11 Cylinder block/crankcase - cleaning and inspection

Cleaning

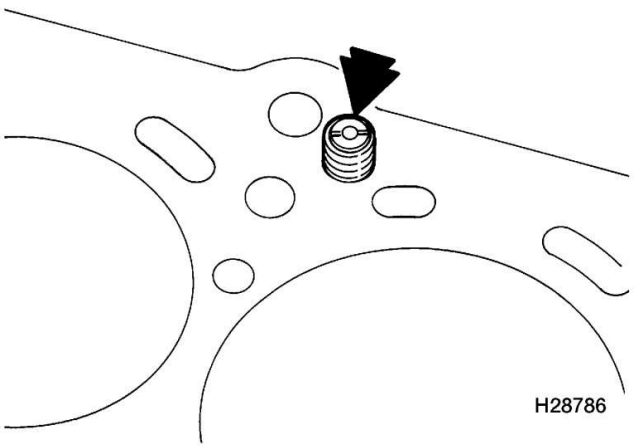
1 Remove all external components and electrical switches/sensors from the block. For complete cleaning, the core plugs should ideally be removed. To remove the core plugs, carefully drive one side of the core plug into the block with a hammer and punch. Grasp the protruding edge with a large pair of adjustable pliers and pull the core plug from the block.

2 Where applicable, pull the piston oil jet spray tubes from the bearing locations in the cylinder block. The tubes are fitted to No. 2 to 5 bearing locations on four-cylinder engines, and No. 2 to 7 bearing locations on six-cylinder engines **(see illustration)** .

11.2 Remove the piston oil spray jet tubes from the main bearing locations

3 On four-cylinder engines, where applicable, remove the oil pressure check valve from the top face of the cylinder block. A screw-in type check valve may be fitted, or on later engines, a calibrated jet may be fitted, with a rubber-lined spacer sleeve above **(see illustrations)** .

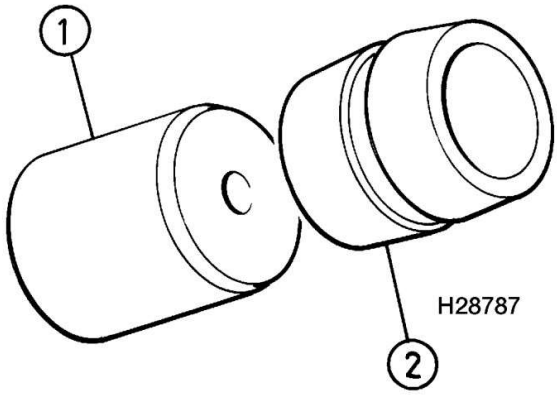
11.3a Oil pressure check valve location in cylinder block - early four-cylinder engines



11.3b Oil pressure calibrated jet components - later four-cylinder engines

1 Jet

2 Spacing sleeve



4 Scrape all traces of gasket from the cylinder block/ crankcase, taking care not to damage the gasket/sealing surfaces.

5 Remove all oil gallery plugs (where fitted). The plugs are usually very tight - they may have to be drilled out, and the holes re-tapped. Use new plugs when the engine is reassembled.

6 If any of the castings are extremely dirty, all should be steam-cleaned.

7 After the castings are returned, clean all oil holes and oil galleries one more time. Flush all internal passages with warm water until the water runs clear. Dry thoroughly, and apply a light film of oil to all mating surfaces, to prevent rusting. Also oil the cylinder bores. If you have access to compressed air, use it to speed up the drying process, and to blow out all the oil holes and galleries. **Warning:** *Wear eye protection when using compressed air!*

8 If the castings are not very dirty, you can do an adequate cleaning job with hot, soapy water and a stiff brush. Take plenty of time, and do a thorough job. Regardless of the cleaning method used, be sure to clean all oil holes and galleries very thoroughly, and to dry all components well. Protect the cylinder bores as described above, to prevent rusting.

9 All threaded holes must be clean, to ensure accurate torque readings during reassembly. To clean the threads, run the correct-size tap into each of the holes to remove rust, corrosion, thread sealant or sludge, and to restore

damaged threads **(see illustration)** . If possible, use compressed air to clear the holes of debris produced by this operation. **Note:** *A good alternative is to inject aerosol-applied water-dispersing lubricant into each hole, using the long spout usually supplied.* **Warning:** *Wear eye protection when cleaning out these holes in this way!*

11.9 Cleaning a cylinder block threaded hole using a tap

10 Ensure that all threaded holes in the cylinder block are dry.

11 After coating the mating surfaces of the new core plugs with suitable sealant, fit them to the cylinder block. Make sure that they are driven in straight and seated correctly, or leakage could result. A large socket with an outside diameter which will just fit into the core plug can be used to drive core plugs into position.

12 Apply suitable sealant to the new oil gallery plugs, and insert them into the holes in the block. Tighten them securely.

13 Where applicable, thoroughly clean the oil pressure check valve/calibrated jet (see Paragraph 3), then install the components as follows.

14 If a screw-in type check valve is fitted, check that the valve can be blown through from bottom-to-top, but not from top-to-bottom. Thoroughly clean the valve, and where applicable, fit a new O-ring, then install the valve and tighten securely.

15 If a calibrated jet is fitted, install the jet, ensuring that it is fitted the correct way up, with the stepped collar at the bottom, then install the spacer sleeve. **Warning:** *If the calibrated jet is fitted incorrectly, it may starve the oil supply to the cylinder head* .

16 Where applicable, thoroughly clean the piston oil spray tubes which fit in the bearing locations in the cylinder block, then install the tubes **(see illustration)** .

11.16 Clean the holes (arrow) in the oil spray tubes

17 If the engine is not going to be reassembled right away, cover it with a large plastic bag to keep it clean; protect all mating surfaces and the cylinder bores as described above, to prevent rusting.

Inspection

18 Visually check the castings for cracks and corrosion. Look for stripped threads in the threaded holes. If there has been any history of internal water leakage, it may be worthwhile having an engine overhaul specialist check the cylinder block/ crankcase with special equipment. If defects are found, have them repaired if possible, or replace the assembly.

19 Check each cylinder bore for scuffing and scoring. Check for signs of a wear ridge at the top of the cylinder, indicating that the bore is excessively worn.

20 If the necessary measuring equipment is available, measure the bore diameter of each cylinder at the top (just under the wear ridge), center, and bottom of the cylinder bore, parallel to the crankshaft axis.

21 Next, measure the bore diameter at the same three locations, at right-angles to the crankshaft axis. Compare the results with the figures given in the Specifications. If there is any doubt about the condition of the cylinder bores, seek the advice of a BMW dealer or suitable engine reconditioning specialist.

22 If the cylinder bore wear exceeds the permitted tolerances, or if the cylinder walls are badly scored or scuffed, then the cylinders will have to be rebored by a suitably-qualified specialist, and new oversize pistons will have to be fitted. A BMW dealer or automotive machine shop will normally be able to supply suitable oversize pistons when carrying out the reboring work.