

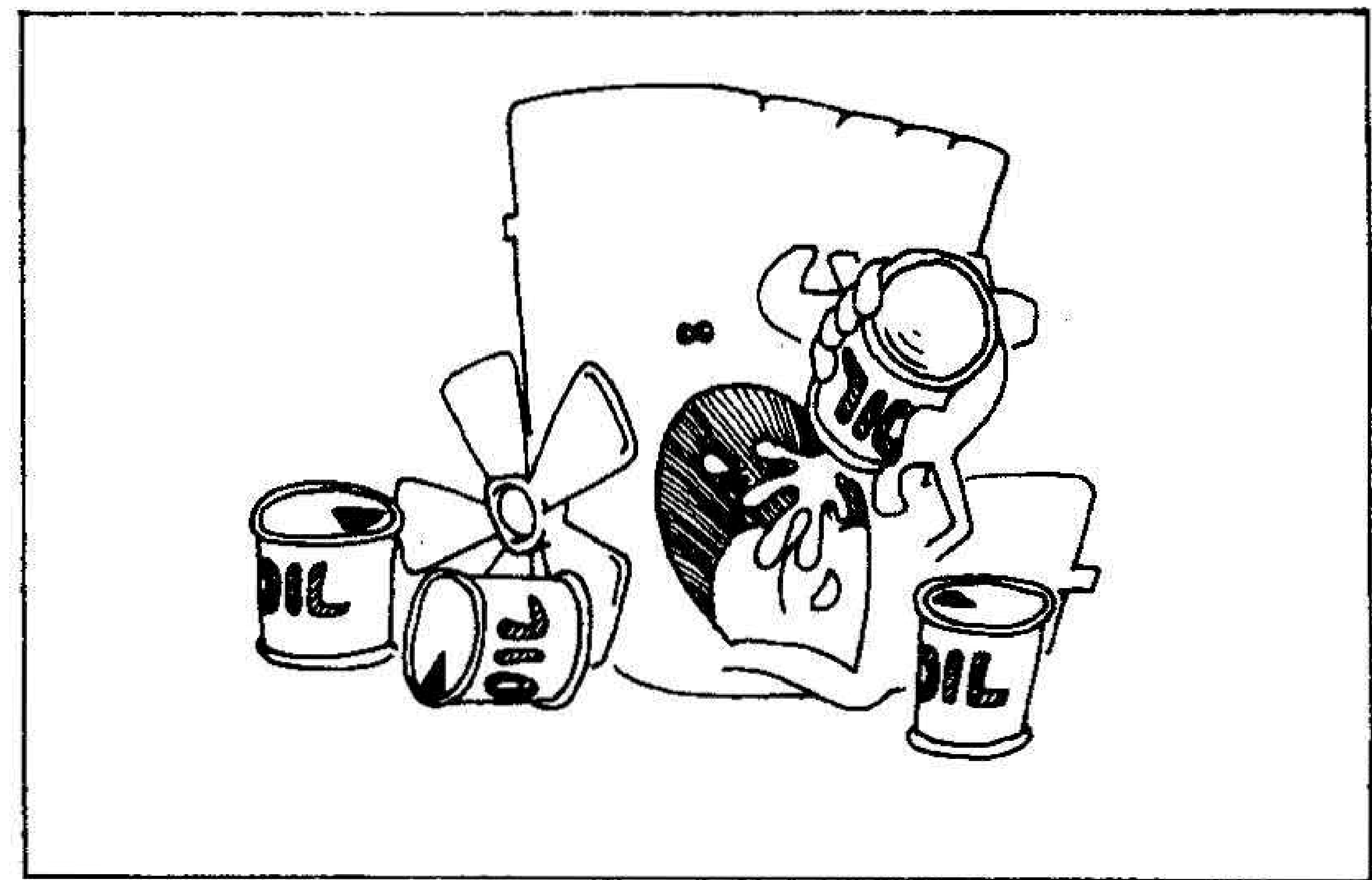
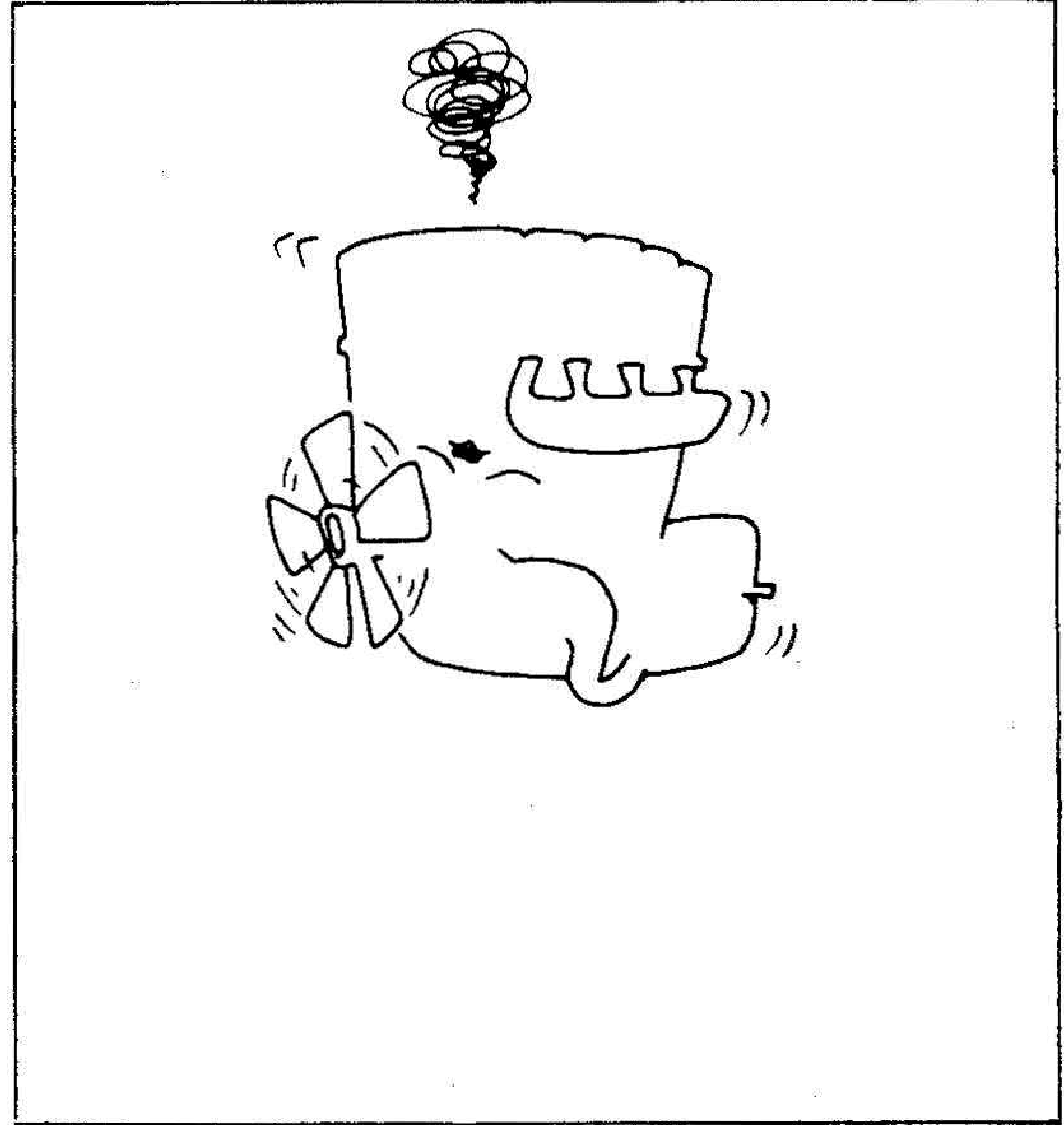
4-1 DETERMINING TIME TO OVERHAUL

When determining a time to overhaul the engine, first check for a low compression pressure. If increased blow-by gases as well as low compression pressure are evident, it is safe to consider that the engine needs overhauling.

A low output, a radical increase in engine oil consumption, an increase in fuel consumption, low oil pressure, hard starting, etc. could be symptoms suggesting the need for overhauling the engine, but these are often due to effects of other causes and do not necessarily mean a time to overhaul the engine.

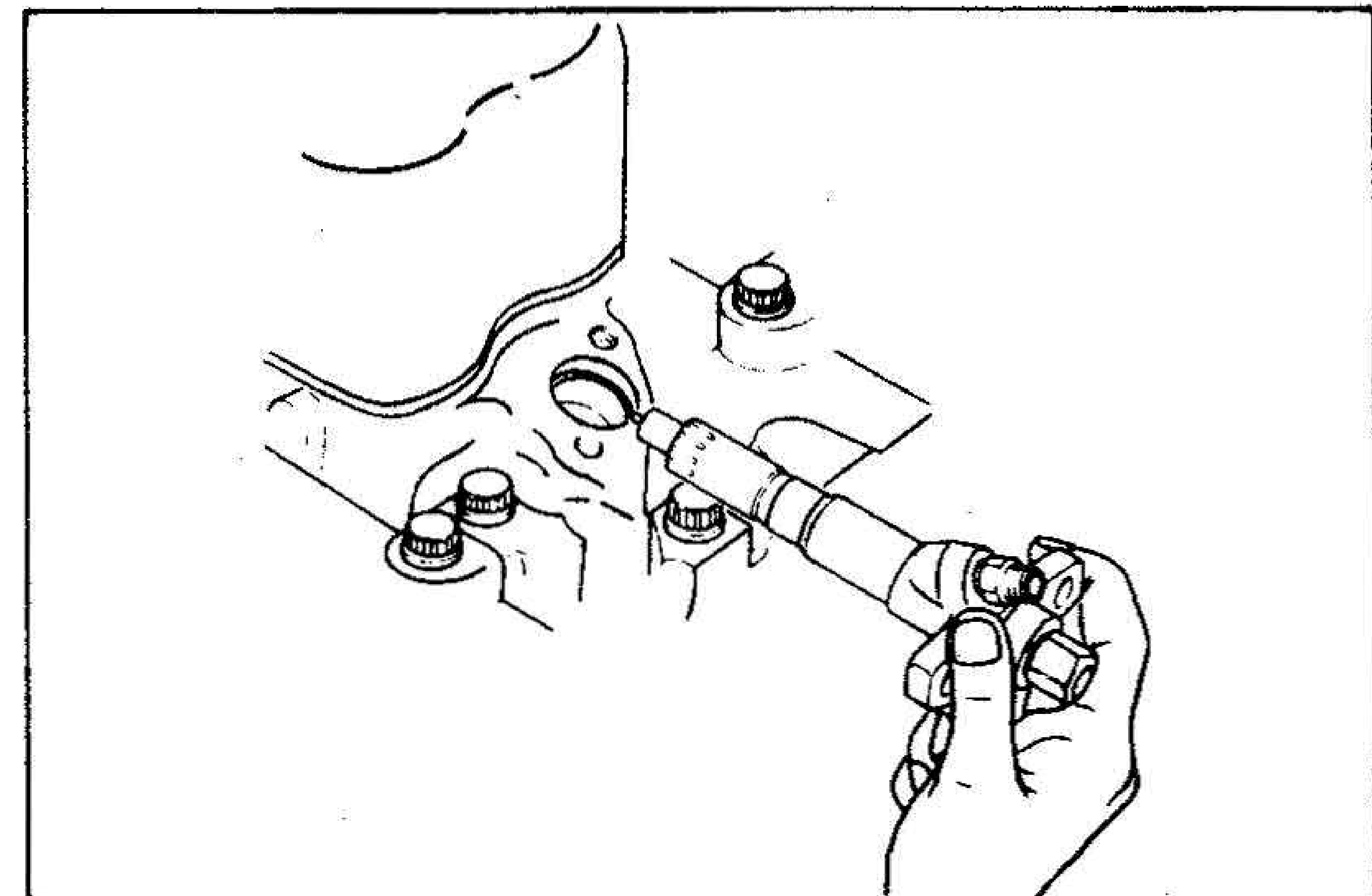
NOTE : 1. Measure the compression pressure at regular intervals and keep records of its changes.

2. When the engine is new or when parts are replaced, the compression pressure slightly rises due to inadequate seating of the piston rings, valve seats, etc. but will soon fall as the parts are worn down.



4-1-1 Measurement of Compressor Pressure

- (1) Allow the engine to warm up until the engine coolant temperature reaches 75 to 85°C.
- (2) Remove all injection nozzles from the cylinder head.



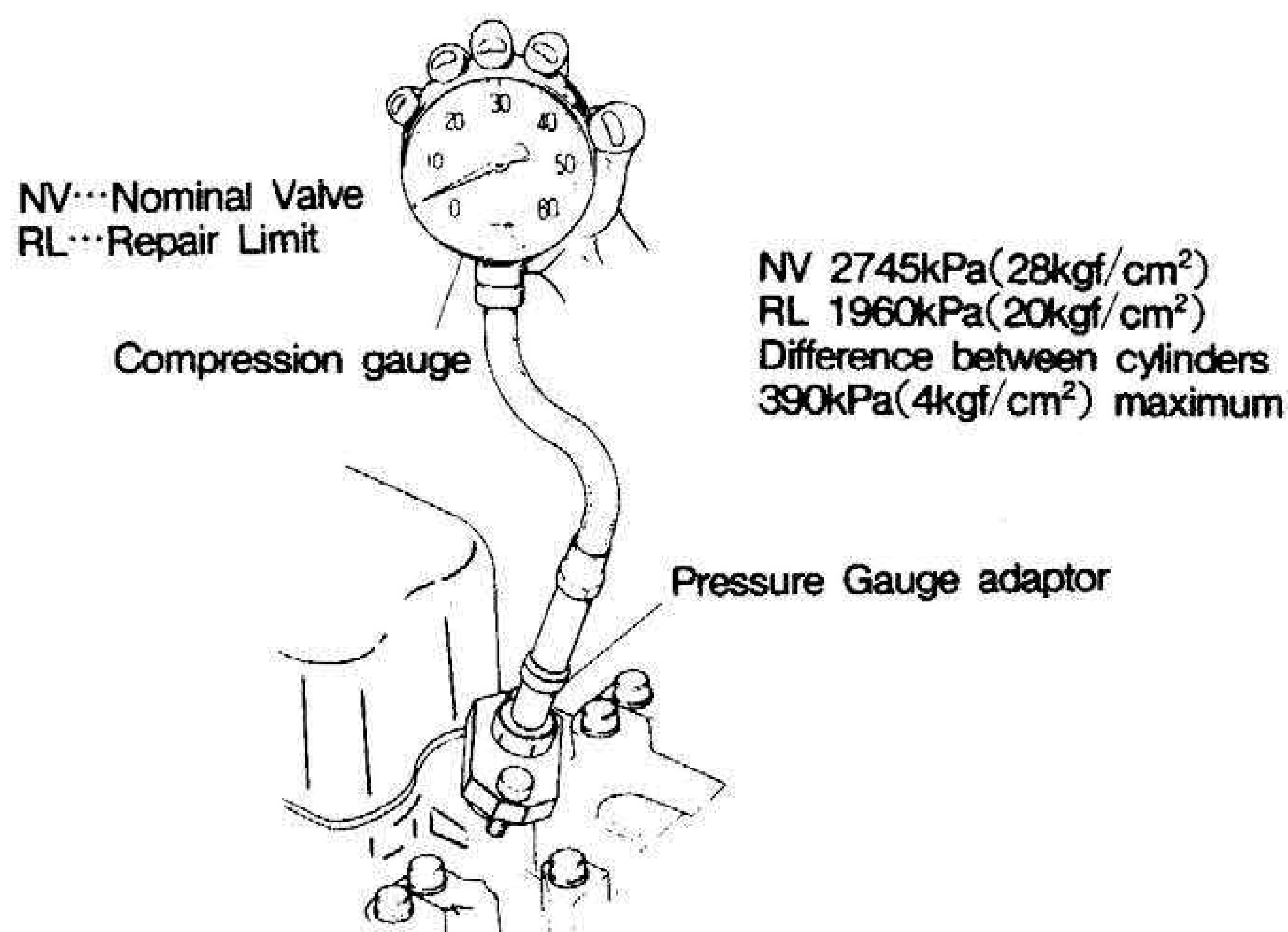
NOTE : Put a cover on the injection nozzle mounting holes and injection pipes to prevent entry of dust and dirt.

- (3) Install a special tool(the Pressure Gauge Adaptor) to the injection nozzle mounting hole together with the gasket and connect a measuring instrument(the Compression Gauge).
- (4) Operate the starter to rotate the engine and read the pointer of the compression gauge when the engine speed is 200 rpm.
- (5) If the reading is below the repair limit, disassemble and check.

NOTE : 1. Since the compression pressure varies with the engine speed, make sure that the engine speed is measured at the same time.

2. Since the wear and other conditions differ from cylinder to cylinder, be sure to measure all the cylinders.

Measuring one cylinder and estimating the rest could result in a wrong decision.

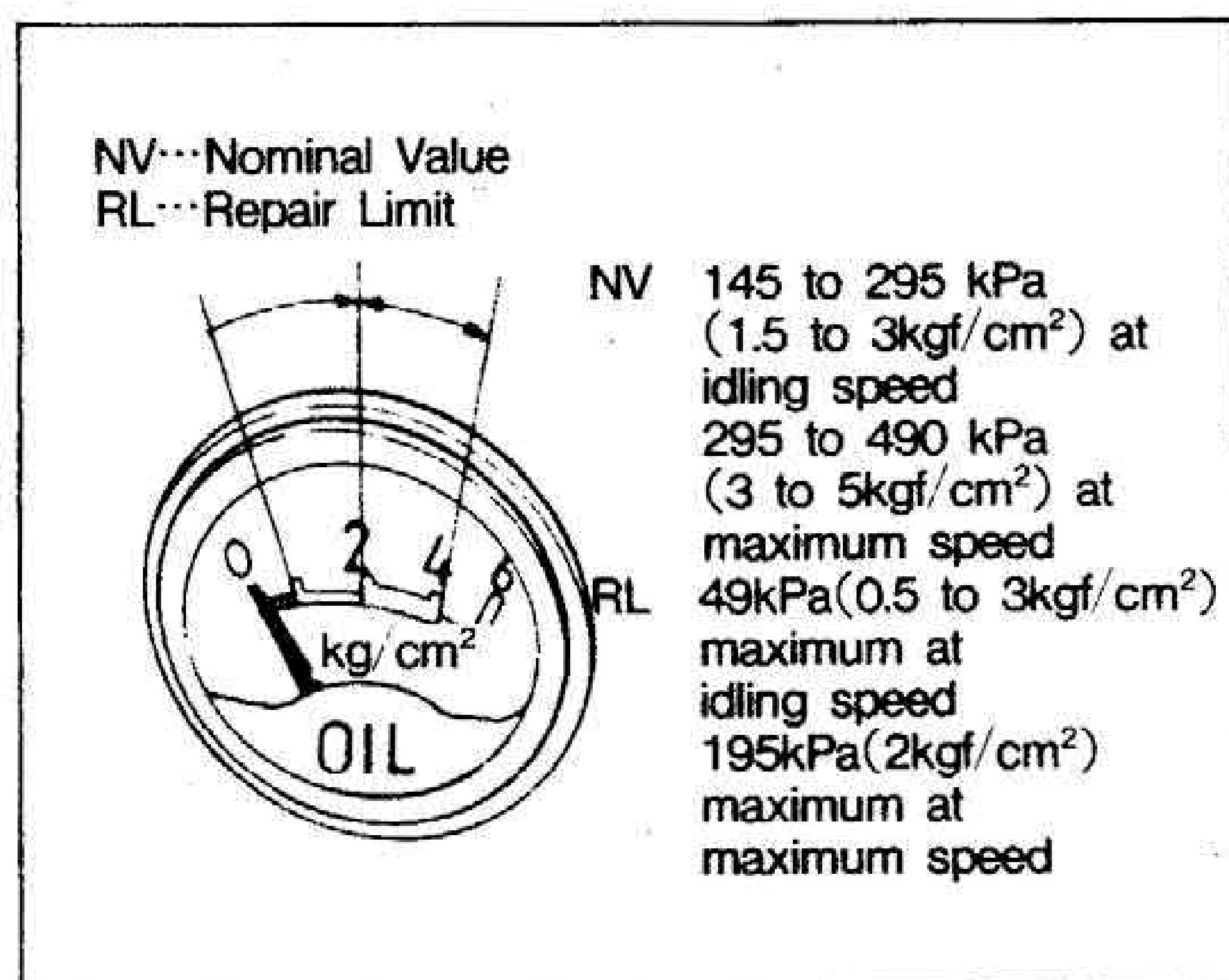


4-1-2 Engine Oil Consumption

The engine oil consumption could increase, depending on the operating condition. engine oil quality, oil leakage, etc. Check the compression pressure as well as the oil consumption from the overall point of view before making a decision.

4-1-3 Low Oil Pressure

- (1) Allow the engine to warm up until the oil temperature reaches 70 to 90°C
- (2) Measure oil pressures at idling and maximum speeds. If the readings are below the repair limit, overhaul the lubrication system.



4-2 TROUBLESHOOTING

The symptoms and causes shown in this paragraph are typical examples. In actual operations, locate the causes according to the symptoms.

4-2-1 Engine

