

CHAPTER

77

**ENGINE
INDICATING**

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GENERAL

The engine run operation is checked by following engine instruments: pressure gauge of manifold pressure, oil pressure set, fuel pressure set, oil temperature set, RPM indicator, CHT set, EGT set and carburetor thermometer.

Z 143 L

Quadruple engine indicator indicates the oil pressure and temperature, fuel pressure and carburetor temperature.

Z 143 LSi

Quadruple engine indicator indicates the oil pressure and temperature, fuel pressure and fuel consumption.

MEASUREMENT OF PRESSURE, ENGINE SPEED AND CONSUMPTION

DESCRIPTION AND OPERATION

The manifold pressure gauge, quadruple engine indicator (oil pressure, fuel pressure and fuel consumption (only Z 143 LSi airplane)) and RPM indicator are located in instrument panel.

Wiring diagram of quadruple engine indicator is issued in section 91-80-00.

REPAIRS

Fault	Possible reason	Remedy
The quadruple engine indicator after turning the ENGINE INSTR. switch on does not indicate initial, i.e. actual temperature or zero pressure, data.	Faulty quadruple engine indicator (Fig. 91-13, item M6).	Replace quadruple engine indicator
Incorrect indication of pressure.	Faulty oil pressure sensor (Fig. 91-13, item M17) or fuel pressure sensor (M16).	Remove short circuit, repair or replace faulty parts.
	Cut electric circuit.	Check the circuit by ohmmeter, repair or replace faulty parts. Replace cut conductors.
	Cut KRAFTST. DR. 1A or ÖLDRUCK 1A fuse (airplane registered in FRG)	Detect reason and replace fuse.
The quadruple engine indicator does not indicate after turning the ENGINE INSTR. switch on.	Short circuit (Fig. 91-13, item M6).	Remove short circuit and repair or replace faulty parts.
	Cut ENGINE INSTR. 2A (up to S/N 0045 incl.).	Detect reason and replace fuse.
	ENGINE INSTR. circuit breaker is OFF (from S/N 0046 incl.).	Detect reason and circuit breaker ON.
	Open electric circuit.	Check the circuit by ohmmeter, repair or replace faulty parts. Replace cut conductors.
Pointer of RPM Indicator swings at constant RPM.	Improperly greased flexible shaft of RPM indicator.	Uncouple the flexible shaft from the RPM Indicator and grease it with several drops of engine oil.
	Faulty RPM Indicator.	Replace RPM Indicator.

EFFECTIVITY: All

MAINTENANCE**APPROVED REPAIRS****REPAIRS OF INSTALLATION MEANS OF PRESSURE GAUGES AND RPM INDICATORS**

Fault	Remedy
1) Faulty or expired rubber hoses of manifold pressure gauge and fuel and oil pressure sensors (Fig. 77-1; 77-2; 77-3 and section 05-10-00.	Replace faulty or expired hoses.
2) Corrosive or faulty flexible shaft of RPM indicator.	Replace faulty flexible shaft.

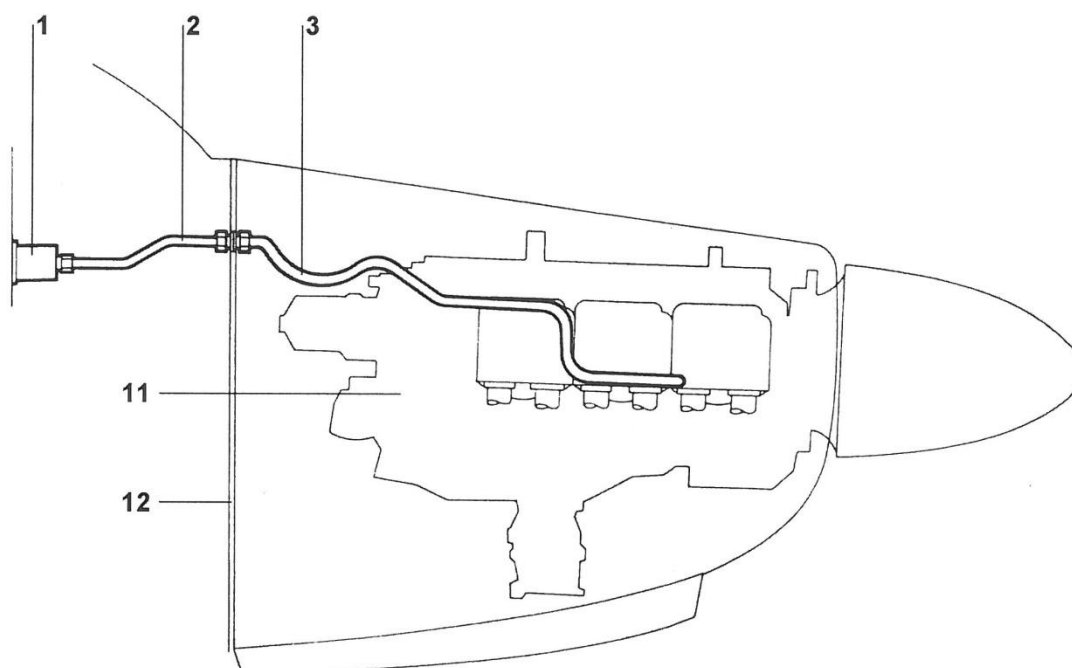
ENGINE MANIFOLD PRESSURE GAUGE

DESCRIPTION AND OPERATION

The underpressure in engine induction channel is picked up from the channel of first right cylinder. The manifold pressure gauge (Fig. 77-1, item 1) is connected with the spot of measurement upon the engine (11) by hoses (2, 3).

NOTE

The hose (3) is coupled to have the end piece with Ø 0,8 mm (0,03 in) orifice and screw at the engine. The arrow upon the hose end piece shows from the engine to firewall.



- 1 ... manifold pressure gauge
- 2 ... hose (Js 4)
- 3 ... hose (Js 4)

For information only:

- 11 ... engine
- 12 ... firewall

Fig. 77-1 Set of manifold pressure gauge

OIL PRESSURE MEASUREMENT

DESCRIPTION AND OPERATION

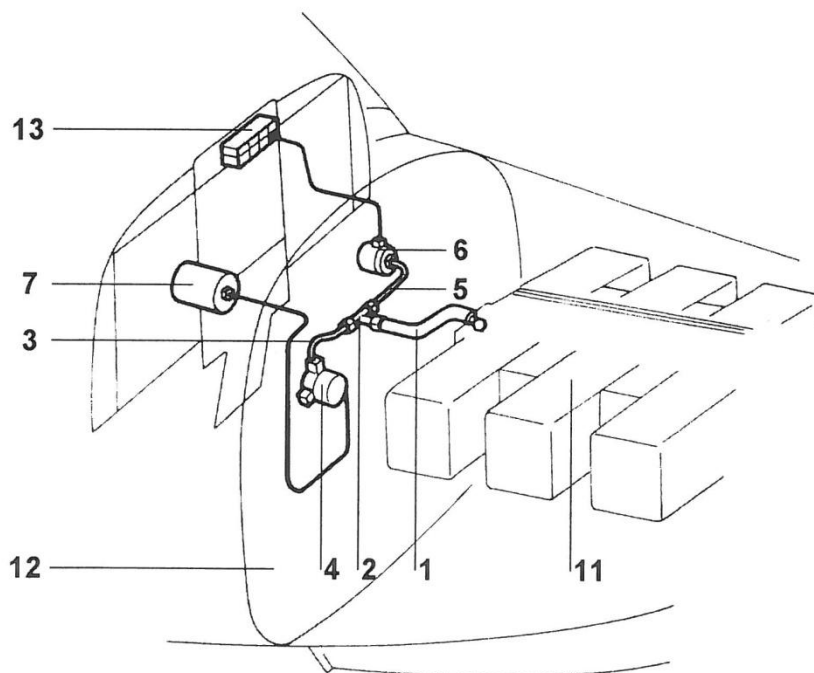
The oil pressure is picked up from the port upon the rear engine wall (Fig. 77-2, item 11) above the right magneto. The oil pressure is led by means of hose (1) to T-piece (2) distributing the oil pressure through pipe (3) to oil pressure sensor (4) and through pipe (5) to oil pressure switch (6).

NOTE

The hose (1) is coupled with the end piece with Ø 2 mm (0,08 in) nozzle to the engine and the arrow upon the sheet placard of rubber hose shows from the engine to firewall.

The pressure sensor (4), which is upon the firewall converts oil pressure to proportional electric signal. The electric signal produced by oil pressure sensor is led by conductors to quadruple engine indicator (7).

The pressure switch (6), which is upon the firewall is connected to light annunciation panel (13). The switch in case of oil pressure drop below 170 kPa (25 p.s.i.) switches the red **OIL PRESS. LOSS** light annunciator.



- 1 ... hose (Js 4)
- 2 ... T - piece
- 3 ... pipe
- 4 ... oil pressure sensor
- 5 ... pipe
- 6 ... pressure switch
- 7 ... quadruple engine indicator

- For information only:
- 11 ... engine
 - 12 ... firewall
 - 13 ... light annunciator panel

Fig. 77-2 Oil pressure measurement

REPAIRS

Fault	Possible reason	Remedy
The red warning OIL PRESS. LOSS annunciator is lit in light annunciation panel white oil pressure indicates standard pressure	Short circuit in oil pressure switch circuit (Fig. 91-15, item M11)	Remove reason short circuit, repair or replace faulty parts.
	Faulty oil pressure switch	Replace faulty pressure switch.

EFFECTIVITY: All

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FUEL PRESSURE MEASUREMENT, CONSUMPTION

DESCRIPTION AND OPERATION

Z 143 L

The fuel pressure picked up from the carburetor body (Fig. 77-3, item 11) is led by hose (1) to fuel pressure sensor (2).

NOTE

The hose (1) is coupled to carburetor with the end piece containing screw with $\varnothing 0,8$ mm (0,03 in) nozzle and arrow upon the rubber hose sheet placard indicates from carburetor to firewall.

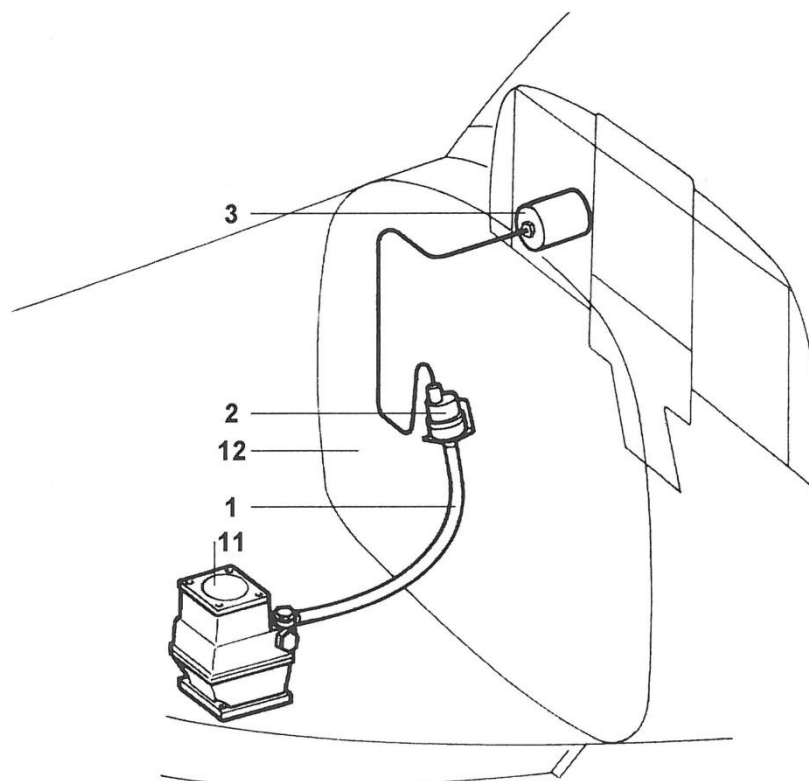
The fuel pressure sensor, that is upon the firewall, converts fuel pressure to proportional electric signal. The pressure sensor is connected electrically with quadruple engine indicator (3).

Z 143 LSi

Fuel pressure picked up from the injector (Fig. 77-3A, item 11) is carried by hose (1) and piping (6) to the fuel pressure transmitter. Fuel pressure picked from the fuel distributor is carried by piping (7) and hose (4) to the transmitter of fuel consumption indicator pressure (5).

NOTE

The fuel pressure sensor and fuel consumption sensor, located is upon the firewall, converts fuel pressure to proportional electric signal. The sensors are connected electrically with quadruple engine indicator (3).

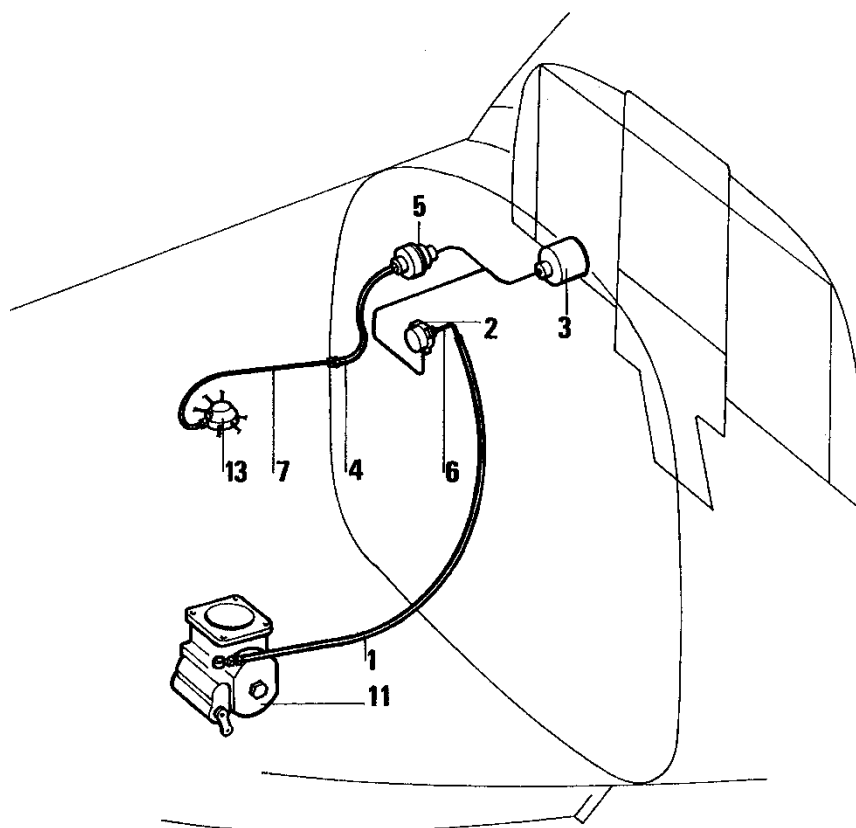


- 1 ... hose (Js 4)
- 2 ... fuel pressure sensor
- 3 ... quadruple engine indicator

For information only:

- 11 ... carburetor
- 12 ... firewall

Fig. 77-3 Fuel pressure measurement of Z 143 L



- | | |
|----------------------------------|--|
| 1 ... hose AEROQUIP | 5 ... fuel consumption pressure sensor |
| 2 ... fuel pressure sensor | 6 ... piping |
| 3 ... quadruple engine indicator | 7 ... piping |
| 4 ... hose AEROQUIP | |

For information only:

- 11 ... injector
- 12 ... firewall
- 13 ... fuel distribution

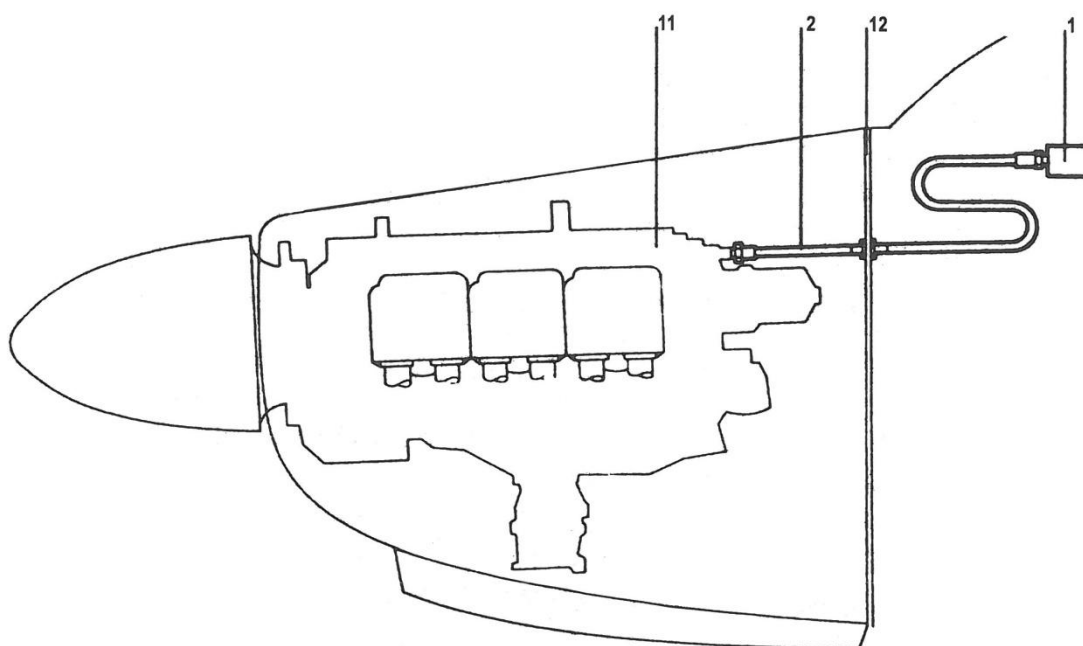
Fig. 77-3A Fuel pressure measurement of Z 143 LSi

EFFECTIVITY: Z 143 LSi

ENGINE SPEED MEASUREMENT

DESCRIPTION AND OPERATION

RPM. indicator (Fig. 77-4, item 1) is the mechanical instrument driven by flexible shaft (2) coupled to the engine drive pad upon rear engine wall (11).



- 1 ... RPM indicator
- 2 ... flexible shaft

For information only:

- 11 ... engine
- 12 ... firewall

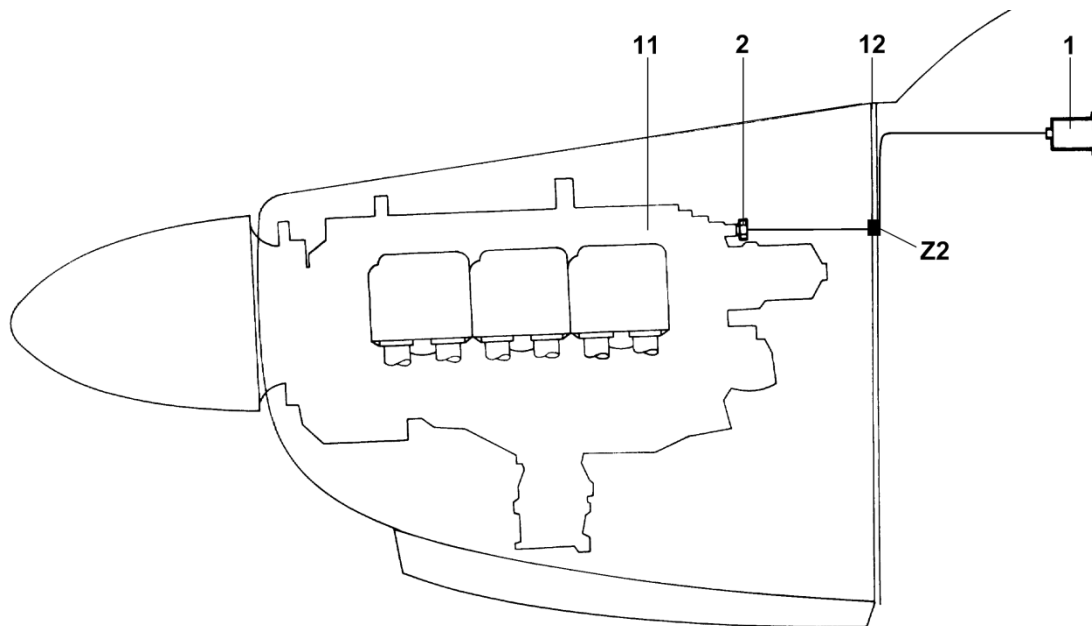
Fig 77-4 Mechanical drive of RPM indicator

RPM INDICATOR

DESCRIPTION AND OPERATION

The RPM indicator (Fig. 77-4A, item 1) displays engine speed with help of speed transmitter (Fig. 77-4A, item 2) by analogue pointer on the scale and digitally on the display. It registers and displays number of operation hours.

The speed transmitter (rear engine wall) is electrically connected to RPM indicator.



- 1 ... RPM indicator
- 2 ... speed transmitter

For information only:

- 11 ... engine
- 12 ... firewall
- Z2 ... connector

Fig. 77-4A Engine speed measurement

TEMPERATURE MEASUREMENT

DESCRIPTION AND OPERATION

Z 143 L

The quadruple engine indicator containing oil and carburetor temperature indicators, CHT indicator and EGT indicator are in the instrument panel. The wiring diagram of quadruple engine indicator is issued in section 91-80-00; wiring diagrams of CHT and EGT indicators is issued in subsection 91-82-00.

Z 143 LSi

The quadruple engine indicator containing oil and temperature indicators, CHT indicator and EGT indicator are in the instrument panel. The wiring diagram of quadruple engine indicator is issued in section 91-80-00; wiring diagrams of CHT and EGT indicators is issued in subsection 91-82-00.

REPAIRS

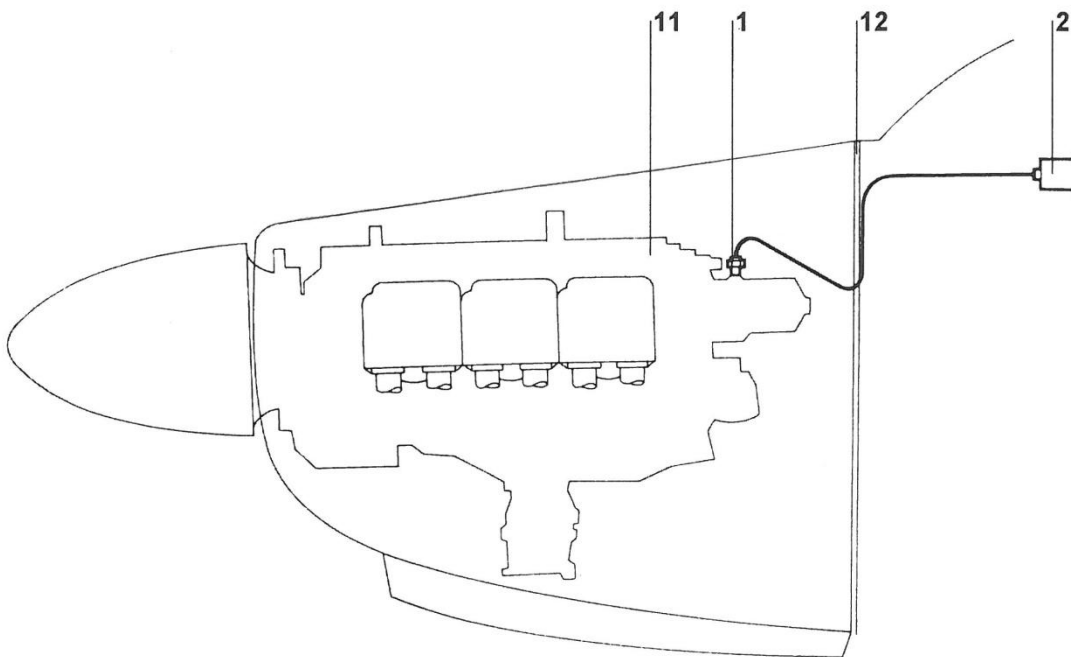
Fault	Possible reason	Remedy
The quadruple engine indicator does not indicate initial data, i.e. zero pressure and actual temperature, after turning the ENGINE INSTR. switch on.	Faulty quadruple engine indicator (Fig. 91-13, item M6)	Replace quadruple engine indicator.
Incorrect indicator of measured temperature.	Faulty oil temperature probe (Fig. 91-13, item M5)	Remove short circuit, repair or replace faulty parts.
	Interrupt electric circuit.	Check the circuit by ohmmeter and repair or replace faulty parts. Replace cut conductors.
	Cut VERG. TEMP. 1A or ÖLTEMP 1A fuse (aircraft registered in FRG).	Detect reason of short circuit and replace fuse.
CHT indicator indicates low temperature at standard lube oil and EGT temperatures.	Faulty CHT/EGT indicator set (Fig. 91-15, item M1) or CHT probe (M2) and/or compensation leads.	Remove the set from the airplane and check it in laboratory. Replace faulty parts or complete set.
EGT indicator indicates low temperature at standard lube oil and CHT temperature.	Faulty CHT/EGT indicator set (Fig. 91-15, item M1) or EGT probe (M4) and/or compensation leads.	Remove the set from the airplane and check it in laboratory. Replace faulty parts or complete set.

EFFECTIVITY: All

OIL THERMOMETER

DESCRIPTION AND OPERATION

The oil temperature is measure by temperature probe (Fig. 77-5, item 1) that is in oil filter adapter. The oil temperature probe is electrically connected to quadruple engine indicator (2).



- 1 ... oil temperature probe
- 2 ... quadruple engine indicator

For information only:

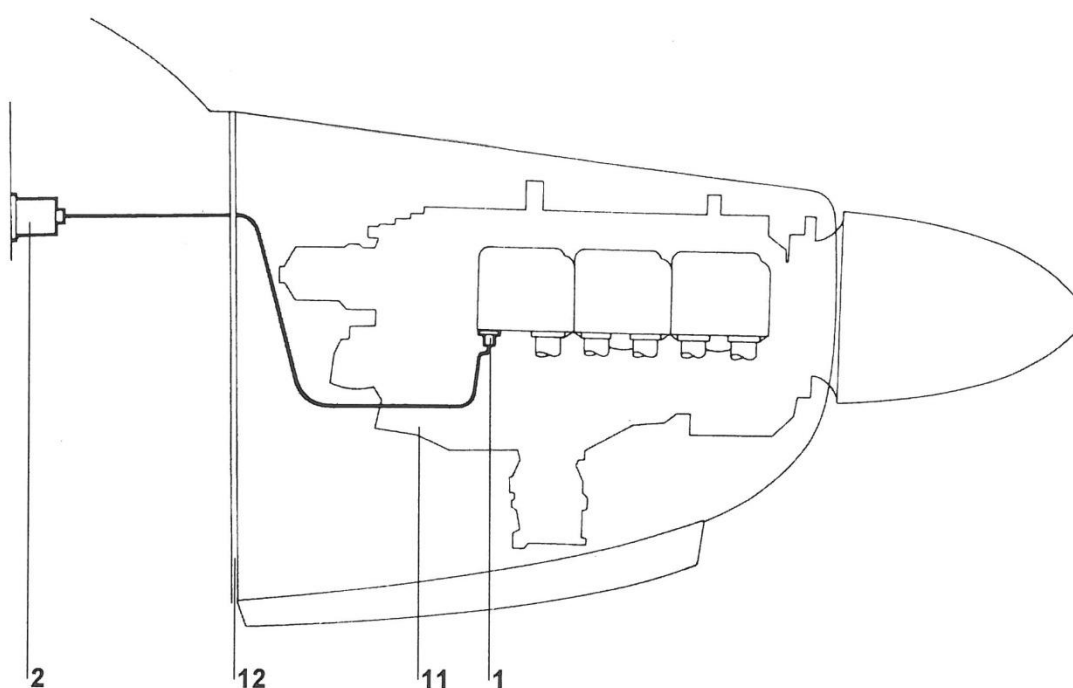
- 11 ... engine
- 12 ... firewall

Fig. 77-5 Oil temperature measurement

CYLINDER HEAD THERMOMETER

DESCRIPTION AND OPERATION

The cylinder head temperature is measured by CHT probe (Fig 77-6, item 1) that is in the head of right rear cylinder. The CHT probe is connected to CHT/EGT indicator (2) via compensation leads.



- 1 ... CHT probe
- 2 ... CHT/EGT indicator

For information only:

- 11 ... engine
- 12 ... firewall

Fig. 77-6 CHT measurement

EFFECTIVITY: All

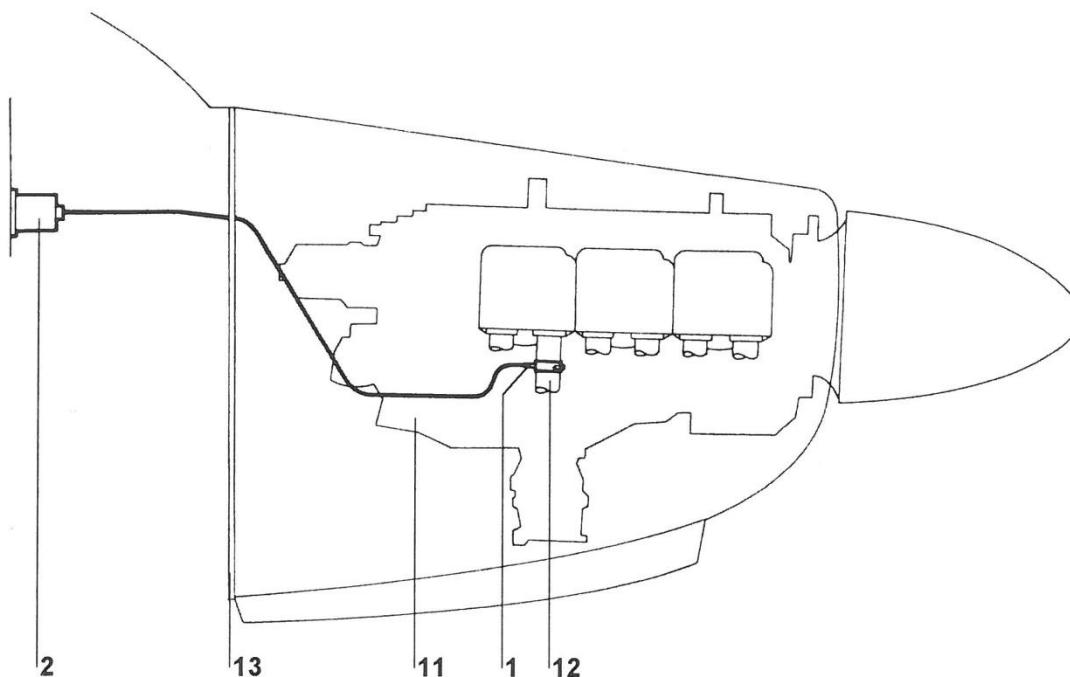
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EXHAUST GAS THERMOMETER

DESCRIPTION AND OPERATION

The exhaust gas temperature is measured by EGT probe (Fig. 77-7, item 1) located in exhaust (12) of right aft engine cylinder. The EGT probe is connected to CHT/EGT indicator (2) via compensation leads.



- 1 ... EGT probe
- 2 ... CHT/EGT indicator

For information only:

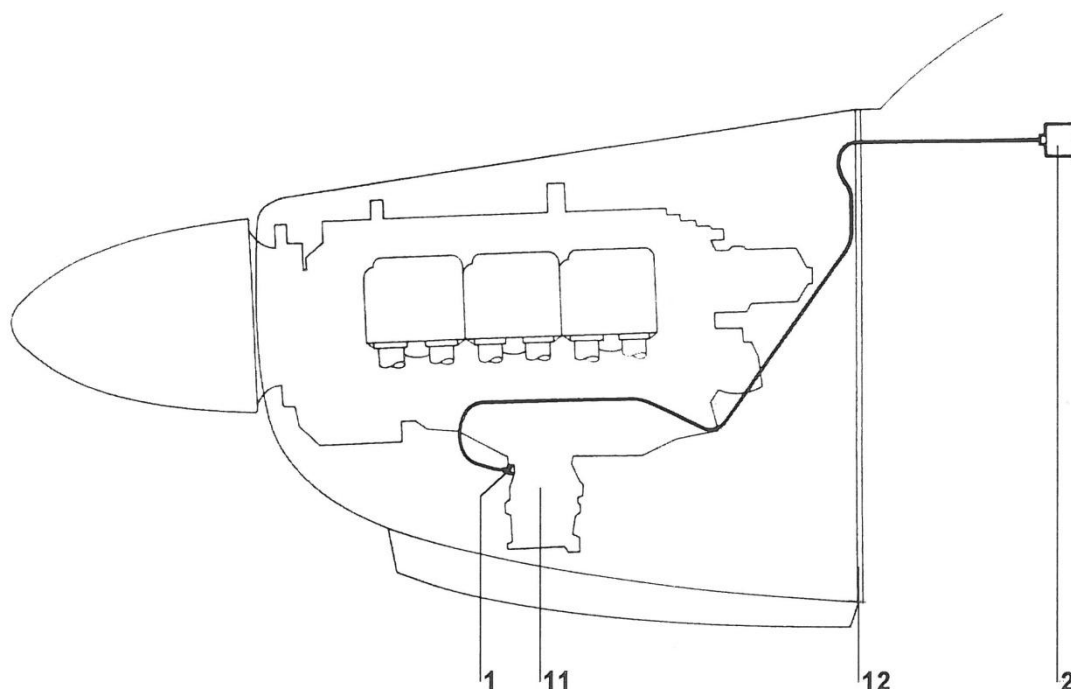
- 11 ... engine
- 12 ... engine exhaust
- 13 ... firewall

Fig. 77-7 EGT measurement

CARBURETOR THERMOMETER

DESCRIPTION AND OPERATION

The carburetor temperature is measurement by carburetor temperature probe (Fig. 77-8, item 1), that is located in carburetor diffuser. The carburetor temperature probe is electrically connected to quadruple engine indicator (2).



- 1 ... carburetor temperature probe
- 2 ... quadruple engine indicator

For information only:

- 11 ... carburetor
- 12 ... firewall

Fig. 77-8 Measurement of carburetor temperature

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