

**Engine assembling special tools**

**Objective:** At the end of this lesson you shall be able to

- use of special tools.

**Engine assembling**

Place the crankshaft in position on the crankcase and use of the following special tools for assembling the engine parts.

<b>Engine Assembling</b>	<b>Special Tools</b>
1. Refitting of liner	Hydraulic press
2 Bearing oil - clearance check	Plastic gauge
<b>3 Piston assembly</b>	
(a) piston clearance	Feeler gauge
(b) Piston pin assembling	Copper Drift, circlip plier
(c) Piston ring removing and refitting	Piston ring expander
(d) Piston ring groove cleaning	Piston ring groover cleaning tool
4 Inserting of piston into cylinder block	Piston ring compressor
<b>5 Connecting rod</b>	Connecting rod alignment fixture
<b>6 Crankshaft checking</b>	Crankshaft balancer , Dial gauge, Feeler gauge, Out side micrometer.
<b>7 Cylinder bore ovality and taper</b>	Bore dial gauge
<b>8 Connecting rod bearing diameter</b>	Telescopic gauge

<b>Cylinder Head</b>	<b>Special Tools</b>
Valve assembly	Valve spring compressor
Valve measurement	Vernier caliper, bevel protractor, valve guide gauge
Valve Reconditioning	Valve refacing m/c (machine)
Valve seat reconditing	Valve seat grinding m/c , valve seat cutter
Valve spring	Valve spring tester
Valve leakage checking	Valve leakage Tester
Fly wheel	Surface plate
Warpage checking	Straight edge, Feeler gauge
Cylinder block crack	Ultrasonic tester , magnetic particle inspection test
Cylinder head	Torque wrench
Cylinder compression test	Compression gauge
Cylinder vacuum test	Vacuum gauge