Manual for the Engine SOLO type 2350

Serial - no.  
Manufactured  

Aircraft - type  
Registration no.  
Owner  

Log of revisions

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Edition 3  
November 16\(^{th}\), 2005  
Edition 2 is replaced  
July 19\(^{th}\), 2001  
page - no. 1
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1. Description of construction

- In-line-two-cylinder-two-stroke engine
- Air-cooling
- mixture control via two diaphragm carburetors
- CDI ignition
- Crankshaft mounted propeller
- No engine starter
- Crank-case-pressure operated fuel pump

2. Technical data

Engine displacement 430 ccm, cyl. bore 70 mm, stroke 56 mm
Compression ratio 10 : 1
Ignition unit Magneto SOLO, ignition coil Ducati
Spark plugs BOSCH W 5 AC heat range 225 or Champion L82 C, Gap 0,5 mm
Thread M 14X1,25 mm. In combination with spark-plug-cap (23 00 701, R=5kOhm)
Carburetor Solo, metering-device WALBRO
Fuel pump Bing
Direction of rotation Counterclockwise, seen in direction of flight
Fuel Two-stroke mix (gas/ oil), premium gas, AVGAS 100LL
Mixture Ratio 1 : 40, 2-stroke oil Castrol Super TT, TTS, Go! 2T, RS 2T
Weight Approxx. 16,8 kg complete with muffler, without propeller
3. Operational data and limitations

<table>
<thead>
<tr>
<th></th>
<th>Without muffler (d=22 mm)</th>
<th>With muffler (d=12 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise power</td>
<td>19,6 kW at 5500 1/min</td>
<td>15,3 kW bei 5500 1/min</td>
</tr>
<tr>
<td>Max. RPM</td>
<td>6500 1/min</td>
<td>6500 1/min</td>
</tr>
<tr>
<td>Recommended RPM</td>
<td>5000 1/min</td>
<td>5000 1/min</td>
</tr>
<tr>
<td>Low idle RPM</td>
<td>Not available - no throttle control</td>
<td>Not available - no throttle control</td>
</tr>
<tr>
<td>Cylinder head temp.</td>
<td>275 °C max. measured at spark plug</td>
<td>275 °C max. measured at spark plug</td>
</tr>
<tr>
<td>Fuel consump. at cruise</td>
<td>Approx 2,24 US gal./hr (8,5 1/h)</td>
<td>Approx 2,24 US gal./hr (8,5 1/h)</td>
</tr>
</tbody>
</table>

4. Operating manual

In order to have best engine performance available, it is absolutely necessary to follow the following instructions:

- **Before starting the engine**
  - Daily check done?
  - Check fuel level in tank
  - Airbleed fuel lines.
    - Gently squeeze hand pump and at the same time press on carburetor diaphragm. To do this use a pin and push through the small hole in the carburetor chamber covers until fuel is injected. Listen if fuel is injected.

- **Start engine according to the instructions in the flight manual of the aircraft**
  - Fuel Valve OPEN
  - Ignition switch ON
  - Decompression OPEN, until engine Revs are stable.

- **Stop engine according to the instructions in the flight manual of the aircraft**
  - Ignition switch OFF
  - Fuel Valve CLOSED
5. Maintenance manual

- Before every flight check the following with ignition in "Off" position:
  With compression release valves in open position engine should crank over by hand very easily and without any internal mechanical noise, with valves closed engine turn over should be difficult.

- Every 12 months or 25 operating hours, whatever comes first, check the following points in addition to the daily checks:
  - fuel lines
  - All wiring, exhaust system and spark plugs
  - Clean engine
  - Disassemble, wash and check the decompression – valves

- Special examination after 5 years. This check can be carried out by the manufacturer or a certified maintenance organisation or a certified maintenance person.

- Special examination after 200 operating hours. This check has to be done by the manufacturer.

- Special examination after shock - loading. This check has to be carried out by the manufacturer or an approved maintenance facility.

- Conservation and storage:
  If an engine is not used for 2 months or more, the following work must be done:
  - Empty fuel system
  - Inject approx. 5 ccm of 2-stroke oil into each inlet manifold. Turn the engine over by hand 10 times. Make sure, ignition is in "Off" position and compression release valves are open.
  - Cover intake and exhaust openings.

- Torque values
<table>
<thead>
<tr>
<th>Part</th>
<th>Torque Value</th>
<th>Foot Lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark plug</td>
<td>20 Nm</td>
<td>14,5</td>
</tr>
<tr>
<td>Compression release valves</td>
<td>20 Nm</td>
<td>14,5</td>
</tr>
<tr>
<td>Hub (on crankshaft) M12 x 1 left hand</td>
<td>50 Nm</td>
<td>36</td>
</tr>
<tr>
<td>Cylinder head nut (SW9)</td>
<td>M6 12 Nm</td>
<td>8,5</td>
</tr>
<tr>
<td>Cylinder head nut (SW12)</td>
<td>M8 20 Nm</td>
<td>14,5</td>
</tr>
<tr>
<td>Hex. Head bolts and allen</td>
<td>M4 3 Nm</td>
<td>2</td>
</tr>
<tr>
<td>head bolts or nuts or same</td>
<td>M6 10 Nm</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>M8 23 Nm</td>
<td>16,5</td>
</tr>
<tr>
<td>Slotted screws and nuts</td>
<td>M3 0,9 Nm</td>
<td>0,6</td>
</tr>
<tr>
<td>Slotted screws</td>
<td>M4 2 Nm</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>M5 4 Nm</td>
<td>3</td>
</tr>
<tr>
<td>Cylinderbase screws (Elongation Screw)</td>
<td>M8 13 Nm</td>
<td>9,5</td>
</tr>
</tbody>
</table>
- **Fuel/Air Mixture control**
  The fuel delivery to the engine is controlled by a jet each and was optimized by the manufacturer. Changes or corrections of jets should be approved by the manufacturer.

- **Main fuel jets (muffler without reduction, diameter 22 mm)**
  - Front: HD 112 1. Cylinder in cooling air
  - Rear: HD 114 2. Cylinder in cooling air

- **Main fuel jets (muffler with reduction, diameter 12 mm)**
  - Front: HD 110 1. Cylinder in cooling air
  - Rear: HD 112 2. Cylinder in cooling air

- **Changing of the main fuel jets.**
6. Engine trouble shooting

- Engine will not start:
  - Wrong timing of ignition: Spark plug cables can be mixed up
  - No fuel: Check the fuel lines to the carburetors and the fuel pump.
  - No spark: Short-cut of wiring to ground – check wires
  - No spark on one of the spark plugs: Defective spark plug.

- Engine flooded:
  - Open decompressor valve and turn engine over several times.
  - Make sure, that ignition is in „OFF“ position.

- Engine overheated:
  - Not enough fuel.
  - Cooling air is too hot.
  - Engine very dirty.
  - Defective spark plugs.

- Engine does not reach max. RPM:
  - Not enough fuel: Check the fuel lines, fuel pump and fuel filter.
  - Defective spark plugs: Replace spark plugs
  - Decompressor valves are leaking: Clean valves
  - Pulse hose to fuel pump is blocked: Check or replace
  - Defective carburetor unit: Change diaphragm and control module.

7. Installation instructions

Mount the propeller to the hub of the engine. Tighten all M6 nuts with 10 Nm.

Mount engine on the 3 mounting points in accordance with the manual of the aircraft.

The fuel lines are connected in accordance with the manual of the aircraft.

The electrical connection has to be made in accordance with the manual of the aircraft.
8. Wiring diagram

Ignition switch
black
yellow-green
Ignition coil
Spark plug

9. Power curve

19.6 kW (26.6 hp)
15.3 kW
Muffler without reduction
diameter 22mm
Muffler with reduction
diameter 17mm
Recommended RPM
Max. Power
Max. RPM

Edition 3
April 11th, 2002