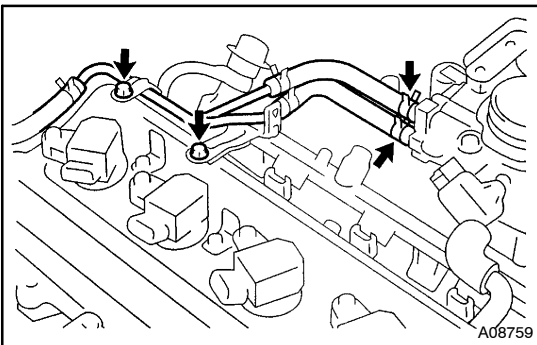


REMOVAL

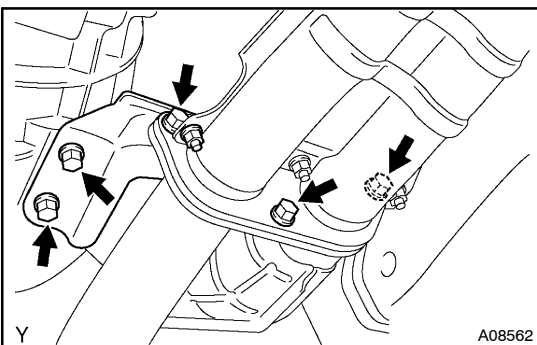
NOTICE:

Do not remove or install the camshaft timing gear (VVT-i) beside changing the camshaft timing gear (VVT-i) or camshaft.

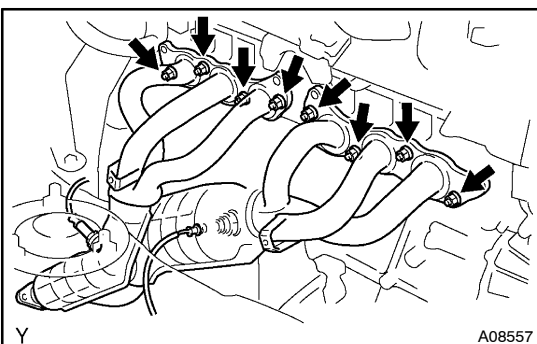
1. REMOVE NO.1 ENGINE UNDER COVER
2. DRAIN ENGINE COOLANT
3. REMOVE AIR CLEANER INLET
4. REMOVE AIR CLEANER ASSEMBLY
5. REMOVE NO.3 CYLINDER HEAD COVER
6. REMOVE ALTERNATOR (See page CH-6)
7. REMOVE PCV HOSE
8. REMOVE NO.2 CYLINDER HEAD COVER
9. DISCONNECT ENGINE WIRE FROM CYLINDER HEAD
10. REMOVE IGNITION COILS (See page IG-6)
11. REMOVE SPARK PLUGS (See page IG-1)



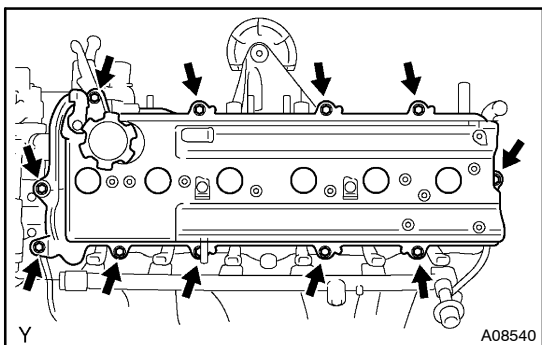
12. REMOVE NO.3 WATER BYPASS PIPE
 - (a) Disconnect the 4 water bypass hoses.
 - (b) Remove the 2 bolts and water bypass pipe.
13. DISCONNECT HEATER HOSE FROM CYLINDER HEAD REAR PLATE
14. M/T:
REMOVE CYLINDER HEAD REAR PLATE
Remove the bolt, 2 nuts, rear plate and gasket.



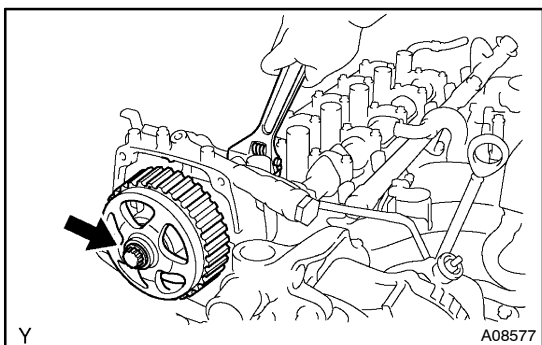
15. REMOVE EXHAUST MANIFOLD
 - (a) Remove the 3 bolts, retainer and nut holding the front exhaust manifold to the front exhaust pipe.
 - (b) Remove the 2 bolts and exhaust manifold stay.
 - (c) Remove the 6 bolts and 2 heat insulators.
 - (d) Disconnect the 2 oxygen sensor connectors.



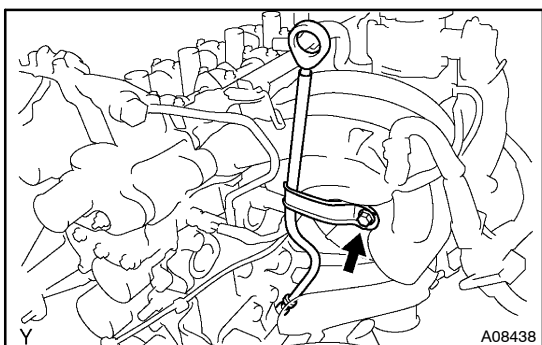
- (e) Remove the 8 nuts, exhaust manifold and 2 gaskets.
16. RHD:
REMOVE STEERING SLIDING YOKE
(See page SR-12)
17. REMOVE TIMING BELT (See page EM-20)
18. REMOVE AIR CLEANER INLET DUCT BRACKET

**19. REMOVE CYLINDER HEAD COVER**

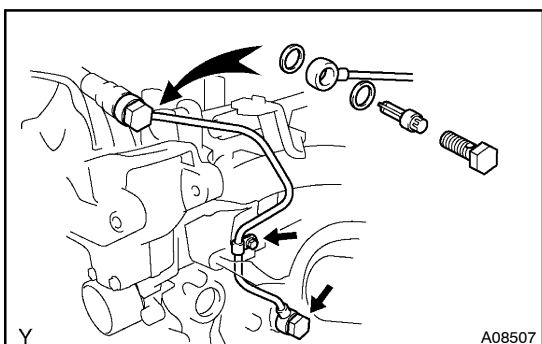
Remove the 11 bolts, cylinder head cover and gasket.

**20. REMOVE CAMSHAFT TIMING PULLEY**

Hold the hexagon portion of the camshaft with a wrench, and remove the cam-pulley set bolt and camshaft timing pulley.

**21. REMOVE OIL DIPSTICK AND GUIDE**

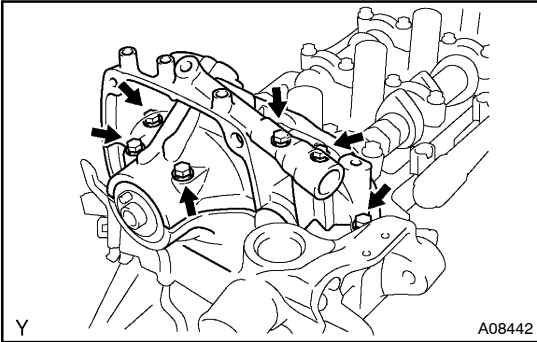
- (a) Remove the bolt and pull out the dipstick guide together with the dipstick.
- (b) Remove the O-ring from the dipstick guide.

**22. REMOVE NO.1 OIL PIPE**

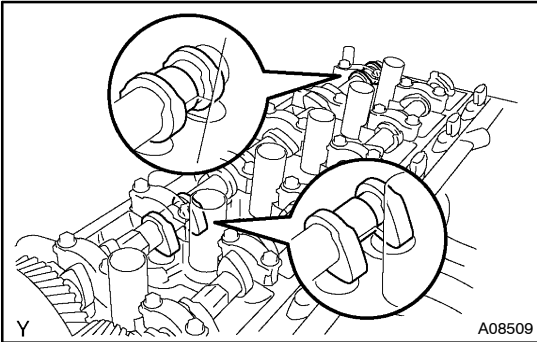
- (a) Remove the bolt holding the oil pipe to the cylinder head.
- (b) Remove the union bolt and 2 gaskets, and disconnect the oil pipe from the cylinder block.
- (c) Remove the union bolt, oil control valve filter, 2 gaskets and oil pipe from the No.1 camshaft bearing cap.

23. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE
(See page FI-44)**24. REMOVE CAMSHAFTS****NOTICE:**

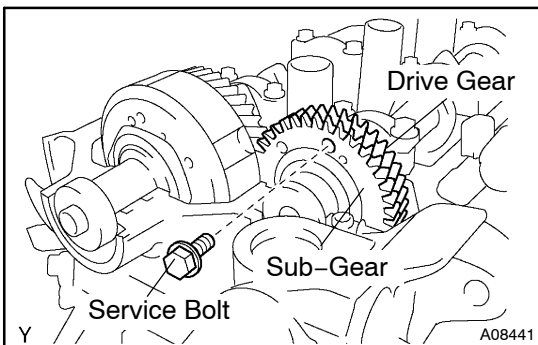
Since the thrust clearance of the camshaft is small, the camshaft must be kept leveled while it is being removed. If the camshaft is not kept leveled, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, the following steps should be carried out.



- (a) Remove the No.1 camshaft bearing cap. Remove the 6 bolts, 4 seal washers and No.1 camshaft bearing cap.
- (b) Remove the camshaft oil seal and semi-circular plug.



- (c) Remove the exhaust camshaft.
 - (1) Check or set the exhaust camshaft as shown in the illustration so that the No.2 and No.6 cylinder cam lobes face down toward their valve lifters with equal force.



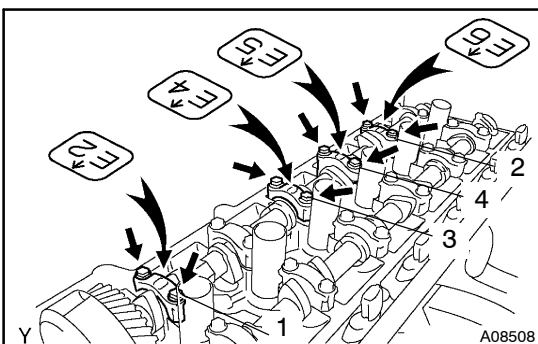
- (2) Secure the intake camshaft sub-gear to the drive gear with a service bolt.

Recommended service bolt:

Thread diameter	6 mm
Thread pitch	1.0 mm
Bolt length	16 - 20 mm (0.63 - 0.79 in.)

HINT:

When removing the camshaft, make sure that the torsional spring force of the sub-gear has been eliminated by the above operation.

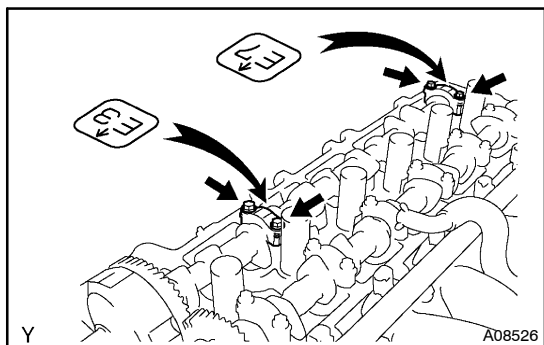


- (3) Uniformly loosen and remove the 8 bearing cap bolts on the No.2, No.4, No.5 and No.6 bearing caps, in several passes, in the sequence shown.

NOTICE:

Do not remove the No.3 and No.7 bearing cap bolts at this stage.

- (4) Remove the No.2, No.4, No.5 and No.6 bearing caps.



- (5) Alternately and uniformly loosen and remove the 4 bearing cap bolts on the No.3 and No.7 bearing caps.

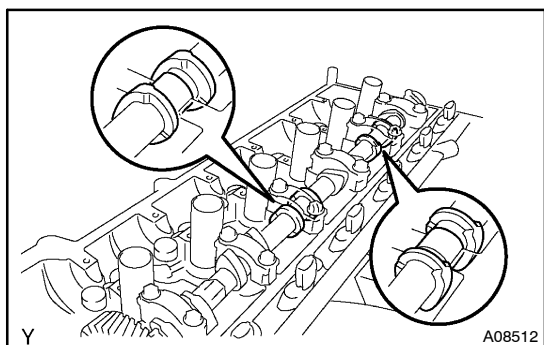
HINT:

- As the 4 No.3 and No.7 bearing cap bolts are loosened, make sure that the camshaft is lifted out straight and level.
- If the camshaft is not being lifted out straight and level, uniformly retighten the 4 No.3 and No.7 bearing cap bolts. Then reverse the order of above steps from (4) to (1) and repeat steps from (1) to (5) once again.

NOTICE:

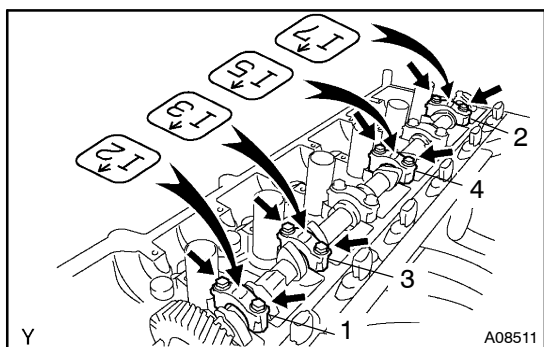
Do not pry on or attempt to force the camshaft with a tool or other object.

- (6) Remove the No.3 and No.7 bearing caps and exhaust camshaft.



- (d) Remove the intake camshaft.

- (1) Check or set the intake camshaft as shown in the illustration so that the No.3 and No.5 cylinder cam lobes face down toward their valve lifters with equal force.

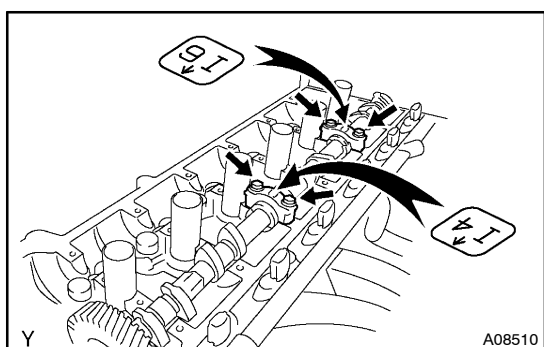


- (2) Uniformly loosen and remove the 8 bearing cap bolts on the No.2, No.3, No.5 and No.7 bearing caps, in several passes, in the sequence shown.

NOTICE:

Do not remove the No.4 and No.6 bearing cap bolts at this stage.

- (3) Remove the No.2, No.3, No.5 and No.7 bearing caps.



- (4) Alternately and uniformly loosen and remove the 4 bearing cap bolts on the No.4 and No.6 bearing caps.

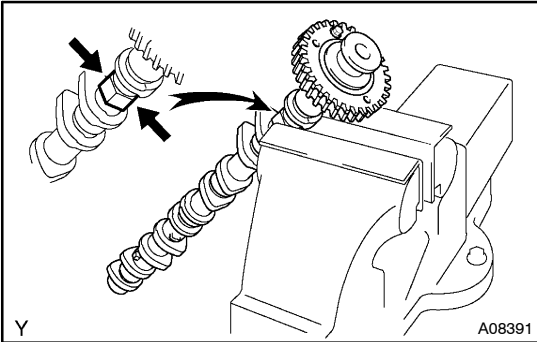
HINT:

- As the 4 No.4 and No.6 bearing cap bolts are loosened, make sure that the camshaft is lifted out straight and level.
- If the camshaft is not being lifted out straight and level, uniformly retighten the 4 No.4 and No.6 bearing cap bolts. Then reverse the order of above steps from (3) to (1) and repeat steps from (1) to (4) once again.

NOTICE:

Do not pry on or attempt to force the camshaft with a tool or other object.

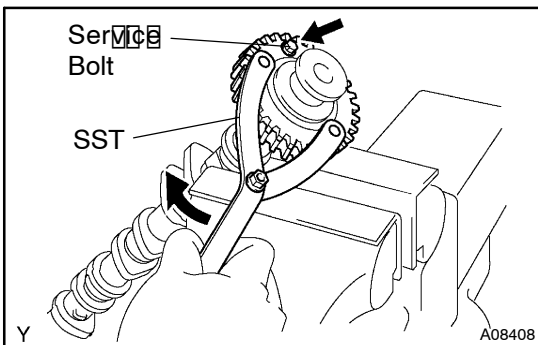
- (5) Remove the No.4 and No.6 bearing caps and intake camshaft.

**25. DISASSEMBLE INTAKE CAMSHAFT**

- (a) Mount the camshaft in a vise.

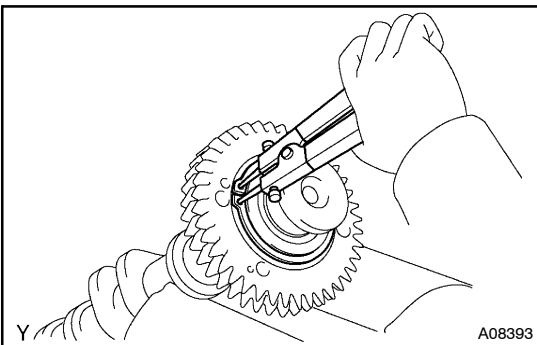
NOTICE:

Be careful not to damage the camshaft.

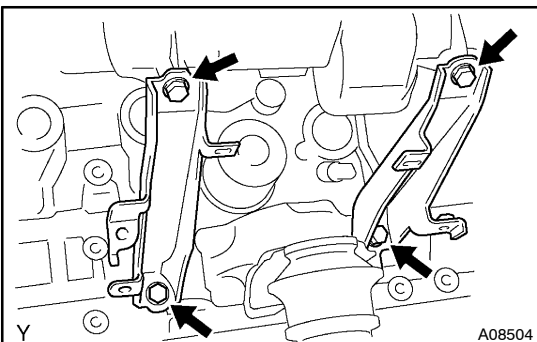


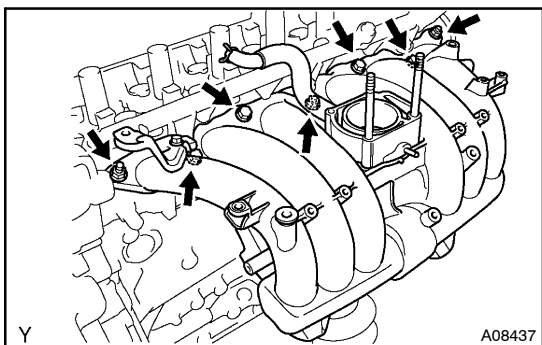
- (b) Using SST, turn the sub-gear clockwise, and remove the service bolt.

SST 09960-10010 (09962-01000, 09963-00500)

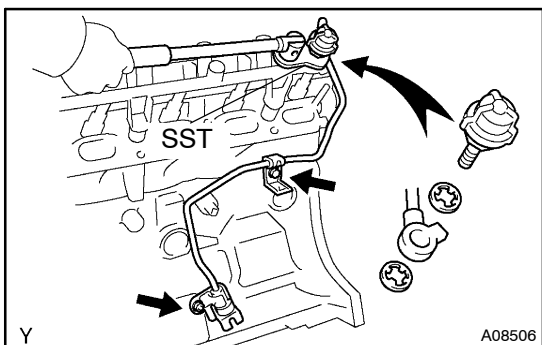


- (c) Using snap ring pliers, remove the snap ring.
(d) Remove the wave washer, camshaft sub-gear and gear spring.

26. REMOVE THROTTLE BODY (See page FI-36)**27. REMOVE NO.1 AND NO.2 AIR INTAKE CHAMBER STAYS**

**28. REMOVE INTAKE MANIFOLD**

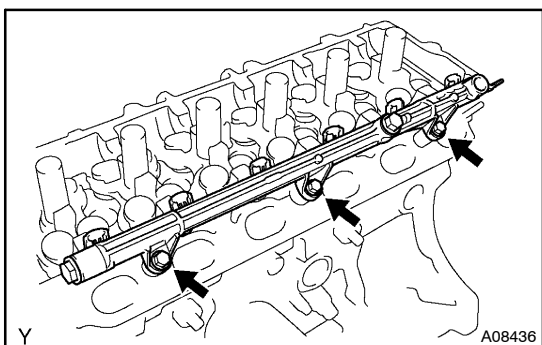
- (a) A/T:
Remove the bolt, and disconnect the oil dipstick guide for the A/T.
- (b) Disconnect the brake booster vacuum hose.
- (c) Remove the 4 bolts, 3 nuts, intake manifold and 6 gaskets.

**29. DISCONNECT NO.1 FUEL PIPE**

- (a) Using SST, remove the fuel pressure pulsation damper and 2 gasket.
SST 09612-24014 (09617-24011)

CAUTION:

- Put a shop towel under the delivery pipe.
 - Slowly loosen the pulsation damper.
- (b) Remove the bolt and nut, and disconnect the No.1 fuel pipe.

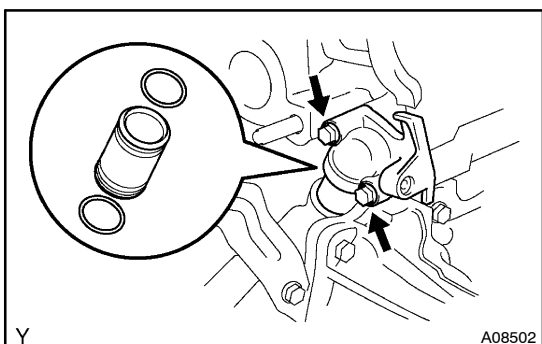
**30. REMOVE DELIVERY PIPE AND INJECTORS**

- (a) Remove the 3 bolts and delivery pipe together with the 6 injectors.

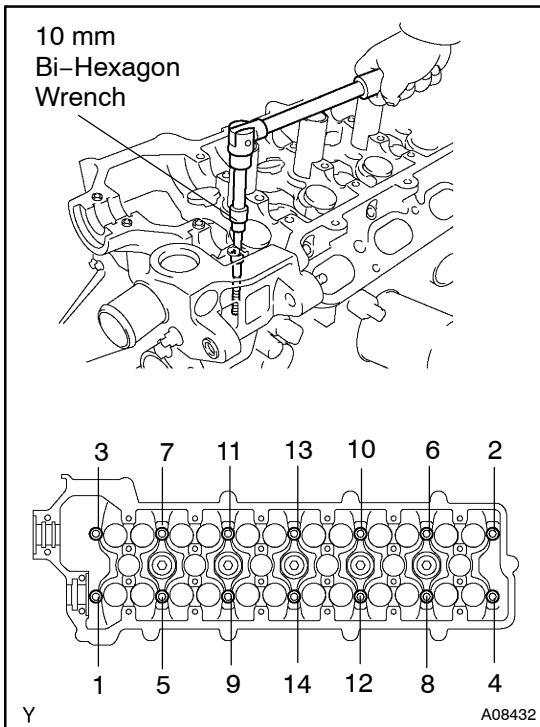
NOTICE:

Be careful not to drop the injectors when removing the delivery pipe.

- (b) Remove the 6 insulators and 3 spacers from the cylinder head.

**31. REMOVE WATER BYPASS OUTLET AND NO.1 WATER BYPASS PIPE**

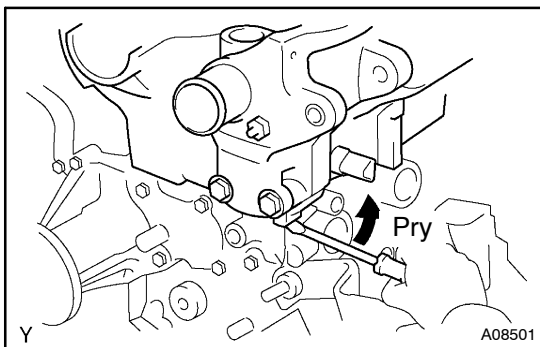
- (a) Remove the 2 bolts, water bypass outlet, No.1 water bypass pipe and gasket.
- (b) Remove the 2 O-rings from the No.1 water bypass pipe.

**32. REMOVE CYLINDER HEAD**

- (a) Using a 10 mm bi-hexagon wrench, uniformly loosen the 14 cylinder head bolts, in several passes, in the sequence shown. Remove the 14 cylinder head bolts and plate washers.

NOTICE:

Cylinder head warpage or cracking could result from removing bolts in incorrect order.



- (b) Lift the cylinder head from the dowels on the cylinder block, and place the cylinder head on wooden blocks on a bench.

HINT:

If the cylinder head is lift off, pry between the cylinder head and cylinder block with a screwdriver.

NOTICE:

Be careful not to damage the contact surfaces of the cylinder head and cylinder block.