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<td>6.4 Shroud 31</td>
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<td>6.5 Cylinder / Crankshaft 32</td>
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## 13. Special Servicing Tools

## 14. Servicing Aids
1. Introduction and Safety Precautions

1.1 Introduction

This service manual contains detailed descriptions of all the repair and servicing procedures specific to this power tool.

You should make use of the illustrated parts lists while carrying out repair work. They show the installed positions of the individual components and assemblies.

Refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts.

A fault on the machine may have several causes. To help locate the fault, consult the chapter on "Troubleshooting" and the "STIHL Service Training System" for all assemblies.

Refer to the "Technical Information" bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list until a revised edition is issued.

The special tools mentioned in the descriptions are listed in the chapter on "Special Servicing Tools" in this manual. Use the part numbers to identify the tools in the "STIHL Special Tools" manual. The manual lists all special servicing tools currently available from STIHL.

Symbols are included in the text and pictures for greater clarity. The meanings are as follows:

In the descriptions:
- Action to be taken as shown in the illustration above the text
- Action to be taken that is not shown in the illustration above the text

In the illustrations:
- Pointer
- Direction of movement

4.2 = Reference to another chapter, i.e. chapter 4.2 in this example.

Service manuals and all technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.

Servicing and repairs are made considerably easier if the machine is mounted to assembly stand (3) 5910 890 3100. To do this, secure the mounting plate (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.

The screws must not project since they, depending on the machine, may damage housings when the machine is clamped in position.

The above operation is not necessary with the new assembly stand 5910 890 3101 since the mounting plate is already fitted.
Engage the bar mounting studs in the outer bores in the mounting plate and secure the machine in position with the nuts (arrows).

Preparations for servicing

Remove the chain sprocket cover, saw chain and guide bar before carrying out repairs or mounting the machine to the assembly stand.

Always use original STIHL replacement parts. They can be identified by the STIHL part number, the STIHL logo and the STIHL parts symbol (1). This symbol may appear alone on small parts.

Storing and disposing of oils and fuels

Collect fuel or lubricating oil in a clean container and dispose of it properly in accordance with local environmental regulations.

1.2 Safety Precautions

If the machine is started up in the course of repairs or maintenance work, observe all local and country-specific safety regulations as well as the safety precautions and warnings in the instruction manual.

Gasoline is an extremely flammable fuel and can be explosive in certain conditions.

Always wear suitable protective gloves for operations in which components are heated for assembly or disassembly.

Improper handling may result in burns or other serious injuries.

Do not smoke or bring any fire, flame or other source of heat near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

Always perform leakage test after working on the fuel system and the engine.

Always replace damaged parts. Check disassembled parts for wear or damage before re-installing – replace as necessary.

Run the machine only with the shroud mounted in position – there is otherwise a risk of injury from the fanwheel and a risk of engine damage due to overheating.

The chapter on tightening torques lists all machine components that have to be tightened to a specific torque or coated with threadlocking adhesive. The specifications must be maintained when tightening down screws, nuts and other fasteners in all the procedures described in this service manual.

Fuel system – hose barb connectors

Pull off or push on fuel hoses in line with the connector, preferably by hand, to ensure the tightness of the fuel system.

Avoid damaging the hose barb – do not use sharp-edged pliers, screwdrivers, etc.

Do not cut open fuel hoses with a knife or similar tool.

Do not re-use fuel hoses after removal. Always install new hoses – fuel hoses can be overstretched during removal.

Install new fuel hoses either dry or with the aid of STIHL press fluid, 14.

Other press fluids are not approved and may result in damage to the fuel hoses.

Coat the ends of the hoses and the connectors with STIHL press fluid and then push the new hoses on to the hose barbs, 14.
2. Specifications

2.1 Engine

<table>
<thead>
<tr>
<th>Specification</th>
<th>MS 311</th>
<th>MS 391</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>59 cm$^3$</td>
<td>64.1 cm$^3$</td>
</tr>
<tr>
<td>Bore</td>
<td>47 mm</td>
<td>49 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>34 mm</td>
<td>34 mm</td>
</tr>
<tr>
<td>Engine power to ISO 7293:</td>
<td>3 kW (4 bhp)</td>
<td>3.2 kW (4.4 bhp)</td>
</tr>
<tr>
<td>Maximum permissible engine speed</td>
<td>13,000 rpm</td>
<td>13,000 rpm</td>
</tr>
<tr>
<td>with guide bar and chain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idle speed</td>
<td>2,800 rpm</td>
<td>2,800 rpm</td>
</tr>
<tr>
<td>Clutch</td>
<td>Centrifugal clutch without linings</td>
<td>Centrifugal clutch without linings</td>
</tr>
<tr>
<td>Clutch engages at:</td>
<td>3,500 rpm</td>
<td>3,500 rpm</td>
</tr>
<tr>
<td>Engine housing leakage test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at gauge pressure:</td>
<td>0.5 bar</td>
<td>0.5 bar</td>
</tr>
<tr>
<td>under vacuum:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 Fuel System

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carburetor leakage test at gauge pressure:</td>
<td>0.8 bar</td>
</tr>
<tr>
<td>Operation of tank vent at gauge pressure:</td>
<td>0.5 bar</td>
</tr>
<tr>
<td>Fuel</td>
<td>as specified in instruction manual</td>
</tr>
</tbody>
</table>

2.3 Ignition System

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air gap between ignition module and fanwheel:</td>
<td>0.20...0.30 mm</td>
</tr>
<tr>
<td>Spark plug (resistor type):</td>
<td>NGK BPMR 7 A</td>
</tr>
<tr>
<td></td>
<td>BOSCH WSR6F</td>
</tr>
<tr>
<td>Electrode gap:</td>
<td>0.5 mm</td>
</tr>
</tbody>
</table>

2.4 Chain Lubrication

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed-controlled oil pump with reciprocating piston and manual flow control:</td>
<td></td>
</tr>
<tr>
<td>Oil delivery rate:</td>
<td>11.5 (+2.5) cm$^3$/min at 10,000 rpm</td>
</tr>
<tr>
<td>Ematic oil pump:</td>
<td></td>
</tr>
<tr>
<td>Oil delivery rate:</td>
<td>6.0 (+/-2.0)...17.5 (+3.0 / -4.5) cm$^3$/min at 10,000 rpm</td>
</tr>
</tbody>
</table>
2.5 Tightening Torques

DG and P (Plastoform) screws are used in polymer and light metal components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without impairing the strength of the screwed assembly, providing the specified tightening torque is observed. For this reason it is essential to use a torque wrench.

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Thread size</th>
<th>For component</th>
<th>Torque Nm</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw</td>
<td>P 4x14</td>
<td>Chain tensioner cover/engine housing</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 4x12</td>
<td>Brake band/engine housing</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Collar screw</td>
<td>M 10</td>
<td>Collar stud for bar / engine pan</td>
<td>30.0</td>
<td>1)</td>
</tr>
<tr>
<td>Collar screw</td>
<td>D 8x24</td>
<td>Collar stud for bar / engine housing</td>
<td>16.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 5x16</td>
<td>Cover, chain brake / engine housing</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Collar screw</td>
<td>M 10x1</td>
<td>Decompression valve</td>
<td>14.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 5x16</td>
<td>Hand guard / fan housing</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>M 6x30</td>
<td>Shroud / engine housing</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 6x38</td>
<td>Chain catcher / bearing plug</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 5x16</td>
<td>Spiked bumper / engine housing</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>M 4x12</td>
<td>Manifold/cylinder</td>
<td>4.0</td>
<td>3)</td>
</tr>
<tr>
<td>Screw</td>
<td>P 6x21.5</td>
<td>Bearing plug / engine housing</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>M 5x16</td>
<td>Bearing plug/cylinder</td>
<td>10.0</td>
<td>4)</td>
</tr>
<tr>
<td>Screw</td>
<td>P 5x20</td>
<td>Fan housing / engine housing</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 4x12</td>
<td>Air baffle / engine housing</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Carrier</td>
<td>M 12x1 LH</td>
<td>Carrier / crankshaft</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>M 6x25</td>
<td>Engine housing / cylinder, stage 1</td>
<td>4.0</td>
<td>3)</td>
</tr>
<tr>
<td>Screw</td>
<td>M 6x25</td>
<td>Engine housing / cylinder, stage 2</td>
<td>12.0</td>
<td>3)</td>
</tr>
<tr>
<td>Screw</td>
<td>D 4x18</td>
<td>Oil pump</td>
<td>4.0</td>
<td>3)</td>
</tr>
<tr>
<td>Screw</td>
<td>M 5x16</td>
<td>Muffler / cylinder</td>
<td>10.0</td>
<td>1) 3)</td>
</tr>
<tr>
<td>Screw</td>
<td>M 8x1</td>
<td>Flywheel/crankshaft</td>
<td>33.0</td>
<td>5)</td>
</tr>
<tr>
<td>Nut</td>
<td>M 5</td>
<td>Carburetor/collar stud</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 4x14</td>
<td>Pre-separator / engine housing</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>P 4x12</td>
<td>Cover plate/fan housing</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>M 14x1.25</td>
<td>Spark plug</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Screw</td>
<td>D 4x18</td>
<td>Ignition module / engine pan</td>
<td>4.0</td>
<td>3)</td>
</tr>
</tbody>
</table>
Remarks:

1) Loctite 242 or 243, medium strength
2) Loctite 648, high strength
3) Screws with antifriction coated binding head
4) Screws with micro-encapsulated binding head
5) Degrease crankshaft/flywheel and mount oil-free

Use the following procedure when refitting a DG or P screw in an existing thread:

Place the screw in the hole and rotate it counterclockwise until it drops down slightly.
Tighten the screw clockwise to the specified torque.

Coat micro-encapsulated screws with medium-strength threadlocking adhesive before re-installing.

This procedure ensures that the screw engages properly in the existing thread and does not form a new thread and weaken the assembly.

Power screwdriver setting for polymer: DG and P screws max. 500 rpm
Do not use an impact wrench for releasing or tightening screws.

Do not mix up screws with and without binding heads.
### 3. Troubleshooting

#### 3.1 Clutch

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw chain stops under load at full throttle</td>
<td>Clutch shoes badly worn</td>
<td>Install new clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch drum badly worn</td>
<td>Install new clutch drum</td>
</tr>
<tr>
<td>Saw chain rotates at idle speed</td>
<td>Engine idle speed too high</td>
<td>Readjust with idle speed screw LA (counterclockwise)</td>
</tr>
<tr>
<td></td>
<td>Clutch springs stretched or fatigued</td>
<td>Replace the clutch springs or install new clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch spring hooks broken</td>
<td>Replace the clutch springs or install new clutch</td>
</tr>
<tr>
<td>Loud noises</td>
<td>Clutch springs stretched or fatigued</td>
<td>Replace the clutch springs or install new clutch</td>
</tr>
<tr>
<td></td>
<td>Needle cage damaged</td>
<td>Fit new needle cage</td>
</tr>
<tr>
<td></td>
<td>Clutch shoe retainer broken</td>
<td>Install new retainer or clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch shoes and carrier worn</td>
<td>Install new clutch</td>
</tr>
</tbody>
</table>
### 3.2 Chain Drive, Chain Brake, Chain Tensioner

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain sprocket wears rapidly</td>
<td>Chain not properly tensioned</td>
<td>Tension chain as specified</td>
</tr>
<tr>
<td></td>
<td>Wrong chain pitch</td>
<td>Fit chain of correct pitch</td>
</tr>
<tr>
<td></td>
<td>Insufficient chain lubrication</td>
<td>Check chain lubrication</td>
</tr>
<tr>
<td></td>
<td>Chain sprocket worn</td>
<td>Fit new chain sprocket</td>
</tr>
<tr>
<td>Saw chain stops under load at full throttle</td>
<td>Clutch shoes badly worn</td>
<td>Install new clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch drum badly worn</td>
<td>Install new clutch drum</td>
</tr>
<tr>
<td></td>
<td>Brake band blocked</td>
<td>Check freedom of movement and operation of brake band</td>
</tr>
<tr>
<td>Saw chain rotates at idle speed</td>
<td>Engine idle speed too high</td>
<td>Readjust with idle speed screw LA (counterclockwise)</td>
</tr>
<tr>
<td></td>
<td>Clutch springs stretched or fatigued</td>
<td>Replace the clutch springs or install new clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch spring hooks broken</td>
<td>Replace the clutch springs</td>
</tr>
<tr>
<td>Saw chain does not stop immediately when brake is activated</td>
<td>Brake spring stretched or broken</td>
<td>Fit new brake spring</td>
</tr>
<tr>
<td></td>
<td>Brake band stretched or worn</td>
<td>Fit new brake band</td>
</tr>
<tr>
<td></td>
<td>Clutch drum worn</td>
<td>Install new clutch drum</td>
</tr>
</tbody>
</table>
### 3.3 Chain Lubrication

In the event of trouble with the chain lubrication system, check and rectify other sources of faults before disassembling the oil pump.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain receives no oil</td>
<td>Oil tank empty</td>
<td>Fill up with oil and check setting of oil pump if necessary</td>
</tr>
<tr>
<td></td>
<td>Oil inlet hole in guide bar is blocked</td>
<td>Clean oil inlet hole</td>
</tr>
<tr>
<td></td>
<td>Intake hose or pickup body clogged or intake hose ruptured</td>
<td>Fit new intake hose and pickup body</td>
</tr>
<tr>
<td></td>
<td>Valve in oil tank blocked</td>
<td>Clean or replace valve</td>
</tr>
<tr>
<td></td>
<td>Teeth on worm worn</td>
<td>Install new worm</td>
</tr>
<tr>
<td></td>
<td>Worm drive spring broken</td>
<td>Install new worm</td>
</tr>
<tr>
<td></td>
<td>Oil pump damaged or worn</td>
<td>Install new oil pump</td>
</tr>
<tr>
<td>Machine losing chain oil</td>
<td>Oil pump body damaged</td>
<td>Install new oil pump</td>
</tr>
<tr>
<td></td>
<td>Oil pump damaged or worn</td>
<td>Install new oil pump</td>
</tr>
<tr>
<td></td>
<td>Oil intake hose connection damaged</td>
<td>Install new oil intake hose</td>
</tr>
<tr>
<td>Oil pump delivers insufficient oil</td>
<td>Oil pump worn</td>
<td>Install new oil pump</td>
</tr>
<tr>
<td></td>
<td>Worm drive spring not engaged in clutch drum</td>
<td>Engage drive spring in notch in clutch drum</td>
</tr>
<tr>
<td></td>
<td>Oil pump delivery rate set too low</td>
<td>Adjust oil pump (only on version with adjustable oil pump)</td>
</tr>
</tbody>
</table>
### 3.4 Rewind Starter

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter rope broken</td>
<td>Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically</td>
<td>Fit new starter rope</td>
</tr>
<tr>
<td></td>
<td>Normal wear</td>
<td>Fit new starter rope</td>
</tr>
<tr>
<td>Starter rope does not rewind</td>
<td>Very dirty or corroded</td>
<td>Clean or replace rewind spring</td>
</tr>
<tr>
<td></td>
<td>Insufficient spring tension</td>
<td>Check rewind spring and increase tension</td>
</tr>
<tr>
<td></td>
<td>Rewind spring broken</td>
<td>Fit new rewind spring</td>
</tr>
<tr>
<td>Starter rope cannot be pulled out far enough</td>
<td>Spring overtensioned</td>
<td>Check rewind spring and reduce tension</td>
</tr>
<tr>
<td>Starter rope can be pulled out almost without resistance (crankshaft does not turn)</td>
<td>Guide peg on pawl or pawl itself is worn</td>
<td>Fit new pawl</td>
</tr>
<tr>
<td></td>
<td>Spring clip on pawl fatigued</td>
<td>Fit new spring clip</td>
</tr>
<tr>
<td>Starter rope is difficult to pull or rewinds very slowly</td>
<td>Starter mechanism is very dirty</td>
<td>Thoroughly clean complete starter mechanism</td>
</tr>
<tr>
<td></td>
<td>Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)</td>
<td>Coat rewind spring with a small amount of standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored</td>
</tr>
<tr>
<td></td>
<td>Decompression valve is not open</td>
<td>Open, check and replace decompression valve if necessary</td>
</tr>
</tbody>
</table>
3.5 **Ignition System**

Exercise extreme caution while carrying out maintenance and repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine runs roughly, misfires, temporary loss of power</td>
<td>Spark plug boot is loose</td>
<td>Press boot firmly onto spark plug and fit new spring if necessary</td>
</tr>
<tr>
<td></td>
<td>Spark plug sooted, smeared with oil</td>
<td>Clean the spark plug or replace if necessary. If sooting keeps recurring, check air filter</td>
</tr>
<tr>
<td></td>
<td>Ignition lead loose in ignition module</td>
<td>Secure ignition lead properly</td>
</tr>
<tr>
<td></td>
<td>Fuel/oil mixture – too much oil</td>
<td>Use correct mixture of fuel and oil</td>
</tr>
<tr>
<td></td>
<td>Incorrect air gap between ignition module and flywheel</td>
<td>Set air gap correctly</td>
</tr>
<tr>
<td></td>
<td>Flywheel cracked or damaged or pole shoes have turned blue</td>
<td>Install new flywheel</td>
</tr>
<tr>
<td></td>
<td>Ignition timing out of adjustment, flywheel warped, machined key in flywheel sheared</td>
<td>Install new flywheel, check crankshaft stub for damage and replace crankshaft if necessary</td>
</tr>
<tr>
<td></td>
<td>Weak magnetization in flywheel</td>
<td>Install new flywheel</td>
</tr>
<tr>
<td></td>
<td>Irregular spark</td>
<td>Check operation of switch shaft/contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace ignition module if necessary. Check operation of spark plug. Clean the spark plug or replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Engine housing damaged (cracks)</td>
<td>Install new engine housing</td>
</tr>
</tbody>
</table>
### 3.6 Carburetor

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carburetor floods; engine stalls</td>
<td>Inlet needle not sealing – foreign matter in valve seat or cone</td>
<td>Remove and clean the inlet needle, clean the carburetor</td>
</tr>
<tr>
<td></td>
<td>Inlet needle worn</td>
<td>Replace the inlet needle</td>
</tr>
<tr>
<td></td>
<td>Inlet control lever sticking on spindle</td>
<td>Check the inlet control lever and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Helical spring not located on nipple of inlet control lever</td>
<td>Remove the inlet control lever and refit it correctly</td>
</tr>
<tr>
<td></td>
<td>Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever</td>
<td>Fit a new metering diaphragm</td>
</tr>
<tr>
<td></td>
<td>Metered diaphragm deformed</td>
<td>Fit a new metering diaphragm</td>
</tr>
<tr>
<td>Poor acceleration</td>
<td>Setting of low speed screw too lean</td>
<td>Check basic carburetor setting, correct if necessary</td>
</tr>
<tr>
<td></td>
<td>Setting of high speed screw too lean</td>
<td>Check basic carburetor setting, correct if necessary</td>
</tr>
<tr>
<td></td>
<td>Inlet needle sticking to valve seat</td>
<td>Remove inlet needle, clean and refit</td>
</tr>
<tr>
<td></td>
<td>Diaphragm gasket leaking</td>
<td>Fit new diaphragm gasket</td>
</tr>
<tr>
<td></td>
<td>Metering diaphragm damaged or shrunk</td>
<td>Fit a new metering diaphragm</td>
</tr>
<tr>
<td></td>
<td>Tank vent faulty</td>
<td>Replace tank vent</td>
</tr>
<tr>
<td></td>
<td>Leak on fuel hose from tank to carburetor</td>
<td>Seal connections or install new fuel hose</td>
</tr>
<tr>
<td>Condition</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Engine will not idle, idle speed too high</td>
<td>Throttle shutter opened too wide by idle speed screw LA</td>
<td>Reset idle speed screw LA correctly</td>
</tr>
<tr>
<td></td>
<td>Oil seals/engine housing leaking</td>
<td>Seal or replace oil seals/engine housing</td>
</tr>
<tr>
<td></td>
<td>Throttle shutter does not close</td>
<td>Replace throttle shutter and shaft</td>
</tr>
<tr>
<td></td>
<td>Air valve does not close</td>
<td>Replace end cover with air valve.</td>
</tr>
<tr>
<td>Engine stops while idling</td>
<td>Idle jet bores or ports blocked</td>
<td>Clean the carburetor</td>
</tr>
<tr>
<td></td>
<td>Low speed screw too rich or too lean</td>
<td>Reset low speed screw L correctly</td>
</tr>
<tr>
<td></td>
<td>Setting of idle speed screw LA incorrect – throttle shutter completely closed</td>
<td>Reset idle speed screw LA correctly</td>
</tr>
<tr>
<td></td>
<td>Tank vent faulty</td>
<td>Replace tank vent</td>
</tr>
<tr>
<td></td>
<td>Leak on fuel hose from tank to carburetor</td>
<td>Seal connections or install new fuel hose</td>
</tr>
<tr>
<td>Saw chain rotates at idle speed</td>
<td>Engine idle speed too high</td>
<td>Readjust with idle speed screw LA (counterclockwise)</td>
</tr>
<tr>
<td></td>
<td>Clutch springs stretched or fatigued</td>
<td>Replace the clutch springs or install new clutch</td>
</tr>
<tr>
<td></td>
<td>Clutch spring hooks broken</td>
<td>Replace the clutch springs</td>
</tr>
<tr>
<td>Condition</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Engine speed drops quickly under load – low power</td>
<td>Air filter dirty</td>
<td>Clean air filter or replace if necessary</td>
</tr>
<tr>
<td></td>
<td>Throttle shutter not opened fully</td>
<td>Check throttle cable and rod</td>
</tr>
<tr>
<td></td>
<td>Tank vent faulty</td>
<td>Replace tank vent</td>
</tr>
<tr>
<td></td>
<td>Fuel pickup body dirty</td>
<td>Install new pickup body</td>
</tr>
<tr>
<td></td>
<td>Fuel strainer dirty</td>
<td>Clean fuel strainer in carburetor, replace if necessary</td>
</tr>
<tr>
<td></td>
<td>Leak on fuel hose from tank to carburetor</td>
<td>Seal connections or install new fuel hose</td>
</tr>
<tr>
<td></td>
<td>Setting of high speed screw</td>
<td>Check basic carburetor setting, correct if necessary</td>
</tr>
<tr>
<td></td>
<td>H too rich</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Main jet bores or ports blocked</td>
<td>Clean the carburetor</td>
</tr>
<tr>
<td></td>
<td>Pump diaphragm damaged or fatigued</td>
<td>Fit new pump diaphragm</td>
</tr>
<tr>
<td></td>
<td>Ignition timing wrong, flywheel out of adjustment, key in flywheel has sheared off</td>
<td>Fit key if necessary and secure flywheel properly or install new flywheel</td>
</tr>
<tr>
<td>Engine running extremely rich, has no power and a very low maximum speed</td>
<td>Air valve does not open</td>
<td>Check the carburetor and service or replace if necessary.</td>
</tr>
<tr>
<td>Engine running too rich, loss of power and maximum speed too low</td>
<td>Air valve does not open fully in full throttle position</td>
<td>Check the carburetor and service or replace if necessary.</td>
</tr>
<tr>
<td>Erratic idle – too lean</td>
<td>Air valve does not close completely</td>
<td>Check the end cover with air valve and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Intake manifold faulty</td>
<td>Install new intake manifold</td>
</tr>
</tbody>
</table>
3.7 Engine

Always check and, if necessary, repair the following parts before looking for faults on the engine:
- Air filter
- Fuel system
- Carburetor
- Ignition system

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine does not start easily, stalls at idle speed, but operates normally at full throttle</td>
<td>Oil seals in engine housing damaged</td>
<td>Replace the oil seals</td>
</tr>
<tr>
<td></td>
<td>Engine housing leaking/ damaged (cracks)</td>
<td>Seal or replace the engine housing</td>
</tr>
<tr>
<td>Engine does not deliver full power or runs erratically</td>
<td>Piston rings worn or broken</td>
<td>Fit new piston rings</td>
</tr>
<tr>
<td></td>
<td>Muffler / spark arresting screen carbonized</td>
<td>Clean the muffler (inlet and exhaust), replace spark arresting screen, replace muffler if necessary</td>
</tr>
<tr>
<td></td>
<td>Air filter dirty</td>
<td>Replace air filter</td>
</tr>
<tr>
<td></td>
<td>Fuel/impulse hose severely kinked or damaged</td>
<td>Fit new hoses or position them free from kinks</td>
</tr>
<tr>
<td>Decompression valve is not closed</td>
<td>Close, check and replace decompression valve if necessary</td>
<td></td>
</tr>
<tr>
<td>Engine overheating</td>
<td>Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty</td>
<td>Thoroughly clean all cooling air openings and the cylinder fins</td>
</tr>
</tbody>
</table>
4. **Clutch**

- Troubleshooting, [3.1](#)
- Remove the shroud, [6.4](#).
- Remove the clutch drum, [4.1](#).

- Pull boot (1) off the spark plug.
- Unscrew the spark plug.

- Push the locking strip (1) 0000 893 5903 into the spark plug hole, wide end first, so that “OBEN-TOP” faces up.

- The locking strip (1) 0000 893 5903 must butt against the cylinder wall (arrow) as shown.

- Apply wrench to hexagon (arrow) and unscrew the clutch (1).

Note that the clutch has a left-hand thread.

**Disassembling**

- Pull the clutch shoes off the carrier.
- Remove the retainers (1).

- Clean all parts, [14](#).
- Replace any damaged parts.

If the clutch is noticeably worn, replace all three clutch shoes at the same time – not individual shoes – since runout may otherwise affect correct operation of the clutch.

- Use hook (2) 5910 890 2800 to remove the clutch springs (1).
• Fit the retainers (1).

• Fit the clutch shoes (2) over the arms (1).

• Clamp the clutch in a vise (arrow).

• Attach the springs (1) on the side with the raised hexagon (arrow).
  • Attach one end of each spring (1) to the clutch shoes.
  • Use the hook (2) 5910 890 2800 to attach the other ends of the springs and press them firmly into the clutch shoes.

• Make sure the washer (1) is in place.
  Installed position is correct when TOP (arrow) faces outwards.

• Check the clutch – all springs (arrows) must be properly attached.

• Position the clutch on the crankshaft stub so that the raised hexagon (arrow) faces outwards.
Screw the clutch (1) on to the crankshaft stub and tighten down the hexagon (arrow) firmly – left-hand thread.

- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.

### 4.1 Clutch Drum

- Inspect the clutch drum (1) for signs of wear.

If there are signs of serious wear on the inside diameter of the clutch drum (1), check the remaining wall thickness. If it is less than about 80% of the original thickness, install a new clutch drum.

- Install the clutch drum.

- Pull off the needle cage (1).

- Clean the needle cage and crankshaft stub. ![image](14)
- Lubricate the needle cage and crankshaft stub. ![image](14)
5. Chain Brake

5.1 Checking Operation

The chain brake is one of the most important safety devices on the machine. Its efficiency is measured in terms of the chain braking time, i.e. the time that elapses between activating the brake and the saw chain coming to a complete standstill.

Contamination (with chain oil, chips, fine particles of abrasion, etc.) and smoothing of the friction surfaces of the brake band and clutch drum impair the coefficient of friction, which prolongs the braking time. A fatigued or stretched brake spring has the same negative effect.

- Starting the engine

- With the chain brake activated (locked), open the throttle wide for a brief period (max. 3 seconds) – the chain must not rotate.

- With the chain brake released, open the throttle wide and activate the brake manually – the chain must come to an abrupt stop.

The braking time is in order if deceleration of the saw chain (less than a second) is imperceptible to the eye.

If the chain brake does not operate properly, refer to troubleshooting, \textit{3.2}.

5.2 Brake Band

- Remove the clutch drum, \textit{4.1}

- Troubleshooting, \textit{3.2}

- Engage the chain brake.

The brake band is now tensioned.

- Pull off the bumper strip (1).

- Take out the screws (arrows).

- Pull the hand guard towards the handlebar to simplify assembly of the brake band.

- Remove the brake band (1).

Do not overstretch the brake band.

- Pry the brake band (1) out of its seat (arrow).

- Remove the cover (1).

- Remove the brake band (1).
Turn the brake band (1) to one side and disconnect it from the brake lever (2).

Install a new brake band if there are noticeable signs of wear (large areas on inside diameter and/or parts of outside diameter – arrows) and its remaining thickness is less than 0.6 mm.

Installing

Hold the brake band (1) sideways, attach it to the brake lever (2) and then swing it in the direction of its seat.

Position the brake band (1) in the guide (arrow) first.

– Disengage the chain brake.

Push the brake band (1) over the guide lugs (arrows) and into its seat.

Push the brake band (1) into its seat (arrow) as far as stop.

Fit the screw (1) on the underside of the machine and tighten it down firmly.

Engage the cover (1) in the slots (arrows) first and then swing it into position.
- Insert the screws (arrows) and tighten them down firmly.
- Fit the bumper strip.
- Install the clutch drum, 4.1
- Check operation, 5.1
- Reassemble all other parts in the reverse sequence.

5.3 Brake Lever

- Troubleshooting, 3
- Remove the brake band, 5.2
- Engage the chain brake.

The brake spring is now relaxed.

- Use the assembly tool 1117 890 0900 to disconnect the brake spring (1) from the anchor pin (arrow).
- Remove the brake spring from the brake lever.

- Remove the shroud, 6.4
- Take out the screws (arrows).
- Remove the sleeve (1).
- Lift the hand guard a little and remove the fan housing.

- Remove the E-clip (1).
- Lift and turn the strap (1) slightly, push it towards the hole (arrow) and remove it.
- Remove the spacer sleeve (2) from the brake lever.

- Pull the hand guard (1) and brake lever (2) off the pivot pins (arrows) together.
- Remove the hand guard and brake lever.
Take the brake lever (2) out of the hand guard (1).

- Inspect the pivot pins and replace if necessary, p. 5.5
- Inspect the cam lever and replace if necessary, p. 5.4

**Installing**

- Hold the brake lever (1) so that the brake spring attachment point (arrow) is at the top.
- Push the brake lever (1) into the hand guard recess and line up the holes.
- Fit the spacer sleeve (1).
- Clean all disassembled parts, p. 14
- Lift the bearing boss of the hand guard and the brake lever a little and position them over the pivot pins (arrows).
- Fit the strap (1).
- Fit the E-clip (2).

- Push the hand guard with brake lever (1) over the machine until they are positioned against the pivot pins (arrows).
- Turn the cam lever (1) to one side until the cam of the hand guard (arrow) slips passed it.
- Push the hand guard bearing boss and the brake lever on to the pivot pins.
The turns of brake spring must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.

- Position the protective tube so that it leaves the first two turns (arrow) free.

- If the groove in the spring’s anchor pin is worn, install a new pin, b 5.5

5.4 Cam Lever

The cam lever defines the locked position of the hand guard.

- Remove the brake lever, b 5.3

- Disconnect the spring (1) from the anchor pin (2).

- Remove the E-clip (3).

- Pull off the cam lever.

- Check the cam lever (1) and spring (2) and replace if necessary.

- Check the condition of the cam contour (arrow) and replace the hand guard if necessary.

Installing

- Position the cam lever (1) so that its cam (arrow) faces the pin (3).

- Push the cam lever (1) on to the pivot pin (2).

- Attach the spring (1) to the cam lever so that the open side of the spring hook (arrow) points away from the housing.

If the groove in the spring’s anchor pin is worn, install a new pin, b 5.5

- Attach the spring (1) to the anchor pin (2).

The cam lever is not yet under tension – the spring may become detached.

- Reassemble all other parts in the reverse sequence.

- Lubricate the cam lever, b 14
5.5 Pins

The anchor pins secure the springs. Worn pins must be replaced – the springs may otherwise become detached and pop out.

The pins must be driven home squarely.

For greater clarity, all parts have been removed from the pins in the following illustrations.

- Use suitable tool to remove the pins (1 - 5).

Installing

- Before installing the new pin, coat its knurled shank with threadlocking adhesive, 14

- Position the new pin in the bore (arrow) so that the knurling on the pin meshes with the existing knurling in the bore.

Turn pin back and forth as necessary.

- Drive home the pins (1 and 2) as shown in the illustrations.

- Drive home pins (3, 4 and 5) as specified below.

5.6 Chain Tensioner

- Troubleshooting, 3.2

- Turn the spur gear (2) clockwise until the tensioner slide (1) butts against the right-hand end and the screw (3) is visible.

- Take out the screw (3).
Pull out the spur gear (1) and tensioner slide (2).

- Inspect the thrust pad (3), support (4), tensioner slide (1), spur gear set (2) and replace as necessary.
- Clean all disassembled parts, 14
- Lubricate thread with STIHL multipurpose grease, 14
- Reassemble in the reverse sequence.

5.7 Bar Mounting Studs

- Push stud puller 5910 893 0501 (1) over the collar studs (2) as far as it will go and unscrew the studs counterclockwise.
- Before installing, coat threads (1) and (2) of collar studs with threadlocking adhesive, 14
- Fit the collar studs and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
6. Engine

6.1 Muffler

Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

– Troubleshooting, 3.7

– Remove the shroud, 6.4

Before removing the muffler, set the piston to top dead center to ensure that no dirt falls into the cylinder.

– Pry the plug (1) out of the drive tube.
  – Do not refit old plugs, always fit new ones.

– Take out the screws (1).

– Remove the muffler (2).

– Remove the exhaust gasket (1).
  – Remove and install the spark arresting screen – see instruction manual.

Installing

– Hold the machine upright.

– Inspect and clean the sealing faces (arrows) and remove any gasket residue.

Always replace components with damaged sealing faces.

– Carefully place the muffler (1) in position.

– Check the position of the gasket and fit the screws (2).

  – Fit and tighten down the screws (2) firmly.

  – Fit new plugs.
6.2 Leakage Test

Defective oil seals and gaskets or cracks in castings are the usual causes of leaks. Such faults allow supplementary air to enter the engine and upset the fuel-air mixture.

This makes adjustment of the prescribed idle speed difficult, if not impossible.

Moreover, the transition from idle speed to part or full throttle is not smooth.

Always perform the vacuum test first and then the pressure test.

The engine can be checked thoroughly for leaks with the pump 0000 850 1300.

6.2.1 Preparations

- Remove the shroud, 6.4
- Pull off the boot and unscrew the spark plug.
- Set the piston to top dead center. This can be checked through the spark plug hole.
- Remove the decompression valve, 6.9
- Fit the plug (1) 1122 025 2200 and tighten it down firmly.
- Fit the spark plug (2) and tighten it down firmly.

- Pry out the plugs.
  - Do not refit old plugs, always fit new ones.
  - Loosen the screws (1).
- Fit the sealing plate (1) 0000 855 8107 between the cylinder exhaust port and muffler and tighten down the screws moderately.

  The sealing plate must completely fill the space between the two screws.
  - Remove the carburetor, 12.5
Check that the sleeve (1) and washer (2) are in place.

– Line up the flange (1) 1140 890 1200 and fit it over the studs

– Fit the test flange (1) 1140 890 1200.

– Fit the nuts (2) and tighten them down firmly.

### 6.2.2 Vacuum Test

Oil seals tend to fail when subjected to a vacuum, i.e. the sealing lip lifts away from the crankshaft during the piston’s induction stroke because there is no internal counterpressure.

A test can be carried out with pump 0000 850 1300 to detect this kind of fault.

Connect suction hose (1) of pump 0000 850 1300 to the nipple (arrow).

Push ring (2) to the left.

Operate the lever (3) until the pressure gauge (4) indicates a vacuum of 0.5 bar.

If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition. However, if the pressure continues to rise (reduced vacuum in the engine), the oil seals must be replaced, 6.3.

– After finishing the test, push the ring to the right to vent the pump.

– Continue with pressure test, 6.2.3

### 6.2.3 Pressure Test

Carry out the same preparations as for the vacuum test, 6.2.2

Connect suction hose (1) of pump 0000 850 1300 to the nipple (arrow).

Push ring (2) to the left.

Operate the lever (3) until the pressure gauge (4) indicates a vacuum of 0.5 bar.

If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition. However, if the pressure continues to rise (reduced vacuum in the engine), the oil seals must be replaced, 6.3.

– After finishing the test, push the ring to the left to vent the pump – disconnect the hose.

– Remove the flange.

– Loosen the screws on the muffler and pull out the sealing plate.

– Tighten down muffler screws firmly and fit new plugs.

– Install the carburetor, 12.5

– Reassemble all other parts in the reverse sequence.
6.3 Oil Seals

Use oil seal (1) 9638 003 1581 for replacement on closed engine. Use oil seal (2) 9639 003 1585 for replacement on opened engine.

It is not necessary to disassemble the engine to replace the oil seals.

Ignition side
- Remove the fan housing, 8.2
- Remove the flywheel, 7.6
- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.

Installing
- Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.
  - Clamp the puller arms.
  - Pull out the oil seal.
  - Take care not to damage the crankshaft stub.
  - Clean the sealing face, 14
  - Lubricate sealing lips of new oil seal with grease, 14

Clutch side
- Remove the clutch, 4
- Remove the oil pump, 11.3
- Remove the E-clip (1).

Installing
- Slip the oil seal, open side (snap ring) facing outwards, over the crankshaft stub.
- Use press sleeve (2) 1122 893 2405 to install the oil seal (1).
- The seating face must be flat and free from burrs.
- Wait about one minute, then rotate the crankshaft several times.
- Degrease the crankshaft taper, 14
  - Reassemble all other parts in the reverse sequence.
– Free off the oil seal in its seat by tapping it with a suitable tube or a punch.

- Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.

- Clamp the puller arms.

- Pull out the oil seal.

The crankshaft stub and oil pump spur gear must not be damaged.

- Clean the sealing face, 14

- Lubricate sealing lips of new oil seal with grease, 14

Installing

- Fit the installing sleeve (1) 1122 893 4600.

- Slip the oil seal, open side (snap ring) facing outwards, over the installing sleeve.

- Remove the installing sleeve (1).

- Use press sleeve (1) 1122 893 2405 to install the oil seal (2).

The seating face must be flat and free from burrs.

- Fit the E-clip (1).

- Wait about one minute, then rotate the crankshaft several times.

- Reassemble all other parts in the reverse sequence.

6.4 Shroud

- Set the Master Control lever to “0”.

- Push the front hand guard forwards to engage the chain brake.

- Take out the screws (arrows).

- Remove the shroud (1).
Use a suitable drift (1) to drive out the screws (arrow).

Installing

Use a suitable drift (2) to drive home the screws (1).

- Reassemble in the reverse sequence.

6.5 Cylinder / Crankshaft

- Remove the shroud, 6.4
- Pull off the boot and unscrew the spark plug,
- Remove the fan housing, 8.2
- Remove the filter base, 12.3
- Remove the carburetor, 12.5
- Remove the manifold, 12.9
- Remove the muffler, 6.1
- Remove the decompression valve, 6.9
- Remove AV spring from handlebar, 9.4

- Pull the crankshaft (1) out of the bearing seats (arrows).

- Carefully pull the crankshaft (1) with piston out of the cylinder.

- Check the crankshaft and ball bearings and replace if necessary, 6.6

- Inspect the piston and piston rings and replace if necessary, 6.7, 6.8

- Use the lug (arrow) to pry the cylinder (1) upwards.

- Remove the cylinder with crankshaft.
- Remove the E-clip (1).

- Pull the oil seals (arrows) off the crankshaft stubs.

- Inspect and clean the sealing faces (arrows) and remove any gasket residue. 14

The sealing faces must be in perfect condition. Always replace components with damaged sealing faces.

## Installing

- Fit the installing sleeve (1) 1118 893 4602.

- Push the new oil seals, open side facing inwards, on to the crankshaft stubs.

- Fit the E-clip (1).

Use oil seal (1) 9638 003 1581 for replacement on closed engine.
Use oil seal (2) 9639 003 1585 for replacement on opened engine.
– Lubricate the piston, piston rings and cylinder wall with oil.

– Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove (arrows) – there is otherwise a risk of ring breakage.

– Line up the piston with crankshaft before fitting them in the cylinder.

Viewed from the exhaust port (arrow), the long crankshaft stub (1) must be on the right.

When properly aligned, the piston rings are compressed by the cylinder's taper.

– Carefully push the piston with crankshaft (1) into the cylinder.

– Place the crankshaft with bearings and oil seals in the bearing seats, making sure the oil seals are firmly against their stops (arrows) in the cylinder.

– Hold the crankshaft (1) steady.

– Inspect and clean the sealing face on the engine housing and remove any gasket residue, 14

The sealing faces must be in perfect condition. Always replace components with damaged sealing faces.

– Apply sealant to the groove in the sealing face, 14

– Fit the cylinder (2) with crankshaft (1) in the engine housing.
Fit the screws (arrows).

Tighten down the screws (arrows) in an alternate pattern.

Reassemble all other parts in the reverse sequence.

6.6 Bearings / Crankshaft

– Remove the cylinder, 6.5

– Remove the crankshaft and pull off the oil seals, 6.5

– Remove the piston, 6.7

Pull the ball bearing (1) off the straight crankshaft stub.

The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit.

When fitting a replacement crankshaft, always install new ball bearings and oil seals.

Before installing, clean the crankshaft, 14

Heated ball bearings must be installed quickly because the crankshaft stubs absorb heat and expand.

– Heat the bearing inner race to about 150°C (300°F).

– Push the ball bearing onto the straight crankshaft stub as far as stop.

– Heat the bearing inner race to about 150°C (300°F).

– Push the ball bearing onto the tapered crankshaft stub as far as stop.

– Lubricate the needle bearing with oil.

– Install the piston, 6.7

– Install the crankshaft and oil seals, 6.5

Pull the ball bearing (1) off the tapered crankshaft stub.
6.7 Piston

- Remove the cylinder, 6.5

The snap ring at the clutch side cannot be removed.

- At the ignition side, use a suitable tool at the recess (arrow) to remove the hookless snap ring from the piston boss.

- Push the assembly drift (1) 1108 893 4700 through the installed snap ring.

- Use the assembly drift (1) 1108 893 4700 to push the piston pin out of the piston.

- If the piston pin is stuck, release it by tapping the end of the drift lightly with a hammer. Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.

- Remove the piston.

- Inspect the piston rings and replace if necessary, 6.8

- Pull out the needle cage (1), check it and replace if necessary, 14

Installing

- Push the assembly drift (1) 1108 893 4700, small diameter first, through the piston and small end (needle cage) and line up the piston.

- Lubricate the piston pin (2) with oil.

- Fit the piston pin (2) on the assembly drift (1) and slide it into the piston.

- Lubricate the needle cage with oil and push it into the connecting rod.

- Position the piston as shown so that the mark (arrow) points to the rear and the long crankshaft stub (1) is on the right.

- Place the piston on the connecting rod.

- Remove the sleeve (1) from the installing tool (2) 5910 890 2212.
- Attach the snap ring (1) to the magnet (2) so that the snap ring gap is on the flat side of the tool's shank (arrow).

- Press the installing tool downwards into the sleeve until the magnet butts against the end of the guide slot.

- Push the large slotted diameter of the sleeve over the magnet and snap ring.

- Remove the sleeve and slip it onto the other end of the shank – the inner pin must point towards the flat face.

- Apply the installing tool 5910 890 2212 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

- Fit the snap ring (1) so that its gap (arrow) points either up or down.

Use a suitable base.

Make sure the tool shank is held square on the piston pin axis.

The inner pin (1) must point towards the flat face (2) of the tool's shank.
6.8 Piston Rings

- Inspect the piston rings and replace if necessary, 6.8
- Check the oil seals and ball bearings and replace if necessary, 6.5
- Install the cylinder, 6.5
- Reassemble all other parts in the reverse sequence.

- Remove the piston, 6.7
- Remove the piston rings from the piston.

- Use a piece of old piston ring to scrape the grooves (arrows) clean.

- Install the new piston rings in the grooves so that the radii face upward (arrows).

- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove (arrows).

- Check correct installed position of the piston rings (arrows).

- Install the piston, 6.7
- Reassemble all other parts in the reverse sequence.

6.9 Decompression Valve

- Remove the shroud, 6.4
- Unscrew the decompression valve (1).

- Check the sealing cone (arrow) on the decompression valve for damage.

- If the sealing cone does not close completely or shows signs of damage, install a new decompression valve.

- Fit the decompression valve and tighten it down firmly.

- Reassemble all other parts in the reverse sequence.
7. **Ignition System**

Exercise extreme caution when troubleshooting and carrying out maintenance or repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents.

Troubleshooting on the ignition system should always begin at the spark plug, 2.3

- Remove the fan housing, 8.2

The electronic (breakerless) ignition system basically consists of an ignition module (1) and flywheel (2).

### 7.1 Ignition Timing

Ignition timing is fixed and cannot be adjusted during repair work.

Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment during operation.

### 7.2 Preseparator

- Remove the fan housing, 8.2
- Take out the screw (1).
- Remove the preseparator (2).
- Reassemble in the reverse sequence.

### 7.3 Ignition Module

The ignition module accommodates all the components required to control ignition timing. There are two electrical connections on the coil body:

- High voltage output (1) with ignition lead
- The connector tag (2) for the short circuit wire

Testing in the workshop is limited to a spark test. A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition).

**Removing**

- Remove the shroud and pull off the spark plug boot, 6.4
- Remove the fan housing, 8.2
- Remove the preseparator, 7.2

- Pull the ignition lead (1) out of the cable channel (arrows).
- Disconnect the short circuit wire (1).
- Take out the screws (2).
- Remove the ground wire (3).
- Remove the ignition module.
The ignition module (1) and ignition lead (2) form a unit.

- Before installing, check that the sleeve (4) is on the ignition lead (2) and its opening (arrow) is pointing in the same direction as the spark plug boot.

- Inspect the spark plug boot (3) and replace if necessary, 7.5

- Troubleshooting, 2.3

Installing

- Fit the ignition module (1) and insert the screw (arrow) – do not tighten down yet.

- Fit the ground wire (3) and insert the screw (2) – do not tighten down yet.

Crimped side of terminal must face the screw head.

The setting gauge is not shown in the illustration.

- Push the ignition module (1) back and hold it there

- the flywheel must move freely.

- Rotate the flywheel until the magnet poles (arrows) are next to the ignition module (1).

- Press the ignition module (1) against the setting gauge.

Hold the ground wire terminal steady – it must point towards the cable guide.

- Tighten down the screws firmly.

- Remove the setting gauge.

Check operation – rotate the flywheel and make sure it does not touch the ignition module.

Connect the short circuit wire terminal (1) – the terminal must be pushed fully home.

Starting at the ignition module, push the ignition lead into the cable channel.
Fit the boot (1) on the spark plug.

Line up the sleeve (2) – distance 'a' about 3 mm to the edge of the housing and its open side (arrow) facing the cylinder.

Reassemble all other parts in the reverse sequence.

7.4 Testing the Ignition Module

To test the ignition module, use either the ZAT 4 ignition system tester 5910 850 4503 or the ZAT 3 ignition system tester 5910 850 4520.

The ignition test refers only to a spark test, not to ignition timing.

Using the ZAT 4 ignition tester 5910 850 4503

Before starting the test, install a new spark plug in the cylinder and tighten it down firmly.

Connect the spark plug boot to the input terminal (1) and push the tester's output terminal (3) onto the spark plug.

High voltage – risk of electric shock.

Crank the engine quickly with the rewind starter and check spark in the tester's window (2).

The engine may start and accelerate during the test.

If a spark is visible, the ignition system is in order.

If no spark is visible in the window (2), check the ignition system with the aid of the troubleshooting chart. 7.8

Using the ZAT 3 ignition tester 5910 850 4520

Before starting the test, install a new spark plug in the cylinder and tighten it down firmly.

Connect spark plug boot to the terminal (2).

Attach the ground terminal (1) to the spark plug.

Use adjusting knob (4) to set the spark gap to about 2 mm, see window (3).
While using the ZAT 3, hold it only by the handle (4) or position it in a safe place. Keep fingers or other parts of your body at least 1 cm away from the spark window (3), high voltage connection (2), ground connection (5) and the ground terminal (1).  

**High voltage – risk of electric shock.**

- Crank the engine quickly with the rewind starter and check spark in the tester’s window (3).

The engine may start and accelerate during the test.

If a spark is visible in the window (3), the ignition system is in order.

- If no spark is visible in the window (3), check the ignition system with the aid of the troubleshooting chart, 7.8  

7.5 Spark Plug Boot / Ignition Lead

The ignition module (1) and ignition lead (2) form a unit. A new ignition module must be installed if the ignition lead is damaged.

- Remove the shroud, 6.4

- Use suitable pliers to pull the leg spring out of the spark plug boot.

- Unhook the leg spring from the ignition lead.

- Pull the boot off the ignition lead.

- Remove the sleeve.

Installing

Do not shorten the ignition lead.

- Use a pointed tool to pierce the center of the new ignition lead’s insulation, about 15 mm from the end of the lead.

- Pinch the hook of the leg spring into the pierced hole in the center of the lead (arrow).

- Coat the inside of the spark plug boot with STIHL press fluid, 14

- Hold the ignition lead and leg spring together and push them into the spark plug boot.
- Make sure the leg spring (arrow) locates properly inside the spark plug boot.

Do not use either graphite grease or silicone insulating paste.

- Reassemble all other parts in the reverse sequence.

### 7.6 Flywheel

- Remove the shroud, 6.4

- Use locking strip to block the piston, 4

- Unscrew the flywheel nut (1).

- Fit the puller (3) 1135 890 4500 on the flywheel and tighten the screws (1) as far as stop.
  - Tighten the screws uniformly.

- Screw home the thrust bolt (2) clockwise until the flywheel is released from the crankshaft.

- Remove the puller (3) 1135 890 4500 from the flywheel.

- Make sure the key (arrow) engages the slot in the crankshaft.

  - Set the air gap between the ignition module and flywheel, 7.3

  - Reassemble all other parts in the reverse sequence.

The flywheel and magnet poles (arrows) must not be damaged or have turned blue. Replace flywheel if necessary.

The flywheel and crankshaft stub must be free from grease before assembly.
7.7 Short Circuit Wire

7.7.1 Testing

If the spark plug, ignition lead and spark plug boot are in order, check the short circuit wire.

- Remove the fan housing, 8.2
- Disconnect the short circuit wire (1).
- Connect the ohmmeter to ground (2) and the short circuit wire (1).
- Set the Master Control lever to "0".

The resistance measured must be about 0 Ω. If it is much higher, the reason is a break and the wiring harness has to be replaced, 7.7.

- Set the Master Control lever to "I".

The resistance measured must be infinitely high. If not, fit a new short circuit wire, 7.7.

Perform the contact and continuity test on the ground wire too.

- If no fault can be found, check the ignition system with the aid of the troubleshooting chart, 7.8.
- Reassemble in the reverse sequence.

7.7.2 Removing and Installing

- Pull the boot off the spark plug.
- Remove the shroud, 6.4
- Remove the fan housing, 8.2
- Disconnect the choke rod, 10.2.1
- Remove the contact spring, 7.7.4

The ground and short circuit wires are combined in a wiring harness.

- Pull the ignition lead (3) out of the guide (arrows).
- Remove the connector (1).
- Take out the screw and remove the ground wire (2).

- Pull the short circuit wire (1) out of the guides (arrows).
- Pull the ring terminal (2) off the pin.

- Lift the ring terminal (1) a little and pull it off the pin (2).
- Remove the filter base, 12.3

- Pull the short circuit wire (1) out of the guides (arrows).

- Pull the wiring harness (1) out of the guides (arrows).
Installing

- Position the short circuit wire so that the yellow mark lines up with the edge (arrow).
  - Push the wiring harness (1) into the guide.

- Position the protective tube (2) so that it is in line with the yellow mark (arrow).
- Push the protective tube (2) with short circuit wire (1) into the guide (centered as shown).

- The wire must be laid straight and fit snugly against the housing.
  - Push the short circuit wire (1) into the guides (arrows).

- Position the ring terminal (1) so that its crimped side faces up.
  - Push the ring terminal (1) onto the pin (arrow) as far as stop.

- Position the short circuit wire so that it forms a loop and can move along with the switch shaft.
  - Push the short circuit wire (1) into the guides (arrows).

- Install the filter base, 12.3
  - Position the ring terminal (1) so that its crimped side faces up.
  - Push the ring terminal (1) onto the pin (arrow) as far as stop.

- Check that short circuit wire is properly seated, push it fully into the guide (arrow) if necessary.
  - Position the ring terminal (1) so that its crimped side faces up.
  - Fit the ring terminal (1) of the ground wire on the pin (2) and swing it down.
The ring terminal (1) must locate behind the lug (2).

- Check the ground wire ring terminal and replace it if necessary, \( 7.7.3 \)
- Lift the contact spring (1) over the lug (arrow) and pull it out.
- Check the ground wire ring terminal and replace it if necessary, \( 7.7.3 \)
- Place the contact spring (1) in position at a slight angle.
- Push the contact spring (1) onto the pins (arrows) as far as stop.

7.7.3 Ground Wire

A faulty ground wire may impair or prevent operation of the short circuit wire.

The ground wire is combined with the short circuit wire in a wiring harness. If damaged, the wiring harness must be replaced

- Check for contact and continuity and replace the wiring harness, \( 7.7 \)
- Check the ground wire ring terminal and replace it if necessary, \( 7.7.3 \)

7.7.4 Contact Spring

- Remove the shroud, \( 6.4 \)
- Remove the choke rod, \( 10.2.1 \)
- Move the switch shaft (1) towards the tank housing until the contact spring (2) is free.

Installing

- Fit the contact spring, \( 7.7.4 \)
- Push the ground wire (1) into the guide (arrow).
- Install the ignition lead, \( 7.3 \)
- Reconnect the choke rod, \( 10.2.1 \)
- Reassemble all other parts in the reverse sequence.
Make sure the lug (arrow) locks the contact spring in position.

- Lift the contact spring (1) and push it over the switch shaft.

- Check operation.
  - short circuit wire’s connector must touch the contact spring (arrow) in position “0”.
  - Reassemble all other parts in the reverse sequence.
Machine does not run

Stop switch:
– in position "I"?

Check the spark plug:
– Smeared with oil, black?
– Sooted?
– Electrode gap correct?
– Contacts shorted?
– Clean, readjust or replace the plug, § 7.4

Check the spark plug boot:
– Firmly seated on plug (leg spring)?
– Leg spring hook in center of ignition lead?
– Boot damaged?
– If necessary, install new spark plug boot and/or leg spring,
  § 7.5

Test ignition system:
with ZAT 3 or ZAT 4
(use ZAT 3 as main spark gap
see TI 32.94),
§ 7.4

1
Check the flywheel:
- Have pole shoes turned blue?
- Install new flywheel if necessary, 7.6

Check short circuit wire:
- Wire damaged?
- Connectors firmly seated?
- Check continuity, replace wiring harness if necessary, 7.7.2

Check the ignition lead:
- Severe chafing?
- Spark plug boot: Holes/cracks?
- Resistance: spark plug boot to ground:
  spec. 1.5 – 12 kΩ
- Check resistance of ignition lead (spark plug boot and ignition module removed)
  Spec.: < 10 Ω.
  If necessary, install new spark plug boot and/or ignition lead with module, 7.3
Engine runs?

- Powerful spark?

  yes

  - Check operation of switch shaft:
    - Short circuit wire chafed?
    - Function between contact spring and switch shaft contact:
      - Position "I" = no connection
      - Position "0" = connection
    - Install new short circuit wire if necessary, 7.7.2

  no

  - Install new ignition 7.3

- Machine runs trouble-free, no further action necessary

- Look for fault in fuel system or carburetor
  - Check engine for leaks
  - Check position of flywheel on crankshaft, 7.6, 6.5
8. Rewind Starter

8.1 General

If the action of the starter rope becomes very stiff and the rope rewinds very slowly or not completely, it can be assumed that the starter mechanism is in order but plugged with dirt. At very low outside temperatures the lubricating oil on the rewind spring may thicken and cause the spring windings to stick together. This has a detrimental effect on the function of the starter mechanism.

In such a case it is sufficient to apply a few drops of a standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons) to the rewind spring.

Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

Before installing, lubricate the rewind spring and starter post with STIHL special lubricant, 14.

If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the spring.

– Clean all components, 14

8.2 Fan housing

– Remove the shroud, 6.4

– Take out the screws (arrows).

– Lift the hand guard a little and remove the fan housing.

– Reassemble in the reverse sequence.

8.2.1 Segment

– Remove the fan housing, 8.2

– Pry the segment (1) off the lugs (arrows) and lift it away.

Installing

– Engage the segment (1) in the slots (arrows) in the fan housing first and then swing it into position.

– Push the segment (1) into the lugs as far as stop.

– Reassemble in the reverse sequence.

8.3 Pawls

– Remove the fan housing, 8.2

– Relieve tension of rewind spring, 8.4

– Carefully ease the spring clip (1) off the starter post.
Remove the pawls (1).

Installing

- Fit the new pawls in the bores (arrows) and lubricate the pegs (1).

The spring clip’s guide loops must be in line with the pawls (arrows).

Check operation.
- Pull the starter rope, the rotor turns and the pegs on the pawls move in the direction of spring loops – the pawls move outwards.
- Reassemble all other parts in the reverse sequence.

8.4 Rope Rotor

Rewind spring must be relaxed.
- Carefully remove the rope rotor (2).
- Coat bore in rope rotor with STIHL special lubricant, 14

Relieving tension of rewind spring
The system will not be under tension if either the starter rope or rewind spring is broken.
- Remove the fan housing and the segment, 8.2
- Pull out the starter rope (1) about 5 cm and hold the rope rotor (2) steady.

- Take three full turns of the rope off the rope rotor.
- Pull out the rope with the starter grip and slowly release the rope rotor.
- Remove the starter rope or remaining rope from the rotor, 8.5
- Remove the spring clip and pawls, 8.3

- Position the spring clip (1) so that its loops engage the pegs on the pawls. The rounded part of the spring clip (short arrow) must engage the starter post’s groove.

- Push the straight part of the spring clip over the starter post until it snaps into the groove.

- Remove the washer (1).
Installing

- Fit the rope rotor on the starter post so that the inner spring loop (arrow) engages the recess (1).

The recess in the hub of the rope rotor is the anchor point for the spring.

- Fit the cover washer.
- Install the pawls and spring clip, 8.3
- Install the starter rope, 8.5
- Tension the rewind spring, 8.6
- Lubricate pegs on pawls with grease, 14
- Reassemble all other parts in the reverse sequence.

8.5 Starter Rope / Grip

- Remove the fan housing and the segment, 8.2
- Relieve tension of rewind spring, 8.4

The system will not be under tension if the starter rope is broken.
- Remove remaining rope from the rope rotor and starter grip.

Do not shorten the starter rope.

- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope out of the rope rotor and fan housing.
- Pull the old rope out of the starter grip.

Installing

- Tie one of the special knots shown in the end of the rope.
- Thread the rope through the top of the starter grip.
- Pull the rope into the starter grip until the knot is properly seated in the grip (small arrow).
Thread the starter rope (1) through the guide bushing (arrow).

Thread the starter rope (1) through the side of the rope rotor.

– Secure the rope (1) with a simple overhand knot.

Pull the rope (1) back into the rotor until the knot locates in the recess (arrow).

– Tension the rewind spring, \( 8.6 \)

– Install the segment and fan housing, \( 8.2 \)

– Reassemble all other parts in the reverse sequence.

8.6 Tensioning the Rewind Spring

– Hold the rope rotor (2) steady.

– Pull out the twisted rope (1) with the starter grip and straighten it out.

– Hold the rope rotor (2) steady.

– Pull out a short length of starter rope (1).

– Use the starter rope (1) to rotate the rope rotor (2) six turns clockwise.

The rewind spring is now tensioned.

Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.

– Hold the starter grip (1) firmly to keep the rope tensioned.

– Let go of the rope rotor and slowly release the starter rope so that it can rewind properly.
The rewind spring is correctly tensioned when the starter grip sits firmly in the rope guide bushing (arrow) without drooping to one side. If this is not the case, tension the spring by one additional turn.

When the starter rope is fully extended, it must still be possible to rotate the rope rotor another full turn before maximum spring tension is reached. If this is not the case, reduce spring tension since there is otherwise a risk of breakage.

To reduce spring tension:
Pull the rope out, hold the rope rotor steady and take off one turn of the rope.

- Install the fan housing, 8.2

8.7 Replacing the Rewind Spring

- Troubleshooting, 3.4

The replacement spring, in a spring housing, comes ready for installation.

- Wear a face shield and work gloves to protect your eyes and hands from injury.

- Remove the fan housing and the segment, 8.2

- Relieve tension of rewind spring if necessary and remove the rope rotor, 8.4

- Remove any remaining pieces of old spring.

If the rewind spring can no longer be properly tensioned, install a new spring.

Even a worn rewind spring is still pre-loaded in the installed condition.

- Place a blanket over the work area and pull the rewind spring out of the fan housing.

- Lubricate the replacement spring with frame with a few drops of STIHL special lubricant before installing, 14

- Position the replacement spring with frame in the fan housing – the anchor loop (2) must be above the lug (1).

- Push the rewind spring with frame into its seat (arrow) in the fan housing. The frame slips off during this process.

The rewind spring may pop out and unwind.

- Remove the frame.
Make sure that the new rewind spring (1) is properly seated and the outer anchor loop is engaged on the lug (arrow). If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing.

If the rewind spring has popped out, refit it in the fan housing as follows:

- Arrange the spring (1) in its original position.
- Fit the anchor loop in its seat (arrow) in the fan housing.
- Fit the rewind spring (1) clockwise in the housing.
- Hold the spring windings so that they cannot pop out.

Make sure that the rewind spring (1) is properly seated. If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing

- Secure the spring so that it cannot pop out.
- Install the rope rotor, 8.4
- Reassemble all other parts in the reverse sequence.
9. Servicing the AV System

Vibration-damping springs and buffers are used for the connection between the handlebar, tank housing and engine housing.

Damaged springs and buffers must always be replaced.

9.1 Buffer on Oil Tank

- Remove the handlebar, \textbullet \textsuperscript{9.7}

\begin{itemize}
  \item Pull off the buffer (1).
\end{itemize}

Installing

\begin{itemize}
  \item Use STIHL press fluid to simplify assembly, \textbullet \textsuperscript{14}
  \item Push the buffer (2) onto the peg (1) on the handlebar as far as stop.
\end{itemize}

9.2 AV Spring on Oil Tank

The antivibration spring is at the forward end of the oil tank and is secured to the underside of the machine.

- Remove the handlebar, \textbullet \textsuperscript{9.7}

\begin{itemize}
  \item The peg's head (arrow) must locate properly on the buffer.
  \item Reassemble all other parts in the reverse sequence.
\end{itemize}

9.3 AV Spring on Fuel Tank

- Remove AV spring from handlebar, \textbullet \textsuperscript{9.4}
- Remove the stop buffer, \textbullet \textsuperscript{9.6}

\begin{itemize}
  \item Take out the screw (1).
  \item Lower the tank housing (2).
  \item Pry out the AV spring (1).
  \item Screw home the bearing plug (1) as far as stop.
  \item Screw the AV spring (2) into the handlebar (arrow) as far as stop.
  \item Reassemble all other parts in the reverse sequence.
\end{itemize}
Unscrew the AV spring (1).
Unscrew the bearing plug (2).

Installing

– Screw home the bearing plug (2) as far as stop.
– Screw the AV spring (1) into the plug (arrow) on the tank housing as far as stop.
– Push the AV spring (1) into its seat.

Fit and tighten down the screw (1) firmly.
– Reassemble all other parts in the reverse sequence.

9.4 AV Spring on Front Handle
The AV spring is located between the handle frame and cylinder.
– Remove the shroud, 6.4

Take out the screws (1 and arrows).
– Remove the complete AV spring (2).

Installing

– Push the complete AV spring (1) into the handlebar.

– Insert the screws (arrows) and tighten them down firmly.
– Coat the screw (2) with threadlocking adhesive, fit it and tighten it down firmly, 14
– Reassemble all other parts in the reverse sequence.
9.5 Stop Buffer at Clutch Side

The stop buffers are located between the tank housing and engine housing. They are fitted at the ignition and clutch sides.

- Remove the tank housing, 12.11.4
- Remove the cover, 5.2

- Ease the stop buffer (1) out of the bore.

Installing

- Position the stop buffer (1) with its short end facing the engine housing.
- Use STIHL press fluid to simplify assembly, 14

- Push the stop buffer (1) into the bore and make sure it is properly seated.
- Reassemble all other parts in the reverse sequence.

9.6 Annular Buffer at Ignition Side

- Remove the ignition module, 7.3

- Pry out the annular buffer (1).

Installing

- Line up the annular buffer (1) with its tapered end facing the engine housing.
- Use STIHL press fluid to simplify assembly, 14

- Annular buffer (1) must be properly seated in the recess (arrow).
- Reassemble all other parts in the reverse sequence.

9.7 Handlebar

- Remove the shroud, 6.4
- Remove AV spring from handlebar, 9.4

- Take out the screw (1) and remove the chain catcher (2).
- Remove the screws (1) from the underside of the machine.

- Ease the tank housing to one side and pry out the AV spring (1).

- Take out the screws (arrows).

- Ease the handlebar (1) sideways and take it out of the guide (arrow).

- Push the AV spring (1) into its seat (2).

- Push the handlebar (1) out of the lower guide.
  - Remove the handlebar (1).
  - Check the annular buffer and replace it if necessary, \textit{\textbf{9.1}}

\textbf{Installing}

- Position the handlebar (1) against the guide (arrow).

- Ease the handlebar (1) sideways and place it in the guide (arrow).
  - Insert the screws and tighten them down firmly.
  - Reassemble all other parts in the reverse sequence.
10. Control Levers

10.1 Master Control Lever

- Remove the filter base, 12.3
- Pry the switch shaft (1) out of its mount (arrow).
- Lift the switch shaft (1) a little and pull it away.

Installing

- Carefully push the switch shaft (1) over the taper (arrow).
- Push the switch shaft (1) onto the pin (2) until it snaps into position.

- Install the filter base, 12.3
- Reassemble all other parts in the reverse sequence.
- Check operation.

10.2 Throttle Trigger/Interlock Lever

- Take the throttle rod (1) out of the guide (arrow) and disconnect it from the throttle trigger (2).
- Ease the interlock lever (1) out of its mounts (arrows).

- Disconnect the torsion spring and remove the interlock lever.
Use a suitable drift (2) to drive out the pin (1).

Remove the throttle trigger (1) with torsion spring (2).

Install:

Attach the torsion spring (1) to the trigger (2) – note the installed position (arrow).

Place the throttle trigger (1) in the handle and line up the holes in the trigger and handle.

Use a suitable drift (2) to center the throttle trigger (1).

Drive home the pin (3) until it is recessed by same amount at both sides.

Attach the throttle rod (1) to the trigger (2) and fit it in the guide (arrow).

Push the interlock lever (1) into its pivot mounts (arrows) until it snaps into position – check that torsion spring is in position.

The interlock lever (1) may pop out.

Attach the torsion spring (1) to the interlock lever (arrow).
Engage tabs of handle molding (1) in the openings (arrow).

- Push down the handle molding (1) until it snaps into position.

- Check operation.

- Reassemble all other parts in the reverse sequence.

10.2.1 Choke Rod

- Remove the air filter, 12.1

- Carefully pry the choke rod (2) out of its seat in the guide (arrow) and move the switch shaft (1) in the direction of cold start at the same time.

- Move the switch shaft (1) in the direction of the carburetor and disconnect the choke rod (2).

- Take the choke rod (2) out of the guide.

- Position the choke rod (1) in the guide (arrow).

- Rotate the switch shaft (2) and push the choke rod (1) fully into the guide.

- Check operation – rotate the switch shaft. If necessary, push home the choke rod until it is properly seated.

Disconnect the choke rod (1) from the choke shaft (arrow).

Installing

- Engage the choke rod (1) in the bore (arrow) in the choke shaft (2).
10.2.2 Throttle Rod

- Disconnect the throttle rod from the trigger, \( \text{\S} \) 10.2
- Remove the filter base, \( \text{\S} \) 12.3

1. Pry the throttle rod (1) out of the carburetor carrier (2).

2. Pull the throttle rod in the direction of the handle until its bent end (1) is in front of the opening (arrow).

Installing

- Rotate the throttle rod (1) about 90° counterclockwise. Pass the throttle rod (1) through the opening (arrow) in the direction of the tank housing and remove it.

- Rotate the bent end (1) clockwise and push it under the throttle trigger.

- Push the throttle rod (1) between the tank housing and air guide shroud and rotate it about 90° at the same time.

- Check operation – the throttle lever on the carburetor must move upwards when the throttle trigger is pulled.

- Reassemble in the reverse sequence.
11. Chain Lubrication

11.1 Pickup Body

Impurities gradually clog the fine pores of the filter with minute particles of dirt. This prevents the oil pump from supplying sufficient oil. In the event of problems with the oil supply system, first check the oil tank and the pickup body. Clean the oil tank if necessary, 11

- Troubleshooting, 3.3
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, 1

Use hook (2) 5910 893 8800 to remove the pickup body (1) from the oil tank.

Do not overstretch the suction hose.
- Pull off the pickup body (1).
- Reassemble in the reverse sequence.

11.2 Oil Suction Hose

- Remove the clutch, 4
- Remove the brake band, 5.2
- Open the oil tank cap and drain the oil tank 1.
- Remove the oil pump, 11.3

Installating

- Line up the oil suction hose (1) – the tab (arrow) must locate against the housing.

- Use STIHL press fluid to simplify assembly, 14

- Push home the oil suction hose (1) until its groove is properly seated in the engine housing.

- Check position of pickup body. If necessary, use hook 5910 893 8800 to position it properly.

- Install the oil pump, 11.3

- Reassemble all other parts in the reverse sequence.

- Push the oil suction hose (1), pickup body first, through the housing bore (arrow).
11.3 Oil Pump

- Troubleshooting, 3.3
- Remove the brake band, 5.2
- Remove the clutch, 4

1. Remove the washer (1).

2. Pull the worm (1) with drive spring (2) out of the oil pump.

3. The spring (1) and worm (2) form a single unit and must be replaced if damaged.

Installing

- Pull off the oil suction hose (1).

- Take out the screws (1).

- Pull the oil pump (1) off the nipple (2) and then lift it off over the crankshaft stub.

- Fit the oil pump (1) over the crankshaft stub (2).

- Push the connector (1) onto the nipple (arrow).
11.4 Valve

A valve is installed in the tank wall to keep internal tank pressure equal to atmospheric pressure. The valve must be replaced if it is faulty.

- Place the oil pump (1) in position.
- Fit and tighten down the screws (2) firmly.
- Connect the oil suction hose to the oil pump.
- Push the worm fully home.
- Fit the cover washer (1) so that the word TOP (arrow) faces outwards.
- Check adjustment of oil pump and readjust if necessary – see instruction manual.
- Reassemble all other parts in the reverse sequence.

- Open the oil tank cap and drain the oil tank 1.

- Use a 6 mm drift to carefully drive the valve out of its seat in the housing and into the oil tank.

- Remove the old valve (1) from the oil tank.

- Installed depth of new valve: $a = 1 \text{ mm } +/- 0.1$

- Reassemble all other parts in the reverse sequence.

Installing

Check correct installed position.

- Insert the valve in the housing bore (arrow).
- Use a 6 mm drift to carefully drive in the new valve from outside – note installed depth.
12. Fuel System

12.1 Air Filter

Dirty air filters reduce engine power, increase fuel consumption and make starting more difficult. The air filter should be checked when there is a noticeable loss of engine power.

- See also Troubleshooting, 3.6, 3.7
- Remove the shroud, 6.4

- Lift the retaining tab (1) a little and remove the air filter (2).
- Check the air filter and clean or replace if necessary – see instruction manual.
- Reassemble in the reverse sequence.

12.2 Baffle

- Remove the air filter, 12.1
- Unscrew the nuts (arrows).
- Remove the baffle (1).
- Reassemble in the reverse sequence.

12.3 Filter Base

- Remove the air filter, 12.1
- Remove the baffle, 12.2
- Remove the choke rod, 10.2.1
- Disconnect the ground wire from the contact spring, 7.7.4.

- Pull the short circuit wire (1) out of the guides (arrows).
- Pull the ring terminal off the pivot pin (2).

- Pull the filter base (1) out of rubber buffer (3) first and then rubber buffer (2).
- Remove the filter base (1).
Pry out the rubber buffer (1).

Installing

- Use STIHL press fluid to simplify assembly, p. 14

- Push the rubber buffer (1), tapered end first, into the bore (arrow) as far as stop – the tapered end must slide fully home and engage the bore.

- Slide the filter base (1) over the studs.

- Push the filter base (1) fully into the rubber buffer (arrow).

- Push the filter base (1) fully into the rubber buffer (arrow).

- Install the short circuit wire, p. 18

- Reassemble all other parts in the reverse sequence.

12.4 Air Guide Shroud

- Remove the filter base, p. 12.3

- Remove the throttle rod, p. 10.2.2

- Remove the carburetor, p. 12.5

- Remove the manifold, p. 12.9

- Pull the ignition lead (1) out of the guides (arrows).
Pull the short circuit wire (1) out of the guides (arrows).

Take out the screws (arrows).

Push the air guide shroud (1) in the direction of the intake port until it engages the edge (arrow).

Remove the air guide shroud (1) upwards.

Position the fuel hose (1) in the recess in the air guide shroud (arrow).

Line up the air guide shroud (1) and hold the fuel hose (2) at the same time.

Push the (1) fully into its seat (arrow) until it snaps into position.

Make sure the protective tube (1) covers the opening (arrow).

Fit and tighten down the screws (1) firmly.

Pay attention to mark when installing the short circuit wire, 7.7.2

Reassemble all other parts in the reverse sequence.
12.5 Carburetor

- Remove the filter base, 12.3
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, 1

Disconnect the fuel hose only when the tank cap is open.

- Push the fuel hose (1) back a little – the fuel hose is disconnected.
- Remove the carburetor (1).
  - Install a new fuel hose, 12.11.2

Installing

- Check that the sleeve (1) and washer (2) are in place.
- Push the carburetor (1) into position.
- The fuel hose must be located in its seat (arrow).
- When positioning the carburetor, make sure the stub (1) is pushed into the fuel hose.

- Shoulder (arrow) must fully engage the intake manifold (1).
- Use STIHL press fluid to simplify assembly, 14
- Install the filter base, 12.3
- Install the air filter, 12.1
- Check operation.
- Reassemble all other parts in the reverse sequence.

12.5.1 Leakage Test

In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, 12.10

The carburetor can be tested for leaks with the pump 0000 850 1300.

- Remove the filter base, 12.3
Push the fuel hose (1) 1110 141 8600 onto the nipple (2) 0000 855 9200.

Push the fuel hose with nipple onto the carburetor’s fuel stub (arrow).

Push the pressure hose of pump 0000 850 1300 onto the nipple.

Push the ring (1) to the right and pump air into the carburetor until the pressure gauge (2) indicates a pressure of about 0.8 bar (80 kPa).

If this pressure remains constant, the carburetor is airtight. However, if it drops, there are three possible causes:

1. The inlet needle is not sealing (foreign matter in valve seat, sealing cone of inlet needle is damaged or inlet control lever is sticking). Remove to clean, 12.6.2

2. Metering diaphragm or gasket damaged, replace if necessary, 12.6.1

3. Pump diaphragm or gasket damaged, replace if necessary, 12.6.3

After completing the test, push the ring (1) to the left to vent the system and then pull the fuel hose off the carburetor.

Install the filter base, 12.3

Reassemble all other parts in the reverse sequence.

Troubleshooting, 3.6

Remove the carburetor, 12.5

Take out the screws (arrows).

Remove the end cover (1).

If the gasket and diaphragm are stuck to the carburetor, remove them very carefully.

Carefully separate the metering diaphragm (1) and gasket (2).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e. the diaphragm distorts and swells and has to be replaced.

Check the metering diaphragm for signs of damage and wear. Install a new gasket.
Installing

- Note installed positions of metering diaphragm (2) and gasket (1).

- Fit the gasket (1) and metering diaphragm (2) on the pegs (arrows).

- Position the end cover (1) so that the lever (arrow) points in the direction of the choke shutter.

- Move the end cover (1) a little until the pegs engage the holes in the end cover.

12.6.2 Inlet Needle

- Remove the metering diaphragm, (1) 12.6.1

- Take out the screw (1).

- Pull the inlet control lever (1) with spindle (2) out of the inlet needle's groove.

The small spring under the inlet control lever may pop out.

- Remove the inlet needle (1).

- Remove the spring (2).
If there is an annular indentation (arrow) on the sealing cone of the inlet needle, fit a new inlet needle.

**Installing**

- Fit the inlet needle (1).
- Fit the spring (2) in the bore.
- Position the inlet control lever (3) with spindle (2) on the spring (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).
  
  Make sure the spring locates on the control lever's nipple.
  
  – Press the inlet control lever down and secure it with the screw.
  
  – Check that the inlet control lever moves freely.
  
  – Install the metering diaphragm, 12.6.1

12.6.3 Pump Diaphragm

- Troubleshooting, 3.6
- Remove the carburetor, 12.5

- Take out the screw (1).
- Remove the end cover (2).
  
  If the gasket and pump diaphragm are stuck to the carburetor, remove them very carefully.

- Carefully remove the pump diaphragm with gasket.
• Carefully separate the pump diaphragm (2) and gasket (1).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e., the diaphragm distorts and swells and has to be replaced.

– Check the pump diaphragm for signs of damage and wear. Install a new gasket.
– Check fuel strainer for contamination and damage. Clean or replace if necessary.

• Use a needle to remove the fuel strainer (1) from the carburetor body. Clean or replace the fuel strainer.
– Reassemble in the reverse sequence.

Installing

• Fit the new gasket (1) so that the contours (arrows) match and it is held in position by the pegs (2).

• Fit the pump diaphragm on the gasket (1) so that the contours (arrows) match and it is held in position by the pegs (2).

• Position the end cover (1) so that the lever (arrow) points in the direction of the adjusting screws.

• Fit the end cover (1) from below so that the pump diaphragm and gasket are still held in position.

– Move the end cover (1) a little until its pegs engage the holes in the carburetor body.
– Check that the pump diaphragm and gasket are properly seated.
• Fit and tighten down the screw (2) firmly.
– Reassemble all other parts in the reverse sequence.
12.6.4 Air Valve

Air valve shaft stiff or air valve cannot be closed or opened properly:

The air valve matches the end cover. If it is damaged, the complete end cover must be replaced.

– Carburetor troubleshooting, § 3.6

Position of throttle shutter/air valve

The correct position of the air valve can be checked visually as follows.

– Throttle shutter in idle position
  – air valve fully closed.

– Throttle shutter in idle position / full throttle position – air valve closed / wide open.

– Throttle shutter in full throttle position – air valve wide open.

– Throttle shutter in cold start position
  – air valve fully closed.

– Throttle shutter in warm start position
  – air valve open about 5°

The air valve must move freely in both directions (open and closed) and always return to the idle position.

The air valve is fully closed in the idle position.

12.6.5 Levers on Throttle Shaft

Lever (1) must butt against lever (2) and engage lever (3).

Lever (5) must engage lever (2) for cold and warm starts – the choke lever (5) returns to the idle position when the throttle is opened.

– Screw (4) must be tightened down firmly.

The torsion springs (arrows) must be preloaded and attached to the levers.

– Remove the carburetor, § 12.5

– Carburetor troubleshooting, § 3.6

Installing

– Take out the screw (1).

– Relieve tension of the torsion spring (2) and remove the lever (3).

– Pull off the torsion spring (2) and lever (4).

– Push the lever (1) onto the throttle shaft as shown (arrow).
Fit the torsion spring (1) so that its leg locates against the lever (arrow).

Attach the torsion spring to the lever (arrow).

Fit the lever (1) and tighten the screw (2) moderately - the lever must still turn freely.

Hold the lever (2) steady.

Rotating the lever (1) clockwise until it butts against the stop on lever (2) and engages the end of the throttle shaft.

Hold lever (1) and lever (2) together against the stop (arrow).

Hold down the screw (3) firmly.

Check operation.

Reassemble all other parts in the reverse sequence.

12.6.6 Adjusting Screws

Grommet has been removed for the sake of clarity.

There are three adjusting screws on the carburetor:

- **H** = high speed screw (1)
- **L** = low speed screw (2)
- **LA** = idle speed screw (3)

If the carburetor cannot be adjusted properly, the problem may be the adjusting screws.

The high speed screw H has a limiter cap, which has to be removed before the screw is removed.

- Remove the carburetor, 12.5
- See also carburetor troubleshooting, 3.6

Pull off the grommet (1).
Low speed screw

- Take out the low speed screw L (1).

- Inspect the sealing ring (1), washer (2) and spring and replace if necessary.

- Inspect the tip (arrow) for damage or wear and replace the low speed screw (L) if necessary.

- Screw down the low speed screw (L) as far as stop.

- Continue with the high speed screw.

High speed screw

The high speed screw (H) has a limiter cap, which has to be removed before the screw is removed.

- Pull out the limiter cap (1).
  - Take out the high speed screw (H).

- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.

- Inspect the tip (arrow) for damage or wear and replace the screw (H) if necessary.

- Screw down the high speed screw (H) as far as stop.

- Continue with pre-installing limiter cap.
12.7 Carburetor Adjustment

12.7.1 Basic Setting

The basic setting is necessary only if the high speed screw (H) or low speed screw (L) has to be replaced or after cleaning and adjusting the carburetor from scratch.

It is necessary to carry out the basic setting after removing the limiter cap.

The carburetor, air filter and grommet are installed, the adjusting screws fitted and the new limiter cap pre-installed.

- Check chain tension and adjust if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, 3.7 or 6.1
- Check the air filter and clean or replace if necessary, 12.1

For the sake of clarity the adjusting screw is shown on the exposed carburetor.

- Starting with the high speed screw H (1) against its seat, open it one full turn counterclockwise
  - this is the basic setting.
- Starting with the low speed screw L (2) against its seat, open it one full turn counterclockwise
  - this is the basic setting.
- Warm up the engine.

Setting disk 5910 893 6600 may be fitted on the screwdriver 5910 890 2304 to simplify adjustments.
To adjust the high speed screw (H), insert the screwdriver (1) 5910 890 2304 through the opening (arrow) and push the pre-installed limiter cap into the high speed screw (H).

Adjust idle speed with a tachometer. Adjust specified engine speeds within a tolerance of ± 200 rpm.

1. Adjust engine speed idle speed screw (LA) to 3,300 rpm.

2. Turn the low speed screw (L) clockwise or counterclockwise to obtain the maximum engine speed.

If this speed is higher than 3,700 rpm, abort the procedure and start again with step 1.

3. Use the idle speed screw (LA) to set the engine speed again to 3,300 rpm.

4. Set the engine speed to 2,800 rpm with the low speed screw (L).

5. Set engine’s maximum speed to 13,000 rpm with the high speed screw (H).

Push a suitable drift through the opening (arrow) and push home the limiter cap until it is flush with the carburetor body.

This completes the basic setting of the high speed screw (H) and the low speed screw (L) and the high speed screw (H) is locked.

12.7.2 Standard Setting

The limiter cap must not be removed for the standard setting.

Always perform the following steps before carrying out any adjustments:

– Troubleshooting, 3.6

– Check chain tension and adjust if necessary.

– Inspect the spark arresting screen (if fitted) and clean or replace if necessary, 3.7 or 6.1

– Check the air filter and clean or replace if necessary, 12.1
<table>
<thead>
<tr>
<th>Standard Setting</th>
<th>Erratic idling behavior, poor acceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Shut off the engine.</td>
<td>(although standard setting is correct)</td>
</tr>
<tr>
<td>– Turn the high speed screw (H) slowly counterclockwise as far as stop, but not more than a 3/4 turn.</td>
<td>Idle setting too lean.</td>
</tr>
<tr>
<td>– Turn the low speed screw (L) slowly clockwise as far as stop, then turn it back 1 full turn.</td>
<td>– Warm up the engine.</td>
</tr>
<tr>
<td>Adjusting engine idle speed</td>
<td>– Turn the high speed screw (H) clockwise (leaner) – no further than stop.</td>
</tr>
<tr>
<td>– Carry out standard setting.</td>
<td>– Turn the low speed screw (L) counterclockwise until the engine runs and accelerates smoothly.</td>
</tr>
<tr>
<td>– Warm up the engine.</td>
<td>It is usually necessary to change the setting of the idle speed screw (L) after every correction to the low speed screw (L).</td>
</tr>
<tr>
<td>Engine stops while idling</td>
<td>Adjustment for operation at high altitude</td>
</tr>
<tr>
<td>– Turn the idle speed screw (LA) clockwise until the chain begins to run, then turn it back 1/2 a turn.</td>
<td>A minor correction may be necessary if engine power is not satisfactory when operating at high altitude.</td>
</tr>
<tr>
<td>Saw chain runs while engine is idling</td>
<td>– Check standard setting.</td>
</tr>
<tr>
<td>– Turn the idle speed screw (LA) counterclockwise until the chain stops running, then turn it back 1/2 a turn.</td>
<td>– Warm up the engine.</td>
</tr>
<tr>
<td></td>
<td>– Turn the high speed screw (H) clockwise (leaner) – no further than stop.</td>
</tr>
<tr>
<td></td>
<td>Turn the adjusting screws only very slightly. Even minor adjustments can noticeably affect engine running behavior.</td>
</tr>
<tr>
<td></td>
<td>If the setting is made too lean there is a risk of engine damage as a result of lack of lubrication and overheating.</td>
</tr>
<tr>
<td>12.8 Carburetor Carrier</td>
<td></td>
</tr>
<tr>
<td>– Remove the carburetor, 12.5</td>
<td>– Disconnect fuel suction hose from the carburetor carrier.</td>
</tr>
<tr>
<td>● Take out the sleeve (2) and washer (1).</td>
<td>● Push the manifold flanges (1) out of the carburetor carrier (2) in the direction of the cylinder.</td>
</tr>
<tr>
<td></td>
<td>● Remove the carburetor carrier (2).</td>
</tr>
</tbody>
</table>
Installing

To pull the manifold flanges through the openings in the carburetor carrier, wind pieces of string (1) (about 15 cm long) around the backs of the flanges and pass the ends of the strings through the openings.

Pull the ends of the strings with the manifold flanges through the intake opening.

- Pull the manifold flanges into the openings in the carburetor carrier with the string.

- Remove the string.

Fit the fuel hose (1) in the guide (arrow).

Take out the sleeve (2) and ring (1).

When reassembling, check that all wires are properly seated in their guides.

- Reassemble all other parts in the reverse sequence.

12.9 Intake Manifold

A damaged intake manifold can result in engine running problems.

- Troubleshooting, 3.6 or 3.7

- Remove the shroud, 6.4

- Remove the carburetor, 12.5

- Remove the carburetor carrier, 12.8

Take out the screws (1).

- Remove the intake manifold (2).

- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, 3.7
Inspect and clean the sealing faces (arrows), 14

The sealing faces must be in perfect condition. Always replace components with damaged sealing faces.

Installing

- Position the manifold (2) on the cylinder.

- Fit and tighten down the screws (1) firmly.

- Install the carburetor carrier, 12.8

- Reassemble all other parts in the reverse sequence.

12.10 Tank Vent

12.10.1 Testing

If problems occur on the carburetor or the fuel supply system, also check and clean the tank vent and replace it if necessary. Check function by performing pressure and vacuum tests on the tank via the fuel hose.

- Open the fuel tank cap and drain the fuel tank, 1.

- Close the tank cap.

- Remove the carburetor, 12.5

- Push the nipple (1) 0000 855 9200 into the fuel hose (arrow).

- Push the ring (1) to the left and connect the pump (2) 0000 850 1300 to the nipple (arrow)

  - subject the fuel tank to a vacuum.

Equalization of pressure takes place via the tank vent. There must be no buildup of vacuum in the fuel tank.

- Clean the area around the tank vent.

- Always install a new fuel hose.

- If necessary, install a new tank vent or fuel tank, 12.10 or 12.11.4
### Pressure test

- Push the ring (1) to the right and connect the pump (2) to the nipple (arrow) - pressurize the fuel tank.

- Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the fuel tank, including the tank vent, is airtight. If the pressure drops, the leak must be located and the faulty part replaced.

- Always install a new fuel hose.

- Reassemble in the reverse sequence.

### 12.10.2 Removing and Installing

- Take out the screws (arrows) and pry the AV spring (1) out of the handlebar.

- Take out the screw (1).

- Lower the tank housing (2).

- Slide the wooden assembly block (1) between the engine housing and tank housing.

- Pry the tank vent (1) out of its seat using the rib (arrow) for leverage.

- Pry home the tank vent by hand until it snaps into position.

- Reassemble all other parts in the reverse sequence.

### 12.11 Fuel Intake

#### 12.11.1 Pickup Body

Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

In the event of problems with the fuel supply system, always check the fuel tank and the pickup body first.

- Troubleshooting, \[ 3.6 \] or \[ 3.7 \]

Clean the fuel tank if necessary,

- Open the tank cap and drain the fuel tank.

- Pour a small amount of clean gasoline into the fuel tank. Close the tank and shake the saw vigorously.

- Open the tank again and drain it.

- Dispose of fuel properly in accordance with environmental requirements, \[ 1 \]

Always install a new tank vent.

- Coat sealing ring of new tank vent with STIHL press fluid, \[ 14 \]
Open the tank cap.

- Use hook 5910 893 8800 to remove the pickup body (1) from the fuel tank.

Do not overstretch the fuel hose.

- Pull off the pickup body (1).

- Reassemble in the reverse sequence.

12.11.2 Fuel Hose

- Remove the shroud, 6.4
- Remove the air guide shroud, 12.4
- Take out the screw (1).
- Lower the tank housing (2).

- Pull out the fuel hose (1) with connector.

- Remove the fuel hose (1).

- Pull the fuel hose (2) off the connector (1).

- Slide the wooden assembly block (1) between the engine housing and tank housing.

- Take out the screws (arrows) and pry the AV spring (1) out of the handlebar.
12.11.3 Fuel Suction Hose

- Push the fuel hose (1) onto the connector (2) as far as stop.

Note position of the hose – the flats (arrows) must be in alignment.

- Push the fuel hose (1) through the opening (arrow) in the engine housing.

- Push the fuel hose (1) with connector into the fuel suction hose (2).

- Reassemble all other parts in the reverse sequence.

- Line up the fuel suction hose (1) and push it into the housing bore as far as stop – the flange must engage the guide (arrow).

- Use STIHL press fluid to simplify assembly, 14

- Install the tank housing, 12.11.4

- Use hook 5910 893 8800 to remove the fuel suction hose (1) from the fuel tank.

Do not overstretch the fuel suction hose.

- Fit the pickup body, 12.11.1

- Close the tank cap.
12.11.4 Tank Housing

- Drain the fuel tank, 1
- Remove the handlebar, 9.7
- Remove the stop buffer, 9.5
- Remove the control levers, 10

- Take out the screw (1).
- Lower the tank housing (2).

- Pull out the connector (1) with fuel hose.

- Pull out the tank housing (1).

Only transfer those parts from the old tank housing that are not included with the replacement – see parts list.

Installing

- Slide the tank housing (1), narrow part (2) first, into the engine housing.

- Push the connector (1) with fuel hose into the fuel suction hose.

- Reassemble all other parts in the reverse sequence.
## Special Servicing Tools

### New Special Tools

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Application</th>
<th>Rem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test flange</td>
<td>1140 890 1200</td>
<td>Leakage Test</td>
<td></td>
</tr>
</tbody>
</table>

### Existing Special Tools

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Application</th>
<th>Rem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pump</td>
<td>0000 850 1300</td>
<td>Testing engine and carburetor for leaks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Sealing plate</td>
<td>0000 855 8107</td>
<td>Testing carburetor for leaks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Nipple</td>
<td>0000 855 9200</td>
<td>Testing carburetor for leaks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Hose for leakage test</td>
<td>1110 141 8600</td>
<td>Testing carburetor for leaks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Plug for leakage test</td>
<td>1122 025 2200</td>
<td>Leakage testing decompression valve</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Installing tool</td>
<td>0000 890 2201</td>
<td>Installing rope guide bushing</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Locking strip</td>
<td>0000 893 5903</td>
<td>Blocking the crankshaft</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pliers DIN 5254-A 19</td>
<td>0811 611 8380</td>
<td>Removing and installing external circlips</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Screwdriver bit, T 27 x 125</td>
<td>0812 542 2104</td>
<td>Removing and installing spline socket</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- screws with electric or</td>
<td></td>
<td>screws with electric or pneumatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pneumatic screwdrivers;</td>
<td></td>
<td>tightening down screws</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tightening down screws</td>
<td></td>
<td>with torque wrench</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Wooden assembly block</td>
<td>1108 893 4800</td>
<td>Installing tank vent</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Setting gauge</td>
<td>1111 890 6400</td>
<td>Adjusting air gap between the ignition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>module and flywheel</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Assembly drift</td>
<td>1108 893 4700</td>
<td>Removing and installing piston pin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Assembly tube</td>
<td>1117 890 0900</td>
<td>Attaching springs</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Installing sleeve</td>
<td>1118 893 4602</td>
<td>Protecting the oil seal</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Installing sleeve</td>
<td>1122 893 2405</td>
<td>Installing oil seal</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Installing sleeve</td>
<td>1122 893 4600</td>
<td>Protecting the oil seal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(clutch side)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Combination wrench</td>
<td>1129 890 3401</td>
<td>Spark plug</td>
<td>1)</td>
</tr>
<tr>
<td>14</td>
<td>Puller</td>
<td>1135 890 4500</td>
<td>Removing flywheel</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Ignition system tester, ZAT 4</td>
<td>5910 850 4503</td>
<td>Testing ignition system</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Ignition system tester, ZAT 3</td>
<td>5910 850 4520</td>
<td>Testing ignition system</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Torque wrench</td>
<td>5910 890 0302</td>
<td>0.5 to 18 Nm</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Torque wrench</td>
<td>5910 890 0312</td>
<td>6 to 80 Nm</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Installing tool 12</td>
<td>5910 890 2212</td>
<td>Installing hookless snap rings in piston</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Part No.</td>
<td>Application</td>
<td>Rem.</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------</td>
<td>-----------------------</td>
<td>--------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>20</td>
<td>Screwdriver</td>
<td>5910 890 2304</td>
<td>Adjusting carburetor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Setting disk</td>
<td>5910 893 6600</td>
<td>Add-on for screwdriver (adjusting carburetor)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Screwdriver bit, T 27 x 150</td>
<td>5910 890 2400</td>
<td>IS-P screws (4 mm)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Hook</td>
<td>5910 890 2800</td>
<td>Detaching springs on clutch shoes</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Assembly stand</td>
<td>5910 890 3101</td>
<td>Holding machines for repairs</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Puller</td>
<td>5910 890 4400</td>
<td>Removing oil seals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Jaws (No. 3.1)</td>
<td>0000 893 3706</td>
<td>Removing oil seal(s)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Puller</td>
<td>5910 890 4500</td>
<td>Removing limiter caps</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Stud puller M8</td>
<td>5910 893 0501</td>
<td>Removing bar mounting studs</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Socket, 13 mm, long</td>
<td>5910 893 2804</td>
<td>Removing and installing decompression valve</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Hook</td>
<td>5910 893 8800</td>
<td>Removing pickup body</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**
1) Use for releasing only.
## 14. Servicing Aids

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lubricating grease (225 g tube)</td>
<td>0781 120 1111</td>
<td>Oil seals, sliding and bearing points</td>
</tr>
<tr>
<td>2</td>
<td>STIHL special lubricant</td>
<td>0781 417 1315</td>
<td>Bearing bore in rope rotor, rewind spring in fan housing</td>
</tr>
<tr>
<td>3</td>
<td>STIHL press fluid OH 723</td>
<td>0781 957 9000</td>
<td>Rubber components, AV elements</td>
</tr>
<tr>
<td>4</td>
<td>STIHL multipurpose grease</td>
<td>0781 120 1109</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Dirko HT red sealant</td>
<td>0783 830 2000</td>
<td>Engine housing</td>
</tr>
<tr>
<td>6</td>
<td>Medium-strength threadlocking adhesive (Loctite 242 or 243)</td>
<td>0786 111 2101</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>High-strength threadlocking adhesive (Loctite 648)</td>
<td>0786 111 2117</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons</td>
<td></td>
<td>Cleaning sealing faces and carburetor, crankshaft stubs and flywheel taper</td>
</tr>
</tbody>
</table>