

## D. Fitting Pistons, Together with Rings, into Cylinders

In Model 190 "full-skirt autothermic" pistons (so-called slipper pistons with extended skirts) are fitted (Fig. 03 — 5/12).

**The piston play is 0.04 mm.**

The piston size is punched on the head of the piston. The piston must be selected so as to correspond with the diameter of the cylinder, allowing a running clearance of 0.04 mm. The pistons are therefore available in three gradings — within the overhaul stages — in steps of 0.01 mm.

If, when carrying out repairs, only pistons of one particular overhaul stage dimension are available, hone the cylinder wall surfaces to match the pistons available.

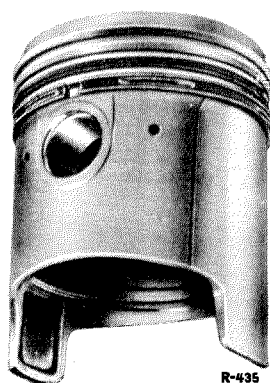


Fig. 03 — 5/12

### Pistons Available

Overhaul stage	Piston diameter in mm
Standard size	84.96
	84.97
	84.98
Intermediate stage	85.21
	85.22
	85.23
1st Overhaul stage	85.46
	85.47
	85.48
2nd Overhaul stage	85.96
	85.97
	85.98
3rd Overhaul stage	86.46
	86.47
	86.48

Each piston is slightly tapered. The diameter is greatest at the bottom, at the skirt end (piston skirt). The cross-section at this point is not a perfect circle but an ellipse, the axis A being smaller than the axis B (Fig. 03 — 5/13).

The diameter of the piston is measured at the lowest part of the skirt end in the direction B. This dimension is identical with the size punched on the head of the cylinder.

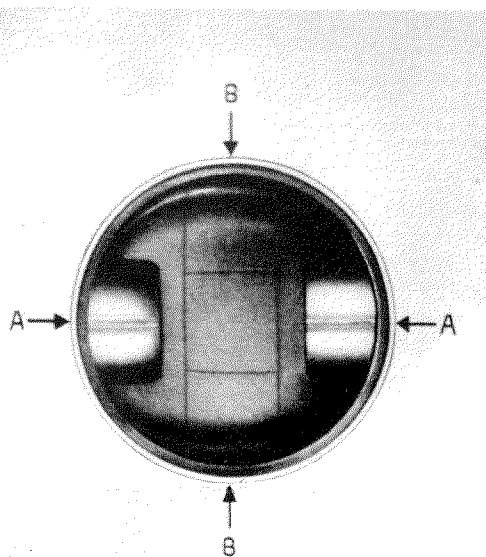


Fig. 03 — 5/13

When selecting the pistons, care must also be taken to ensure that the difference in weight between the pistons in any one engine does not exceed 4 g.

A check must be made to ensure that the piston rings are inserted in the correct sequence (Fig. 03 — 5/14).

1. Compression ring 10f85×77.6×2
2. Tapered compression ring 11f85×77.6×2.5
3. Novi stepped ring 85×3 T 16 Nova
4. Novi slotted ring 85×5 T 17 Nova

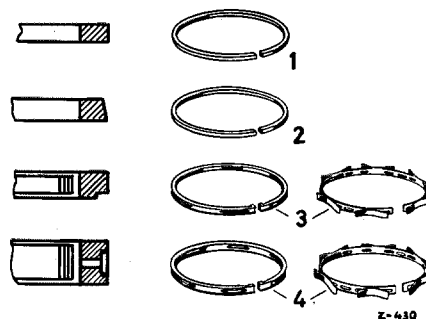


Fig. 03 — 5/14

When installing the Novi stepped ring and the Novi slotted ring, the corresponding expander must be fitted so that the gap of the expander is at the side opposite the gap of the piston ring in each case.

It is normally unnecessary to check piston ring gap and groove clearance because the piston is supplied together with piston rings and piston pin ready for installation.

For the exceptional case, where piston rings are ordered and have to be fitted individually, the permissible vertical and gap clearances are given in the following list.

#### Piston Ring Clearances in mm

	Vertical clearance	Gap clearance
1. Compression ring	0.035—0.062	0.55—0.70
2. Tapered compression ring	0.035—0.062	0.45—0.60
3. Novi stepped ring	0.035—0.062	0.30—0.45
4. Novi slotted ring	0.035—0.062	0.25—0.40

The vertical play of the piston rings in the ring grooves is measured with a feeler gage (Fig. 03—5/15).

When measuring gap clearance, the piston rings must be placed in the bore about 40—50 mm below the upper separating surface of the

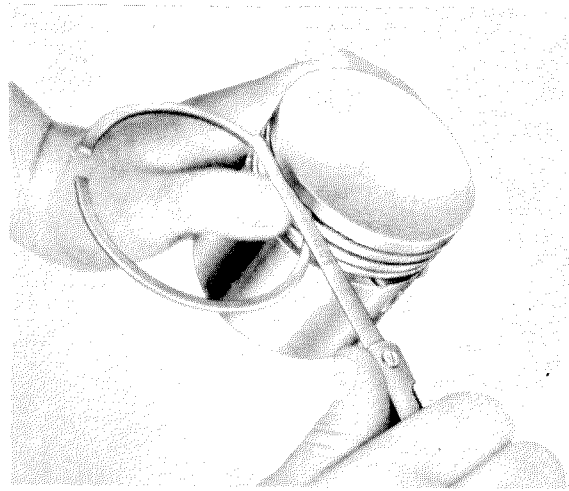


Fig. 03—5/15

crankcase. Make sure that when measurements are taken, the rings are exactly at right angles to the cylinder wall (Fig. 03—5/16).

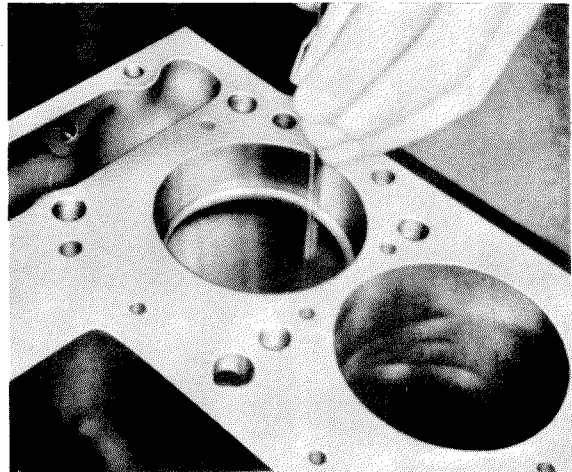


Fig. 03—5/16