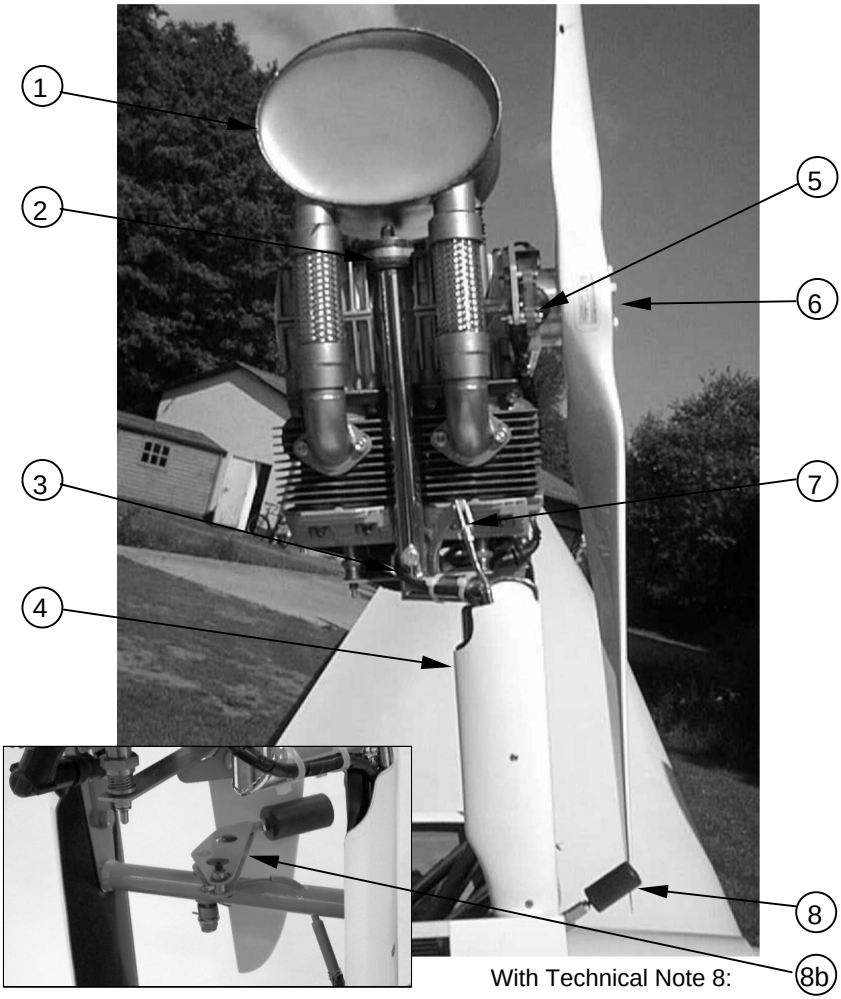
2.13 Power-plant

2.13.1 Description of Components

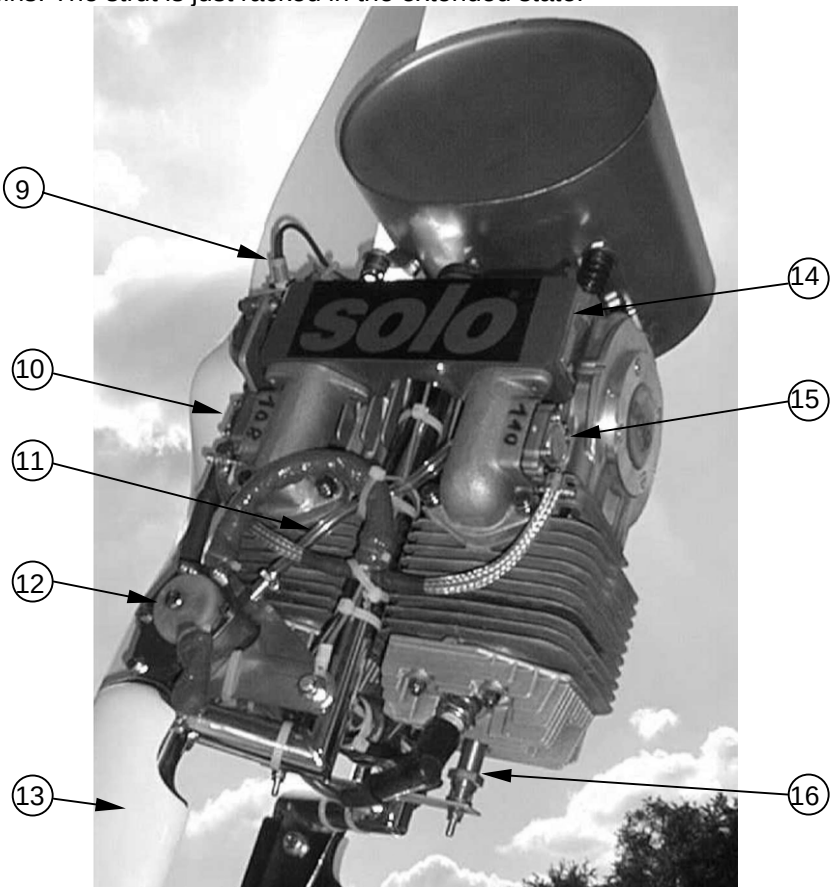
Power-plant Configuration

The propeller is bolted with five screws M8x1 (6) to the crankshaft of the engine (Solo 2350) and secured with lock wire. The engine is mounted on three rubber bearings (2, 3) at the engine mount carrier.



With Technical Note 8:

The pneumatic fuel pump (12) and the lever (7) for actuating the decompression valves are mounted on this likewise. The engine mount carrier is supported on two CRP-swords. An electric spindle (25) moves the whole unit out of the engine bay. Nearby a gas spring (27) takes most of the weight. A limit switch (26) confirms the extended state of the power-plant. In the extended state, a toggle strut (30) holds up the engine installation and supports itself on the cross tube between the lift pins. The strut is just racked in the extended state.



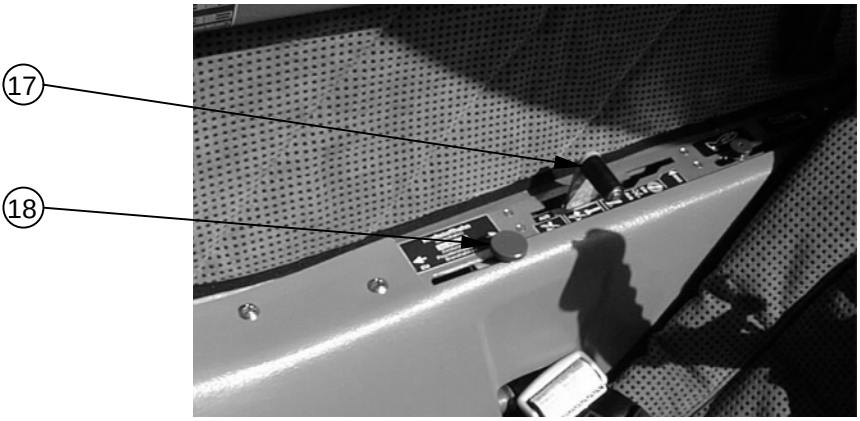
The bowden cable (4) for the decompression valves (16) and the pilotages for ignition and rev measurement lay under the right-hand FRP-fairings. The fuel pipe is hidden under the left-hand FRP-fairing (13). During extension of the engine, the FRP-fairings push the bay doors open, first via two spring loaded clamps (31), than through a separator (28). Rubber chords pull the flaps close again.

The propeller stopper (8) is also operated through a bowden cable. There are three variants: two variants are mounted at the base of the right CRP-sword. One pivots away sideways, the other backwards. The latter has to have a conical shape. The third variant (8b) is mounted atop the CRP swords. For propellers with a diameter of less than 1.2m, propeller stopper (8b) is necessary.

The limit switch (29) for the retracted state and the refuelling connector (24) with cover is located in the front part of the engine bay.

Engine Operating Element in Cockpit

The main switch (21) for the engine electric, the power-plant instrument (22) and a mirror (19) is located in the instrument panel. Left-hand next to the seat pan is the control console with the power-plant lever (17) and the fuel cock (18).

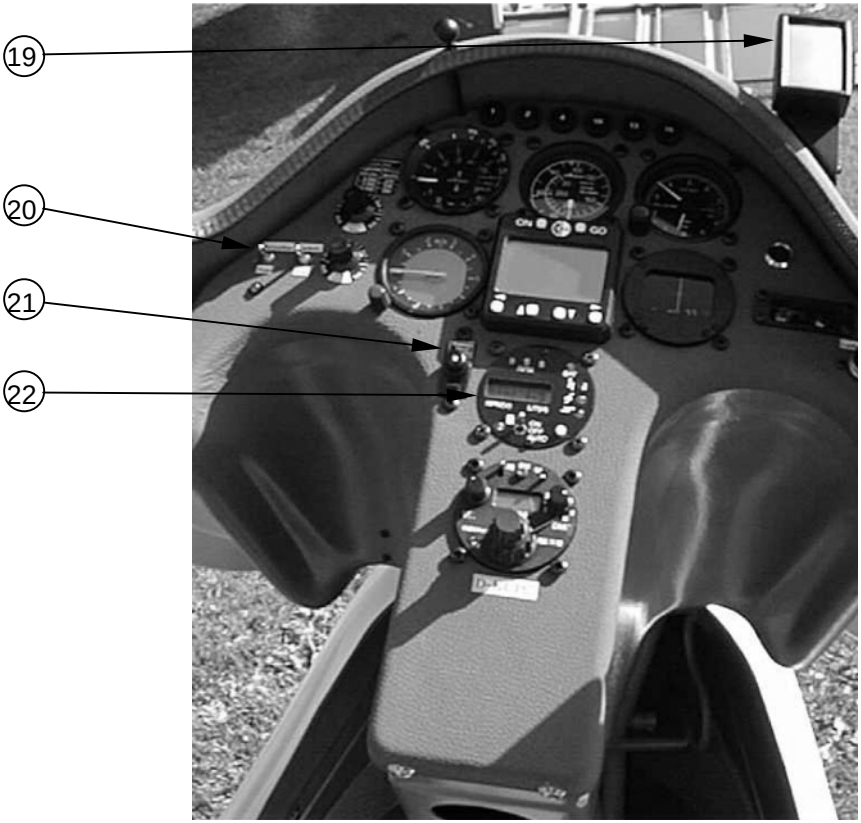


A fuel pump is attached for refuelling, which can be operated over a switch (20) in the instrument panel

Fuel Systems and Tanks

The engine is fed from a fuel tank, which is left-hand next to the landing gear box. On ground, the fluid level in the tank can be controlled through a slit in the fairing, when the seatback is removed. Removing some screws first the seat pan and then the fairing can be removed. Thereby, the fuselage tank, the fuel filter and the electric primer-pump is accessible. The head of the capacitive fuel level sensor is located on the fuselage tank. Ventilation and drainer are located under the left landing gear door in front of the main wheel.

The electric refuelling pump can be found behind the landing gear box. To access it, remove the cover in the engine bay behind the spindle.



slit of about 6 mm (1/4 in.) between speed sensor and magnetized pole results. Secure the nut of the speed sensor with Loctite 242. The installation of the exhaust has to be checked by an inspector.

Minimum material necessary for re-assembly:

1 Thermag-nuts SW9 M6 SSN 441
2 Thermag-nuts SW12 M8 SSN 441
1 self-locking nut M5
1 self-locking nut M8
Loctite 242
Hose clips, cable-fixer

2.13.3 Temporarily shut down of the Power-plant

If an engine is not going to be operated for longer than two months, it has to be preserved according to the Engine Manual:

Drain the fuel system. Inject about 5 cm^3 (0.3cu.in.) two-stroke oil through the intake system into both intake ports. With the ignition turned off, and open decompression valve, turn with the propeller about 10 revolutions.

Lock the entrance opening at the air intake and the exhaust opening.

2.13.4 Power-plant Dismantling & Re-Assembling

To simplify the work, the rubber chords of engine bay doors can be disconnected, or the doors can be held open a strut.

Extract the power-plant just short before its fully extended position. Detach the fairing of the right sword with the two cross recess screws and take it away sideways and rearwards. Unhook the clevis at the decompression lever and unscrew it from the bowden cable, as well remove the counter nut and spiral spring.

With the variant of the propeller stopper pivoting rearwards, unengage the stopper with the power-plant lever. Moving the stopper forward by hand, relaxes the bowden cable enough, so it can be unhooked. Then detach the fuselage sided spiral spring.
With the sideways pivoting variant, screw off the C-shaped bearer. With variant (8b) screw off the cylindrical carrier. In both cases leave the unit in the plane. If otherwise the stucking of the Bowden cable is opened, a new traction must be applied when reinstalling the engine.

The electric plug-in connector (23) has a bayonet coupling.

IMPORTANT NOTE: *If connector (23) is pulled, the ignition is definitively on! Therefore, also pull the spark plug caps!*

Pinch off the fuel line at the lower end of the left-hand sword, and close both ends, so no dirt can penetrate. Screw off the end switch (26) at the toggle strut and open the cable fixer at the strut.

Open the shrink hose covering the electric lines of the spindle and disconnect the terminals. Screw off the spindle at both ends and take it out.

IMPORTANT NOTE: *If the gas spring is intact, the power-plant will keep on staying unsupported in its extended position. If, however, the toggle strut is pushed in, the power-plant will flip in violently. Therefore, a helper should secure the toggle strut and the engine.*

Screw off the toggle strut from the swivel heads at the cross tube between the lift pins.

IMPORTANT NOTE: *When the screws are pulled out of the swivel heads, the strut immediately wants to kick upwards under the force of the gas spring.*

Carefully release the strut upwards by hand, until the gas spring arrives at its stop. Support the engine and screw off the gas spring.

Lower the power-plant carefully into the engine box, folding and placing the toggle strut the way it usually does. Both socket screws, around which the swords pivot, can be screwed off now, they are saved with lock wire. Then, the whole power-plant can be taken out, but solicitously take care to move the bowden cable of the decompression through the hole in the sword.

The mounting follows in reverse order. When reconnecting the decompression lever, take care that in rest position it just does not touch the sheet metal between the decompression valves. With the propeller stopper variant mounted atop the CRP swords (8b), Loctite 242 is needed for the screws that go into the propeller stopper carrier. The screws of the sword fairing are secured with Loctite 222. Take care not to squeeze the cables under the fairing. The installation of the power-plant has to be checked by an inspector!

Minimum material necessary for re-assembly:

Lock wire
2 self-locking nuts M3
2 self-locking nuts M6
4 self-locking nuts M8
Loctite 222 (if applicable 242)
hose clips, cable-fixer

2.13.5 Operation with Removed Power-plant

Operation with removed power-plant is possible. All loose parts (bowden cable, end switch, if applicable propeller stopper...) must be safely tied up.

A C.G. calculation or better weighing must be done for operation with removed power-plant. Lever arms can be found in chapter 6.8. The permissible C.G. range or the permissible masses are not changing.

Power-Plant:

The points marked below must be greased in the course of each annual C. of A. inspection.

Fig. 8.0-2 Lubrication Scheme Engine Compartment