

## CYLINDER HEAD (Turbo Charged Engines)

The cylinder head is different in that it has valve seat inserts on the inlet and exhaust valves, also a "Scallop" machined between the two valves.

## VALVES AND SPRINGS

The valves, which have 30° seats, are mounted vertically in the cylinder head, the inlet valve head diameter being larger than the exhausts. Their respective diameters are 45.24 mm. (1.78 in.) and 38.89 mm. (1.53 in.) and both valves have stems which are phosphate coated to improve durability. The relative positions of the valves are inlets Nos. 2, 3, 6 and 7 (4-cylinder) and 2, 4, 5, 8, 9 and 11 (6-cylinder) and exhausts Nos. 1, 4, 5 and 8 (4-cylinder), and 1, 3, 6, 7, 10 and 12 (6-cylinder).

Identical valve springs are fitted to both valves and are close-coiled at one end. When fitting these springs ensure that the close coiled end is located in the pressed steel seat located around the valve guide. The inlet valve spring is retained by a hardened steel retainer and split tapered collets, while the exhaust has a hardened steel retainer with parallel collets, as the exhaust valve is of the rotator type. With this type of valve a small cap is fitted over the valve stem to locate in the retainer on top of the collets. Rocker arm pressure is then transmitted directly to the retainer and valve spring and, as there is a small clearance between the cap and the valve stem, the valve is free to rotate when open.

**NOTE:** Some exhaust valves on automotive engines do not have rotator caps and have the tapered collets.

Rotator cap clearance is 0.025 to 0.127 mm. (0.001 to 0.005 in.) and it is very important that this is maintained at all times. Insufficient clearance will prevent the valve rotating when open which will eventually result in the valves and valve seats burning. If the clearance is excessive, the valve will hammer on the collets and lead to excessive wear and possible valve failure.

The use of rotator caps has been discontinued for current production engines. If it is necessary to replace exhaust valve/s fitted with rotator caps, only the latest level of exhaust valve/s must be fitted, e.g. without rotator caps. The valves can be replaced in complete sets or individually. When the latest valve/s is fitted, the valve gap is to be set to 0.381 mm (0.015 in.).

The inlet valve level has also been amended, current engines are now fitted with the same valve as used in the turbocharged engine. These valves can be identified by the letter 'T' stamped on the valve head.

Valve stem caps are fitted to the inlet valve to reduce wear on the rocker arm pads and valve stems. Each valve stem is fitted with an umbrella type seal below the valve spring retainer.

The valves may be re-ground if the face is unduly pitted or distorted providing the edge thickness is not reduced to 0.79 mm. (0.008 in.) or less. Hand lapping may be used but should be kept to a minimum or the angles may be altered and the seat width become too wide. A seat width of 1.59 mm. (0.063 in.) to 2.38 mm. (0.016 in.) is acceptable.

## ROCKER SHAFT ASSEMBLY

The rocker arms, which are handed and fitted with self locking screws, are located on the rocker shaft between supports, each pair of rockers being spaced by a compression spring. The rocker shaft supports are retained on the cylinder head by bolts fitted with spring washers. (Fig. 7).

A two piece hollow rocker shaft is used on 6-cylinder engines, one piece on 4 cylinder engines, and is located in the correct position by bolts through the intermediate supports either side of the central support. The extreme ends of the rocker shafts are sealed with expansion plugs and as these do not retain the end supports it is advisable to attach a piece of cord between them, when removing the rocker shaft assembly, to prevent accidental disassembly.

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