AIRCRAFT ENGINE M 332C

SUPPLEMENT NUMBER 4

TO THE TECHNICAL DESCRIPTION

AND

OPERATOR´S MANUAL FOR THE ENGINES TYPE:
M 337A, AK, M 332A, AK
M 137A, AZ, M 132 A, AK

LOM PRAHA s.p.

Manufacturer: LOM PRAHA s.p., Praha 10 – Malešice, Czech Republic

Purpose of the publication: This supplement to the technical description and operating manual should serve owners, pilots and mechanics, who are responsible for operating and maintenance of aeroplanes equipped with the engine M 332C. In addition to the description of the engine and its parameters, it contains information about operating instructions and maintenance of the engine.

Approved by the Czech Civil Aeronautics Authority, Prague
TI-ÚCL Praha
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PART 1

GENERAL INFORMATIONS

1. WARNING FOR USERS

This "supplement" extends the validity of the "Description and operating instructions for the engines M 337A, AK, M 332A, AK, M 137A, AZ, M132A, AK" (in short the "MANUAL") also for the engine M 332C, which is an up-dated version of the engine M 332AK.
This "supplement" contains exclusively information and instructions, which differ from those in the "MANUAL", in cases, where there is no difference, the user will be referred to the "MANUAL".
The user of the engine is obliged to observe the instructions contained in the "supplement" as well as those referred to in the "manual".
Whenever the pertinent operating instructions or maintenance schedules or other information contained in the manual and in the supplement are not adhered to, the engine power may be impaired.
Exceeding the limiting values of the operating parameters may damage the engine or degrade the service life.
The user may perform repair within the range of current maintenance up to the periodic revisions, as described in the "manual". Repair or disassembly beyond general maintenance, as well as general overhauls (GO) may be performed only by the engine manufacturer LOM Praha, s.p., or by a service organisation, which is equipped with the necessary tools, jigs and gauges, and has an authorisation by the ÚCL ČR (Civil Aeronautics Authority) for this activity.

2. STRUCTURE OF THIS "SUPPLEMENT"

This "supplement" contains 12 parts. Page numbers always are composed of the part number and the page number within the part. The contents of each part are always on page 1 of the part.

3. PERFORMING CHANGES IN THE SUPPLEMENT.

In order to keep your supplement up to date, changes will be introduced according to bulletins distributed by the engine manufacturer LOM Praha, s.p., after approval by the Czech Authority for Civil Aviation (ÚCL ČR).

4. TERMINOLOGY

Paragraph 4 of part 1 of the "manual" is fully applicable to this "supplement".

PART 2

DESCRIPTION OF THE ENGINE.

1/ GENERAL

The aircraft engine type M 332C is an innovated version of the engine M 332AK, it is a four-stroke, spark-ignition, air cooled, inverted four cylinder without reduction (The propeller sits directly on a flange on the conical end of the crank shaft), with a supercharger (compressor), which can be turned on or off, with low pressure fuel injection into the manifold in front of the suction valves. Ignition is by magnetos, screened, redundant, both systems are mutually independent. The valve control gear is OHC.

The engine M 332C is designed for fully aerobatic operation, including inverted flying without time limits.

2/ DESCRIPTION OF ENGINE COMPONENTS

Paragraph 2 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement". The figures referring to the engine M332AK are valid also for the engine M 332C and the numbering of positions on page 2-8 of the "manual" for the engine M 332AK applies equally to the engine M 332C.

3/ VALVE GEAR

Paragraph 3 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement".

4/ BOOST SYSTEM

Paragraph 4 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement" including figures 2-2a and 2-2c including legends and numbering of positions (the engine M 332C is equipped with an injection pump with automatic height corrector LUN 5151.03 of the fuel riches).

5/ IGNITION SYSTEM

Paragraph 5 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement", including figure 2-3a and 2-3b together with its legends and positions.

6/ OIL SYSTEM

Paragraph 6 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement", except for the difference, that a filter with a replaceable cartridge has been inserted into the high-pressure branch on the exit from the oil pump. Figures 2-4 and 2-6 are fully valid, including positions and legends, with the oil intake thermometer mounted as shown in fig. 12-4a.

7/ CRANK CASE VENTING

Paragraph 7 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement".

8/ COOLING

The engine is cooled by airflow. In flight air enters through an opening at the front of the engine cowling into the air flow director (a sheet metal air collector mounted on the engine along the exhaust side of the cylinder block) and is directed by sheet metal deflectors to flow between the ribs of the cylinders and cylinder heads to the space of the suction manifold in the motor cowling. From there the air is sucked away from the engine by an ejector effect of the airflow around the engine cowling. From the deflectors air is also directed to cool the dynamo, if the engine is equipped with one, and to the aneroid boxes of the fuel injection pump.

Note : Conditions for the installation of the engine affecting cooling are listed in paragraph 3 of part 9 of this "supplement".

9/ STARTING THE ENGINE

Paragraph 9 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement".

10/ AUXILIARY DRIVES

Paragraph 10 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement".

11/ MOUNTING THE ENGINE IN THE AEROPLANE

Paragraph 11 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement".

12/ INSTRUMENTS

Paragraph 12 of part 2 of the "manual" is fully applicable to this paragraph of the "supplement". The source of electric power used on the motor is a dynamo type LUN 2111.1 (power 750 W) with a voltage regulator relay type LUN 2141.1. The engine can also be equipped with a vacuum pump 1U128SB1.

PART 3

TECHNICAL PARAMETERS

1/ TECHNICAL PARAMETERS OF THE ENGINE

Type of engine: M 332C

- Fully aerobatic version of the six-cylinder engine with compressor.

The technical parameters listed in the "manual" in paragraph 1 on pages 3-2, 3-3, 3-4, 3-6 in the column for the engine type M 332 applies also to type M 332C, with the exception of the following parameters, which for type M 332C are as follows:

Compression ratio :	7,4 : 1
Basic ignition timing :	2°before Top Dead Centre (TDC)
Cylinder head temperature :	see table 3-3 of the "supplement"

TECHNICAL PARAMETERS M 332C
Power, revolutions, boost pressure

Operating regime		Starting (maximum 5 min.)	Maximum permanent	Maximum cruising H=0, STP*	Reverse thrust	Idling
Power	kW	124±3%	98±3%	72±3%	71±3%	-
	HP	168,6±3%	133,3±3%	98±3%	96,5±3%	-
Revolutions	rpm	3000±30	2700±3%	2400±3%	max. 2600	500–600
Boost pressure	kPa	122±2	108±2	90,25±2	88,3±2	-
	Inch Hg	35,9±0,6	31,85 ± 0,6	26,65 ± 0,6	26,06 ± 0,6	-
	ata	1,24±0,02	1,1±0,02	0,92± 0,02	0,90±0,02	-
Compressor		ON	ON	OFF	ON	OFF

The power listed is the value measured on a brake stand at ground level at standard atmospheric conditions STP* assuming the ram pressure at the air intake 2 kPa.
The engine is not equipped with an exhaust silencer

Note : STP* = Standard Temperature and Pressure

FUEL AND OIL CONSUMPTION

Engine regime at STP		Max. permanent power	Maximum cruising power
Fuel	Lit/h.	Inf. 43	26 – 28
	Gal./h.	Inf. 11,4	6,9 – 7,4
Oil	Lit./h.	0,4	-
	Gal./h.	0,1	-

Measurement of fuel consumption at full permanent power is not prescribed.
Normal fuel consumption at maximum cruising power is measured under the following conditions :

- Compressor turned off
- Suction temperature + 15°C
- Boost pressure 26,65 Inch Hg (90,25 kPa) (0,92 ata)
- Engine revolutions 2400 rpm (revolutions per minute)

Cylinder head temperature

Engine operating regime		Normal range of operation	Start and climbing	Excess revolutions	During descent
Cylinder head temperature	°C	140 to 195	210 max. for 5 minutes	Max.210	Min.70
	°F	284 to 383	410 max. for 5 minutes	Max. 410	Min. 158

If the cylinder head temperature reaches its maximum permissible temperature before the stated time limit has elapsed, the engine regime must be changed and the engine must be left to cool off.

Values of fuel and oil pressure

Operational regime of engine		Revolutions above limit	Starting regime	Maximum permanent power	Maximum cruising power	Idling
Revolutions rpm		3100	3000	2700	2400	500 – 600
Fuel pressure	kPa	Max 50	Max 40	30 to 40	Min.30	Min 10
	psi	Max 7,25	Max 5,8	4,35to5,8	Min 4,35	Min1,45
Oil pressure	kPa	Max 450	Max 400	350to400	Min 350	Min 120
	psi	Max 65,25	Max 58	50,75to58	Min 50,75	Min17,4

Temperature of oil entering the engine

Regime of the engine		Operational 500 – 3000 rpm	Take off 3000 rpm	Excess speed 3100 rpm	Engine test
Oil temperature	°C	Normal 40-80, max 85 for 10 minutes	Maximum 85 for 10 minutes	Max 85	Min. 25
	°F	Normal 104-176, max 185 for 10 minutes	Maximum 185 for 10 minutes	Maximum 185	Min. 77

2/ OPERATIONAL LIMITING VALUES

a/ Take-off power :

- Revolutions 3000 ± 30 rpm, boost pressure 122 ± 2 kPa, (36 ± 0,6 inch Hg), compressor ON.
- Time limit : for not longer than 5 minutes.

b/ Permitted excess revolutions :

- Maximum revolutions 3100 rpm, boost pressure 83 kPa, (24,5 in. Hg), time limit : for not longer than 30 seconds
- Maximum momentary revolutions 3200 rpm, boost pressure 100 kPa, (29,5 in. Hg), time limit : for not longer than 1 second.

When these limiting values of revolutions or running time are violated, it is necessary to check cylinder compression, valve clearance and the state of the oil filter and to enter the observed results in the engine log book.

When the engine has run at 3300 rpm or more, it has to be dismounted from the aeroplane and sent for revision to the engine manufacturer together with a report of the value of rpm reached and the reason for this.

c/ In flight the compressor can be switched on permanently on condition, that the boost pressure value corresponds to the value for maximum permanent power, i.e. 108 ± 2 kPa (31,85±0,6 in.Hg); the pilot maintains the pressure value according to the cockpit boost meter.

d/ In case of emergency the engine can be run at take-off power for a period exceeding that given in the table on page 3-2, but never more than 10 minutes, provided that :

1/ - the engine running parameters do not exceed the limiting values, i.e.

Revolutions :	3200 ± 30 rpm,
Boost pressure :	122 ± 2 kPa,
Oil temp. at engine intake :	max 85 °C
Cylinder head temp., under spark plugs :	max. 210°C

2/ - use of take-off power under exceptional conditions will be entered in the logbook for reference in case of repair or possible warranty claims. But this situation is no a-priori reason for refusing warranty claims.

e/ The engine M 332C is approved for use under atmospheric conditions within the range of ambient temperatures from –40°C to +40°C with relative humidity from from 35 to 100 %, up to a height of 6000 MSA.

f/ Operating limits during aerobatics :

With the engine M 332C it is possible to perform stunt flying within the full range, including inverted flying without time limit, with multiples of gravitation from +8g to –5g, the resulting range of rotation omega = max. 3 rad.sec^{-1}.

During stunt flying the compressor may be switched on only if the values of the permanent regime are not exceeded, i.e. boost pressure max 108_{-4} kPa, max 2700±3% rpm and corresponding power 98±3% kW.

3/ THEORETIC ADJUSTMENT OF VALVE GEAR

Paragraph 4 of part 3 of the "manual", i.e. incl. Fig.3-5 with its legend, is fully applicable to this paragraph of the "supplement", with the exception, that for the engine M 332C the basic ignition-advance setting is 2°.

4/ OPERATING HOURS TO GENERAL OVERHAUL (GO) AND SERVICE LIFE OF THE ENGINE

Operating hours before general overhaul (GO)

4.1 The recommended service time before GO varies with the specific operating conditions, i.e. aerobatics or not, the kind of oil used and heeding the instructions for maintaining flying ability.

4.2 When using oil MS-20 the recommended time before GO is 1200 operating hours, when operating a plane approved for stunt flying the recommended time is at most 850 hours. The limiting time interval to GO is 10 years max.

4.3 When using the oils recommended on page 4-2 and 4-3 of the "manual" (except type MS-20) the recommended time before GO is 2000 flying hours under normal operating conditions, when operating a plane approved for stunt flying the recommended time interval before GO is at most 1400 hours. The limiting time interval to GO is 15 years max.

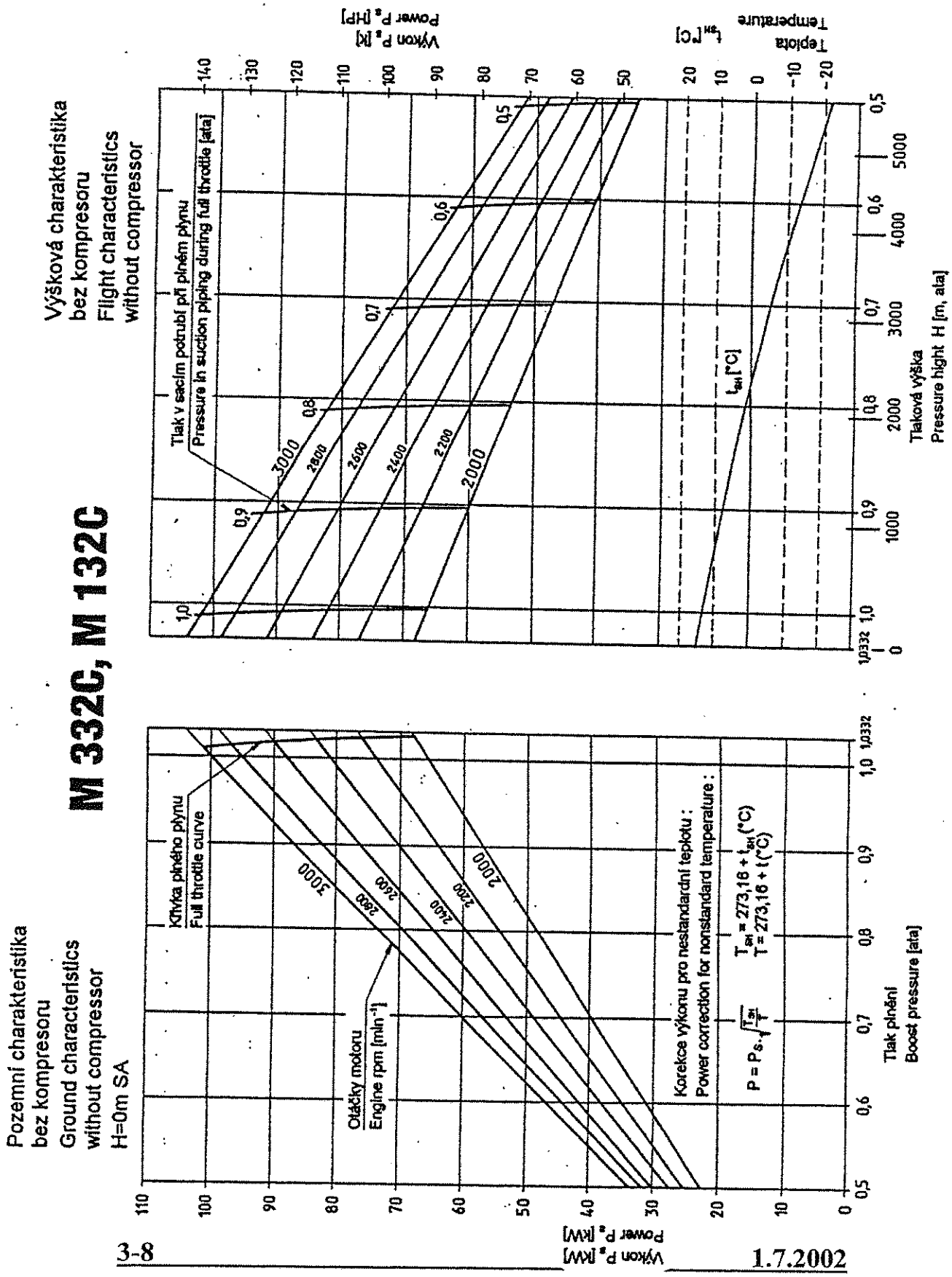
4.4 A precondition for achieving the above recommended operating hours before GO is maintaining the inspection schedule (points 4.2 and 4.3) in full as given in the original documentation of the engine including implementation of all amendments published in the service bulletins and using exclusively original spare parts.

4.5 Operating hours after GO are the same as the operating hours given in points 4.1, 4.2, 4.3 and 4.4.

Total service life of the engine and permissible number of GO's

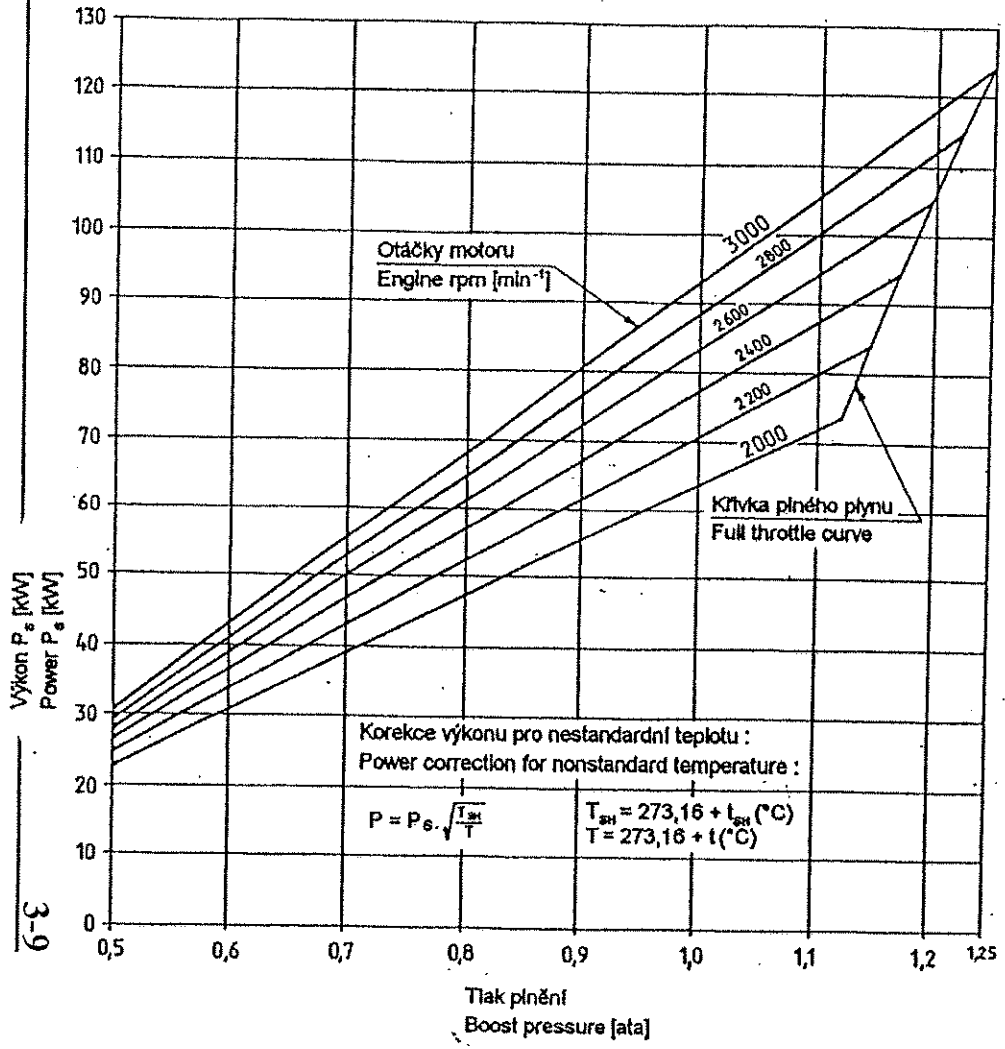
The total service life of the engine and the number of GO's is not limited.

5/ POWER CHARACTERISTICS OF THE ENGINE M 332C

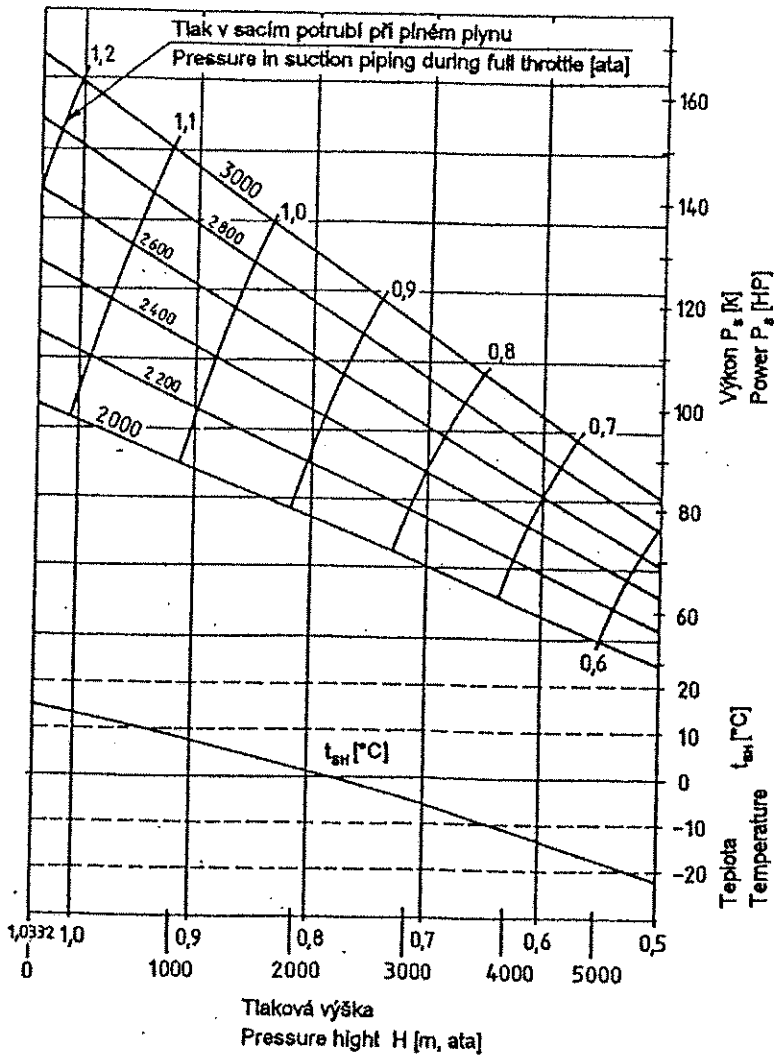


M 332C

Pozemní charakteristika
s kompresorem
Ground characteristics
with compressor
H=0m SA



Výšková charakteristika
s kompresorem
Flight characteristics
with compressor



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PART 4

FUEL, LUBRICANTS, CONSERVATION AGENTS

1/ FUEL

a) Aviation fuel

The engine M 332C uses led-less aviation petrol of minimum octane number 85 MM. There is no upper limit to the octane number of the fuel, which can be used. Ethylated fuels can be used only provided the Tetra Ethyl Lead content does not exceed 0,06 % by volume, i.e. 2,27 ml. TEL per US gal.)

b) Automobile fuel

The engine runs on led-less automobile petrol NATURAL BA-91N, 95N, and 98N. The fuel must conform to the Czech (EU) standard ČSN EN 228, 65 6505 or to equivalent specifications approved by the manufacturer.

2/ OILS AND LUBRICANTS

Chapter 2 of part 4 of the "manual" applies to this chapter of the "supplement" in full, in addition to which it is possible to use for permanent operation also oil MS-20 according to GOST 21743-76

3/ OILS FOR CONSERVATION

Chapter 3 of part 4 of the "manual" applies to this chapter of the "supplement" in full.

PART 5

OPERATING INSTRUCTIONS

1/ ENGINE CONTROL ELEMENTS

The engine control elements are :

- switching the magnetos on and off
- the throttle lever
- the pneumatic choke
- turning the compressor on and off

The adjustable pitch propeller can be set within a range from the minimum pitch angle (maximum revolutions) up to a maximum pitch angle (minimum revolutions), respectively from a negative pitch angle (reverse thrust) to 90° pitch angle (feathered prop.)

2/ STARTING THE ENGINE

Before starting the engine all instruments for control of engine parameters must be switched on, the fuel cock is set to "OPEN", the engine is primed by a few strokes of the priming pump (provided the engine is equipped with a priming pump) in order to flush the fuel system to a pressure of from 20 to 30 kPa, the propeller pitch angle is set to minimum and the compressor is turned ON.

a/ Starting at ambient temperature from+5°C to +20°C

Throttle lever :	- ½ full range
Choke	- shut
Fuel priming	- 2 strokes of the pump, providing the engine has one
Turning the prop. Manually	- 2 to 4 times – magnetos switched OFF !!
Starting the engine	- push the starter button

After start set the throttle lever to 1000 rpm. Check that within 10 seconds the oil pressure must rise to 120 kPa, otherwise the engine must be stopped and the fault found.

NOTE : Before turning the propeller manually, make sure that the magnetos are OFF !!

b/ Starting at ambient temperature above +20°C

Throttle lever :	- set to a position for 1000 rpm
Choke	- shut
Fuel priming	- at most 1 stroke
Turning the prop. Manually	- 2 times , with care!
Starting the engine	- using the magneto switch

Now start the engine. If it will not start, repeat for the same throttle setting (1000 rpm). If it still will not start, change the throttle setting to ½ full range. If this is again unsuccessful, the engine is choked and must be left for some while in order to evaporate the excess fuel in the suction manifold. After this delay, repeat the starting procedure without priming and with the throttle set to 1000 rpm.

c/ starting the hot engine after flight

Throttle setting :	- ½ to ¾ full range
Choke	- shut
No fuel priming	
No turning the prop. Manually	- danger of accident !!
Switch on ignition	- using magneto switch

Start the engine, if unsuccessful, let engine cool down.

d/ Starting at temperatures from +5°C to –15°C

At temperatures between +5°C and –15°C it is recommended to pre-heat the engine and the oil tank using hot air. The temperature of the hot air must not be above 120°C. Heating is continued until the cylinder head temperature and the oil temperature reach + 25°C. The accumulator must not be in the heated region. The pre-heated engine is started according to the procedure for ambient temperatures from +5°C to + 20°C. At low air temperature open the choke.

e/ Starting at temperatures below –15°c

If the temperature falls below –15°C, it is necessary to pre-heat the engine and the oil tank using hot air. The heating as well as the starting procedure is the same as that for the temperature range from +5°C to –15°C.

NOTE : The electric starter must never be used for a period of more than 10 seconds, after that it must be left for 30 seconds to cool down. After three such attempts the starter must be left to cool down completely. The starter must not be switched on or be left switched on when the engine is running.

3/ WARM-UP OF THE ENGINE AFTER START

Paragraph 3 of part 5 of the "manual" is fully applicable to this paragraph of the "supplement".

4/ ENGINE TEST

After "warm-up" of the engine the following engine test is to be performed :

a/ Check of the propeller functions

Boost Pressure- cruising regime value, see part 3 of this supplement

Compressor	- OFF
Propeller pitch adjustment	- change setting 2 to 3 times between extreme positions, i.e. from minimum to maximum pitch angle and back again.

b/ Check of the engine functions

1/ Maximum permanent power regime

Throttle position	- full power
Compressor	- off
Choke	- closed
Propeller pitch	- minimum angle
Revolutions	- correspond to regime of permanent maximum power, see part 3 of this supplement
Boost pressure	- correspond to regime of permanent max. power, see part 3 of this supplement
Fuel pressure	- 30 to 40 kPa
Oil pressure	- 350 to 400 kPa
Oil temperature (intake)	- min. 25°C, max. 85°C
Cylinder head temp.	- min. 120°C, max. 195°C

Ignition check :

Switch on the magnetos alternately, the revolutions should drop by 50 to 80 rpm. If the drop is not in this range, pre-ignition must be set according to part 7. With a constant speed propeller, the ignition test is performed with a boost pressure of 0,9 to 0,95 kPa with the rpm selector set to 3000 rpm.

The time limit for this test is 20 seconds. It is not recommended to run the engine on a single magneto longer, than is necessary to ascertain the drop in rpm, otherwise spark plugs get contaminated.

2/ Take-off power regime

Throttle position	- full power
Compressor	- on
Choke	- closed
Propeller pitch	- minimum angle
Revolutions	- correspond to take-off power regime, see part 3 of this supplement
Boost pressure	- correspond to take-off power regime, see part 3 of this supplement
Fuel pressure	- 30 to 40 kPa
Oil pressure	- 350 to 400 kPa
Oil temperature (intake)	- min. 25°C, max. 85°C
Cylinder head temp.	- min. 120°C, max. 210°C

Check performance of propeller functions:

Propeller pitch control lever set to maximum pitch angle

- revolutions – see technical data and operating instructions of propeller.

Return propeller pitch control lever back to minimum pitch angle.

- revolutions – see technical data and operating instructions of propeller.

This test must not last longer than 10 seconds.

3/ Idling regime

Throttle position	- idling
Compressor	- off
Choke	- closed
Propeller pitch	- minimum angle
Revolutions	- 500 to 600 rpm
Boost pressure	- no value given
Fuel pressure	- min. 10 kPa
Oil pressure	- min. 120 kPa
Oil temperature (intake)	- min. 25°C
Cylinder head temp.	- min. 120°C

Throughout the engine test the engine must run evenly. All prescribed checks are to be performed.

5/ CONTROL OF THE ENGINE IN FLIGHT

Provided all the parameters measured by cockpit instruments are within prescribed limits, the choke is closed, propeller pitch is set to minimum pitch angle (maximum revolutions) and the compressor is turned on, select the take-off regime for the take-off manoeuvre. Engine revolutions must not rise above 3000 +/- 30 rpm, the boost pressure must not rise above 122 +/- 2 kPa. (se paragraph 2 of part 3 of this "supplement").

The take-off regime may be used for at most 5 minutes on condition, that the cylinder head temperature does not rise above 210°C and the oil intake temperature above 85°C.

Should the temperature rise above the quoted limits, the take-off regime must be changed to the regime of maximum permanent power and further operation under the take-off regime must be delayed, until the engine cools down. The 5 minutes time limit should be adequate for climbing to a safe height above obstacles in the airport neighbourhood.

Further climbing is possible in the maximum permanent power regime on condition, that the boost pressure does not exceed 108 +/- 2 kPa, the engine will run at 2700 +/- 3% rpm, the cylinder head temperature will not rise above 195°C and the oil intake temperature remains below 80°C. Before these limiting temperatures are exceeded climbing must be interrupted and the engine left to cool down in horizontal flight.

After climbing, horizontal flight may follow. The flight regime including all pertinent data is given in the manual of the aeroplane manufacturer. During the flight, engine revolutions, pressure and temperature values must be monitored and kept within prescribed limits. The throttle setting must not be changed abruptly. The engine must run smoothly over the entire range of revolutions, without vibrations or misfiring. A possible drop of oil pressure below the limits for the given regime indicates a serious fault in the oil system and in this case it is necessary to land as soon as possible in order to identify the cause of the breakdown.

In aerobatics the limits given in paragraph 2 of part 3 of this supplement must be observed. With the engine M 332C inverted flying is permitted without time limitation. During aerobatics the compressor may be turned on with the engine in the maximum permanent power regime, i.e. the boost pressure will be 108_{-4} kPa, the engine speed will be 2700 +/- 3% rpm, the power will be 98 +/- 3% kW..

If the cylinder head temperature during prolonged descent becomes too low, the engine should be kept warm by some horizontal flight or by occasionally increasing the throttle setting, so that the cylinder head temperature is kept above 70°C. Before landing, especially in cold weather, the engine must be heated at least to 100°C, the compressor turned on and the propeller pitch lever set to minimum pitch angle (if this has not been done before) so that the engine is ready to change over to take-off regime with minimum delay in case the landing is aborted. After landing, turn off the compressor, let the engine idle and slowly cool down, until the cylinder head temperature falls below 140°C. With the engine idling switch off the ignition magnetos. If there is self-ignition with the magnetos switched off, it is possible to make the fuel mixture richer using the choke, this will help to cool the engine more quickly so that ignition can be turned off after a short run.

In order to reach maximum speed in horizontal flight at ground levels the take-off regime can be used for 5 minutes, but in this the given temperature limits must not be exceeded.

For taxiing it is permitted to turn the compressor ON.

Using reduced throttle setting with the compressor turned on is not advisable from the point of view of increased fuel consumption. This regime is advisable only, when it is necessary to leave the compressor turned on at low height in view of a possible need for a sudden increase of power. (Approach for landing).

Table of recommended regimes for the engine M 332C

Engine regime	Power		Speed rpm	Boost pressure		Specific fuel consumption $g.kW^{-1}.h^{-1}$	Com-pressor
	kW ± 3%	HP ± 3%		kPa +/- 2	ata +/- 0,02		
Take-off. Max. for 5 minutes	124	168,6	3000±30	122	1,24	387_{-14}^{+27}	ON
	113	153	2800±3%	120	1,22	380_{-14}^{+27}	
	107	145	2700±3%	118	1,2	360_{-14}^{+27}	
Maximum power for permanent load	98	133,3	2700±3%	108	1,1	315_{-7}^{+14}	ON
	92	125	2700±3%	98	1	285_{-7}^{+14}	OFF
	88	120	2700±3%	98	1	300_{-7}^{+14}	ON
	83	113	2600±3%	98	1	300_{-7}^{+14}	
75 % max. load	92	125	2700±3%	98	1	285_{-7}^{+14}	OFF
65 % max.load	80	109	2500±3%	93,2	0,95	275_{-7}^{+14}	OFF
Max. cru-sing load	72	98	2400±3%	90,25	0,92	265_{-7}^{+14}	OFF
Econo-mical cruising power	68	92,5	2300±3%	90,25	0,92	265_{-7}^{+14}	OFF
	64	87	2400	83,4	0,85	270_{-7}^{+14}	
	59	80	2400	78,5	0,8	275_{-7}^{+14}	
	56	76	2300	78,5	0,8	275_{-7}^{+14}	
	55	74,5	2250	78,5	0,8	275_{-7}^{+14}	

Note : The values of power listed are the values attained on a test stand at ground level under normal atmospheric conditions (NTP, Normal Temperature and Pressure) (ISA), without exhaust silencer and assuming a ram pressure 2 kPa of the intake air.

PART 6

PERIODIC INSPECTIONS

1/ GENERAL

Paragraph 1 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement", with the exception, that the inspection after each 500 running hours as described in the "manual" is (on the engine type M 332C) performed exclusively by a mechanic of the manufacturer, or by a mechanic trained or authorised for these activities by the manufacturer.

2/ INSPECTION BEFORE FLIGHT

Paragraph 2 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement".

3/ INSPECTION BETWEEN FLIGHTS

Paragraph 3 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement".

4/ INSPECTION AFTER FLIGHT

Paragraph 4 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement".

5/ INSPECTION AFTER THE FIRST 10 RUNNING HOURS

Paragraph 5 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement". In case the engine is equipped with an AC generator, check that the vee-belt is taught and undamaged.

6/ INSPECTION AFTER THE FIRST 50 RUNNING HOURS

Paragraph 6 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement", with the exception, that the valve clearance according to point n is performed at an ambient air temperature of at least +10°C with a thermal equilibrium state between the engine and its surroundings. In case the engine is equipped with an AC generator, check that the vee-belt is taught and undamaged.

7/ INSPECTION AFTER EACH 500 RUNNING HOURS

Paragraph 1 of part 6 of the "manual" is fully applicable to this paragraph of the "supplement", excepting point a/ (checking fuel consumption), with the provision, that with the engine type M 332C inspections described in this paragraph may performed exclusively by a mechanic of the manufacturer, or by a mechanic trained or authorised for these activities by the manufacturer. Accomplished inspections after each 500 running hours are certified by an entrance in the engine logbook.

8/ PARTIAL INSPECTION

The text "PARTIAL INSPECTION" of part 6 of the "manual" is fully applicable to this paragraph of the "supplement", with the provision, that disassembly, inspection, modification and repair of components as well as reassembly of the engine type M 332C may be performed exclusively on the premises of the manufacturer (LOM PRAHA s.p.), or at a service organisation, which is equipped with the necessary equipment, tools and jigs and is authorised by the ÚCL-ČR (Civil Aeronautics Authority of the Czech republic) for these activities.

9/ INSPECTIONS ABOVE SCHEDULE

The paragraph "INSPECTIONS ABOVE SCHEDULE" of part 6 of the "manual" is fully applicable to this paragraph of the "supplement", with the provision, that these further kinds of inspections of the engine type M 332C may be performed exclusively on the premises of the manufacturer (LOM PRAHA s.p.), or at a service organisation, which is equipped with the necessary equipment, tools and jigs and is authorised by the ÚCL-ČR (Civil Aeronautics Authority of the Czech republic) for these activities.

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PART 7

MAINTENANCE

Note : When performing work according to the following instructions, it is advisable to use the CATALOGUE OF SPARE PARTS for easier orientation. All the work listed, which goes beyond the activities appropriate to inspections after 10, 50 and 100 running hours may, be performed exclusively by a service technician of the manufacturer, or one who has been trained and authorised by the manufacturer for this activity.

1. EXCHANGING OIL

Paragraph 1 of part 7 of the "manual" applies fully to this paragraph of the "supplement", as well as fig. 7-1a, 7-1b and the detail A of fig. 7-1, including positions and legends with the exception, that the container with the filter cartridge is removed too. When exchanging oil, replace also the filter cartridge (after at most 200 running hours of the engine).

2. CHECK OF THE COMPRESSION PRESSURE IN THE CYLINDERS

Paragraph 2 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

3. TESTING TIGHTNESS OF CYLINDER HEAD BOLTS

Paragraph 3 and fig.7-2 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

4. TESTING AND ADJUSTING VALVE CLEARANCE

Paragraph 4 of part 7 of the "manual" applies fully to this paragraph of the "supplement", provided the ambient air temperature must be at least +10°C during the operation and the engine temperature must be in equilibrium with the ambient temperature. Fig. 7-3 including legends and positions is fully applicable.

5. REPLACING THE MAGNETO.

Paragraph 5 of part 7 of the "manual" applies fully to this paragraph of the "supplement", including fig. 7-4 with positions and legends.

6. MAINTENANCE AND ADJUSTMENT OF MAGNETOS

Paragraph 6 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

7. CHECKING MAGNETOS AFTER 500 RUNNING HOURS

Paragraph 7 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

8. ADJUSTING PRE-IGNITION (IGNITION TIMING)

The basic setting for the lead is 2° before the piston reaches TDC (Top Dead Centre). The lead must further be adjusted so that when switching the two magnets at a boost pressure of 0,90 to 0,95 ata and the revolutions selector set to "take-off" the revolutions will not vary by more than 50 to 80 rpm. If the rpm change by more than the permitted range, it is necessary to perform adjustment as described in paragraph 8 of the "manual".

9. MAINTENANCE AND CHECKING THE STARTER BUZZER

Paragraph 9of part 7 of the "manual" applies fully to this paragraph of the "supplement".

10. MAINTENANCE OF IGNITION SPARKPLUGS

Paragraph 10 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

11. MAINTENANCE OF THE DYNAMO

Paragraph 11 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

12. MAINTENANCE OF THE COMPRESSOR CLUTCH

Paragraph 12 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

13. INSPECTION AND CHECKING THE COMPRESSOR

Paragraph 13 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

14. MAINTENANCE OF THE STARTER UNIT

Paragraph 14 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

15. ADJUSTING THE OIL PRESSURE

Paragraph 15 of part 7 incl fig7-6 of the "manual" applies fully to this paragraph of the "supplement".

16. METHOD OF CHECKING THE FUEL FILTER

Paragraph 16 of part 7 of the "manual" applies fully to this paragraph of the "supplement".

17. ADJUSTING THE FUEL PRESSURE

Paragraph 17 of part 7 (including figure 7-8) of the "manual" applies fully to this paragraph of the "supplement".

18. REPLACING THE PISTON-CYLINDER ASSEMBLY

Paragraph 18 of part 7 including figures 7-9, 7-10 and 7-11 of the "manual" apply fully to this paragraph of the "supplement".
After reassembly of the engine let the engine run in with the propeller used for flight.

RUNNING IN AFTER REPLACEMENT OF THE PISTON-CYLINDER ASSEMBLY

Starting is performed according to instructions in part 5 of this supplement.

Running in schedule :

rpm	Running time	Compressor
Starting		ON
800	10 minutes	OFF
1000	5 minutes	OFF
1100	5 minutes	OFF
1400	5 minutes, oil temp 25°C minimum	OFF
1600	5 minutes	OFF
1800	5 minutes	OFF
2000	5 minutes	OFF
2200	5 minutes	OFF
2400	10 minutes	OFF
2700	20 seconds	OFF
3000_{-100}	10 sec, cylinder head temp.210°C max	ON
2400	10 minutes	OFF
2700	20 seconds	OFF
3000_{-100}	10 sec, cylinder head temp.210°C max	ON
900 to 1100	10 minutes cool down	OFF
500-600	stop	OFF

Total running time 81 minutes.

During running in of the engine all limiting values of temperatures, pressures etc. listed in part 3 of this "supplement" must be observed.
During the first 10 operational hours after running in it is advisable to use "maximum permanent power" and "take-off" regimes as little as possible.

19. ASSEMBLY TOOLS

Together with each new engine the user obtains assembly tools listed below, one piece for each item. In case of damage or loss the missing item can be ordered from the engine manufacturer.

Item number	Designation	Ordering number
1	Tool bag complete	Sc 0870
2	Wrench for compressor nuts, compl.	Sc 0873
3	Wrench for spark plugs, complete	Sc 0876
4	Special screwdriver	Sh 0873
5	Wrench for suction manifold nuts, cylinder head side	Sh 0871
6	Dtto - smaller	Sh 8723
7	Key for openings in camshaft case	Sc 8702
8	Pliers, universal	ČSN 230380
9	Spanner, open, double ended 5,5 x 7	ČSN 23 0611
10	Spanner closed and open ended 8	ČSN 23 0406.7
11	Spanner closed and open ended 9	ČSN 23 0406.7
12	Spanner closed and open ended 10	ČSN 23 0406.7
13	Spanner closed and open ended 12	ČSN 23 0406.7
14	Spanner closed and open ended 13	ČSN 23 0406.7
15	Spanner closed and open ended 14	ČSN 23 0406.7
16	Spanner closed and open ended 17	ČSN 23 0406.7
17	Spanner closed and open ended 19	ČSN 23 0406.7
18	Spanner open ended 19 x 22	ČSN 23 0611
19	Spanner closed, bent, 24 x 27	ČSN 23 0637
20	Spanner closed 22 x24	Sh 8731
21	Tubular box spanner with handle 9	Sh 0875

Item number	Designation	Ordering number
22	Tubular box spanner with handle 10	Sh 0876
23	Tubular box spanner with handle 12	Sh 0877
24	Tubular box spanner with handle 14	Sh 0878
25	Gauge for checking valve clearance	Sh 0879
26	Spanner for assembling magneto	Sh 0872
27	Screwdriver NAREX	Number 8000/1
28	Screwdriver NAREX	Number 8000/9
29	Screwdriver NAREX	Number 8000/13
30	Key for adjusting valve clearance	Si 8712
31	File for buzzer	5001.71

20. SPECIAL TOOLS AND JIGS

The tools and jigs listed below are necessary for some of the work mentioned in the documentation, which is delivered with the engine, but these tools and jigs normally not part of the delivery of the engine. If desired, the user can order them separately.

Designation	Order number
Piston pin puller	P 332 – 1295
Sleeve for removing piston rings	P 332 – 1567
Ram for mounting piston protectors	P 332 – 1196
Rotator with angular scale	P 332 – 1568
Jig for finding Top Dead Centre	P 332 – 1305
Hexagonal socket wrench 9 mm	P 332 – 1203

Designation		Order number
Box spanner, hexagonal, 7 mm		P 332 – 1202
Hexagonal open ended spanner 9 mm		P 332 – 1367
Socket wrench, hexagonal, 14 mm		P 332 – 1204
Milling cutter for suction valve seats		N 137 – 009
Milling cutter for exhaust valve seats		N 137 – 010
Milling cutter for levelling exhaust valve seats		N 137 – 070
Assembly desk for cylinder heads		P 332 – 1569
Support for head		P 332 – 1570
Valve spring assembly lever		P 332 – 1571
Jig for testing silentblocks		P 332 – 1572
Spanner for nuts of regulating screws		P 332 – 1573
Socket inserts for torsion wrenches		P 332 – 1368
Key hexagonal, 7 mm		P 332 – 1369
Key for compressor		P 332 – 1370
Holder for suction valve seat milling cutters		P 137 – 011
Holder for exhaust valve seat milling cutter		P 137 – 012
Reamer holder for suction valves		P 137 – 013
Reamer holder for exhaust valves		P 137 – 013
Engine assembly stand		P 332 – 1285
Wrench for nuts on crankshaft		P 332 – 1296
Torque wrench 0 to 100 Nm	Produced by	OMK – 100
Torque wrench 100 to 500 Nm	TONA PEČKY	OMK – 500
Jig for mounting piston safety pin number 1		P 332 – 1446

Note : Instead of the torque wrenches listed here can be other types of equivalent parameters (range of torques) can be used.

Note : The compression meter, the torque wrenches as well as the gauge for testing valve clearances must be checked and graduated at least once every 12 months. This service can be ordered from the engine manufacturer.

PART 8

FAULTS AND HOW TO REMOVE THEM

Paragraphs 1 to 18 of part 8 in the "manual" are fully applicable also to the engine M 332C, i.e. to paragraphs 1 to 18, part 8 of this "supplement".
This refers also to the *"NOTE"* in part 8 of the manual.

PART 9

TRANSPORT, STORAGE, MOUNTING

1. TRANSPORT AND STORAGE OF THE ENGINE

For transport the engine is wrapped into a LD-PE cover and mounted on a transport support stand, which is attached to sidewalls of the crate.

Note: The LD-PE cover serves as a conserving and protecting means and therefore the engine should be left in its original crate as long as possible. Damage to the LD-PE sheet leads to a partial degradation of the protection of the engine, which is not permissible before further storage.

A/ Removing the engine from the crate

1/ Open the lid of the crate.

2/ Unscrew the engine support stand from the crate sidewalls.

3/ Using a suitable lifting gear remove the engine together with its support stand from the crate.

4/ Unscrew the holding nuts and remove the engine from its supporting stand.

Note : For transport and during manipulation it is necessary to earth the ignition magnetos in order to prevent inadvertedly starting the engine when turning the crankshaft. Use bare copper wire of at least 0,8 mm diameter for connecting the magneto output to the bolt (1) on the engine as shown on fig.9-1

B/ Replacing the engine into the crate :

1/ Cover all openings of the engine using blank flanges, screws and cover nuts.

2/ Ensure that the ignition magnetos are earthed according to fig. 9-1.

3/ Wrap the engine into the LD-PE sheet and mount it on the support stand.

4/ Place the engine into the crate, using the operations of point A in reverse order.

Note : This protection can be used only for transport over short distance and storage for a few days. For overseas transport the engine must be conserved before it is wrapped in an airtight LD PE cover and placed in the crate together with adequate desiccants. Conservation is described in part 10 of this supplement. Engines mounted in the crate should be stored in a dry place with minimum variations of ambient air temperatures.

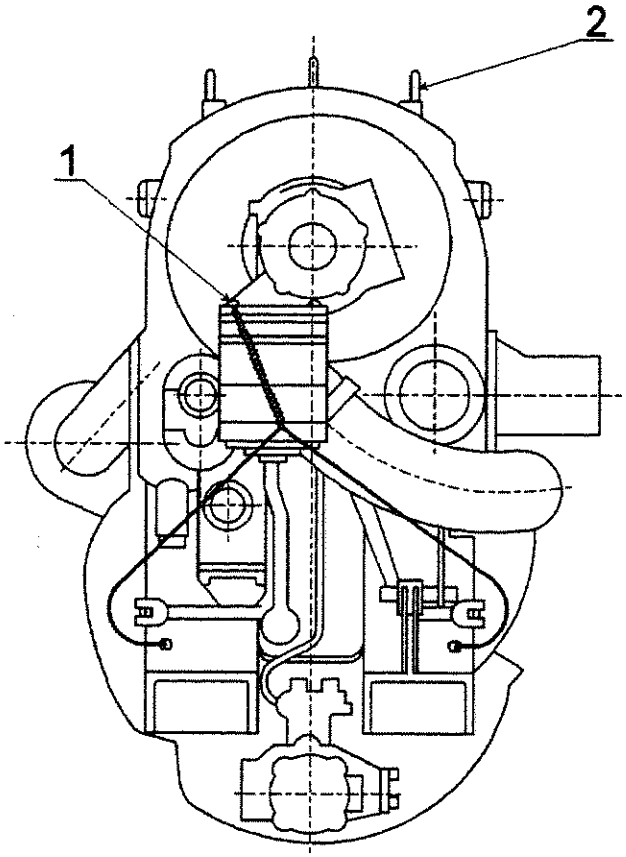


Fig. 9-1

1 – mounting screw for the starter electric motor

2. INSTALLATION AND DE-INSTALLATION OF ENGINE

a. Installation of the engine into the aeroplane

The position numbers used below, if not referred to other figures, refer to the "engine installation drawing", figure number Sc 0006B, i.e. fig. 12-1 in the appendix.

a. After removing the engine from the support stand, fix it through the lifting eyes (9) to the rope of the lifting gear.
b. Remove the protective conservation according to part 10 of this supplement.
c. Place the necessary gaskets between the flanges of the instruments to be mounted and the corresponding engine flanges. All nuts on fixing bolts must be secured by locking washers ore wire loops.
d. Install the mounting lugs with fixing pins to the engine bed (1) for installation of the engine into the aeroplane.

Note : When installing the engine into engine bed of the aeroplane adhere to the procedures recommended in the aeroplane handbook. Especially carefully heed the values of torque in order not to damage the fixation bolts by exceeding permissible torque values when tightening nut or bolts. This value is 15,2 + 2 Nm. Using locking washers as recommended by the aeroplane manufacturer.

e. Connect the operating rod of the throttle to the throttle arm (6) on the console. Connect the operating lever of the choke to the corresponding control element. Connected the compressor starting lever (8) to the corresponding control rod. Connect the propeller pitch control (3) to the pitch control system. The pins of all control systems must be meticulously secured by cotter pins.
f. Remove the blanking flange from the air input flange (2) to the compressor and connect the intake to the air suction manifold.

g. Connect the fuel tubing to the fuel input connecting nipple of the injection pump (15), fig. 9-2. Connect the corresponding tube to the fuel pressure meter connection (16) . Connect the corresponding tube to the venting system of the fuel injection pump (17), this tube must lead back into the fuel tank. At the same time connect overflow tubes to the draining valves (2) fig.9-3 for removing excess fuel from bends (1), fig. 9-3, in the suction manifold.

h. Remove the blanking flange from the oil input connector (10), connect the oil tubing the oil tank to the engine, connect the oil return tubing from the engine outlet (11) back to the oil tank.

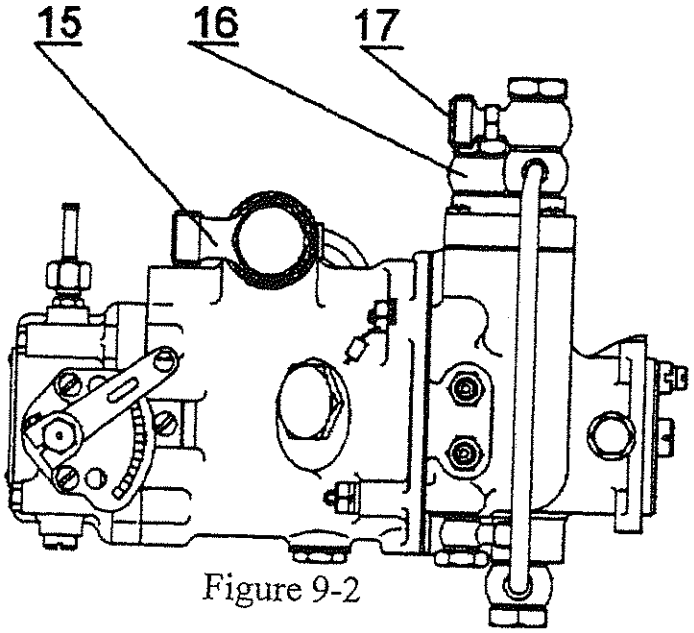
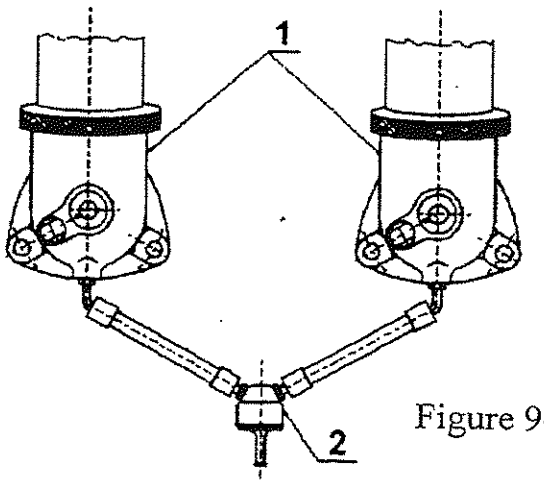


Figure 9-2



1- Knees of the suction manifold
2- Valve for excess fuel drainage

Figure 9-3

Note : Before assembly flush all tubes using pure petrol for technical applications and blow clean with compressed air in order to remove possible impurities. During assembly take meticulous care to have all joints tight, so that no oil can escape and no air can be sucked in.

i. Connect the tube from the oil pressure meter to the corresponding outlet (12) after removing the blanking caps. Install the oil intake temperature sensor (13) on the lid of the oil filter.
j. Connect shorting from the magneto cut off switches cables to the shorting terminals (35) of both magnetos. Carefully connect the shorting cable to clean metal studs on the engine and check the conductivity of the connection.
k. Connect the corresponding cables to the starter terminal (21) and the dynamo terminal (20) (provided the engine has a magneto).

Note : All the electrical installation must be carefully insulated, the cables must not be in touch with any sharp edge of aeroplane components. The connection to the engine terminals must be so elastic as to withstand vibration or movement of the engine .

l. Attach the temperature sensor to the fourth cylinder head below the sparkplug.
m. Mount the electric rpm sensor-transmitter onto the flange (23) after removing the blanking flange. If the rpm are measured mechanically, connect the flexible (Bowden) cable to the connector (19) on the oil pump (after removing the cover screw).
n. After removing the cover from the neck of the vent of the engine case (18) connect the venting tube leading to the region of reduced pressure (partial vacuum).
o. Remove the cover from the exhaust flanges (5), mount the exhaust tubes or exhaust manifold. Between the head and the exhaust insert the prescribed gaskets.
p. Attach the propeller to the flange. Perform this operation in accordance with the manual of the propeller manufacturer.
q. Place and fix the engine cowlings in place.

Note : All covers, blanking flanges, nuts, screws etc. must be stored for use during dismantling of the engine from the aeroplane.

b. Disassembly of the engine from the aeroplane

During disassembly of the engine from the aeroplane the above listed operations are performed in reverse order, but to begin with oil must be drained from the engine. In case of need conservation of the engine is performed according to part 10 of this supplement.

***

3. REQUIREMENTS FOR ENGINE INSTALLATION

NOTE...the construction department of the engine manufacturer must approve every installation of the engine into new or reconstructed aeroplanes in advance, otherwise all previous warranty agreements lose validity.

A. Fuel installation

For this paragraph, paragraph A of chapter 3 of part 9 of the "manual" is fully valid.

B. Oil installation

For this paragraph, paragraph B of chapter 3 of part 9 of the "manual" is fully valid.

C. Oil installation

For this paragraph, paragraph C of chapter 3 of part 9 of the "manual" is fully valid.

D. Engine control elements

The throttle lever controls the throttle flap position, has an adjustable stop position for idling and is mounted on the console of the control levers. Choke control is implemented by the choke needle, which is mounted on the fuel flow corrector. For switching on or off the driving gear (planet wheel) of the compressor there is a lever on the compressor case. Correct function of this switching is checked as follows : when switched on, the clutch must not slip during operation of the electric starter, when switched off the barometer on the cockpit panel must not show a higher boost pressure meter showing the pressure in the input manifold of the compressor, as a rule 96 to 100 kPa. On engines equipped with hydraulic constant speed propellers, a propeller control lever on the rpm controller selects the rpm, with stops for minimum and maximum rpm. Instructions for adjusting the propeller control are contained in the propeller manual. Engine control is adjusted according to instructions contained in part 5 of this supplement.

Control rods between the cockpit and the engine must be so rigid, that they do not vibrate, and mounted so that they are not bent. Connecting joints must be precise and without play. The control elements in the cockpit must have a somewhat wider range of motion than the corresponding control elements on the engine. The control rods between the engine and the cockpit should be as near as possible parallel to the engine axis, so that displacement of the engine on its rubber mounting blocks does not change the control element position.

E. Exhaust tubing

In the delivery of the engine there is an exhaust silencer including a heat exchanger for heating the cabin, or flanges, to which the aeroplane manufacturer installs individual exhaust pipes for each cylinder leading directly out of the engine cowling, or a collecting manifold, or a heat exchanger. These elements must not cause undue stresses on the engine by their weight, inertial forces or thermal dilatation.

NOTE...every installation attached to the exhaust tubing reduces the power of the engine.

NOTE...the construction department of the engine manufacturer LOM PRAHA S.P. Praha must approve the construction of the exhaust tubing as well as the installation in advance , otherwise all previous warranty agreements lose validity.

F. Engine cowling

Reliable function of the engine presumes above all adequate cooling under the prevailing range of atmospheric conditions. For regions with mild clime (-15°C to +30°C) as a rule fixed cowling will suffice, at most with small modifications for winter or summer operations. In order to accommodate a wider temperature range the cowling must be adjustable. In any case the engine cowling must be designed and tested until the operating temperatures and other parameters correspond t those demanded in the engine documents. Especially the minimum pressure drop of the cooling air (see part 3, chap.1 "Cooling" of this "supplement") measured before and behind the engine cylinders must be maintained even under most unfavourable conditions (take-off and climbing). The cowling must also ensure that all cylinders are cooled evenly, the maximum cylinder head temperature difference should be no greater than 30°C.

Special care must be paid to the ventilation after the engine is stopped, when the suction manifold with its fuel injection system is heated by conduction from the hot cylinder heads. The fuel in the fuel system must not reach its boiling point, otherwise the engine will not restart shortly after stopping. By suitable shaping of the covers around the fuel system adequate cooling can be maintained also at minimum airspeeds or with the engine stopped. In case of need flaps can be opened especially around the fuel system in order to keep the cowling interior temperature within acceptable limits.

For operation in winter, especially for very low temperatures, it will be necessary to shut off, or to partly shut off, the flow of cold air in order to maintain the necessary running temperatures of the engine. The fuel injection pump has its own cooling of the regulator case and takes up air by a rubber hose from the air collector. No equipment may be mounted on the injection pump.
The front lid of the engine case must not be exposed to direct flow of cold air, on the contrary, it should be well shielded, so that water will not condense there and create an environment, which could support corrosion inside the engine.
For operation in dusty environments (tropic regions) an efficient air filter must be mounted on the air intake. The filter should pose as little resistance to air flow as possible if the engine is to work with rated power.
When installing the engine it is necessary to take into account the increased pressure of suction as well as of cooling air due to the ram effect. For normal operation it is assumed, that the minimum ram pressure in the compressor air intake region is the same as the minimum cooling air pressure at the engine sump. For increased ram pressures at high speeds the boost pressure limits corresponding to the engine power are valid.
Note : for each new installation of the engine M 332C it is necessary to verify the temperature of the cylinder heads and the oil temperature and to submit the results for approval to the engine manufacturer.

G. Propeller

Propeller power parameters must correspond to the engine parameters (see part 3 of this "supplement"). The propeller must always be precisely centred and balanced. The matching flange of the propeller head must be clean and precisely machined, so that the propeller sits firmly on the shaft flange. All bolts must be drawn tight to the prescribed torque and all nuts must be correctly secured. The engine must never run with an incorrectly balanced or not well mounted propeller. Installation of the propeller and the pitch adjustment gear must be performed according to the instructions of the propeller manufacturer.
Note : The use of a propeller other than the type, which has been tested and recommended by the engine manufacturer must be approved by the engine manufacturer.

PART 10

CONSERVATION AND DE-CONSERVATION OF THE ENGINE

For part 10 of this "supplement", part 10 of the "manual" is fully applicable

PART 11

CONVERSION TABLES

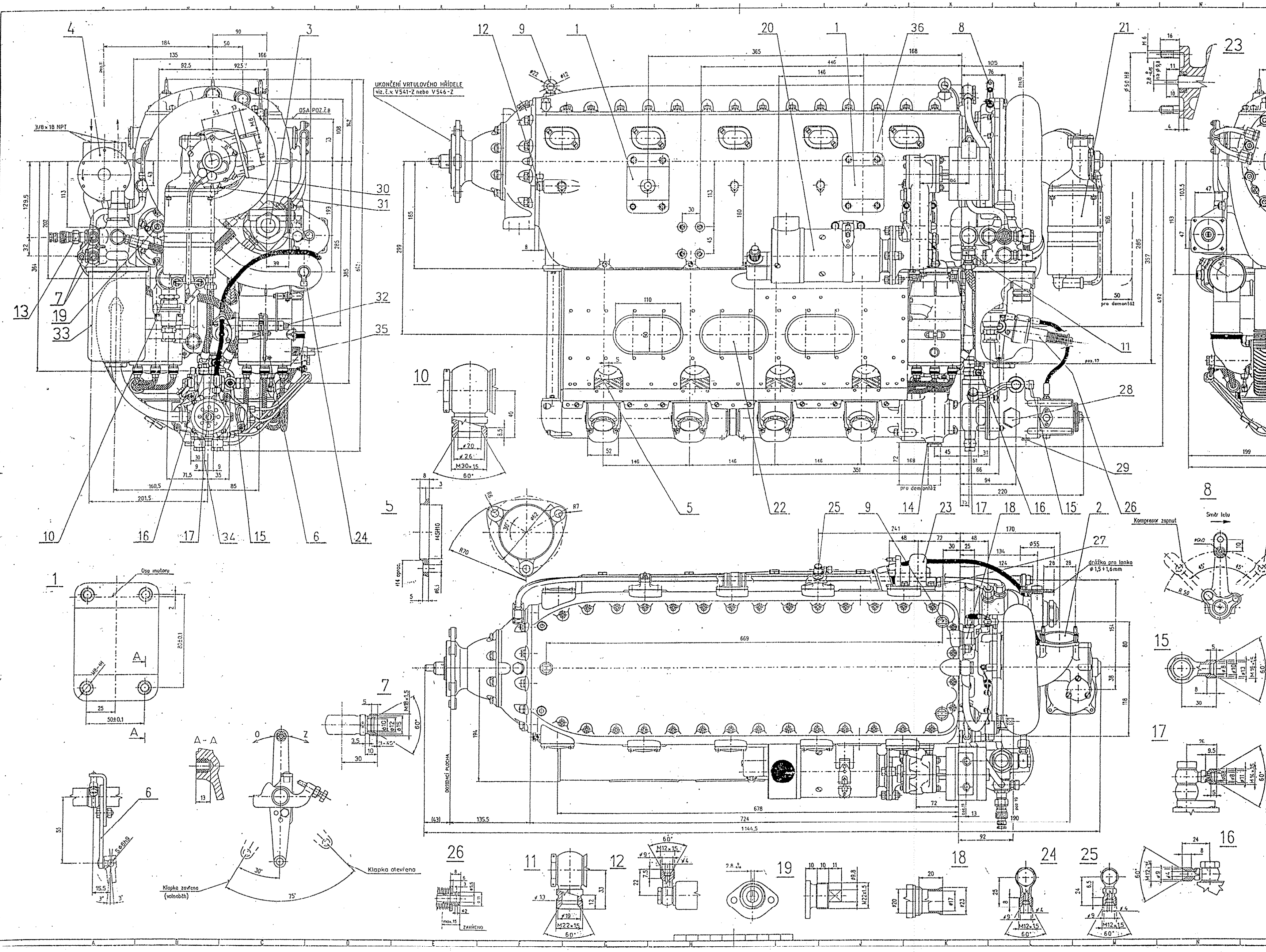
For part 11 of this supplement part 11 of the manual is fully applicable

PART 12

APPENDIX

Legend to the M 332C engine installation drawing

1 Flanges of the engine bed mounting studs
2 Flange of the air intake neck of the compressor
3 Propeller revolutions regulator LUN 7810.03
4 Vacuum pump SIGMA –TEK 1U128B
5 Exhaust flange
6 Throttle lever
7 Oil radiator connections
8 Lever for switching the compressor ON/OFF
9 Engine supporting eyes
10 Engine oil inlet
11 Engine oil outlet
12 Connector for oil pressure gauge
13 Connection for oil inlet thermometer (resistive sensor LUN 1358-8)
14 Oil drainage stud in the valve gear and gravity valve with strainer
15 Fuel input attaching stud
16 Fuel pressure gauge attaching stud
17 Stud for attaching injection pump ventilation
18 Ventilation of the engine case
19 Connector for mechanical rpm indicator, n = 1:2
20 Dynamo LUN 2111, U = 28 V, P = 600 W
21 Electric starter PAL LUN 2253 (left handed operation)
22 Openings for inserting ignition spark plugs
23 Flange for mounting electrical rpm sensor/transmitter, n = 1:1
24 Connector for priming fuel injection
25 Connection for indicator of boost pressure in the suction manifold
26 Valve for correcting fuel flow and pneumatic choke
27 Connector for venting the oil tank
28 Oil plug on the injection pump
29 Oil drainage neck on the injection pump
30 Lubrication nipple for the starter
31 Lubrication drainage nipple of the starter
32 Grease box on the lever console
33 Filter cartridge 016 or oil filter CH 48110
34 Oil drainage stud from the aneroid chamber
35 Magneto shorting connector
36 Connector for earthing engine to the aeroplane frame



APPENDIX

1.7.2002

Fig. 12-1 Engine M 332C

Description and operator's manual, supplement for the engine M 332C

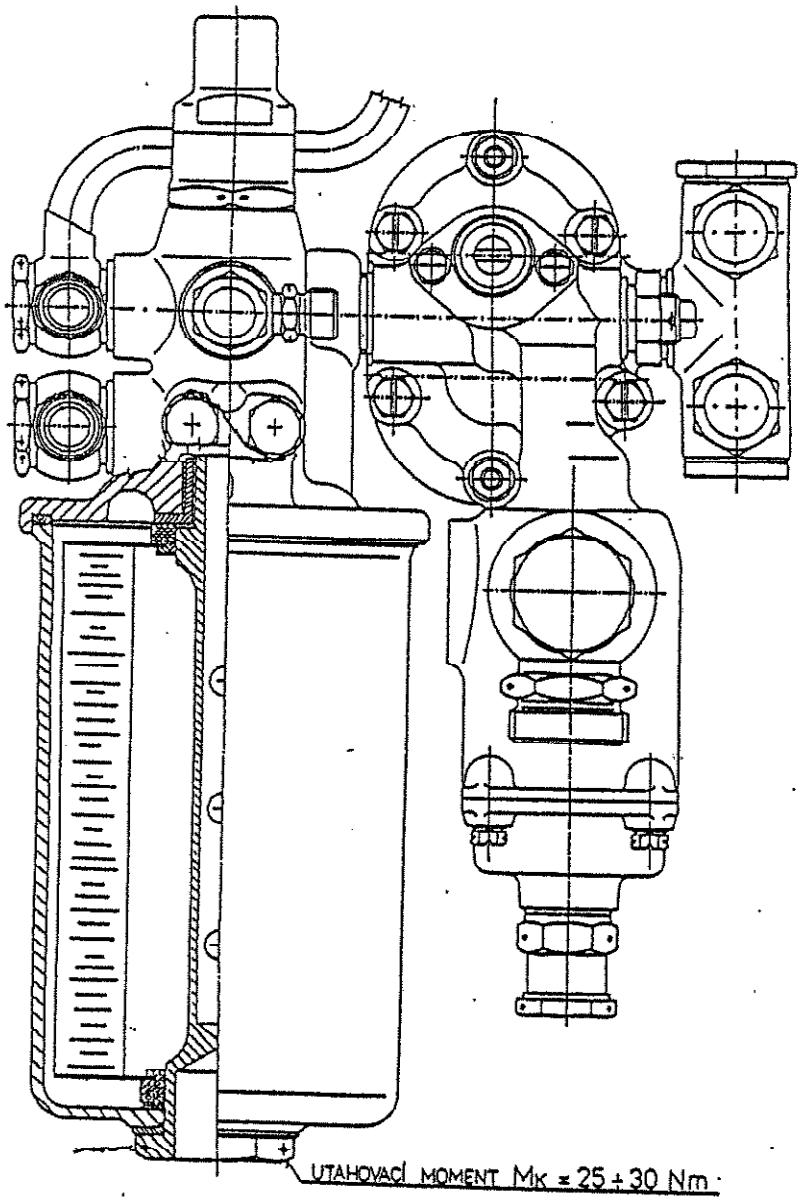
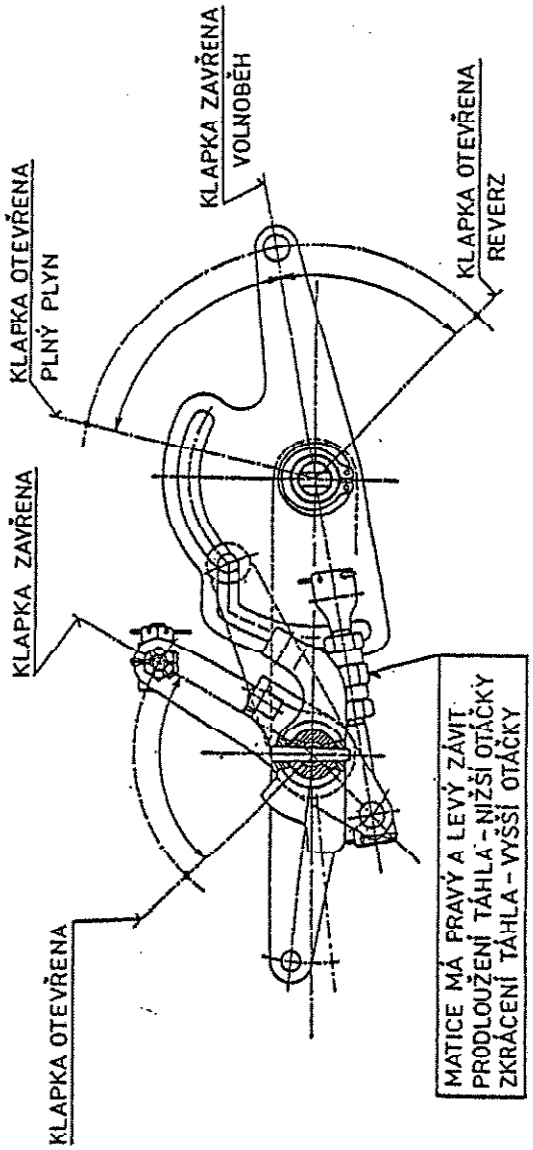


Fig. 12-3 – Oil pump with filter
Utahovací moment = tightening torque



Klapka otevřena = throttle open
Klapka zavřena = throttle closed
Plný plyn = full power
Volnoběh = idling
Reverz = reverse

* Matice má pravý a levy závit = the nut has left hand and right hand threads
Prodloužení táhla = extension of rod
Zkrácení táhla = shortening of rod
Nižší otáčky = lower revolutions
Vyšší otáčky = higher revolutions

Fig. 12-2 Adjustment of idling rpm of the engine with a reversible pitch propeller

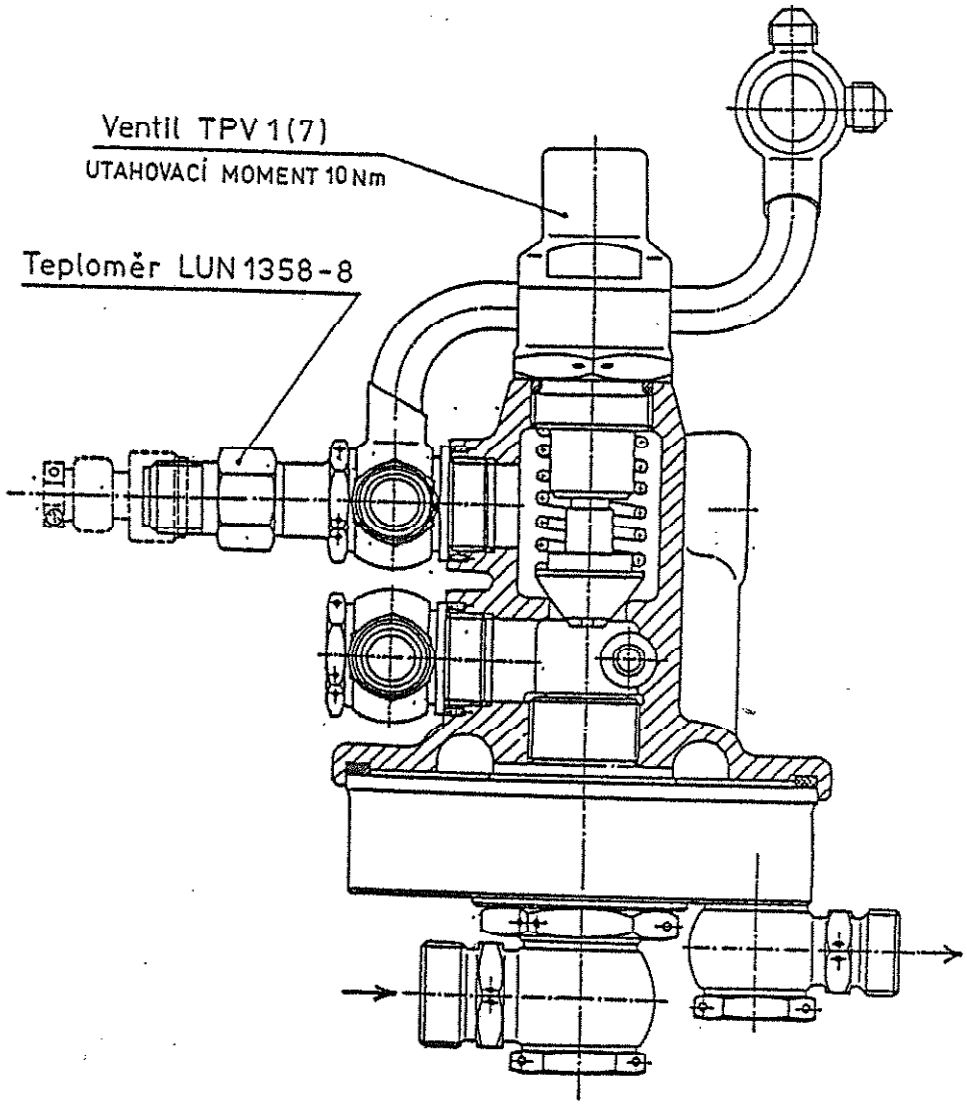


Fig. 12-4a – Oil filter case for filter mounted separately from engine
Ventil = valve
Utahovací moment = tightening torque
Teploměr = thermometer

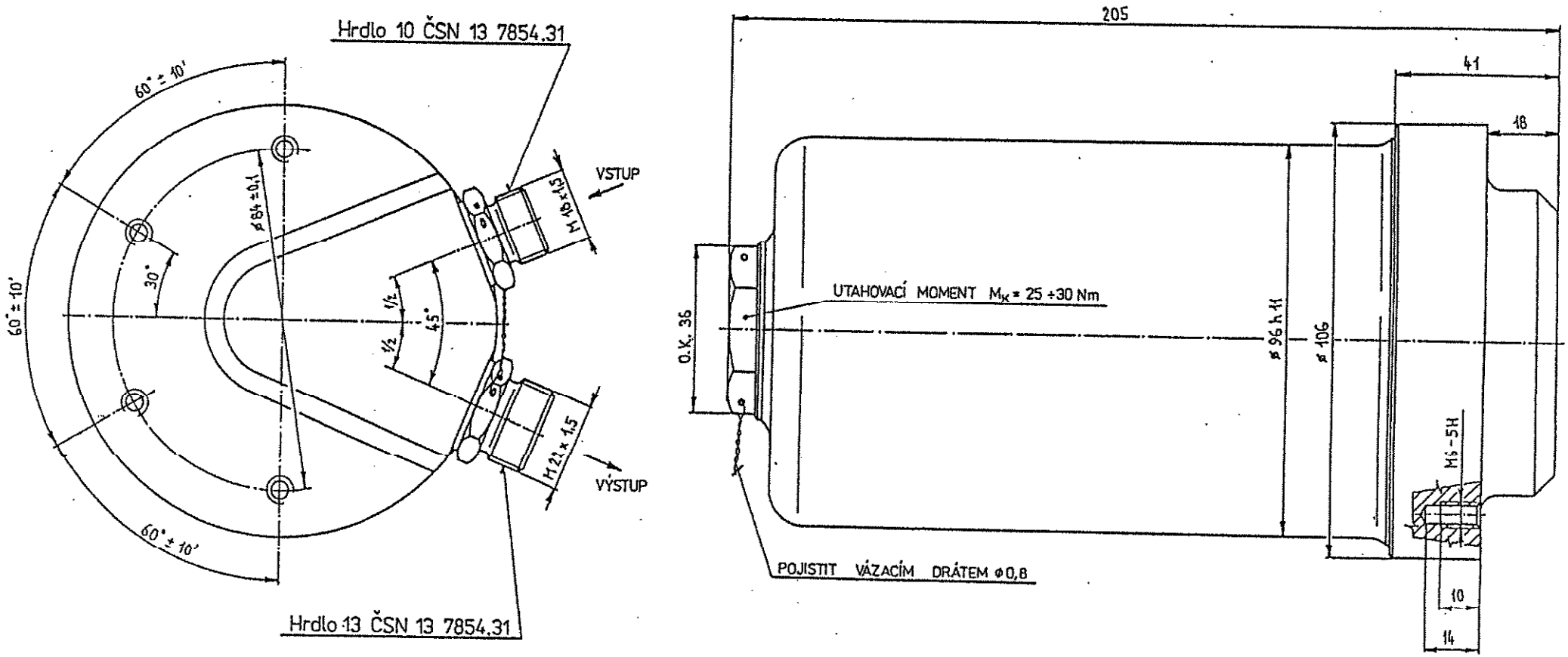


Fig. 12-4b – Oil filter mounted separately from engine
Hrdlo = neck
Pojistit vázacím drátem = secure by wire loop
Utahovací moment = tightening torque