New STIHL Engine Repair Tool Kit part number 5910 890 1700

The new STIHL Engine Repair Kit includes tools to inspect and clean the cylinder components of all 2-stroke and 4-stroke cycle engines.

Components included in tool kit:
The main components of the kit include various abrasive pads for cleaning gasket surfaces, combustion chambers, valve seats, and exhaust ports. A cylinder leak-down tester is also included for checking exhaust and intake valve sealing on all 4-stroke cycle engines and also can be used to check piston ring sealing and piston damage on all 2-stroke cycle engines. Other useful tools are included that are further explained in this bulletin. All of the tools included in the kit are also available separately (see summary on page 9).

When performing a cylinder leak down test the flywheel must be blocked at TDC (top dead center) to avoid rotation of the crankshaft as high pressure air is introduced into the cylinder. When using on 4-stroke cycle engines, the piston should be at TDC on the compression stroke with both valves closed.

To use the cylinder leak down tester on STIHL 4-Stroke engines, remove the valve cover and index the crankshaft as pictured below. Verify that the piston is at TDC on the compression stroke and both intake and exhaust valves are closed.
**STIHL 4-Stroke Engine on Shafted Products**

Index arrow between flywheel fins with lower ignition module mounting screw.

Examples of the flywheel blocking tool used with STIHL 4-MIX® engines:

**STIHL 4-Stroke Engine on Shafted Products**

Insert the long pegs of the blocking tool down between the flywheel fins.

**BR 500, BR 550, BR 600**

Insert the locating pin of the flywheel blocking tool into the bolt hole referenced by the top arrow and secure the tool to the boss at the lower arrow with a 5 mm bolt normally used to mount the starter assembly.
BR 500, BR 550, BR 600
Flywheel blocking tool installed.

The cylinder leak down tester is capable of verifying cylinder leakage in all 2-stroke and 4-stroke cycle engines. The hose on the tester has a 14 mm diameter thread for conventional spark plugs and an adapter is included for use in engines that utilize a 10 mm diameter spark plug thread.

Cylinder Leak Down Tester Installation

To install the tester, thread the adapter hose into the spark plug opening. Before connecting the gauge assembly to the adapter hose, turn the pressure regulator knob counterclockwise until there is no tension on the regulator knob (damage to pressure gauge can occur if the regulator is not backed off before connecting to air compressor). Connect an air source of 90 PSI minimum to the air inlet on the pressure regulator. Turn the regulator clockwise until the needle on the left gauge reaches the red set point at the 12 o’clock position, the needle on the right gauge should now read zero. If not, adjust the regulator until the right gauge is set to zero. The gauge assembly is now ready to be connected to the spark plug adapter hose.

Above view of the tester showing cylinder leakage of 75%.

The recommended leakage should not exceed 10%. If so, the component at fault will need to be determined (exhaust valve, intake valve, piston rings, scored piston). This can be determined by listening for any escaping air at the intake port, exhaust port or pushrod openings in cylinder head.

If the exhaust valve is leaking, STIHL recommends using STIHL Engine De-Carbonizer fluid (part no. 0781 313 8019) before disassembling the engine.
STIHL Engine De-Carbonizer is a mild chemical solution that breaks down ash deposits formed by low ash 2-cycle engine oils and is ideal for removing deposits from exhaust valves on mix lubricated 4-cycle engines and softens combustion deposits in 2-cycle engines.

Procedure for using STIHL Engine De-Carbonizer:

- Move stop switch to the off position.
- Remove spark plug.
- Set piston to top dead center (on 4-stroke engines: TDC between intake and exhaust strokes at valve overlap with both valves slightly open).
- Completely fill the combustion chamber with STIHL Engine De-Carbonizer through the spark plug opening and let stand for approximately one hour. Do not leave the liquid in the cylinder any longer than 12 hours. Note that the de-carbonizer fluid works best and only needs to soak for approximately 15 minutes if the engine can be started and warmed up before applying the chemical.
- Pour the de-carbonizer fluid out of the spark plug opening onto an absorbent towel. The solution can be disposed of in normal trash collection and is not an environmental hazard.
- Pull the starter rope several times to clear the cylinder. On 4-cycle engines, ensure that the valve clearance is set properly.
- Install the spark plug and start the engine.
- Note: the muffler spark arrestor screen may need to be cleaned of loosened combustion deposits after running the engine.

In the event the de-carbonizer fluid does not correct the problem, the engine will have to be disassembled for further inspection and repair.

The tool kit also includes some specialized tools including a 10 mm piston stop (part no. 4282 890 2700) designed for use with all STIHL 4-Stroke engines. The piston stop is used to block the crankshaft from rotating when performing repairs.

Rotate the crankshaft until the piston reaches BDC (bottom dead center). Thread the piston stop into the spark plug hole until fully seated.

Before the removal or installation of any components, rotate the crankshaft in the direction of the item to be removed or installed until the piston contacts the stop. Use the proper tools to remove or install the desired part.

**Important note:** Do not use an air or electric powered impact wrench to assemble or disassemble components on any STIHL product. Doing so will shear the flywheel key and damage other components such as clutches and crankshafts.
To further assist in disassembly, a flywheel removal tool (part no. 1116 893 0800) is included in the tool kit.

After the the piston stop has been installed and the crankshaft blocked from movement, remove the flywheel nut. Thread the puller onto the crankshaft stub until contact with the flywheel is made, now unscrew the puller ½ to 1 full turn.

While holding the flywheel, use a suitable tool to tap the end of the puller to release the flywheel.

Specialty abrasive pads are included in the tool kit that greatly ease and reduce repair times for cleaning gasket surfaces, combustion chambers, valve seats, and exhaust ports on any small engine.

The abrasive pads work ideally with a small air powered right angle grinder. A standard drill motor can also be used although a drill is slower and requires a little more time to clean the components.

The 2" abrasive disk is ideal for quickly and easily cleaning away gasket sealant and cleaning gasket surfaces. It is important to use only light pressure when using this tool. If excessive down pressure is used, the abrasive disk will quickly wear and require replacement.

The abrasive cleaning pads and disks have several uses. Page 6 and 7 list some of the applications and part numbers of the various size pads and disks that are included in the tool kit.
### Abrasive Pads for STIHL (and other) Engines

- **5910 893 1100** Long Mandrel
- **5910 893 5603** ¾” Abrasive Pad - Medium Grit (blue)
- **5910 893 5602** 1” Abrasive Pad - Medium Grit (blue)

**Excellent for removing carbon deposits from cylinder heads and exhaust ports.**

- **5910 893 1100** Long Mandrel
- **5910 893 5607** ¾” Abrasive Pad – Extra Fine Grit (red)
- **5910 893 5604** 1” Abrasive Pad – Extra Fine Grit (red)

**Excellent for cleaning and polishing valve seats in small 4-cycle engines.**
A setting gauge (part no. 4118 890 6401) is included in the tool kit for setting the proper air gap between the ignition module and flywheel. The setting gauge can be used for all STIHL 4-Stroke engines.

To use the setting gauge, install the ignition module or, if the module is already in place, loosen mounting screws. Rotate the flywheel so the magnet poles are not interfering with the ignition module armature and insert the setting gauge.

Rotate the flywheel until the magnet poles are between the setting gauge and the ignition module armature legs. The magnets will draw the ignition module tight against the setting gauge. Tighten the mounting screws to the recommended torque and remove the setting gauge.
A 0.1 mm feeler gauge (part no. 4180 893 6400) is included in the tool kit. This gauge is used for setting the proper valve clearance on all STIHL 4-Stroke engines.

To set the valve clearance, rotate the crankshaft to TDC (top dead center) and verify that both valves are closed. There should be play or movement in both the intake and exhaust valve rocker arms.

Insert the feeler gauge between the rocker arm and valve stem. Use an 8 mm wrench or socket to tighten or loosen the adjusting nut on top of the rocker arm (see arrow) until the gauge is able to slide with some slight resistance between the valve stem and rocker arm.

The recommended valve clearance for all STIHL 4-Stroke engines is 0.1 mm to 0.3 mm (0.004” to 0.012”) when the engine is cold.

The tool kit also includes a lubricant that will assist in the assembly of rubber components such as intake manifolds, anti-vibration buffers, fuel hoses, and o-rings. The lubricant evaporates after assembly without leaving an oily residue.
**Summary:**

**STIHL Engine Repair Tool Kit components and part numbers:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>STIHL Engine Repair Tool Kit</td>
<td>5910 890 1700</td>
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<tr>
<td>Includes:</td>
<td></td>
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<tr>
<td>Leak Down Tester</td>
<td>5910 850 0300</td>
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<tr>
<td>Flywheel Blocking Tool</td>
<td>5910 890 8600</td>
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<tr>
<td>Piston Stop</td>
<td>4282 890 2700</td>
<td>Replaces 4180 890 3400</td>
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<td>Flywheel Puller</td>
<td>1116 893 0800</td>
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<tr>
<td>0.1 mm Feeler Gauge</td>
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<tr>
<td>Ignition Module Setting Gauge</td>
<td>4118 890 6401</td>
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<tr>
<td>Press Fluid Lubricant</td>
<td>0781 957 9000</td>
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<td>Engine De-Carbonizing Fluid</td>
<td>0781 313 8019</td>
<td>1 bottle per kit</td>
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<td>Mandrel for 2” Abrasive Disk</td>
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<td>Long Mandrel for Abrasive Pads</td>
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