Subsequent installation or retrofit of an oil-pump for separate oil lubrication of engine 503-UL-DCDI

1) General:

As of engine serial no. **4,103.549** a subsequent installation of an oil pump is possible. In the crankshaft, magneto side, there is a square profile serving as drive for the oil pump.

2) As a principle:

The installation must be effected only by qualified, professionally instructed and authorized personnel. Careful fitting and observation of all points of these installation instructions warrant operation without problems.

■ ATTENTION: **All parts** that could loosen during engine operation must be secured against loss. Especially important at thrust-propeller configuration!

3) Variants of configuration:

3.1) Engine with rewind starter and 1 carburetor (assembly as per 5.1 and 5.2).

Modification kit, Rotax part no. **887 111**, consisting of:

1x intake cover with diffuser tube

1x oil pump assy.

2x oil pipe (transparent)

1x rewind starter assy.

1x rubber ring (intake cover)

3.2) Engine with rewind starter and 2 carburetors (assembly as per 5.1 and 5.3).

Modification kit, Rotax part no. **887 110**, consisting of:

2x intake socket with diffuser tube

1x oil pump assy.

2x oil pipe (transparent)

1x rewind starter assy.

2x gasket (intake socket)

3.3) Engine with electric-starter or ignition cover and 1 carburetor (assembly as per 5.2 and 5.4).

Modification kit, Rotax part no.: **887 113**, consisting of:

1x intake cover with diffuser tube

1x oil pump assy.

2x oil pipe (transparent)

1x rubber ring (intake cover)

1x shim 4,3

1x oil pump gear

4x TAPTITE-screw M5x16

4x friction washer 5,3

3.4) Engine with electric-starter or ignition cover and 2 carburetors: (assembly as per 5.3 and 5.4).

Modification kit, Rotax part no. **887 112**, consisting of:

2x intake socket with diffuser tube

1x oil pump assy.

2x oil pipe (transparent)

2x gasket (intake socket)

1x shim 4,3

1x oil pump gear

4x TAPTITE-screw M5x16

4x friction washer 5,3

4) Configuration of supply:

For functional and security technical reasons the intake cover respectively intake socket is completed in the factory with the oil pump, thus warranting tightness.

5) Sequence of assembly:

5.1) Exchange of complete rewind starter:

After loosening of 4 Allen screws M6x16 ❶ and lock washers A6 ❷ remove the complete rewind starter ❸.
Grease oil pump gear and square profile of the crankshaft ❼ with BP-ENERGREASE LS-3.
Mount new complete rewind starter ❹ with oil pump ❺ fitted and fix it with 4 Allen screws M6x16 ❶ and lock washers A6 ❷ (tightening torque 10 Nm = 90 in.lb.).

◆ NOTE: When fitting the rewind starter take care that the square profile of the oil pump gear slides easly into the internal square profile of the crankshaft ❼.


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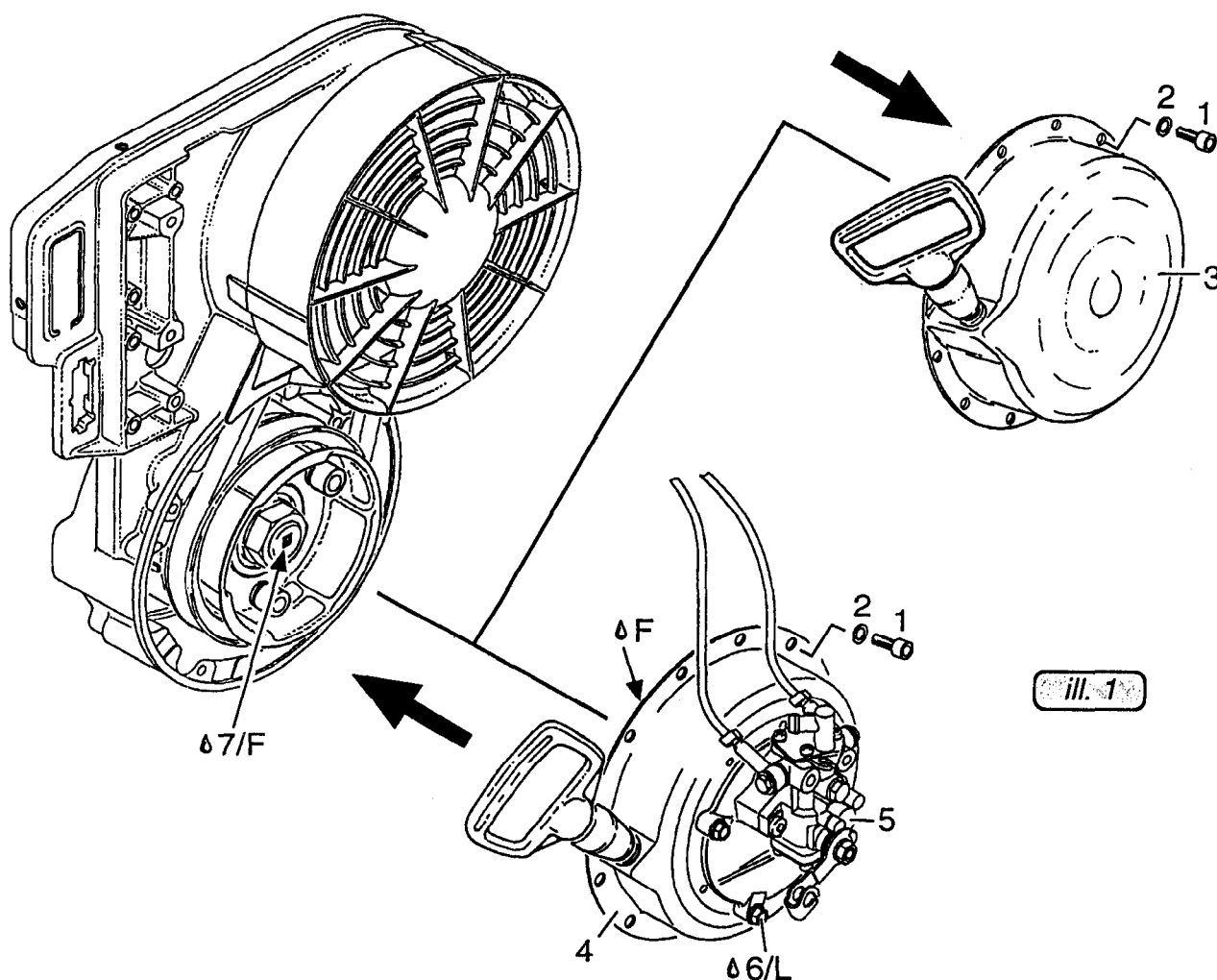
■ ATTENTION: If the rewind starter has to be fitted in a different position, the oil pump must be refitted to be if possible in a vertical position. Secure TAPTITE screws ❻ with LOCTITE 221 (L) and tighten with torque 5 Nm (45 in.lb).

5.2) Exchange of intake cover with 1 carburetor:

Loosen hose clamp ⑪ on intake socket and remove carburetor ⑫ with air filter.
Remove the hex. screws M8x65 ⑬ and the hex. screws M6x30 ⑭ and lock washers from intake cover.
Remove old intake cover ⑰ with gasket ⑱ and fit new pre-assembled intake cover ⑲ with diffuser tubes and new gasket ⑳.
Tighten hex. screws M8x65 ⑬ and lock washers ⑮ with 22 Nm (195 in.lb.) and hex. screws M6x30 ⑭ and lock washers ⑯ with torque 10 Nm (90 in.lb.). Fit carburetor ⑫ with air filter and fix with hose clamp ⑪.
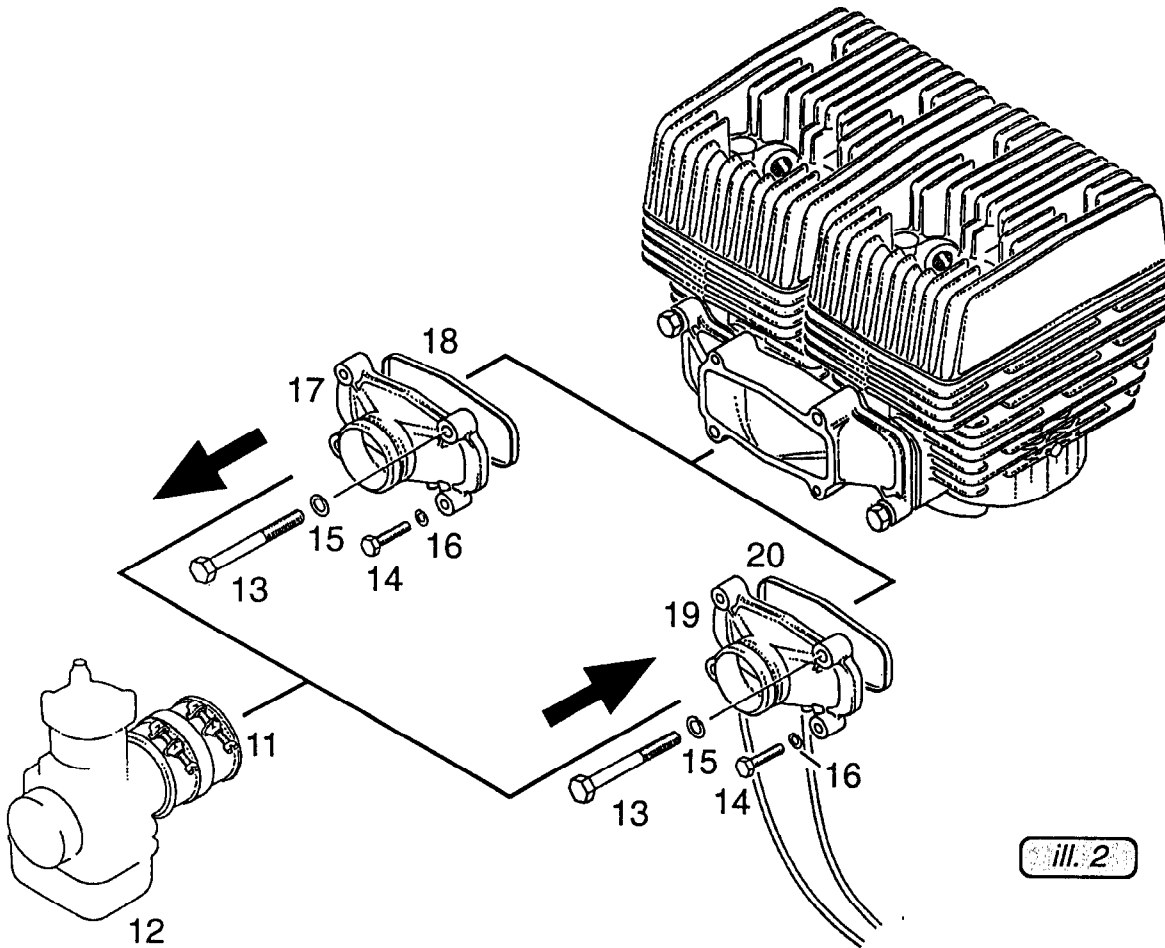

ill. 2

5.3) Exchange of the 2 intake sockets of 2 carburetor version

Slacken hose clamps ㉑ of the intake sockets and remove carburetor ㉒ with air filter.
Remove Allen screws M8x40 ㉓ with lock washers ㉔ from the two intake sockets ㉕.
Remove old intake sockets ㉕ with gaskets ㉖ and fit pre-assembled intake sockets ㉗
with diffuser tube and new gaskets ㉘.
Tighten Allen screws M8x40 ㉓ with lock washers A8 ㉔ with torque 22 Nm (195 in.lb.).
Fit the two carburetors ㉒ and fix them with hose clamps ㉑.
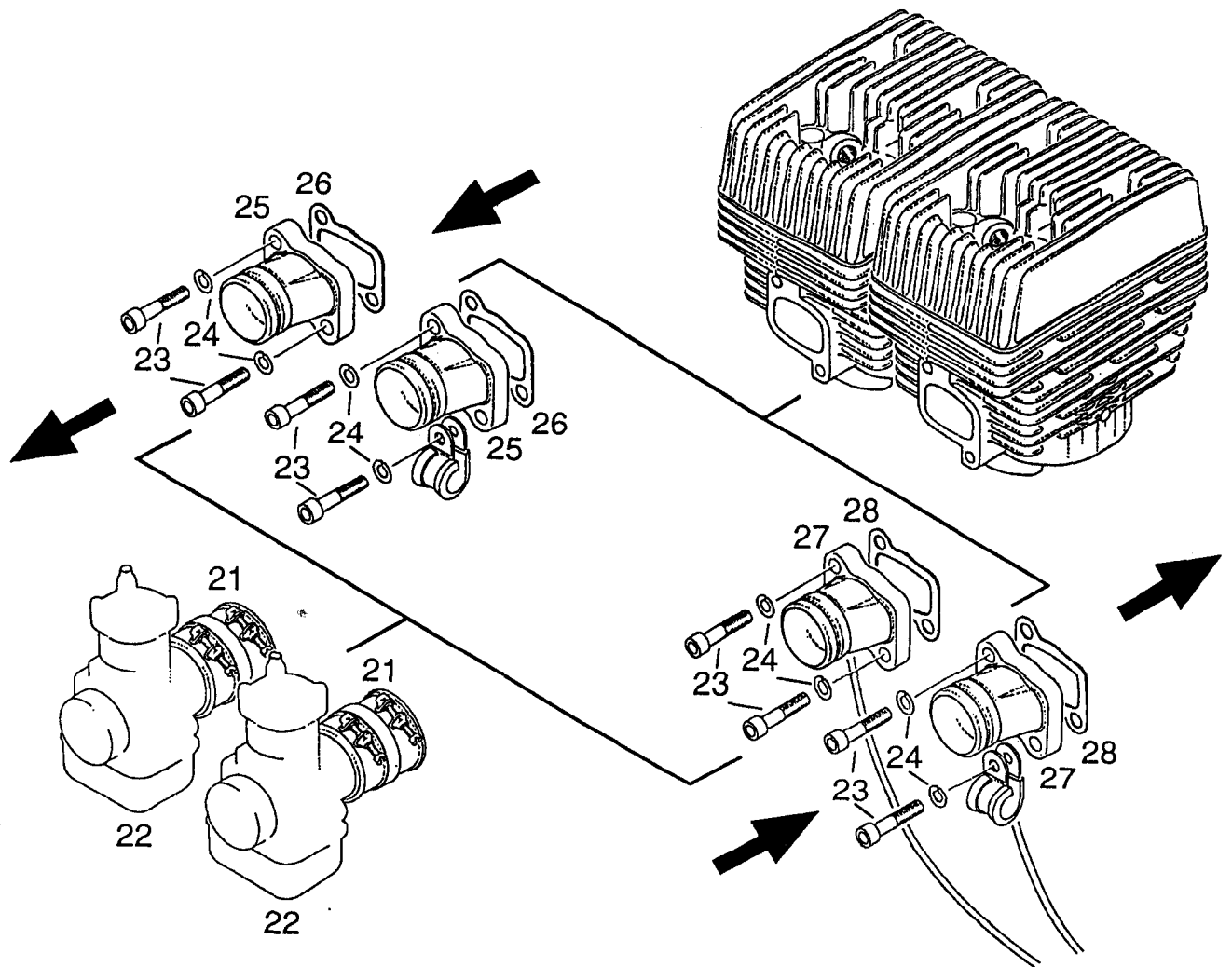
ill.3

5.4) Fitting of pre-assembled oil pump on ignition cover or electric starter cover

Grease oil pump gear ③ on both sides and the square profile of the crankshaft ③ with BP-ENERGREASE LS-3 (F).
Insert the oil pump gear ③ carefully into the internal square profile of the crankshaft.
Fit shim ③ on the pin at the inside of the oil pump.
Fit complete oil pump ③ carefully and fix it with 4 TAPTITE-screws M5x16 ③ and friction washer ③. Secure TAPTITE-screws ③ with LOCTITE 221 (L) and tighten with torque 5 Nm (45 in.lb.).

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◊F
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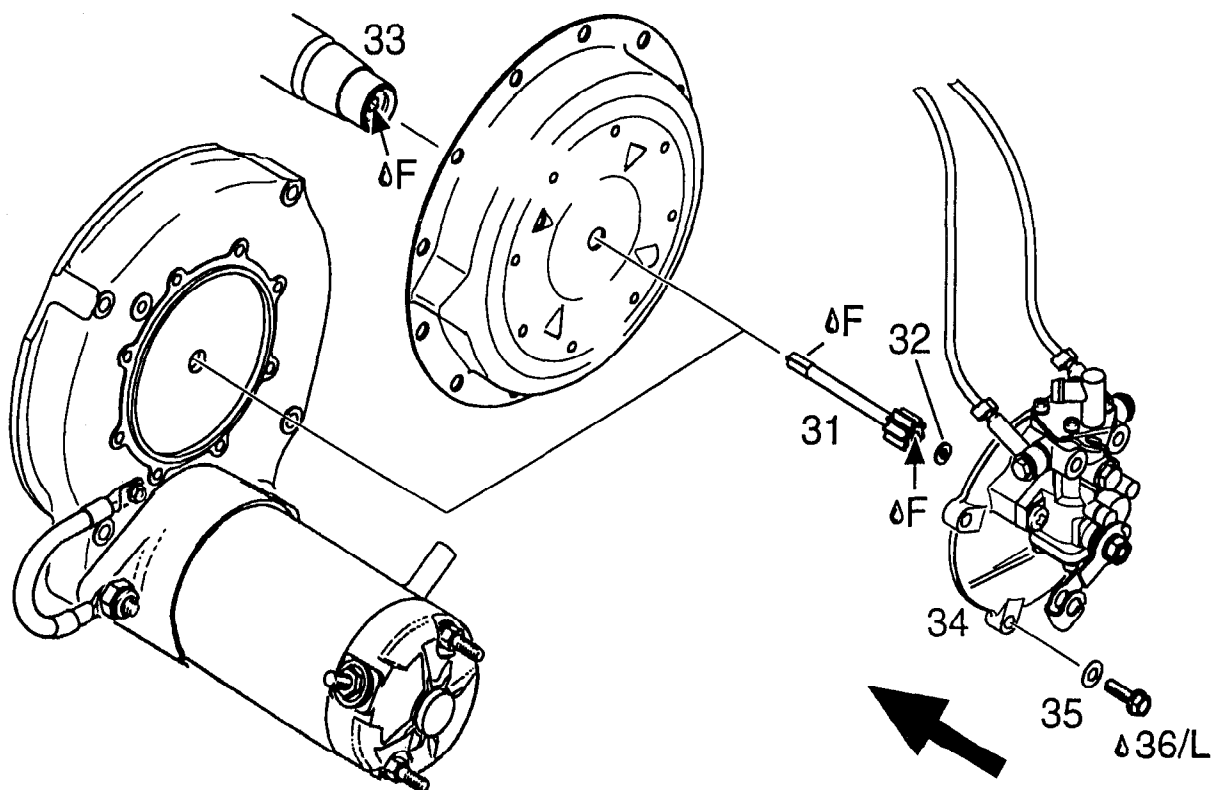
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6) General advice:

The oil pump ③ driven by the crankshaft ③ via the pump gear ③ feeds the engine with fresh oil. The oil pump is a piston type pump with metering system. Via diffuser jets in the intake cover respectively intake socket each cylinder is supplied with exactly proportioned quantity of Super two-stroke oil. The oil quantity is defined by the engine r.p.m and the oil pump lever position. This lever is actuated via a Bowden cable connected to the throttle cable. The oil comes to the pump from an oil tank by gravity.

▲ WARNING: In case of fresh oil lubrication the carburetors are fed with pure fuel (no oil/fuel mixture).

6.1) Technical data and configuration:

Oil supply quantity: max. 192 cm³/h per exit at 1500 1/min pump speed.

Oil: Super two-stroke oil.

■ ATTENTION: The pour point of the oil must be 10°C (50°F) below lowest ambient temperature to be expected.

The oil pump assy. has one oil return nipple and two oil exit nipples with integrated check valve.

6.2) Installation:

The size of the oil tank ❹ should be bigger than 5 % of the fuel tank capacity. Use an oil tank with bottom outlet which must not be installed lower than the level of the pump inlet. It should be mounted as far as possible free of vibrations.

41 oil tank
42 oil filter
43 suction tube
44 oil pump
45 pressure tube
46 check valve

ill. 5
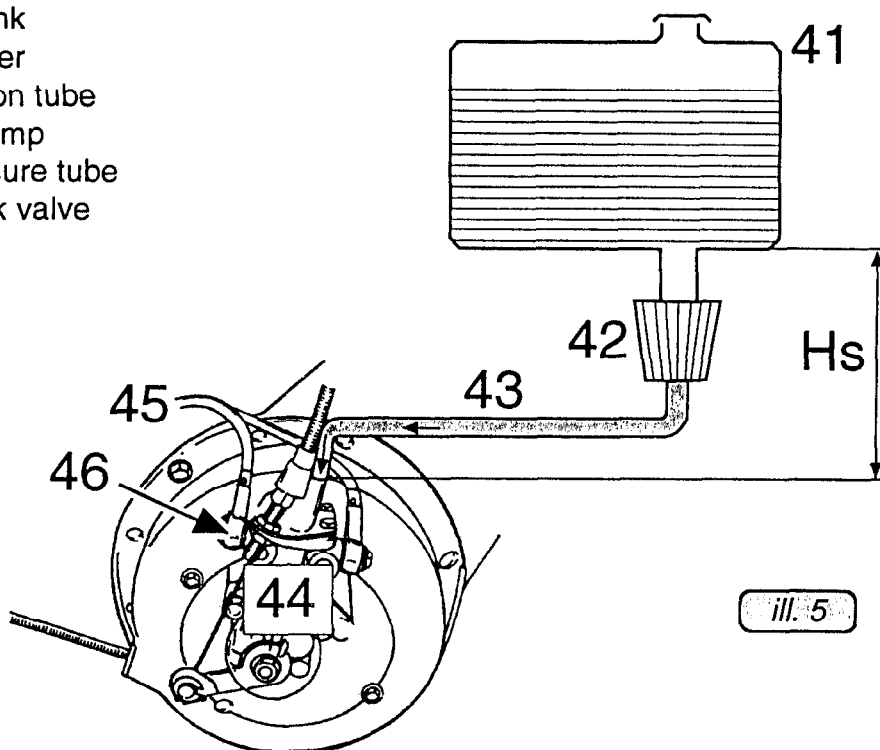
◆ NOTE: The dimension „**Hs**" must be positive (also at descent or climb).

Use only stiff, oil resistant suction tubes ❸ with hose clamps that don't allow kinking of the tubes. A suitable oil filter ❷ (e.g. ROTAX part-no. 956 330) between oil tank and oil pump ❹ is necessary.
A simultaneous Bowden cable actuation for oil pump and the two carburetors is possible via a throttle cable distributor.

6.3) Adjustment:

Set throttle lever to idle position. Fit Bowden cable and pretension the cable ⑫ by slightly pushing back of the pump lever ㊾. With the adjusting nut ㊿ position the pump lever until the mark on the pump lever ⑮ aligns with the mark on the pump housing ⑭ (see illustration).

■ ATTENTION: Throttle piston and oil pump lever must be actuated synchronously.

◆ NOTE: The point-mark on the pump lever serves for calibration by the pump manufacturer.

▲ WARNING: In order to warrant lubrication also in case of torn or disengaged Bowden cable, a clearance of 360° for the pump lever ㊾ is necessary! The pump lever ㊾ turns automatically to maximum supply.

In such a case, due to possible excessive oil feed, check the spark plugs.
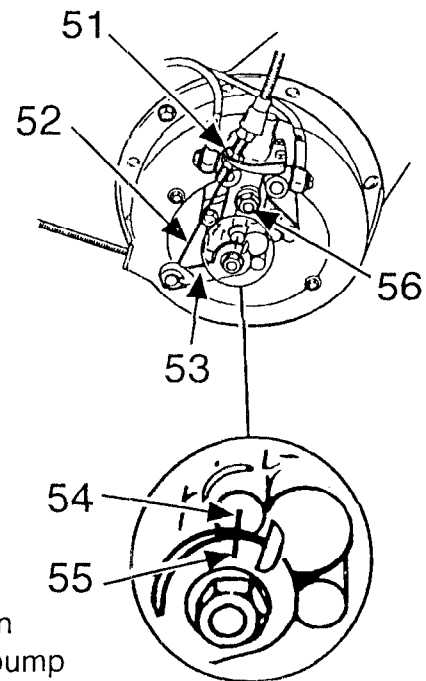
ill. 6

At initial filling of the oil system the suction tube must be carefully vented before starting the engine, by opening of the vent screw ⑯. The oil feed tube must be completely free of air (check the transparent oil tubes for air bubbles). Then close the vent screw carefully (tightening torque 4 - 6 Nm = 35-53 in.lb.)
At first filling of the oil system it is recommended not to use pure fuel but a fuel oil mixture 1:100 to assure lubrication of the engine. Nevertheless the system has to be carefully vented as the oil pump does not vent itself.

6.4) Maintenance:

Check oil level before every flight and refill if necessary. Check oil lines, nipples, connections, oil filter and oil pump lever position at every pre-flight check for tightness and perfect function.

Check to assure that the oil consumption is between 1:80 and 1:50 of the fuel consumption.

■ ATTENTION: The fresh oil lubrication does not lubricate the propeller gearbox.

■ ATTENTION: A wrongly adjusted or wrongly serviced oil pump can cause serious engine damage. When working on the engine running, the craft must be tied down.