirements
- Spare parts – if required

Item	Specification	P/N
Gasket	MS9144-01	1430255
Harness Connector	162GB-16F10-6SN	1261159

Table 801 – spare parts list

For governor installation at ROTAX tractor engine models is available special installation tooling which is compatible with screw head size 10, see Table 802 and Figure 801, 802.

Item	Specification	P/N
Wrench A	Size 10 (for Rotax P/N 440867 screws)	1430833
Wrench B	Size 10 (for Rotax P/N 440867 screws)	1430834

Table 802 – special tooling for Rotax engines

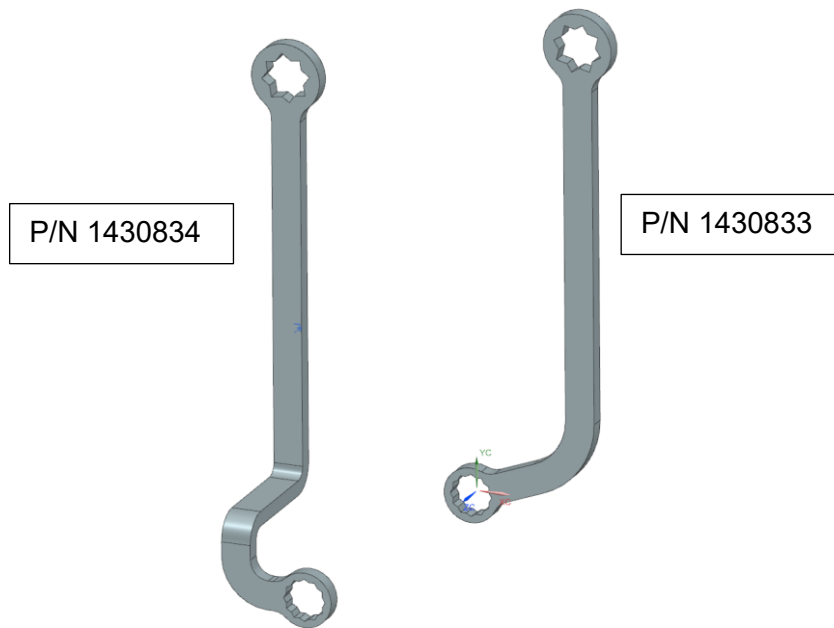


Figure 801 – special tooling for Rotax engines

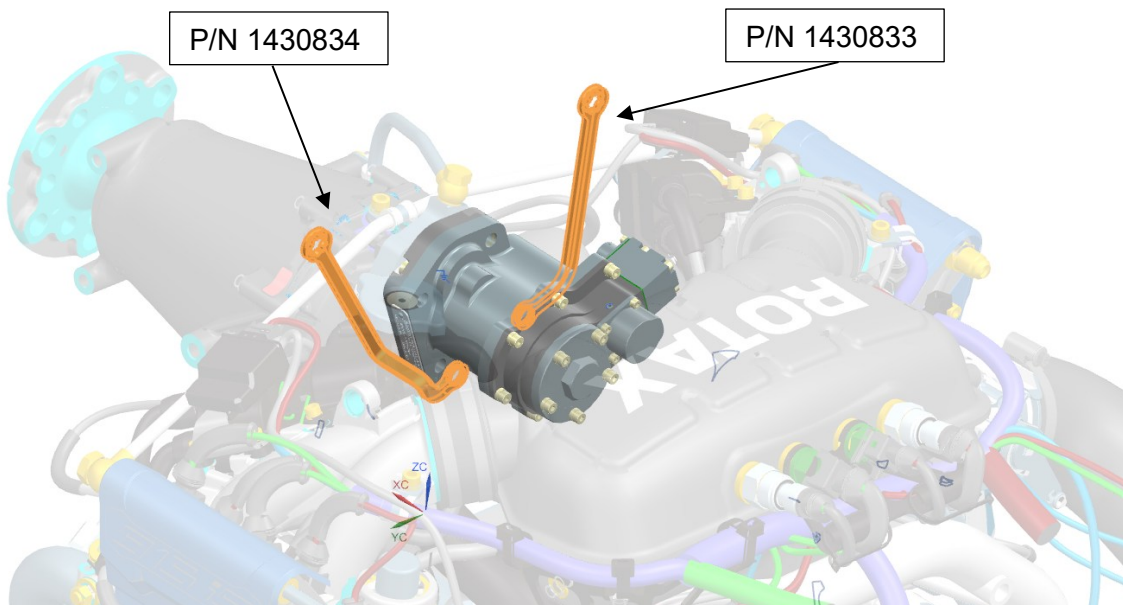


Figure 802 – use of special tooling at Rotax engine

9 PRESERVATION, STORAGE AND DELIVERY

9.1 PRESERVATION:

Inner preservation is done by flushing Governor with engine oil.

NOTE:

WHEN PRESERVATING GOVERNOR USE NEW ENGINE OIL OR LUBRICATING OIL MIL-L-6082 OR EQUIVALENT.

WARNING!

DON'T STORE GOVERNOR WITHOUT INNER PRESERVATION FOR MORE THAN 24 HOURS!

After installing the Governor, the preservation is done together with engine in accordance with the instruction of the engine manufacturer.

External preservation isn't required.

For storage longer than 1 week pack the Governor in two layers of wax-cloth and put it in plastic bag together with appropriate charge of drying agent. The plastic bag should be then vacuum sealed.

Depreservation isn't needed.

9.2 STORAGE

Protect Governor from physical damage by storing in a suitable area.

Store Governors in temperature from +10°C (+50°F) to +50°C (+122°F) and relative humidity to 80 % maximum. Keep the stock room free of gases with deleterious effect and dirt.

9.3 SHIPPING AND DELIVERY

The following documentation is provided with the Governor delivery:

- Releasing quality document - CoC
- Acceptance test report

10 WARRANTY CONDITIONS

10.1 WARRANTY PERIOD

Warranty period for storage is 24 months since the date of sale.

Warranty period for operation is 500 operating hours or 12 months since the date of installation on aircraft whichever occurs first.

10.2 WARRANTY CONDITIONS

The warranty can only be acknowledged if:

- a) Customer will submit a written report with detail malfunction description and operational history containing at least:
 - Date of installation
 - Operational hours
 - Date of deinstallation
 - Engine model
 - Propeller model
 - Flybox APR1-M-LC-J12 Controller model and S/N
- b) Performed maintenance including adjustments
- c) There were performed no unapproved modifications with the Governor.
- d) The Governor is complete – no missing parts.
- e) The Governor is not damaged or corroded.
- f) The Governor had not been operated out of approved operational limits.
- g) The Governor sent for warranty claim is properly packed, preserved and all ports are plugged.
- h) The Governor is within limits of Warranty periods.

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