Subject: Compression check

Affected engines: All engines of the following types:

L 1700
L 2000
L 2400

1. General hints

The value of the compression is the measure for the amount of the fuel-air mixture taken in by the carburetor (volumetric efficiency or fill factor) as well as for the evaluation of the condition of sealing parts, e.g. piston rings and valves. The uniformity of each pressure to the other is an evidence for the uniform output of the cylinder. A nonuniform output of the cylinder decreases the total efficiency of the engine considerably and at the same time increases its vibration environment.

The intake stroke (downward direction of piston) takes in a fuel-air mixture to the cylinder from the carburetor by means of the arising low pressure. Subsequently this fuel-air mixture is compressed. During this procedure the intake and exhaust pipe of the cylinder is firmly locked. The piston's direction upwards increases the pressure in the cylinder and reaches its highest value at the end of the stroke, which means at the upper dead center. The amount of the compression depends structurally on the compression ratio and on the engine temperature as well as on the position of the throttle valve of the carburetor.

2. Working process

Precondition for measuring: oil temperature of engine must at least be 50° C, the throttle of the carburetor must be fully opened.

1. Operate engine until working temperature is reached.
2. Stop engine, give time to cool down cylinder heads and unscrew all spark plugs as long as the engine is still lukewarm.
3. Put a new chart into the compression recorder and adjust the indicator to the initial value of the chart.

   Note: Use only charts which are adapted to the scale range of the compression recorder.
4. Tightly press rubber cone into the plug bore (do not damage the rubber cone).
5. Turn the engine with the starter until the indicator peaks (about 10 - 12 revolutions).

6. Unlock the recorder indicator needle - press the metal pin at the top of the rubber cone. The indicator returns to the initial position.
7. Transport the chart to cylinder 2. The indicator is now prepared for measuring the compression at the next cylinder. Repeat this procedure according to the number of cylinders.

3. Evaluation of test

The first stroke already must result in a strong travel of the indicator (good compression). Generally the compression value is between 8 and 12 bar. As long as the measurement values of the compression of the different cylinders are the same or show only a slight difference the sealing parts (pistons with piston rings and valves) are in good condition. The maximum pressure difference of the cylinders may not exceed 2 bar. If the chart shows larger differences, the measurement values generally indicate wear of the pistons or a damage of the above mentioned parts.

Repeat process for all cylinders to locate which parts are worn out. In advance spray some oil through the plug bores into the cylinders. The oil has the effect of a sealing at the cylinder walls and should therefore totally moisten the walls.

If the result of this test is the same, one or both valves are faulty. If a good result is achieved, you may assume that the cylinder(s) are defect. If the measurement values are only slightly higher than those of the last test, you can assume that both, rings and valves, are defective. New engines only reach a normal compression after finishing the run-in period.

If the compression is only sporadically low an immediate repair is not always necessary. In this case regularly measure the values in shorter periods. If the result becomes poor in course of time, an overhaul of the engine is necessary. Possibly leaky valves are due to residues at the valve seats. Residues e.g. build up if the carburetor's adjustment is overrich, if the engine speed is too low, in winter and when the ignition is not correctly adjusted. A check of the ignition system and a flight over a long route often eliminates this fault by self-cleaning. Without self-cleaning the valves become defective in the course of time.

Notice: This document has been translated to the best of our knowledge. In case of doubt, however, only the German original shall be considered as authoritative.