OPERATION AND INSTALLATION MANUAL

Document number:

EN-1366

(ATA 61-10-66)

HYDRAULICALLY CONTROLLED
VARIABLE PITCH PROPELLERS
(CONSTANT SPEED)

Propeller Models

AV-723-1-B,C,D-(C)-(F)

AV-803-1-B,D,K-(C)

AV-842-1-B,C,D-(C)-(F)

AV-843-1-B,D-(C)

AV-844-1-D-(C)-(F)

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ATTENTION

FOR OWNERS, USERS
AND SERVICE STAFF

This installation and operation manual contains descriptions, technical specifications and instructions for operation and maintenance of AV- propeller type series.
All activities associated with propellers operation and maintenance must be practises according to this manual. Activities which be exceeden scope of this manual, shall be practises only by manufacturer or authorized service centre.

CAUTION

All activities contains in this manual shall be practises only by persons with commensurating qualification !
Breach of the operating instructions and procedures in this manual, exceeding of rated operational terms or performance limits can cause incorrect propeller function !
Manufacturer or authorized service centre doesn´t bear any responsibility for damages incurred non performance instructions or procedures stated in this manual !

SERVICE BULLETINS ,SERVICE INSTRUCTIONS , SERVICE LETTERS

Product user is responsible for this manual up-dating according to issued changes. Implementation of changes it´s necessary to write in list of changes.
Latest revision of this manual as well as Service Bulletins, Service Letters and Service Advisories associated with propellers in this manual are freely disposable at ***www.aviapropeller.com*** .

NOTICE

Illustrations, pictures and drawings in this manual are only by example for displayed object and it´s not to be regarded as binding on any propeller type or her section.

GUARANTEE

Guarantee conditions for each one propeller are determinated in contract of purchase.

THANK YOU FOR CHOOSING AVIA PROPELLER PRODUCT

Properly maintained it will give you many years of reliable service.

Table of content **Page**

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LIST OF CHANGES

Change number	New page issue date	Changed pages	Date
R-64/10	2010-05-19	all	May 19, 2010
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LIST OF EFFECTIVE PAGES

Page	Date of issue	Page	Date of issue
I-1	2010-05-19	9-1	2015-05-12
I-2	2015-05-19	10-1	2010-05-19
II-1	2019-12-04	11-1	2015-02-10
II-2	2010-05-19	11-2	2015-02-10
III-1	2019-12-04	11-3	2015-02-10
III-2	2010-05-19	11-4	2015-02-10
1-1	2019-12-04	11-5	2015-02-10
1-2	2010-05-19	11-6	2015-02-10
2-1	2019-12-04	11-7	2015-02-10
2-2	2019-12-04	11-8	2015-02-10
3-1	2010-05-19	11-9	2015-02-10
3-2	2010-05-19		
4-1	2011-03-16		
4-2	2014-01-31		
4-3	2015-02-10		
4-4	2010-05-19		
5-1	2010-05-19		
5-2	2014-01-31		
5-3	2014-09-18		
5-3-1	2014-10-02		
5-4	2014-09-18		
5-5	2011-10-12		
6-1	2014-10-02		
6-2	2011-10-12		
6-3	2014-01-31		
6-4	2014-01-31		
6-5	2015-05-12		
6-6	2011-10-12		
7-1	2014-09-18		
7-2	2010-05-19		
7-3	2015-07-07		
8-1	2010-05-19		
8-2	2010-05-19		
8-3	2010-05-19		
8-4	2010-05-19		

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1. AIRWORTHINESS LIMITATION

This Airworthiness Limitations Section is EASA approved in accordance with Part 21A.31(a)(3) and CS-P40(b) and 14 CFR Part 35.4 (A35.4). Any change to mandatory replacement times, inspection intervals and related procedures contained in this section must also be approved.

The Airworthiness Limitations Section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternate program has been FAA approved.

A. Life Limits

(1) The life limit should be established for certain part of the propeller assembly. This limit requires the replacement of such part after a specified number of hours of operation (TSN, Time Since New).

(2) This section summarizes the life limited parts of propeller models covered in this manual.

(3) The blade life limit is not affected whether or not the de-icing components are installed.

(4) Below mentioned life limits of the parts apply to all of propeller models and propeller-aircraft-engine combinations, unless specifically noted otherwise.

(5) **Life limited parts of AV series propellers in this manual**

Part Name	Life limit
BLADE	6000 hours
HUB	6000 hours
BEARING RACE	6000 hours
BLADE BUSHING . . . . (AV-723 and AV-803 models only)	6000 hours

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2.0. GENERAL

2.0.1 Statement of Purpose

This publication provides operation, installation and line maintenance information for the Avia hydraulically controlled, constant speed, variable pitch propellers with single-acting system and no reverse capability. Some of the models may have feathering capability.
Propellers in this manual are designed primarily for use with piston engines, but some turbine applications are also covered in this manual.

In addition to the propeller assembly, the propeller governing system is addressed in this manual.

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

All informations, procedures, inspections and limits stated in this manual are valid to all propeller models listed on the cover of this manual, unless specifically noted.

2.0.2 Overhaul

For TBO limits of all Avia propellers refer to latest revision of Avia Service Bulletin No.1 available on Avia Propeller website at www.aviapropeller.cz.

The overhaul is periodic process performed at specific intervals in which the propeller is disassembled and inspected. Damaged parts are repaired or replaced. All sealing elements are replaced. Corrosion preventive coatings of the parts are renewed. Propeller is reassembled, adjusted and balanced.

The overhaul interval is usually referred to as Time Between Overhaul (TBO). The TBO limit is based on operation limit expressed in hours of operation and on calendar limit expressed in calendar months. The overhaul should be accomplished if one of this limit is acquired, whichever occurs first.

The overhaul must be done only in the Avia Propeller or authorized service station in accordance with the latest revision of the Overhaul manual mentioned in „Related Documents“ section in this chapter.

2.0.3 Related Documents

a) Avia Manual EN-1367 (61-10-67)
Propeller Overhaul Manual

b) Avia Manual EN-1370 (61-10-70)
Overhaul Manual for Metal Blades

c) Avia Service Bulletin No.1
Includes an overhaul intervals (TBO) of all Avia propellers. Available at www.aviapropeller.cz.

d) Avia Service Bulletins, Service Letters, Service Advisories which may relate to the propellers in this manual. Available at www.aviapropeller.cz.

2.0.4 Part Replacement

Basically, only some outside mounted parts, such as propeller-to-engine o-ring, de-ice cables and some other de-ice components, some fasteners, may be replaced in the field by the user. Some other parts may be replaced in the field only by person trained and authorized by Avia Propeller.

Contact the Avia Propeller for information on part replacement. Parts that did not come through the manufacturer's quality control system will void the warranty and may render the propeller unairworthy.

2.1.0 The pitch change is conducted by a propeller governor. Once an engine rotational speed is selected it will be held constant at variations of airspeed and power. Usually, this is called a constant speed propeller. Mechanical stops for low pitch and high pitch limit the pitch change travel. In case of the oil pressure of the governor to be lost, the blades return automatically to low pitch or, if counterweights are installed, to high pitch, enabling the pilot to continue the flight. The oil pressure is single acting.

2.2.0 Feathering position of the blades is possible as an option. With the propellers with counterweights oil pressure to decrease pitch is used. Feathering is reached with propeller control being pulled to feathering. Additionally there could be a safety system integrated in the propeller, to avoid unintended feathering with the engine running at high rpm.

3.0. MODEL DESIGNATION

3.1. Hub designation

A V - 8 4 4 - 1 - E - C - ( ) - ( ) - ( ) - ( )
1 2 3 4 5 6 7 8 9 10 11

1 Avia Propeller (manufacturer)

2 A = automatic propeller
V = variable pitch propeller
G = ground adjustable propeller
F = fixed pitch propeller

3 Blade root type

4 Number of blades

5 Number of variant of the propeller model

6 Code letter for flange type
A = Motorglider engines, 7/16“-20 UNF bolts, circle dia 80 mm
B = AS-127-D, SAE No.2 mod., 1/2"-20 UNF bolts
C = SAE No.2 mod., 7/16"-20UNF bolts
D = ARP 502, 1/2“-20UNF bolts
E = ARP 880, 9/16“-18UNF bolts
F = SAE No.1, 3/8"-24UNF bolts
G = Walter/LOM flange, M10 bolts
H = PW 115, 9/16"-18UNF bolts
K = M14 flange

7 Code letter for counterweights
blank = no or small counterweights for pitch change forces to decrease pitch
C = counterweights for pitch change forces to increase pitch

8 Code letter for feather provision
blank = no feather position possible
F = feather position installed

9 Only applicable for reversible propellers

10 Only applicable for reversible propellers

11 Code letter for design changes
small letter for changes which do not affect interchangeability
capital letter for changes which restrict or exclude interchangeability

3.2. Blades designation

( ) ( ) 2 4 5 - 4 0 7 ( )

1 2 3 4 5

1 Code letter for position of pitch change pin

blank	=	pitch change pin position for pitch change forces to decrease pitch
C	=	pitch change pin position for pitch change forces to increase pitch
CF	=	pitch change pin position for feather provision ; pitch change forces to increase pitch

2 Code letter for blade design and installation

blank	=	right-hand tractor
RD	=	right-hand pusher
L	=	left-hand tractor
LD	=	left-hand pusher

3 propeller diameter in cm

4 Number of blade type (contains design configuration and aerodynamic data) according to the certified hub/blade - combinations

5 Code letter for design changes
small letter for changes which do not affect interchangeability of blade set
capital letter for changes which restrict or exclude interchangeability of blade set

3.3. The complete propeller designation is a combination of both designations, for instance AV-844-1-D-C/C245-407c.

3.4. The hub-serial No. starts with the year of manufacture. All records of the propeller are registered in respect to this number.

3.5. The propeller for a certain aircraft-engine combination is always defined according the hub-, blade- and spinner combination. For the actual blade settings, depending on the aircraft model, the propeller logbook must be considered.

4.0. DESIGN AND OPERATION INFORMATION

4.1. The variable pitch propeller consists of the following main groups:

Hub

The one-piece hub is made from forged or milled aluminum alloy with the outer surface shot-peened and anodized.

Propellers with non-threaded blades
The blade bearings are special designed ball bearings, whereas the balls act as split retainers in order to hold the blades in the hub, creating an increased safety factor against blade loss. The outer bearing race is a one-piece part and pressed into the hub, while the inner race is split and installed on the blade ferrule or blade root. The blade preload is adjusted by the thickness of plastic shims. Blade and bearing are held in the hub by a retention ring.

Propellers with threaded blades
The inner bearing race is located on the blade bushing, whereas the blade are screwed into the bushing and tightened by the clamp. The outer bearing race is a one-piece part and pressed into the hub. The blade preload is adjusted by the prestressing nut, which holds the blade bearing and blade in the hub.

The pitch change of the blades is obtained with a pin in the blade root or in the blade bushing face. A plastic block connects the blade with the piston and the axial movement of the servo piston turns the blades. On the front piston the return spring and the sleeve, which acts as high (low) pitch stop, are installed.

Outside the hub are two check nuts with which the low (high) pitch stop can be adjusted. The inner part of the hub is used as the cylinder for the pressure oil. This arrangement allows a simple and lightweight design. The front spinner support is used to have the balance weights installed, if applied. Balance weights can be also installed on the spinner bulkhead.

Propeller blades

Propeller blades are made from aluminium alloy. They are turning in the ball bearings with one or two sets of balls in the propeller hub. Connection with the pitch change mechanism is make through plastic pitch change blocks installed on the pins in the blade shanks (non-threaded blades) or on the blade bushings faces (threaded blades).

Propeller blades can be designed with counterweights installed on the blade shank.

Leading edges of the blades can be protected with polyurethane guards for mechanical damages prevention.

Counterweights

Propellers may by equipped with counterweights on the blade shanks or as the part of the hub.
If governor supplied oil is lost during operation, force from counterweights move the blades to high pitch and feather (if applied) to prevent propeller overspeed.

Spinner

The spinnerdome is made from fiber reinforced composite or spinformed aluminum alloy. The bulkhead is spinformed or truncated aluminium alloy.

If spinnerdome has stiffener no integrated, then the front support is installed as part of the hub. Filler plates increase the stiffness of the dome on the cutouts for the blades. The dome is mounted on the supports by means of screws.

Propeller Governor

The necessary servo pressure of the engine oil is reached by a gear pump in the governor, which increases the oil pressure. Flyweight and a speeder spring move a pilot valve, allowing servo oil flow to and from the piston in the propeller. In on speed condition there is no oil flow. A speed adjusting lever changes the preload of the speeder spring. This results into an engine speed change. The following pictures are showing the system. Please note, that the propeller has a single acting system where the natural twisting forces of the blades always turn them into low pitch position. The governor produces oil pressure to increase pitch. Blades having counterweights installed for aerobatic aircraft or twin engine aircraft always turn them into high pitch position and use oil pressure to decrease pitch.The relief valve pressure should be set between 270 and 340 psi.

Propeller Governor with FADEC

For the propellers installed on the TAE-engine the propeller control contains the following: A gear pump and a magnetic valve , allowing servo oil flow to and from the piston in the propeller. The maximum governor pressure is between 270 and 340 psi. The electronic RPM control is a FADEC system and designed according to DO 178B, Level C. The FADEC system is tested according to EMC test, CAT W and a HIRF test CAT R, equivalent to critically level hazardous.

The governor designation is CSU TAE-125
TAE No.: 02 – 6120 - 16 001 R6
FADEC: 02 – 7610 - 55 001 R1

Table I – HIRF Environment II

FREQUENCY			FIELD STRENGTH / (V/M)	
			PEAK	AVERAGE
10 kHz	-	100 kHz	20	20
100 kHz	-	500 kHz	20	20
500 kHz	-	2 MHz	30	30
2 MHz	-	30 MHz	100	100
30 MHz	-	70 MHz	10	10
70 MHz	-	100 MHz	10	10
100 MHz	-	200 MHz	30	10
200 MHz	-	400 MHz	10	10
400 MHz	-	700 MHz	700	40
700 MHz	-	1 GHz	700	40
1 GHz	-	2 GHz	1,300	160
2 GHz	-	4 GHz	3,000	120
4 GHz	-	6 GHz	3,000	160
6 GHz	-	8 GHz	400	170
8 GHz	-	12 GHz	1,230	230
12 GHz	-	18 GHz	730	190
18 GHz	-	40 GHz	600	150

Propeller de-icing

The propeller may have electrical or liquid de-icing systems installed. The de-icers are bonded onto the blades as usual. The rest of the electrical system is equal to existing components, with slip ring and wire harness.

Unfeathering Accumulator

Feathering propellers may have an unfeathering accumulator installed, connected to the governor. This enables unfeathering without a running engine. An unfeathering accumulator can also be installed to the governor in some aerobatic airplanes, to prevent a decrease of RPM at special aerobatic maneuvers. This unfeathering accumulator maintains the oil supply of the propeller for 5-10 sec. at short loss of oil supply by the engine.

4.2. Oil recommendation:

Propeller operates with oil supplied from engine lubricating system. Refer to engine manufacturer´s manual for information on approved or recommended oil.

Avia Propeller recommends using the following oils for piston engines :

- Mineral oil (non-dispersant) according to SAE J1966 (MIL-L-6082) standard
- Ashless dispersant oil according to SAE J1899 (MIL-L-22851) standard

Avia Propeller recommends using the following oils for turbine engines :

- Synthetic oil according to MIL-PRF-23699 (MIL-L-23699) or DEF STAN 91-101 (DERD 2499) standards

CAUTION:
USE OF OTHER THAN APPROVED OR RECOMMENDED OIL CAN CAUSE EXCESSIVE WEAR INSIDE THE HUB LEADING TO DECREASING THE HUB SERVICE LIFE.

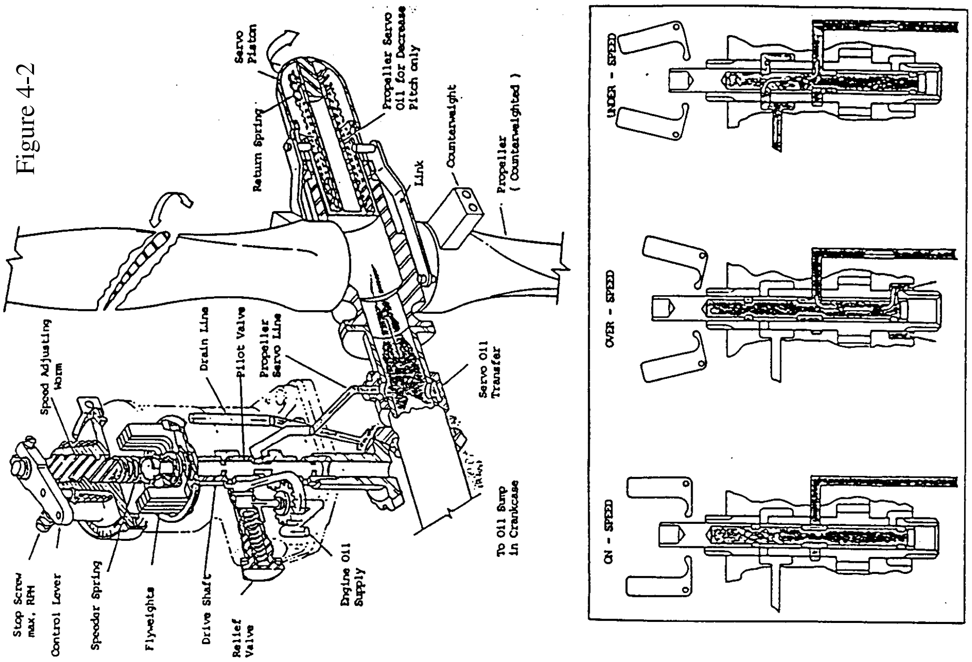


Figure 4-2

Governor oil pressure to decrease pitch, single engine

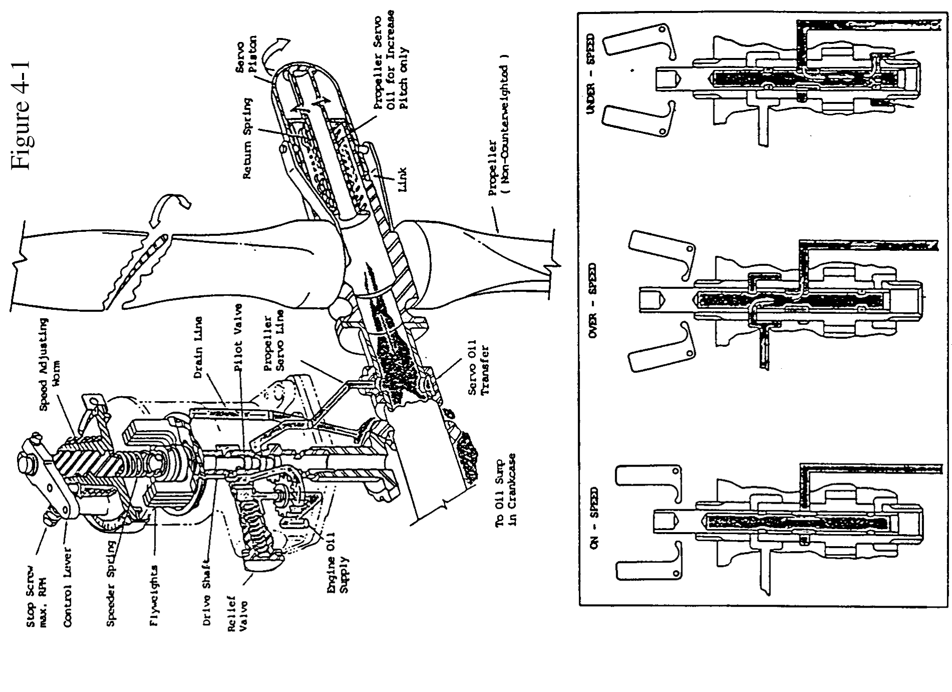
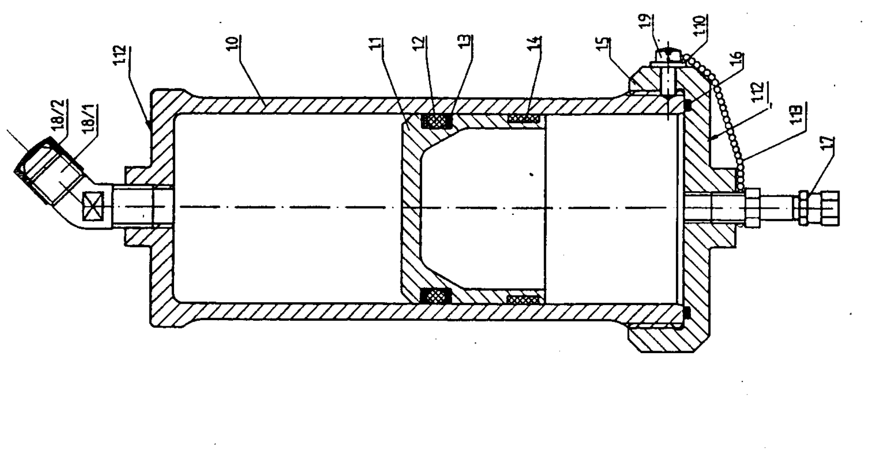


Figure 4-1

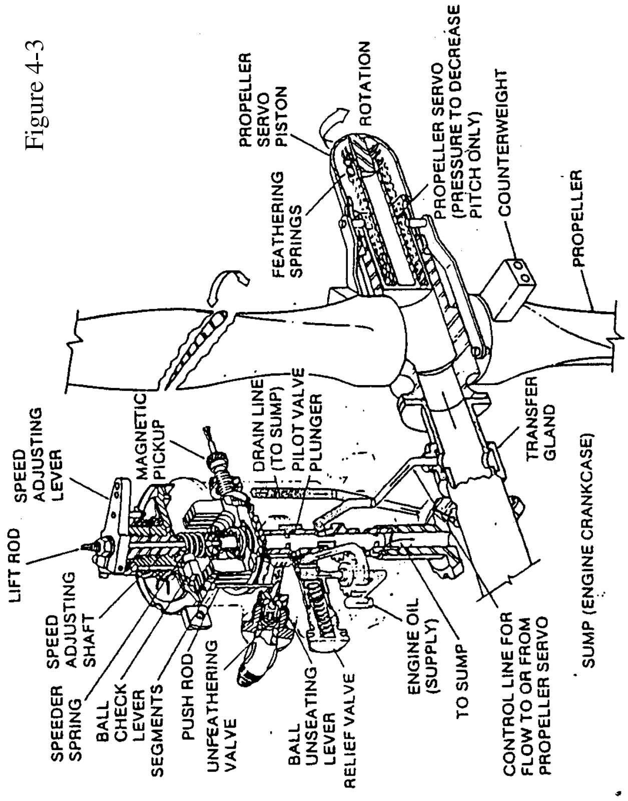
Governor oil pressure to increase pitch, single engine

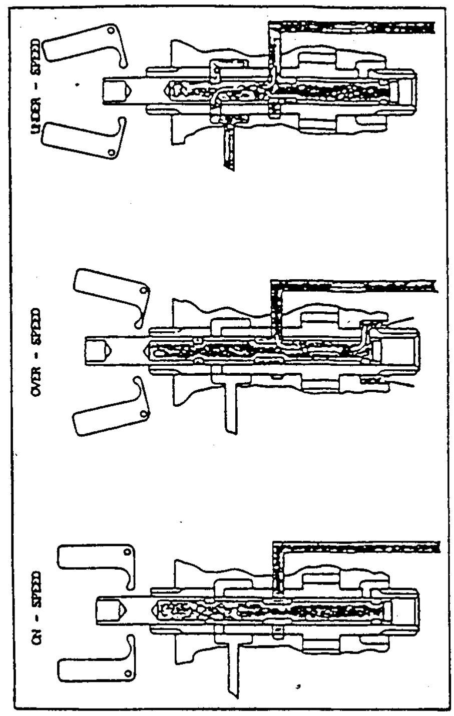
Figure 4-4



Unfeathering accumulator

Figure 4-3





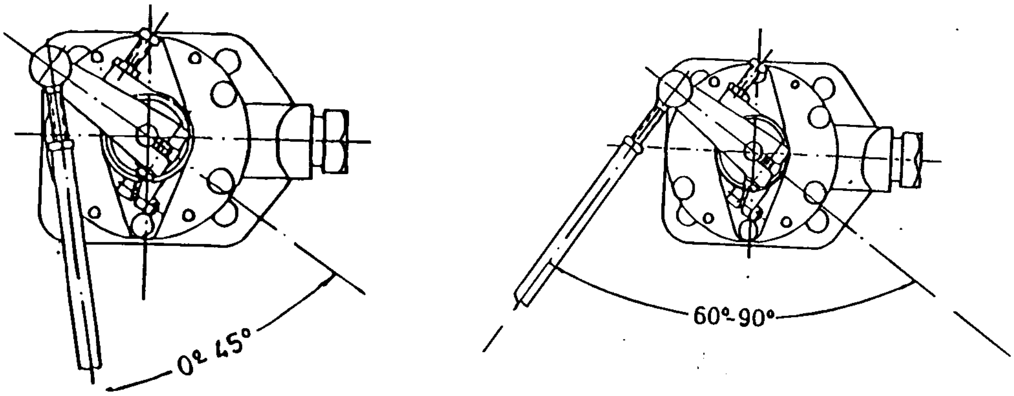
Governor oil pressure to decrase pitch, twin engine

5.0. INSTALLATION AND OPERATION INSTRUCTION

NOTE:
If a TAE-125 engine is installed the CSUM-01-01 must be used for installation and operation of the CSU.

5.1. All propellers of these designs are only suitable for installation on flange type engines. The code for the flange type can be seen from the model designation (see section 3).

5.2. A governor with suitable oil pressure direction has to be installed on the engine, the control lever being mounted as shown below.



WRONG Figure 5-1 **ACCEPTABLE**

5.2.1 If applicable, install the unfeathering akku to the governor and fix it onto the provided positions.

5.2.2 On the TAE-engine the CSU is already installed. Refer to the CSUM-02-01.

5.3. Electrical propeller deicing may be used optionally.
Complete Goodrich kits have to be installed according to Manual 30-60-02. Complete McCauley kits have to be installed according to Manual 830415. Observe the limitations during ground operation in order to avoid damage of the de-icers (overheating).

5.4. Clean engine and propeller flange with solvent of gasoline. Both surfaces must be dry and clean. Remove all surface defects.

5.5. Check position of o-ring in propeller flange.

WARNING: Use only original o-ring delivered by manufacturer.

5.6. Depending on spinner design, install backplate on crankshaft or on propeller hub.

5.7. Install the propeller carefully to the crankshaft. Observe the position of the spinner backplate for the blade position. If the design does not permit installing the flange bolts after the propeller has been fixed on the crankshaft, please observe that the propeller should not be pulled onto the crankshaft with the bolts in order to avoid damage to the hub and to avoid shearing off material causing oil leaks on the o-ring.

CAUTION:
Make sure that complete and true surface contact is established between the propeller hub flange and the engine flange.

5.8. Mounting bolts or stop nuts with washers should be tightened crosswise with equal force. If flange bolts installed with castle nuts in the hub recesses (flange type B and/or C), safety all mounting bolts with 0.032inch (0,8mm) stainless steel wire through the tubular lock pins (two bolts per safety) after installation on engine. Protect the safety wire with delivered protective tube to avoid hub surface damage.
If the propeller is installed on the engine by using the drilled hexagon flange nuts, safety the nuts with 0.032inch (0,8mm) stainless steel wire through the holes in the nuts (two nuts per safety).

Torque:

B Flange	1/2" - 20 UNF bolts		56 - 63 ftlb	75 - 85 Nm
C Flange	7/16" - 20 UNF bolts		41 - 44 ftlb	55 - 60 Nm
D Flange	1/2" - 20 UNF stopnuts	(< 300 HP)	63 - 66 ftlb	85 - 90 Nm
D Flange	1/2" - 20 UNF stopnuts	(> 300 HP)	80 - 85 ftlb	110 - 115 Nm
K Flange	9/16" - 18 UNF stopnuts		100 - 110 ftlb	135 - 150 Nm
K Flange	(Yak-18T only)		70 - 81 ftlb	95 - 110 Nm

NOTE: Torque values are valid for dry, free-moving threads only.

5.9. If the propeller has threaded blades separated from the hub install them into the hub as follows :
Before the blades installation, check the inner surface of the blade bushings for damage or corrosion and clean it from all dirts. Inner surface of the bushing and the blade shank must be clean and dry before blade installation.
Install the o-rings delivered by manufacturer into grooves on the blade shanks if they are not already installed (see Figure 5-2).

CAUTION:
It is important to install the blades into the hub in prescribed sequence. Prior to mounting, verify that the blade mounting number on the blade shank face (behind the serial number or the blade set number) correspond with number stamped on the hub arm. Incorrect installation of the blades can cause the unbalance of the propeller and incorrect blade angles. It can lead to abnormal vibration and the engine can be damaged.

CAUTION:
O-ring prevents moisture to get into the blade bushing thread. If the o-ring will not to be installed, the blade shank can be affected by corrosion. Use only original o-rings delivered by manufacturer.

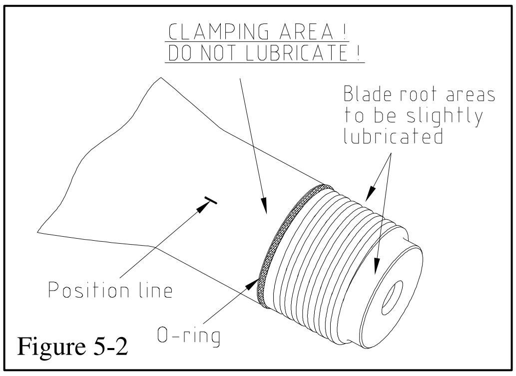


Figure 5-2

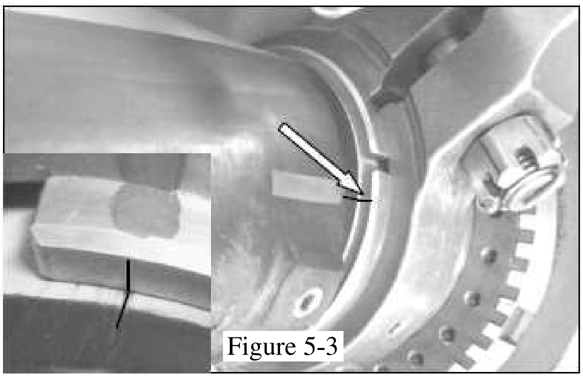


Figure 5-3

Lubricate the thread and centre diameter in the end of the blade shank slightly with grease.

CAUTION:
DO NOT APPLY ANY GREASE TO THE SURFACE WHERE THE BLADE IS CLAMPED IN THE BUSHING (CYLINDRICAL PORTION BETWEEN THE THREAD AND BLADE AIRFOIL - SEE FIGURE 5-2) ! THIS SURFACE MUST BE ABSOLUTELY DRY AND FREE FROM ANY GREASE AFTER BLADE IS INSTALLED IN THE BUSHING !

Screw the blade fully into the bushing and move it back into the right position. The position line on the blade shank must coincide with line on the blade bushing forehead (Figure 5-3). Slightly lubricate the thread of the clamp bolt with graphite grease and tighten with torque 65-70 Nm (48-52 ftlb). Secure the nut by cotter pin.

CAUTION:
Pay close attention to correct seating of the bolt head when tightening the nut-see Figure 5-2-2. Position the bolt head and hold in place with the fingers of one hand, while tightening the nut with other hand until snug. Then, still hold the bolt head, use the torque wrench to torque the nut as specified. Finally, check correct position of the bolt head after torquing. Incorrectly or inaccurately tightened clamp bolt will cause the change of blade angle setting in operation.

CAUTION:
Make sure that the shoulders of the clamp do not touch each other after tightening the clamp bolt to specified torque (figure 5-2-1). If the shoulders touch each other, remove the propeller from service and contact the Avia Propeller. Touching of the shoulders after additional tightening of the clamp bolt for safety with a cotter pin does not affect serviceability of the propeller.

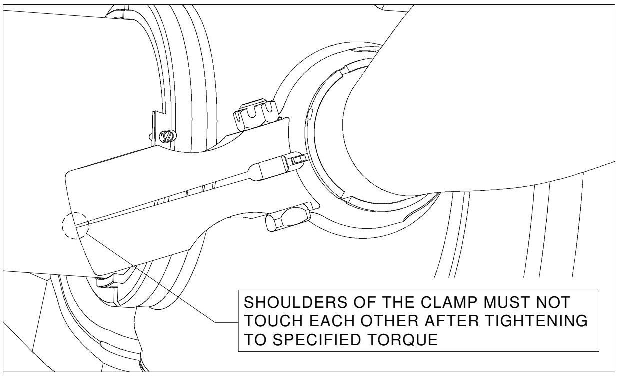


Figure 5-2-1

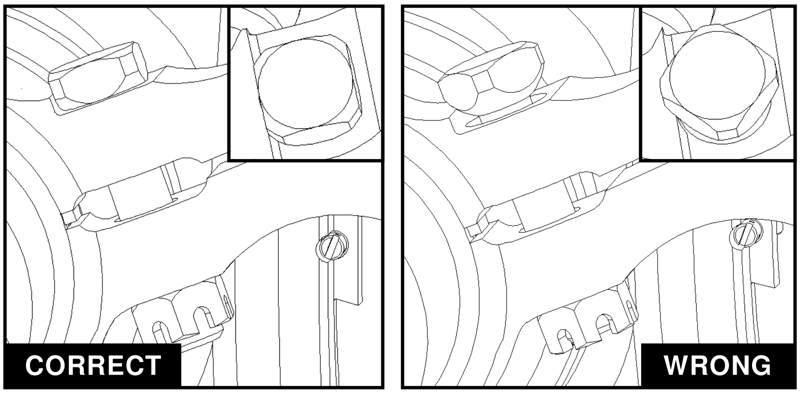


Figure 5-2-2

5.10. Check the blade track. Refer to section 6.2 for blade track procedure and limits.

Turn propeller for safety reasons (ignition) always opposite the usual direction of rotation.

5.11. Install spinner dome on support plates, observe mating marks. Torque the screws with washers to 3-4 Nm (27-35 inlb). Check runout of the dome. Max. 0,08 inch permissible.

CAUTION:
Use cross-head screwdriver with controlled torque or torque wrench with cross-head bit to tighten the spinner screws to required torque. Be careful to correctly tighten the screws.

CAUTION:
DO NOT USE A FLAT-HEAD SCREWDRIVER FOR TIGHTENING OF CROSS-SLOTTED SCREWS.

CAUTION:
USING OF SCREWS WITH DAMAGED CROSS SLOT FOR MOUNTING OF THE SPINNER DOME IS STRICTLY FORBIDDEN. USING OF SUCH SCREWS CAN CAUSE IMPROPER TIGHTENING OF THE SPINNER DOME LEADING TO THE CRACKS. SCREW WITH DAMAGED CROSS SLOT MUST BE ALWAYS REPLACED BY NEW. REFER TO FIGURE 5-3-1 FOR EXAMPLE OF DAMAGE OF THE CROSS SLOT.

Figure 5-3-1

5.12. Brush block installation

a) Check free movement of all brushes before installing. Compress and release the brushes noticing any bind or hang up inside the block.

b) Install the brush block assembly into its place on engine gearbox. Safety all mounting screws to each other with 0,81 mm (0.032 inch) stainless steel wire.

c) Check the brush block assembly for correct distance and angular location to the slip ring, as shown in Figure 5-4. The distance between brush block and slip ring should be between 1,2 and 2,4 mm (0.047 to 0.095 inch) and brush block should be angled of 2 degrees from perpendicular of the copper rings, toward the direction of slip ring rotation. As required, reposition the brush assembly on the mounting bracket as follows:

1) Loosen two screws attaching the brush block to the mounting bracket. Refer to Figure 5-5.

2) Reposition the brush block to establish the correct distance and angular location to the slip ring, as shown in Figure 5-4.

3) Torque the screws attaching the brush block to the mounting bracket to 1-2 Nm (9-18 in-lb). Check correct distance and angle after tightening.

CAUTION:
OVERTIGHTENING THE SCREWS CAN CAUSE BIND OR HANG UP OF THE BRUSHES IN THEIR BLOCKS AND INCORRECT FUNCTION OF DE-ICING SYSTEM.

d) Check radial alignment of the brushes. Make sure that the brushes are aligned so that the entire face of each brush contacts the copper ring throughout full 360 degrees of slip ring rotation. Refer to Figure 5-6.

e) *Cancelled*

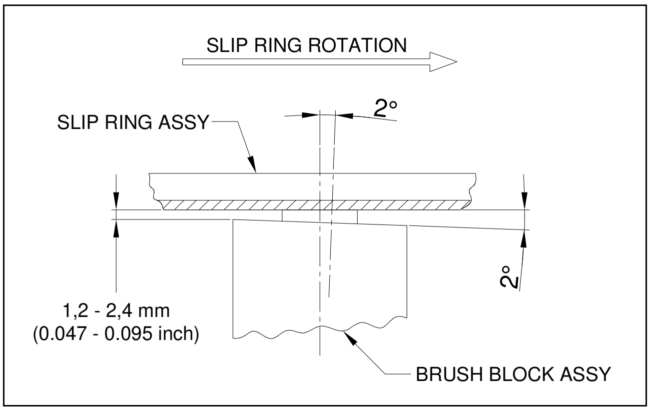


Figure 5-4

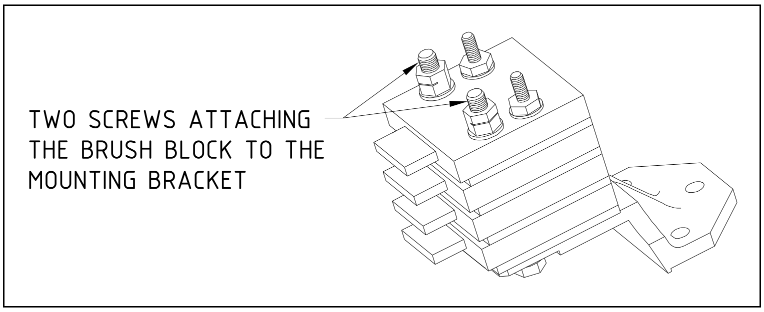


Figure 5-5

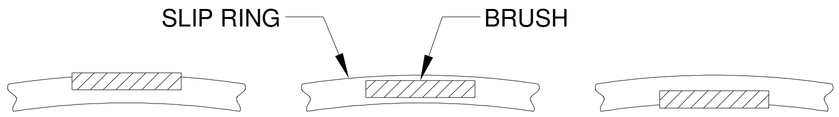


Figure 5-6

5.13. Connect electrical propeller de-icing system, if required. Secure the screws with red paint - see slip ring contacts.

CAUTION:
Test runs of propellers with installed de-icing system are only allowed with mounted spinner because otherwise the de-icing wiring will be damaged. Before running the engine the ground must be cleaned to avoid stone nicks on propeller blade and the de-icers.

5.14. Carry out a functional check.

NOTE:
Engine and propeller manufacturers recommend not to use high engine speed on ground because it can result in an excessive engine temperature and blade damage.

Adjust power lever for approx. 1700 rpm. Pull propeller lever back (out) until the rpm drops by 300 - 500. Push propeller lever full forward (in) for take off position and observe rpm increase.

Decrease and increase of engine speed should have about the same time. Cycle three times to bleed air out of the system.

If A TAE-125 engine is installed the functional check of the CSU must be carried out according to the CSUM-02-01.

5.15. Adjust power lever at approx. 2200 rpm now. Pull propeller lever back until rpm drops about 100 rpm. When the rpm is stabilized, increase manifold pressure by about 3 inhg and observe the governor function. rpm must stabilize.

5.16. Watch for a clean ground surface to avoid blade damage and advance power lever and propeller lever for take off power and rpm. The static rpm must be limited by the propeller and should be 50 - 100 rpm. lower than max. rpm. See chapter "Trouble shooting" to check, if the propeller or governor limits the rpm.
If A TAE-125 engine is installed the functional check of the CSU must be carried out according to the CSUM-02-01.

5.17. Low and high pitch stops are adjusted during manufacture, according to the requirement of the aircraft/engine combination. Low pitch stop can be adjusted by varying the check nuts. High pitch can only be adjusted in a service station. For propellers with counterweight it is conversely.

5.17.1. Check function of the unfeathering akku at propeller AV-( )-C-F. For this select app. 1400 rpm with the throttle, pull propeller lever into feathering position. Stop engine with with propeller blades in feathering position. Wait a few minutes. Push the propeller lever full forward and the propeller blades must move into the start lock, do that without a running engine. Refer to page 14.

5.17.2. CSU TAE-125
Required adjustments are carried out by the manufacturer according to the requirements of the aircraft/engine-combination.

5.18. After the ground runs, check for oil leaks, blade shake and condition of the de-ice system.

5.19. Perform a test flight.

5.20. Operation

Propeller and governor are selected as a result of tests. The governor must allow constant speed. On take off, the static rpm should be approx. 50 - 100 rpm. lower than max. rpm and the propeller must limit this rpm. If the governor limits rpm, it must be readjusted. During the take off run, the rpm must increase with airspeed and the governor must limit max. rpm.

The rpm can be changed at all power and rpm settings and must be held constant automatically within the entire flight envelope.

If oil pressure is lost and high speeds are used, overspeed is possible (none counterweighted propellers) and throttle must be retarded immediately to correct the situation.

High pitch is set to such a value that in case the oil return line is blocked, or for propellers with counterweights installed if the oil pressure fails, it should be possible to continue flight with reduced power. Go around would be from limited to impossible.

NOTE:
Move power lever and rpm lever always slowly to avoid overspeed.

5.21. Pre-flight check

The propeller should be cycled at least twice to spill oil before every flight. In cruise flight an infinite number of power and rpm settings are possible because there is no restriction between the stops. Rpm restrictions from the engine or propeller manufacturer must be observed and the tachometer must be marked.

If a TAE-125 engine is installed the pre-flight check must be performed according to the CSUM-02-01.

If necessary, use the warm air to remove ice from the spinnerdome. Spinnerdome surface can be heated to max.85°C for metal spinnerdome, max.60°C for composite spinnerdome.

5.22. Feathering:

With the AV-( )-C-F feathering is achieved with propeller lever pulled to feathering at about 1500 propeller-rpm. The control must be pulled over a safety stop for unintended feathering.

Before the engine is restarted in the air, move the lever to a low cruise rpm setting in order to avoid overspeed due to windmilling.

During approach after speed and power is reduced accordingly, the propeller lever must be adjusted for take off (max. rpm) in order to have full climb power in case of a missed approach.

For Motorgliders additionally refer to the given procedures in the original POH.

5.23. Propeller De-Icing

Check ammeter reading after switching on the electrical propeller de-ice system. With running propeller, no time limit for "on" is required. With non-running engine the max. switch-on-time of the de-icing system is only 60 sec. Otherwise overheating will occur.

6.0. INSPECTIONS

6.1. Daily Inspection

Before each flight inspect the condition of the blades and spinner. Manually (by hand) check the blades for the shake. Refer to section Annual/100-Hours Inspection for the blade play limits if abnormal shake is noticeable or suspected.

Models with threaded blades only
Check correct installation of the blades in the bushings. Verify that the position line on the blade shank coincide with the line on the blade bushing face. Maximum tolerance for blade and bushing mark straightness is one half of the blade mark thickness. Otherwise reinstall the blade according to section Installation and operation instruction in this manual.

No critical cracks in the blades. PU-strip proper and existing. If not, replace within the next 2 hours after last inspection. No oil leaks.

NOTE:
A new or newly overhauled propeller may leak slightly during the first several hours of operation. This leakage may be caused by the seating of seals and o-rings, and the slinging of lubricants used during assembly. Such leakage should cease within the first ten hours of operation.
If the leakage persists or increases, contact Avia Propeller.

6.1.1. SMA Application

On the SMA application no blade shake is allowed. However, a blade angle play of 2° is acceptable.

CAUTION:
In case of blade shake send the propeller to an authorized service station for re-adjustment.

6.2 Annual/100-Hours Inspection

Note:
Detailed inspection must be made at 100 hour intervals of operation not to exceed 12 calendar months as follows:

CAUTION: ALL DAMAGE MUST BE REPAIRED BEFORE FURTHER FLIGHT.

(1) Remove spinnerdome and check for cracks or damage. Check front and rear spinner plates for cracks and fixing.

(2) Inspect outside condition of the hub and parts for cracks, corrosion, deterioration. Check all safety means to be intact.

(3) Inspect blade shank and hub for oil and grease leaks.

(4) Check tightness of flange bolts or nuts with appropriate torque (refer to section Installation).

(5) If de-icing exist, check de-icers and wire harness for condition and fixing. Check brushes and slip ring for abnormal wear.

(6) Use a clean cloth soaked in soap water to properly clean the blades from all dirts. Use 10x magnifying glass to inspect the blade surface for cracks with special attention to the leading edge and face side of the blade. If crack is detected or suspected or in case of any doubt remove the propeller from service and contact Avia Propeller.

(7) Check the blade play according to blade play limits (see figure 6-1):
Radial play (pitch change) : ±0,5 degree (1 degree total) - measured at reference station
Blade end play : ±1,5mm (0,06inch)
Fore and aft play : ±1,5mm (0,06inch)
In and out play : 0,8mm (0,032inch)

CAUTION:
DO NOT APPLY AN EXCESSIVE FORCE TO THE BLADE WHEN CHECK THE BLADE PLAY. THE FORCE 1 N TO 4 N IS ACCEPTABLE.

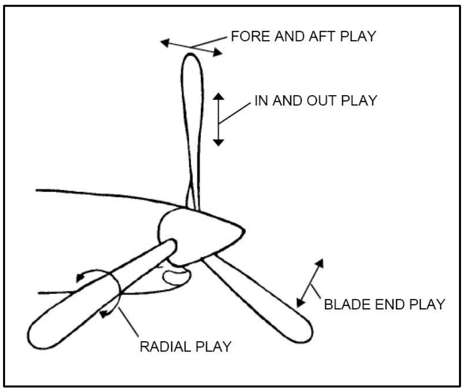


Figure 6-1

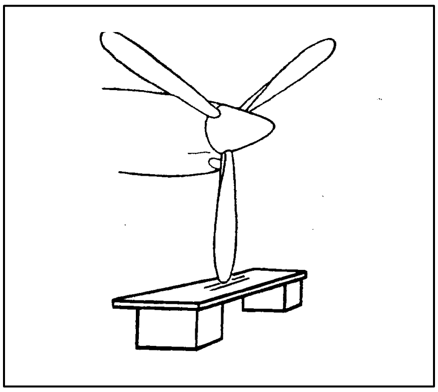


Figure 6-2

(8) Check the blade track as follows (see figure 6-2):

Place a fixed reference point beneath the propeller, within 5 mm (0,2 inch) of the lowest point of the propeller arc.

Rotate the propeller manually in the direction of normal rotation until a blade points directly at the paper. Mark the position of the blade tip in relation to the paper. Repeat this procedure with remaining blades.

Tracking tolerance is ±1,5 mm (0,06 inch), 3 mm (0,12 inch) total.

NOTE:
Abnormal blade track can be caused by dirts between the propeller and engine flange. If no foreign matter is detected, contact Avia Propeller.

(9) Install the spinnerdome according to procedure mentioned in chapter 5 of this manual.

CAUTION:
IT IS VERY IMPORTANT TO MEET ALL REQUIREMENTS AND PROCEDURES MENTIONED IN CHAPTER 5 DURING SPINNER DOME INSTALLATION !

6.2.1.1. SMA - Application

Remove spinner and check for cracks. Check blade shake.
Note: Blade shake is not allowed!
Check blade angle play, max. 2°. If the check shows values above these tolerances, contact the service department of Avia Propeller. Inspect outside condition of the hub and parts for cracks, corrosion, deterioration. Inspect check nut for low pitch stop for tightness. Check all safety means to be intact. Check flange bolts or stopnuts for tightness. Check front and rear spinner plate for cracks and fixing. Inspect blade root and hub for oil and grease leaks. Check position of counterweights if applicable. Check electric de-ice boots and wire harness for connection and condition. Check brushes and slip ring for condition.

6.2.2. Check blades for nicks, gouges, and scratches on blade surface or on the leading or trailing edges of the blade, they must be removed before flight. Field repair of small nicks and scratches may be performed by qualified personnel in accordance with FAA Advisory Circular 43.13-1A, as well as the procedures specified below.

6.2.3. Repair of Nicks or Gouges on blades:

Local repairs may be made using files, electrical or air powered equipment. Emery cloth, scotch brite, and crocus cloth are to be used for final finishing.

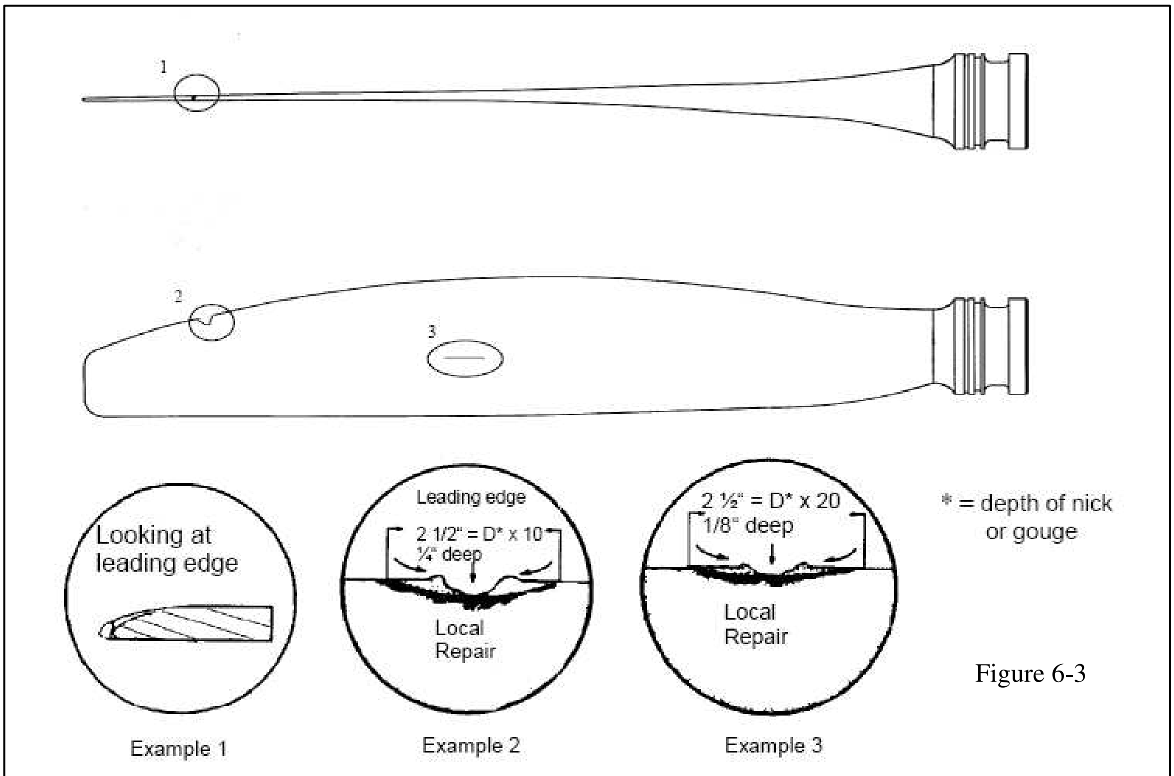


Figure 6-3

WARNING:

Rework which involves cold working the metal, resulting in concealment of a damaged area, is not acceptable. A stress concentration may exist which can result in a blade failure.

Repairs to the leading or trailing edge are to be accomplished by removing material from the bottom of the damaged area. Remove material from this point out to both sides of the damage, providing a smooth, blended depression which maintains the original airfoil general shape.

Repairs to the blade thrust or camber should be made in the same manner as above. Repairs that form a continuous line across the blade section (chordwise, blade leading to trailing edge) are unacceptable.

The area of repair should be determined as follows:
Leading and trailing edge damage: Depth of nick x 10.
Face and camber: Depth of nick x 20.

NOTE:

Leading edge includes the first 10% of chord from the leading edge. The trailing edge consits of the last 20% of chord adjacent to the trailing edge.

After filing or sanding of the damaged area, the area must then be polished, first with emery cloth, and finally with crocus cloth to remove any traces of filing.

Treat the repaired area to prevent corrosion. Apply chemical conversion coating and finish coating as follows:

1) Wipe the surface with acetone or MEK.
2) Apply corrosion preventive coating Alodine 1200 or Alodine 1132 Touch-N-Prep to the bare aluminum surface. Follow manufacturer´s directions.

3) Apply the finish coating. Refer below for approved aerosol paints:
   Tempo A-150 Epoxy Black
   Tempo A-151 Epoxy Gray
   Tempo A-152 Epoxy White

CAUTION:
REPAIR PROCEDURES CAN ALTER PROPELLER BALANCE THAT MAY LEAD TO EXCESSIVE VIBRATIONS OF THE PROPELLER IN OPERATION. THE DYNAMIC BALANCING OF THE PROPELLER MAY BE NECESSARY. REFER TO DYNAMIC BALANCE SECTION IN THIS MANUAL.

6.2.4. Repair of bent blades

CAUTION:

Do not attempt to “pre-straighten” a blade prior to delivery to an approved propeller repair station. This will cause the blade to be scrapped by the repair station.

Repair of a bent blade or blades is considered a major repair. This type of repair must be accomplished by an approved propeller repair station, and only within approved guidelines.

6.3. Special inspections

6.3.1. Overspeed

An overspeed has occurred when the propeller RPM has exceeded the maximum RPM stated in the applicable Aircraft Type Certificate Data Sheet. The total time at overspeed for a single event determines the corrective action that must be taken to ensure no damage to the propeller has occurred.

When a propeller installed on a reciprocating engine has an overspeed event, refer to the Reciprocating Engine Overspeed Limits (figure 6-4) to determine the corrective action to be taken.

In case of overspeed event resulted in inspection or overhaul is required to fill out the report in the end of this chapter and send it with propeller to manufacturer or authorized service centre.

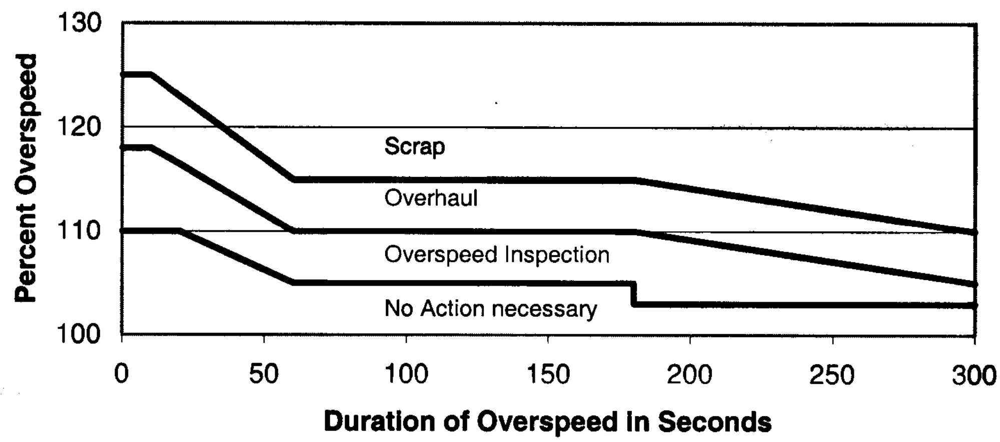


Figure 6-4

For engine mounted accessories (for example, governors, pumps, and propeller control units) manufactured by Avia Propeller, any overspeed at a severity level and /or duration sufficient to require at minimum a search inspection for the propeller, will require the accessory to be disassembled and inspected in accordance with the applicable maintenance manual.

Regardless of the degree of damage, make a log book entry to document the overspeed event.

6.3.1.1. Corrective Action

When no action is necessary, no maintenance is necessary other than to verify that the overspeed was not caused by a mechanical problem.

When overspeed inspection or overhaul is required the propeller must be removed from service and be sended to manufacturer or authorized repair station for inspection or overhaul.

When the corrective action requires to scrap the propeller must be removed from service. Such propeller is not repairable.

6.3.2. Lightning strike

In the event of a propeller lightning strike, an inspection is required before further flight. It may be permissible for a propeller to be operated for an additional 10 hours of operation if the propeller is not severally damaged.

For additional 10 hours of operation before propeller removal, disassembly and inspection is necessary inspect the propeller according to following instructions :

a) Remove the spinner dome and visually inspect the propeller, spinner and de-icing system for damage that would require repair before flight (such as broken de-icing wires or arcing damage to the propeller hub).

b) Inspect the propeller blades for damage caused by the lightning strike.

c) Check operation of the propeller de-icing system.

d) Regardless of the degree of damage, make a log book entry to document the lightning strike.

CAUTION:
Regardless of the outcome of the inspection, after 10 additional hours the propeller must be sended to manufacturer or authorized service centre for proper inspection.

6.3.3. Foreign object strike

Foreign object strike is any event whether or not the engine is operating, when the propeller comes into contact with anything other than air resulting in visible damage of the propeller blades. Only minor damage from stones during normal propeller operation may not be considered as foreign object stike.

A foreign object strike can cause a broad spectrum of damage. It is no possible to detect the extent of damage inside the hub without its disassembly.

Any foreign object strike event resulting in visible damage of the blades except minor stone nicks requires overhaul at manufacturer or authorized service centre.

6.3.4. Exposure to fire or heat

Exposure to fire or extreme heat requires the inspection of the propeller and engine mounted accessories manufactured by Avia at manufacturer or authorized service centre.

6.3.5. Engine oil contamination

Engine oil contamination requires the inspection of the propeller and engine mounted accessories manufactured by Avia at manufacturer or authorized service centre.

6.3.6. Hard landing

The hard landing occurs when the airplane hits the ground with a greater speed and force than usual, with no contact of the propeller with the ground.

a) The hard landing within the load limit of the airplane does not require any action on the propeller.

b) The hard landing above the load limit of the airplane requires inspection of the propeller in Avia Propeller or authorized repair center.

RECORD ON PROPELLER SUBJECT TO OVERSPEED

Owner: ....

Aircraft manufacturer: .... Type:. .... S/No.: ....

Type of engine: .... S/No.: ....

Reduction gear: ....

Type of propeller governor: .... S/No.: ....

Type of propeller hub: .... S/No.: ....

Type of propeller blade: .... S/No. of blade 1: ....

2: ....

3: ....

4: ....

5: ....

Max. overspeed (note whether being indicated or estimated):

....

Propeller position (e.g. take off, cruise): ....

Pre-selected speed: .... Pre-selected manifold Press.: ....

Airspeed: .... Flight Altitude: ....

Overspeed time: ....

Flight attitude during overspeed: ....

Flight weight during overspeed: ....

Supposed cause of overspeed (if known): ....

....

7.0 MAINTENANCE

7.1. There are no frequent maintenance works required on the hub because all moving parts are inside the hub and not exposed to the environment. Blade bearings and pitch change mechanism are filled with special lubricants and there is no need to refill between overhauls. A corrosion protection of the hub with thinned engine oil or anticorrosion spray is recommended.

7.2. Repair of spinner parts is not permissible. Cracked spinner domes, filler plates and backplates are to be replaced by airworthy parts.

7.3. In case of a ground strike with Aluminum blades, refer to Blades Overhaul Manual for evaluation.

7.4. DYNAMIC BALANCE

NOTE:
All manufactured or overhauled propellers are statically balanced. Dynamic balance is recommended but not required unless specified by airframe or engine manufacturer.

7.4.1. Overview

7.4.1.1. Dynamic balance is accomplished by using an accurate means of measuring the amount and location of the dynamic imbalance. After such a undertake the remaining imbalance should be below 0,2 ips.

7.4.1.2. Follow the instructions from the equipment manufacturers for dynamic balance.

7.4.1.3. If the dynamic imbalance is bigger than 1,2 ips, the propeller must be removed and statically rebalanced.

7.4.2. INSPECTION PROCEDURES PRIOR TO BALANCING

7.4.2.1. Visually inspect the propeller assembly after it has been reinstalled on the aircraft prior to dynamic balancing.

NOTE:
The first run-up of a new or overhauled propeller assembly may leave grease on the blades and inner surface of the spinner dome. This is normal and do not mean that it will be a continuing grease leakage.

Use a mild solvent to completely remove any grease on the blades or inner surface of the spinner dome.

7.4.2.2. Prior to dynamic balance record the number and location of all balance weights from the static balance.

7.4.2.3. It is recommended that placement of balance weights on aluminum spinner bulkheads which have not been previously drilled be placed in a radial location.

7.4.2.4. The radial location should be outboard of the slip ring and inboard of the bend at which point the bulkhead creates a flange to attach the spinner dome.

7.4.2.5. Drilling holes for use with the AN3-( ) type bolts with self-locking nuts is acceptable.

NOTE:
Chadwick-Helmuth Manual AW-9511-2, „The Smooth Propeller“ specifies several generic bulkhead rework procedures.

7.4.2.6 All hole/balance weight locations must take into consideration, and must avoid, any possibility of interfering with the adjacent airframe, deice and engine components.

7.4.2.7 In case no spinner is installed, mount balance weights in the mounting threads in the hub, where normally the spinner bulkhead is mounted.

7.4.3. PLACEMENT OF BALANCE WEIGHTS FOR DYNAMIC BALANCE

7.4.3.1. The preferred method of attachment of dynamic balance weights is to add the weights to the rear spinner bulkhead. The static balancing weights are installed on the spinner front plate, if applicable.

7.4.3.2. Subsequent removal of the dynamic balance weights, if they exist, will return the propeller to its original static balance condition. The static balance weights are only allowed to remove exceptionally.

7.4.3.3. Use only stainless or plated steel washers as dynamic balance weights on the spinner bulkhead.

7.4.3.4. Do not exceed maximum weight per location of 32 g. This is approximately equal to eight AN970 style washers.

7.4.3.5. Weights are to be installed using aircraft quality 10-32 inch screws of bolts.

7.4.3.6. Balance weight screws attached to the spinner bulkheads must protrude through the self-locking nuts a minimum of one thread and a maximum of four threads.

7.4.3.7. All propellers which have been dynamically balanced must install a decal on blade no. 1. This will alert repair station personnel that the existing balance weight configuration may not be correct for static balance.

7.4.3.8. Record number and location of dynamic balance weights, and static balance weights if they have been reconfigured, in the Propeller Logbook.

7.5. BLADE REPLACEMENT IN THE FIELD

7.5.1. Remove the blade from the hub.

7.5.2. Install the new blade into the hub per Installation and Operation Instruction section in this manual.

7.5.3. The blades for each propeller are precisely matched. Subsequent replacement of one or more blades in the field and setting the new blade in the same position as was the original blade, can cause mismatch of the blades resulting in aerodynamic unbalance. To prevent this, follow these steps:

a) Using the feathering pump, move the propeller to the low pitch. If the feathering pump is not installed, start the engine and stop it with the propeller at the low pitch.

b) Using a protractor, measure the angle of all blades at the reference station. The reference station is marked with red line on the blade face side.

1 Rotate the propeller to place one of the blades parallel to the ground. Measure the angle of the blade. Make note this angle.

2 Rotate the propeller to place another blade to the same position as the previous blade was measured. Measure and note the angle.

3 Measure the angle of all blades by the same way.

c) If the difference in angle of all blades is between 0,3 degrees, then the installation is correct.

d) When the difference in angle of all blades is above 0,3 degrees, follow these steps:

1 Remove the blade from the hub.

2 Using the sandpaper or needle file, carefully remove the position mark from the edge of the blade bushing. Do not remove more material than is necessary to remove the mark.

3 Thoroughly clean inside of the blade bushing.

4 Reinstall the blade into the hub. Using the protractor, set the blade so that the difference in angle of all blades is between 0,3 degrees. Tighten the blade clamp with a specified torque and check that the blade angle is still correct.

5 Using a sharp tip needle and a suitable flat block, engrave the position mark on the blade bushing edge, opposite to the position mark on the blade.

6 Treat the blade bushing edge with zinc coat or with clear lacquer.

7 Make an entry in the propeller logbook to document that an original position mark was changed.

8.0. TROUBLESHOOTING

Attention : TAE-125 Triebwerk
In case of trouble-shooting the CSUM-02-01 must be used.

8.1. Improper rpm

There are means on propeller and governor to adjust pitch and rpm in the field. Before the original adjustments are changed, please calibrate the tachometer.

Usually there are only two kinds of problems:
- static rpm is too low and/or
- rpm in flight is too high.

8.1.1. Static rpm too low:

To find out whether the governor or the propeller limit the engine, proceed as follows.

- Propeller control to max. rpm.
- Power lever to max. power.
- Pull propeller control back until rpm drops approx. 25 rpm.
- If there is a long way necessary to get the rpm drop, the pitch of the propeller will limit the static engine rotational speed.

Remedy : Reduce pitch with the check nuts on the piston guide. Turning loose nut by ¼ turn will increase rpm by approx. 100 rpm. This is only applicable for non-counter-weighted propellers!

Low pitch of counterweighted or feathering propellers can be changed only by opening of the pitch change mechanism (in the factory). The checknuts will change coarse pitch only.

If the rpm drops immediately after a small movement of the lever, the governor will limit the static rotational speed.

Remedy : Increase governor rpm unscrewing the stop screw. One turn on the screw will change rpm by approx. 25 rpm

Important:
The control must be long enough to have the necessary way in order to contact the stop. Secure screw with safety wire.

8.1.2. Rpm in flight too high:

If the static rpm is within the limits, only the governor allows overspeed. Adjust rpm to the desired value in flight an turn the stop screw in after landing until it touches the governor lever.

Important:
Do not change position of the rpm control during final approach. Secure screw with safety wire.

8.2. Blade shake

8.2.1. Fore and aft movement

Cause : Blade bearing loose

Remedy : If more than 3 mm, return propeller to the factory or any approved repair station to correct the pre-load of the blade retention bearing.

8.2.1.1. SMA Application

Cause : Blade bearing loose

Remedy : No blade shake is allowed. In case of blade shake return propeller to the factory or any approved repair station to correct the pre-load of the blade retention bearing.

8.2.2. Blade angle play

Cause : Blade bearing loose by seating and/or increased play by wear in the pitch change mechanism (pitch change pin, pitch change block)

Remedy : If more than 2°, return propeller to the factory or any approved repair station.

8.3. Sluggish rpm change

Cause : 1. Oil is cold
2. Excessive friction

Remedy : 1. Run the engine until the green arc of the oil temperature is reached.
2. Move blades by turning them with hands within the angular play. If excessive friction exists, the blade retention system has to be inspected, contact factory.

8.4. Surging rpm

Cause : 1. Trapped air in propeller piston
2. Sludge deposit
3. Wrong speeder spring in the governor
4. Wrong pitch stops in the propeller
5. Abrupt movement of propeller or throttle control
6. Wrong carburetor setting
7. Oscillating tachometer

Remedy : 1. Move propeller control at least twice every time before flying at about 1800 rpm with a drop of about 500 rpm.
2. Clean oil tubes in the motor, in the propeller piston and eventually in the governor (only possible at the manufacturer's).
3. 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 a wrong speeder spring, contact factory.
4. Compare pitch values to those of the data sheet. Note static rotational speed.
5. Move the controls carefully and slowly.
6. Correct as specified in the engine manual.
7. Check tachometer and drive.

8.5. Rpm variations between ascend, cruise and descend although having identical propeller setting

Up to ± 50 rpm normal condition. If more:

Cause : 1. Excessive friction in the hub
2. Excessive friction in the governor
3. Worn rpm tachometer

Remedy : 1. Contact manufacturer.
2. Contact manufacturer.
3. Replace/repair instrument.

8.6. Rpm increase during normal operation without change of propeller lever position

Cause : 1. Oil leakage or hot oil
2. Worn oil transfer system causes a decrease in blade angle of attack.
3. Internal leakage in the propeller.
4. Governor drive failure or broken relief valve spring.

Remedy : 1. Check for oil leaks, replace gaskets, decrease oil temperature with higher airspeeds.
2. 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.
3. Contact manufacturer.
4. Check governor drive and governor on the test bench.

Attention:
If sudden oil leakage occurs, 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. 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 underspeed condition and no oil pressure will be transferred from the governor to the propeller.

8.7. Rpm decrease during normal operation without change of propeller lever position

Cause : 1. Speeder spring in the governor broken or sticking pilot valve.
2. Dirt in the fuel system or carburetor.
3. Control inoperative.

Remedy : 1. Check governor on the test bench.
2. Clean or repair.
3. Check free movement and positive stop contact.

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.

8.8. Extremely slow pitch change or no pitch change on ground

(rpm changes with airspeed like a fixed pitch propeller)

Cause : 1. Blocked oil line.
2. Sludge deposit in propeller piston.
3. Damaged pitch change mechanism.
4. Corrosion in the blade bearings.

Remedy : 1. Check engine.
2. Clean propeller and crankshaft.

Concerning 1 and 2:
This behavior does not appear at once and gets worse after some time. It should be observed at the preflight inspection.

3. Contact manufacturer.
This error may appear suddenly.
4. Repair propeller.

8.9 Oil leakage (visible outside or hidden inside)

Cause : Damaged gasket

Remedy : Replace gaskets or repair propeller.

8.10. Rough running engine, possibly in limited rpm range only

Cause :
1. Bad static balance.
2. Bad dynamic balance.
3. Operation in restricted rpm range.

Remedy :
1. Rebalance statically, mount balance weights to forward spinner bulkhead.
2. Rebalance dynamically. Install balance weights to rear spinner bulkhead.
3. Refer to airplane flight manual. Check rpm gauge for correct reading. Repair or replace if necessary.

8.11. Propellers with counterweights or feathering

Propellers with counterweights on the blade roots use oil pressure to decrease pitch. Therefore the information in chapter 8 has to be converted as a result of the changed direction of oil pressure.

8.12. Slow feathering

If more than 10 sec. are needed for full feathering, there is one of the following problems: sticking blades or pitch change mechanism, control too long or wrong adjusted governor. If no discrepancies are found during inspection, readjustment of the liftrod/checknut is possible. Turn out lift rod only in steps of ¼ turn. If the lift rod is turned too far out, early feathering is possible and must be corrected.

8.13. Unfeathering accumulator

Cause : No function of accumulator

Remedy :
1. Increase or refill air at the accumulator
2. Repair leaking check valve of the governor

Remark:
The air pressure in the unfeathering accumulator should be 125 psi with the blades in the start-lock position (low pitch position).

9.0. SHIPPING AND STORAGE

9.1. For any shipment of the propeller use original container. If this is impossible it will be very important to fix the propeller at the blades and the hub, if necessary, in a manner that avoids damage.

In case of returning the propeller it is furthermore recommended to return all accessories and parts together with the propeller. They will also be inspected and not considered to be missing.

9.2. Storage only in a controlled environment under temperature of -5° to +95°F (-20° to +35°C) and rel. humidity of 10% to 75%. Avoid extreme temperature/humidity differences or cycles.

CAUTION:
THE PROPELLER IS PACKED IN A SPECIAL FOIL IMPREGNATED WITH CORROSION INHIBITORS. DO NOT REMOVE THE FOIL WITH NO INTENTION TO INSTALL THE PROPELLER ON ENGINE.

9.3. It is expected that the propeller will be put in service within 24 months since new or overhaul.

CAUTION:
IF THE PROPELLER IS NOT PUT IN SERVICE WITHIN 24 MONTHS FROM NEW OR OVERHAUL, THEN THE CALENDAR TBO LIMIT MAY BE DECREASED. REFER TO AVIA SERVICE BULLETIN NO.1 FOR COMPLETE INFORMATION ON TBO LIMITS.

CAUTION:
INSTALLING THE PROPELLER ON ENGINE LATER THAN 24 MONTHS FROM NEW OR OVERHAUL, OR RETURNING THE PROPELLER TO SERVICE AFTER MORE THAN 24 MONTHS OF STORAGE, WITHOUT THE INSPECTION AT AVIA PROPELLER OR AUTHORIZED SERVICE CENTER, MAY LEAD TO OIL LEAKAGE AND/OR INCORRECT FUNCTION. REFER TO AVIA SERVICE BULLETIN NO.1 FOR MORE INFORMATION.

10.0. SPECIAL TOOLS

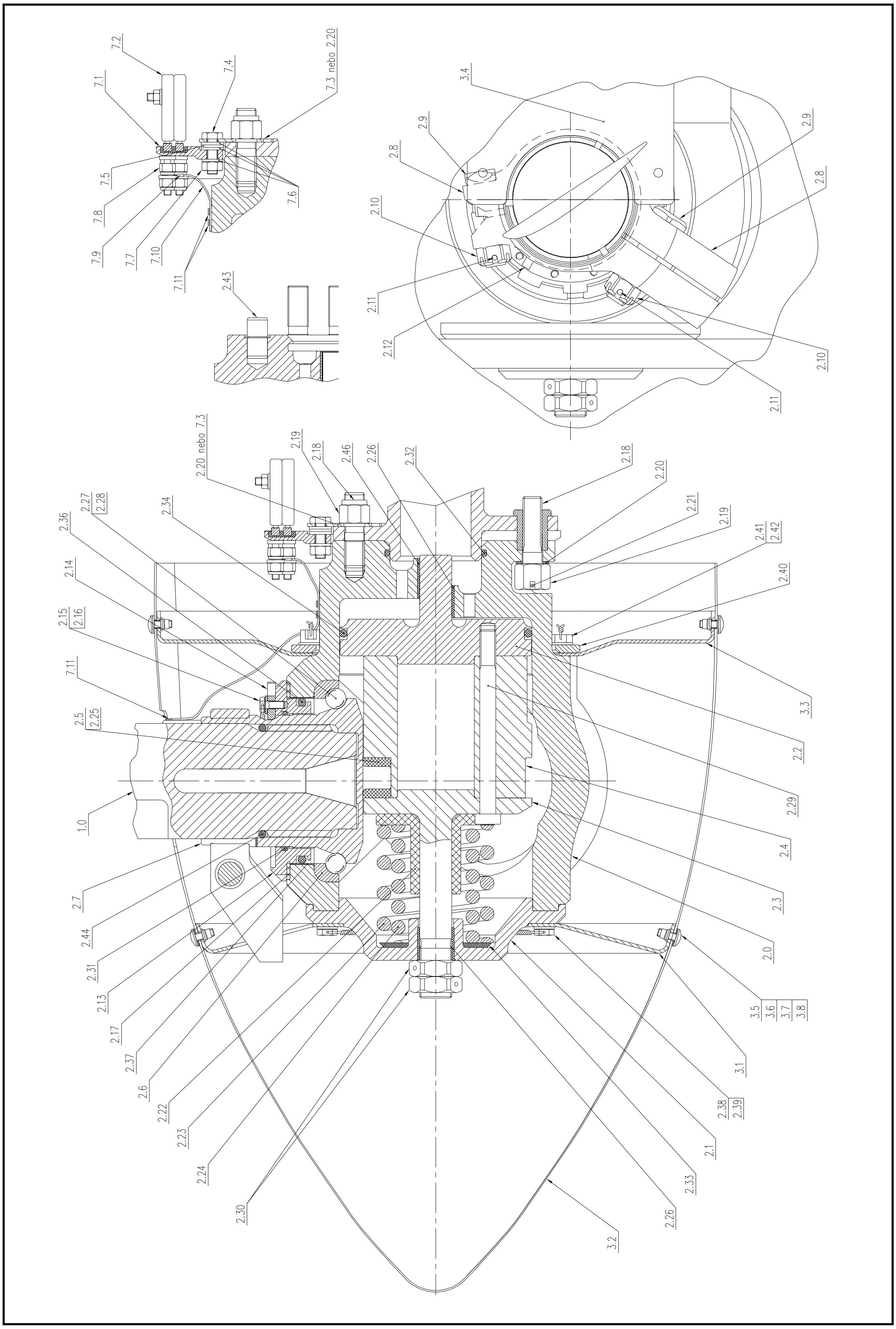
Torque wrench with range 55-150Nm / 40-110 ftlb
(Including all propeller models. See section Installation for torques needed to specific propeller installation).

Insert tools for torque wrench :
19mm or 3/4inch - “B” and “D” flange / blade clamp (only models with threaded blades)
16mm or 5/8inch - “C” flange
22mm or 7/8inch - “K” flange

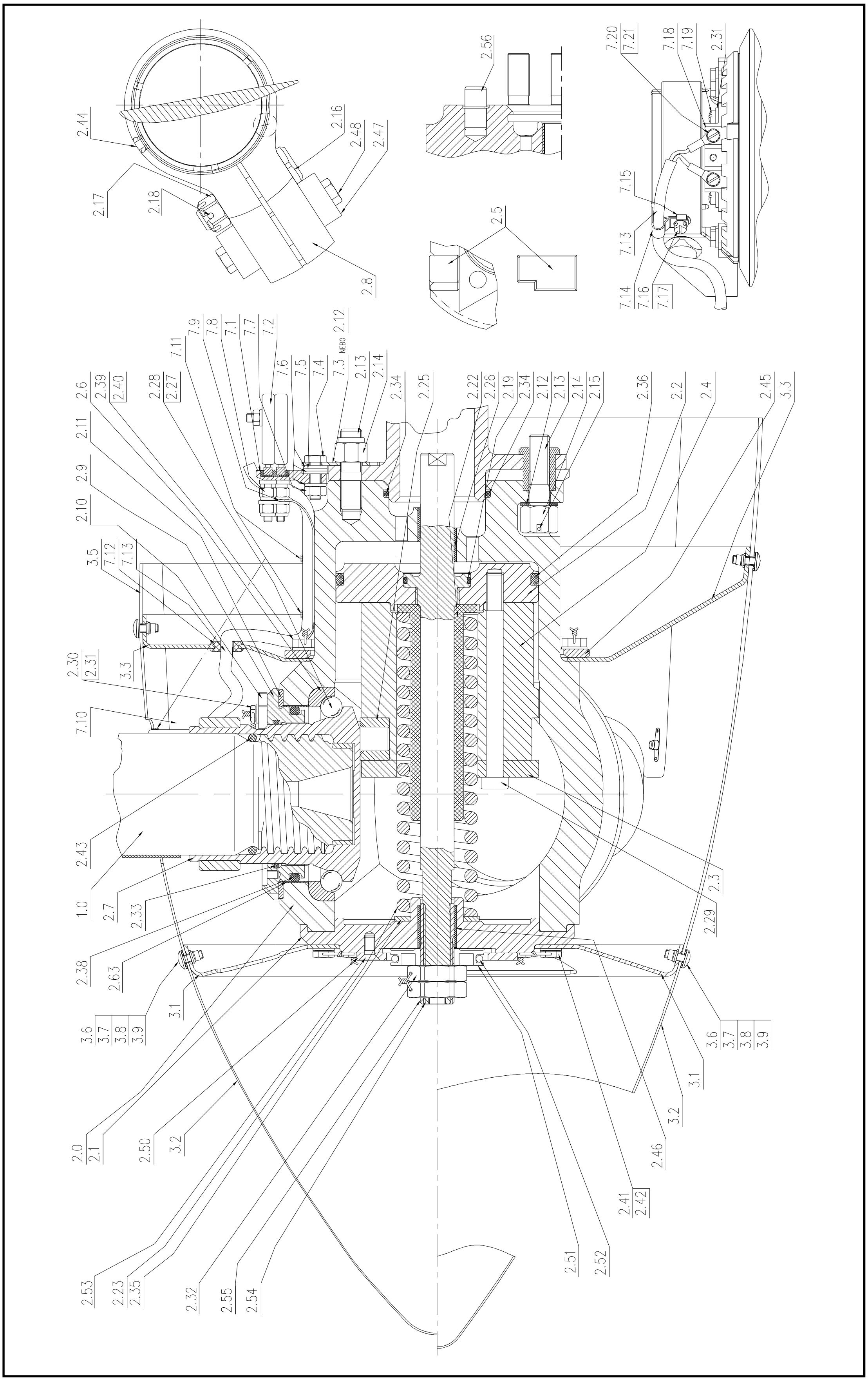
Above-mentioned tools are possible to be delivered based on special order.

11.0. DRAWINGS

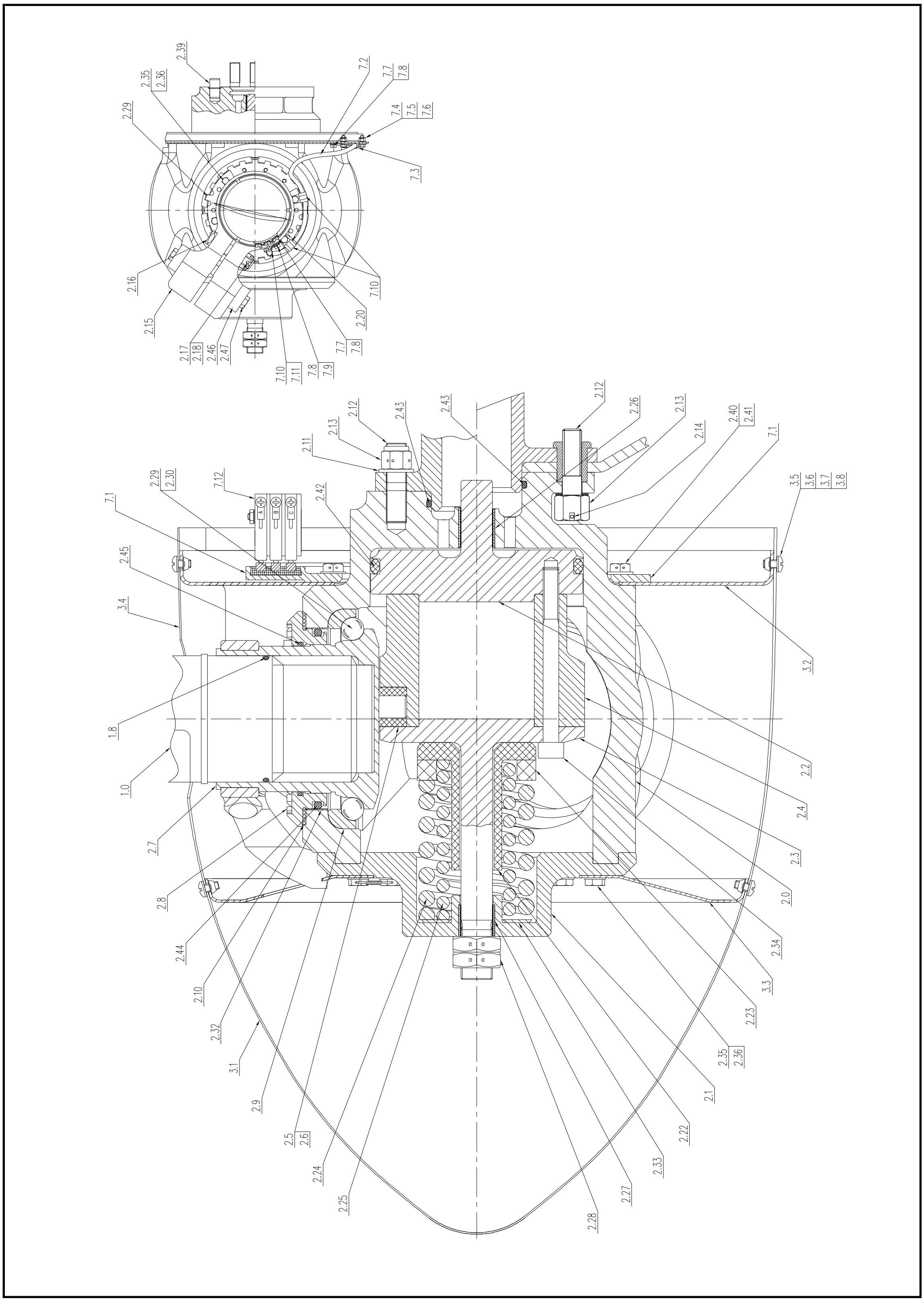
11.1. AV-723-1-(B,C,D) , AV-723-1-(B,C,D)-C



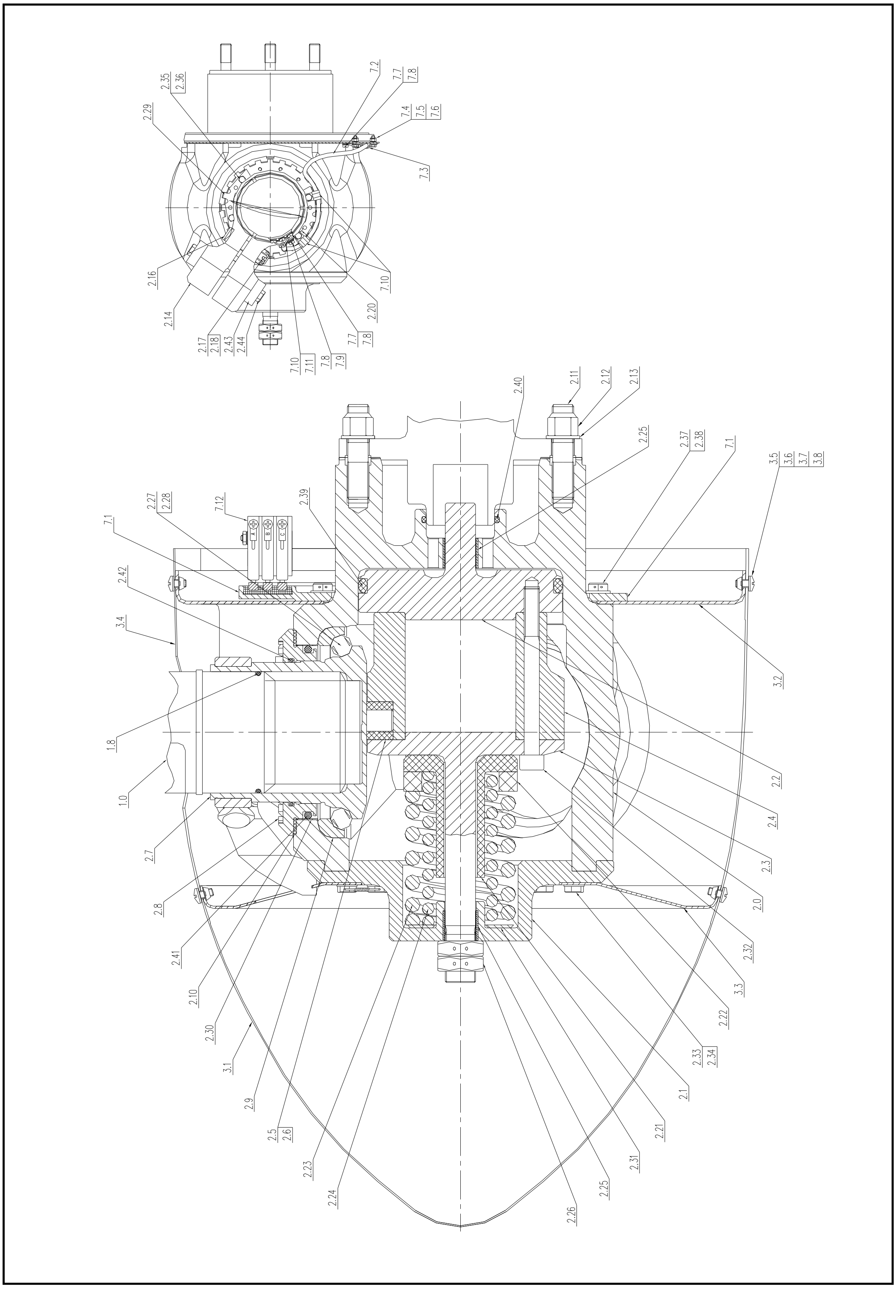
11.2. AV-723-1-(B,C,D)-C-F



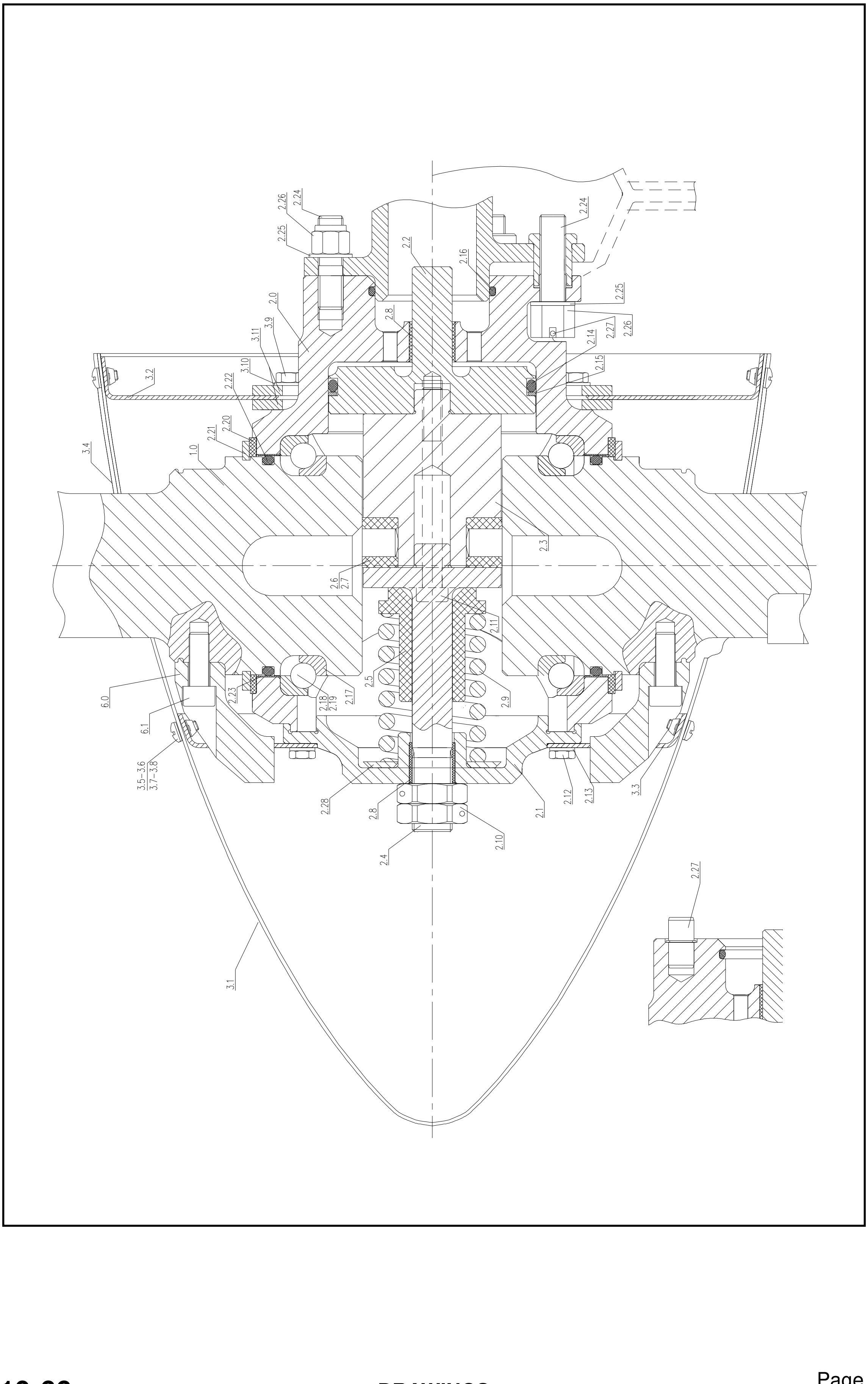
11.3. AV-803-1-(B,D) , AV-803-1-(B,D)-C



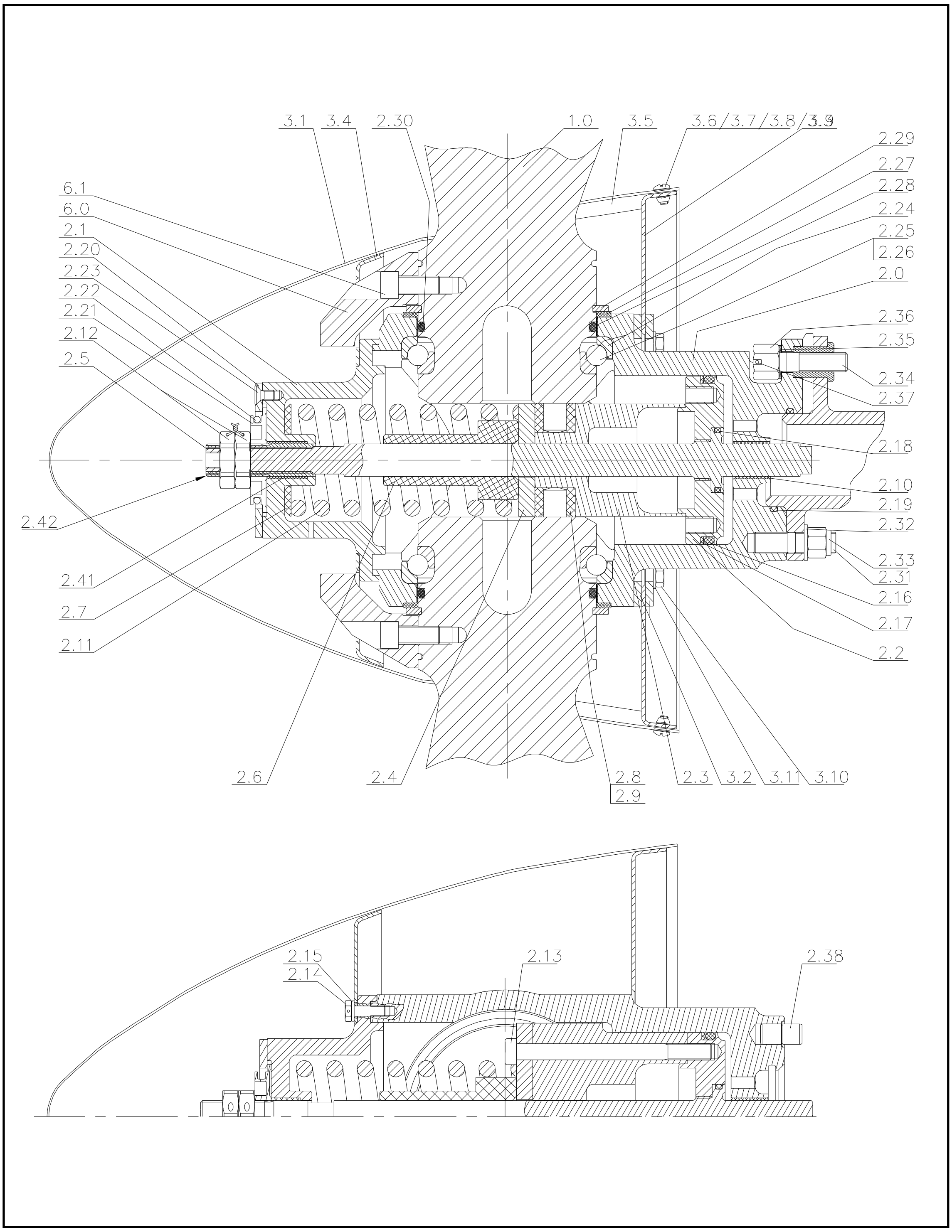
11.4 AV-803-1-K , AV-803-1-K-C



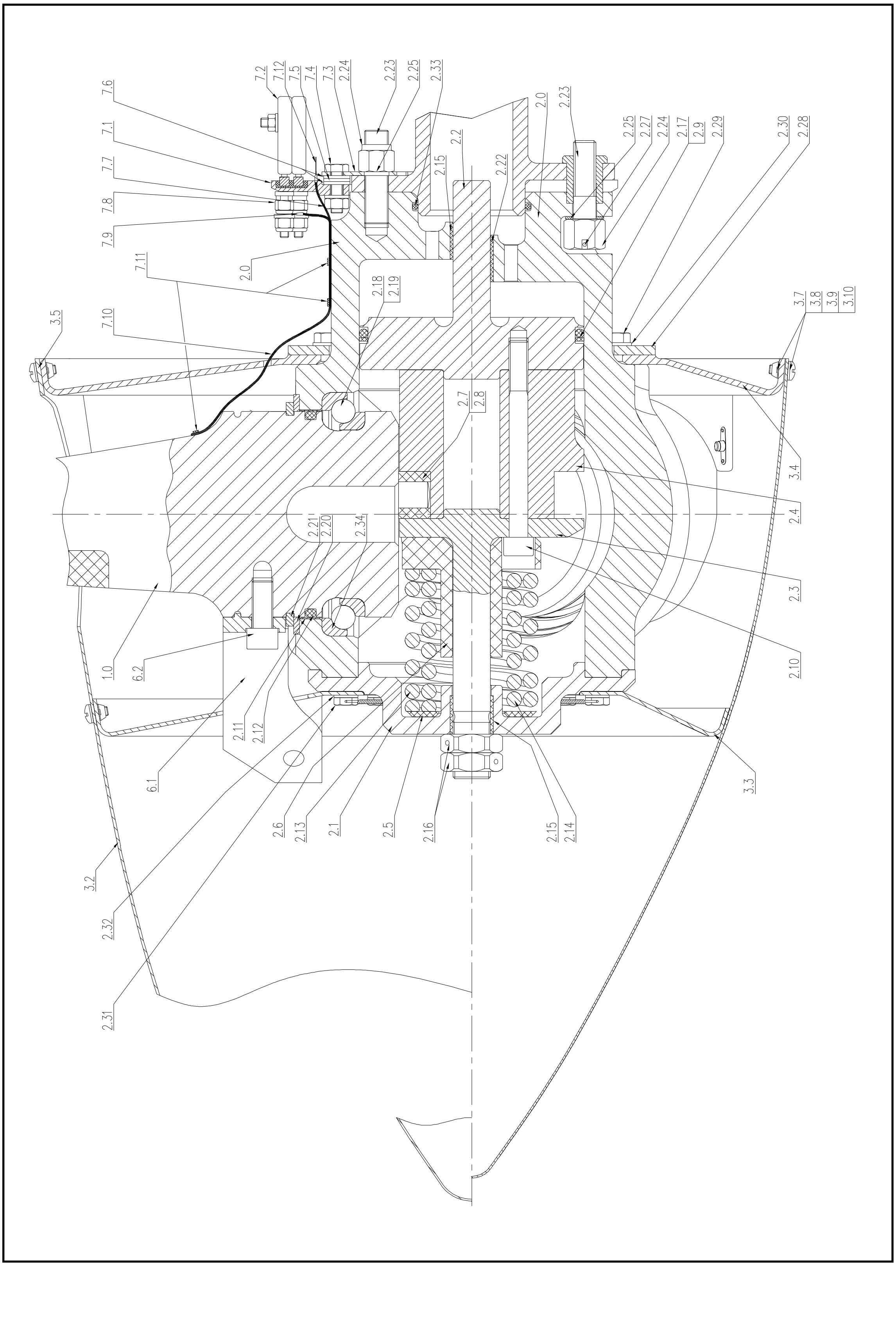
11.5. AV-842-1-(B,C,D) , AV-842-1-(B,C,D)-C



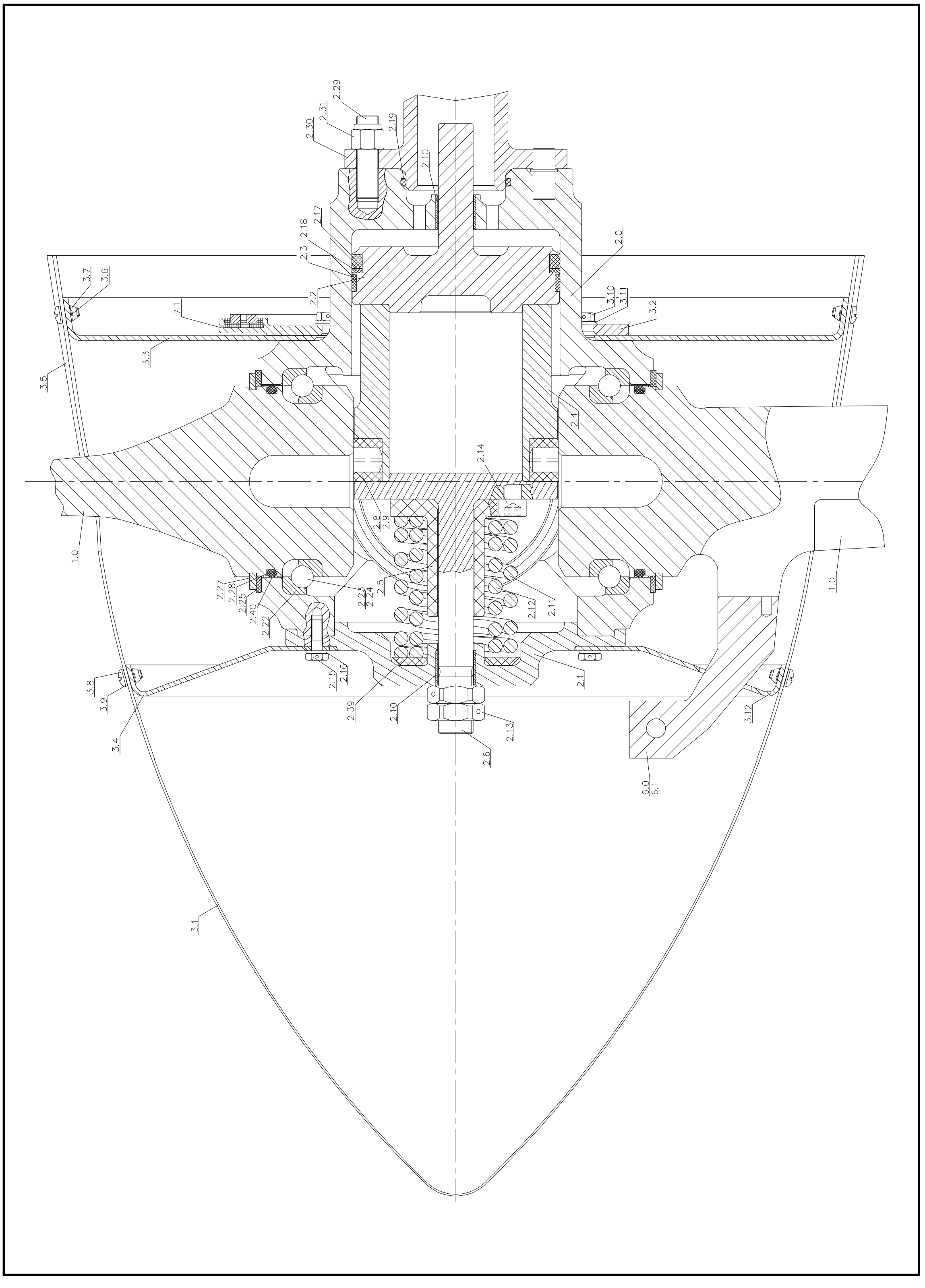
11.6. AV-842-1-(B,C,D)-C-F



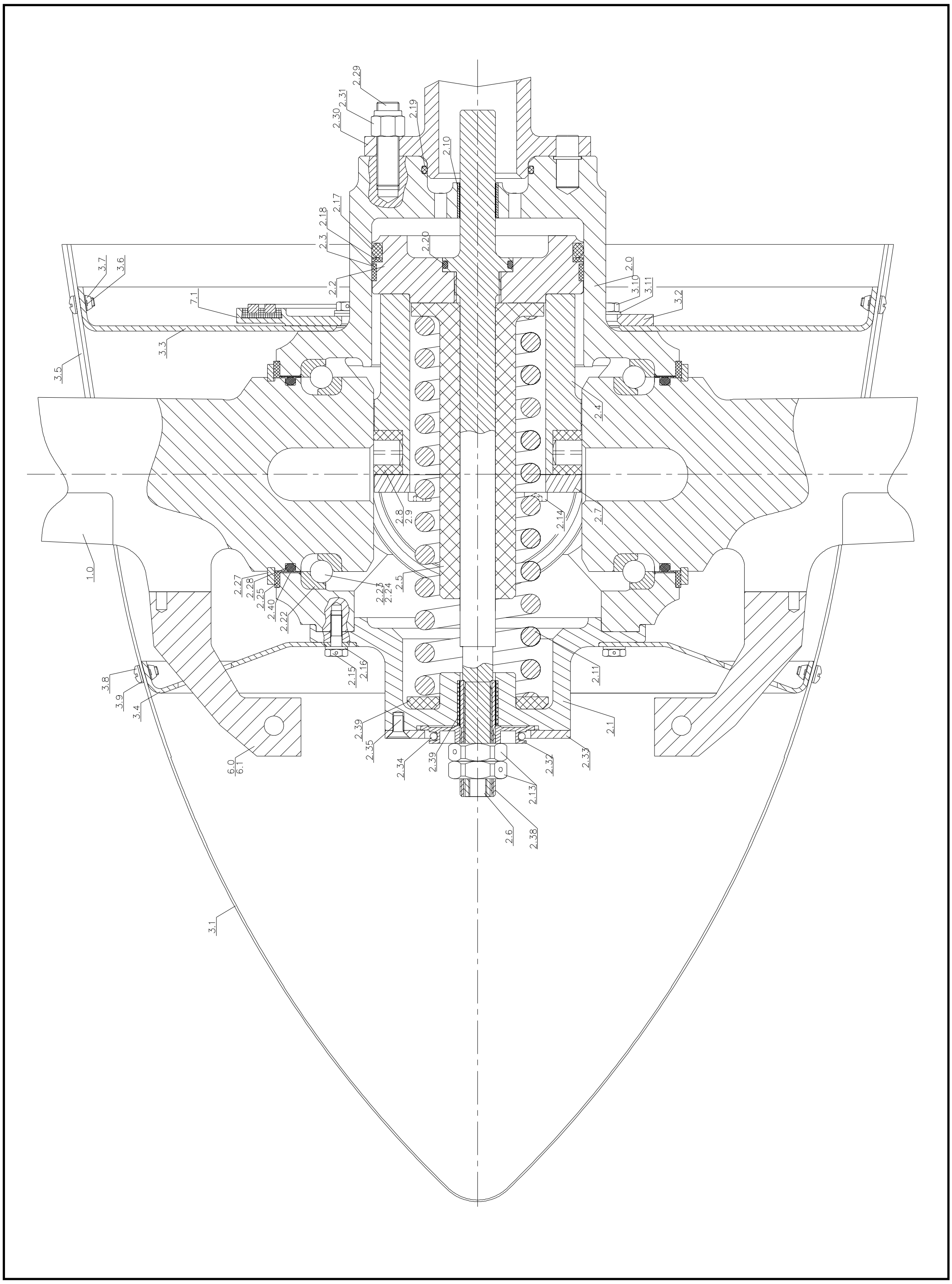
11.7. AV-843-1-(B,D) , AV-843-1-(B,D)-C



11.8. AV-844-1-D , AV-844-1-D-C



11.9. AV-844-1-D-C-F



Avia Propeller Ltd.
since 1919

Highly experienced engineering and manufacturing company. Our specialization is in research and development, manufacturing, repairs, overhauls, service and sales of aircraft, all metal in flight pitch changeable propellers and their parts.

❖

Our R&D team has long term experiences with aircraft propeller design. One of the latest R&D targets is to enlarge the new propeller AV product line (lighter aluminium hub and blades).

❖

Operations department is using up to date machinery incl. CNC devices, accompanied with traditional craftsmanship of staff, manufacturing products of the best quality.

❖

Quality department guarantees the highest quality level of the goods being delivered to our customers. Our quality system fulfilled requirements of the European Aviation Safety Agency (EASA).

❖

Our commercial department co-operate with customers from about 50 countries of the world. We consider each and every customer to be of great importance for us.

Our products and activities

All metal aircraft propellers for piston and turboprop engines up to 2000 HP, used on regional airline airplanes, agricultural, general aviation, sport and aerobatic airplanes.

❖

Licensed blade and spinner manufacturing for propellers made by world famous U.S. company Hamilton Standard Ltd., for „Warbirds“ like the P-51 Mustang, T-6 Texan etc.

❖

High quality products certified in the Czech Republic, USA, and many European, Asian, Australian, Central and South American countries.

❖

Sales and Service Centers in the USA, Canada, Venezuela, Germany

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