

PISTONS AND CONNECTING RODS

To Remove Pistons and Connecting Rods

1. Remove cylinder head.
2. Drain lubricating oil and remove the sump (oil pan).
3. Remove carbon deposits from the top of the cylinder bore.
4. Turn the crankshaft until the relevant crank-pin is towards the bottom of the engine, release the big-end securing setscrews and remove the big-end cap.
5. Remove the piston and connecting rod through the top of the cylinder bore.

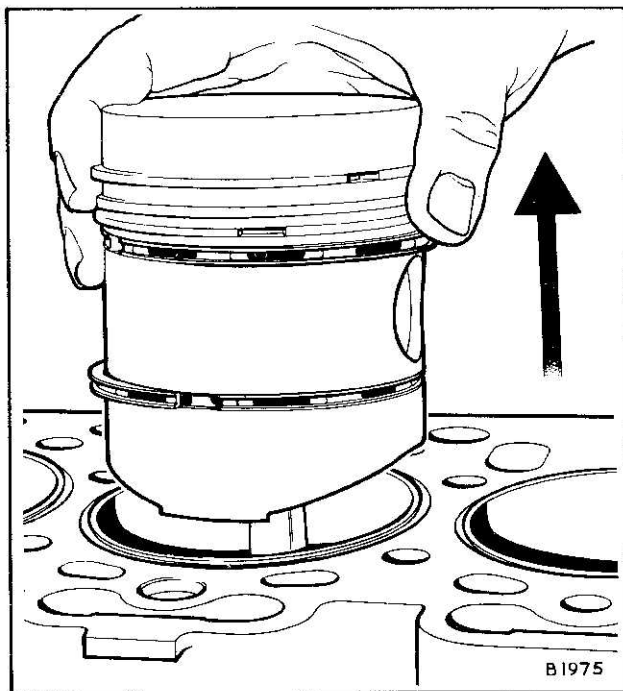


Fig. 1

7. Each connecting rod and cap is marked with a serial number, Fig. 3. The connecting rod only is also marked with its relevant cylinder number, on the opposite side to the serial number.

Mark the top of the piston with its cylinder number and keep the piston, connecting rod, cap and bearings together as an assembly.

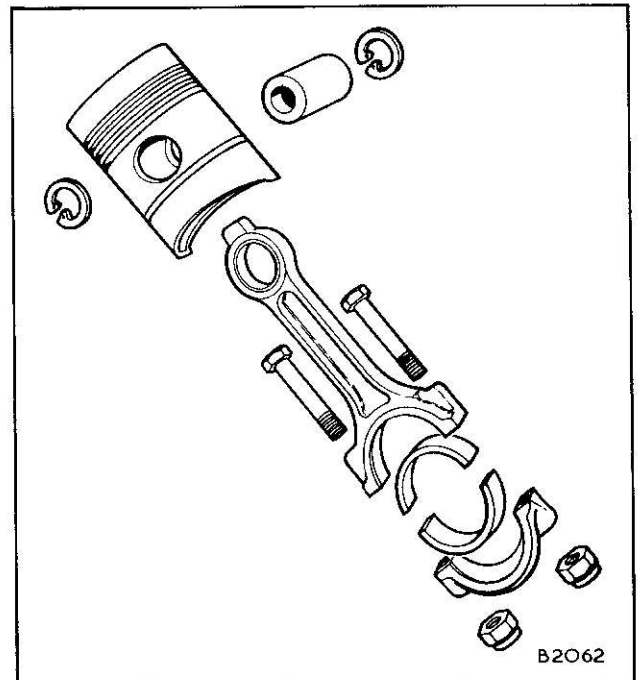


Fig. 2

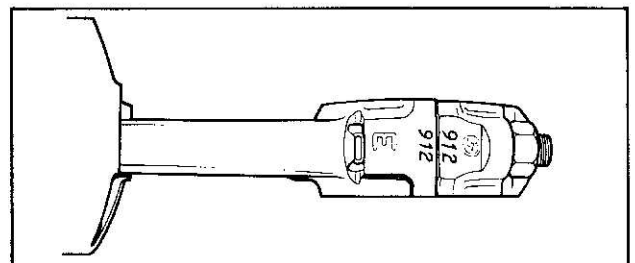


Fig. 3

6. Remove the piston rings taking care not to score the sides of the piston and disconnect the piston from the connecting rod.

If the gudgeon pin cannot be easily pushed out, heat the piston in a liquid to 40-50°C (100-120°F) to facilitate removal.

Pistons and Connecting Rods**Piston and Connecting Rod Inspection**

1. Check piston for scoring or other damage and check ring groove clearance with a feeler gauge, Fig. 4.

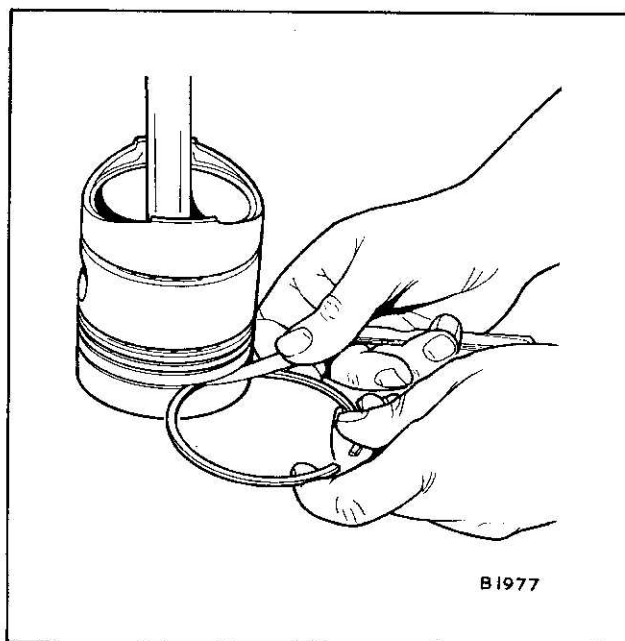
If the clearances exceed those given in 'Data', when a new ring is used for measuring, then renew the piston.

2. Check the piston ring end gap in an unworn part of the cylinder liner, Fig. 5.

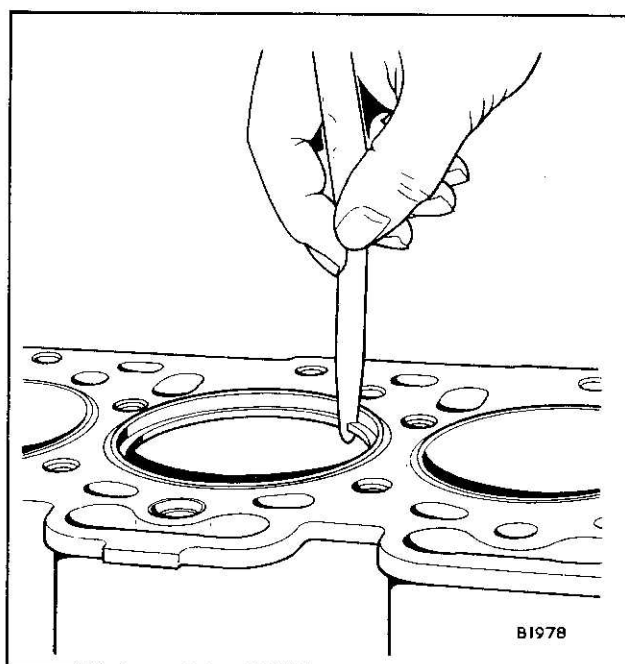
If the limits given in 'Data' are exceeded, replace the piston rings.

3. Check piston pin and small end bush for wear. Renew the piston and pin and connecting rod bush if the wear exceeds that indicated in 'Data'.

4. Check the connecting rod alignment to the limits given in 'Data'.

**Fig. 4****To Renew Small End Bush**

1. Using a suitable adaptor, press out the old bush.
2. Remove any sharp edges from around the small end parent bore.
3. Press in the new bush ensuring that the oil hole aligns with the hole in the top of the connecting rod.
4. Ream out the bush and check for parallelism, see 'Data'.

**Fig. 5**

Pistons and Connecting Rods**To Assemble Piston and Connecting Rod**

Inside the piston skirt will be seen a letter 'F' cast into the inside wall of the piston. The letter 'F' may also be seen stamped on the top or crown of of the piston, Fig. 6.

Referring to paragraph 7 on page 1, and the serial number on the connecting rod and cap, this serial number must be on the fuel pump side of the engine when rod and piston are fitted.

1. Position one of the piston pin retaining circlips in its recess in the piston.
2. Heat the piston in a liquid to 40-50°C (100-120°F) and fit the piston pin into position in the piston and connecting rod small end.
3. Fit the remaining piston pin circlip.

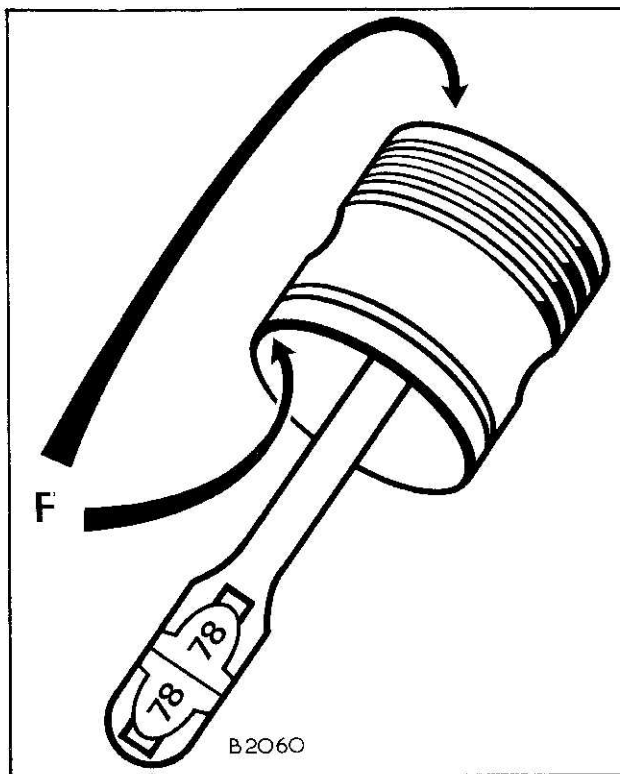


Fig. 6

To Refit Pistons and Connecting Rods

1. Fit the piston rings to the pistons, Fig. 7. Where the rings are marked 'T' or 'TOP', ensure these marks are towards the top of the piston.

The piston ring gaps should be equally spaced around the piston.

2. Fit the half bearing shell into the connecting rod and lubricate the assembly with clean new engine oil.
3. Turn the relevant crankpin towards the bottom of the engine. Insert the piston assembly into the cylinder bore using a piston ring squeezer, ensuring that the 'F' mark on the piston (see above) is towards the front of the engine. When the assembly is fitted, the cylinder number on the connecting rod should be on the camshaft side of the engine, Fig. 8.

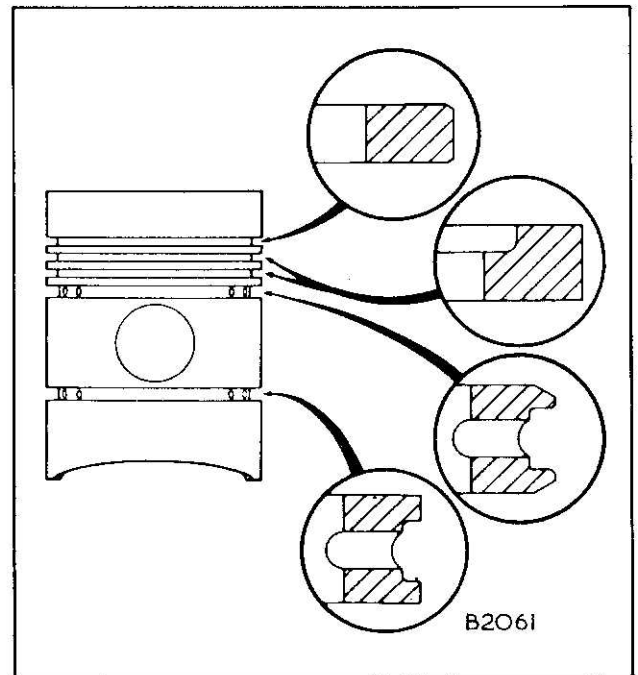


Fig. 7

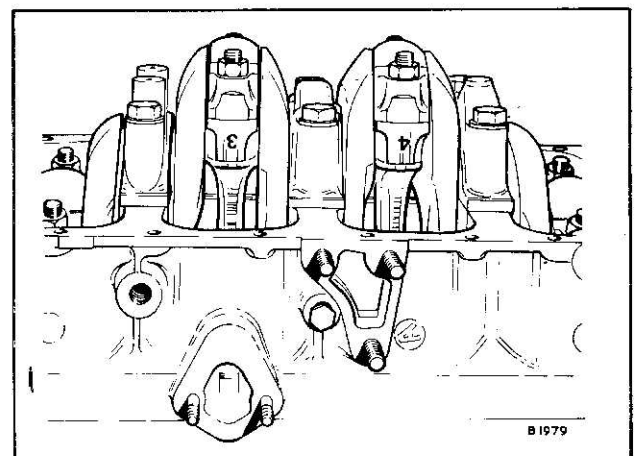
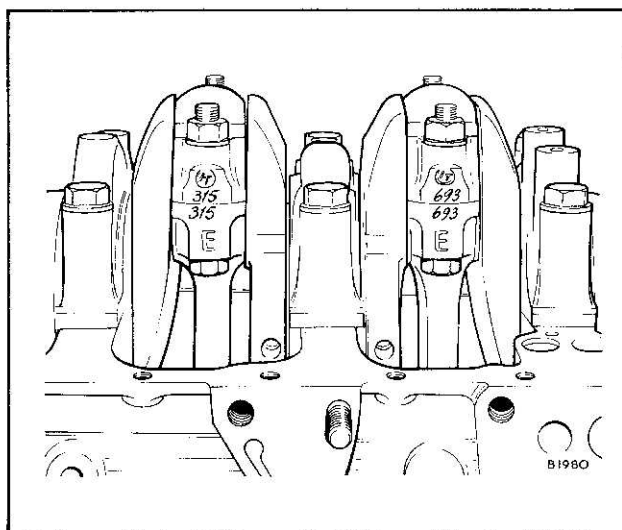


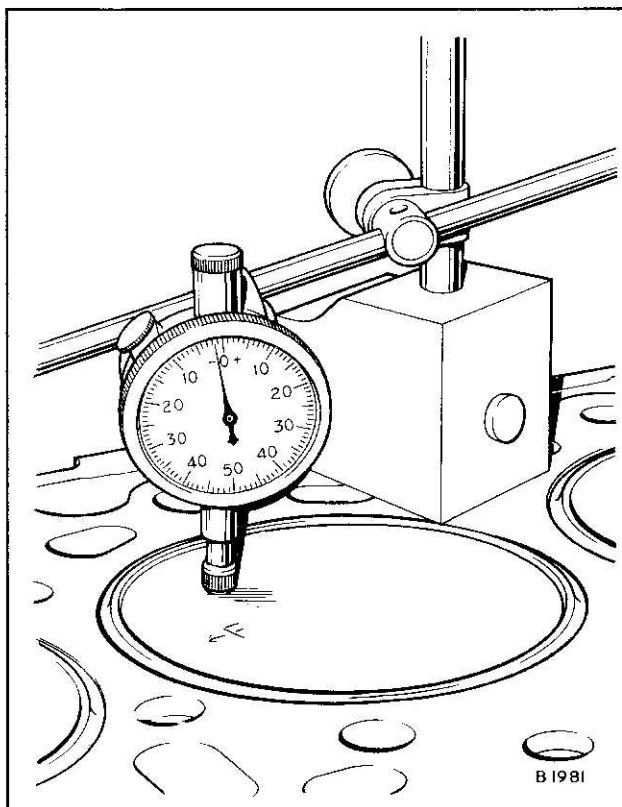
Fig. 8

Pistons and Connecting Rods**To Refit Pistons and Connecting Rods
(continued)**

4. Lubricate the relevant crankpin and big end cap with the half bearing in position. Pull the connecting rod to the crankpin and fit the cap with the serial number on the rod and cap coinciding, Fig. 9.
5. Check the connecting rod side clearance. See 'Data' for the tolerance.

**Fig. 9**

6. With the piston at Top Dead Centre, check the piston height in relation to the cylinder block top face, Fig. 10. See 'Data' for the tolerance.
7. Refit the cylinder head.
8. Refit the lubricating oil sump and fill with the approved oil to the correct level.

**Fig. 10**