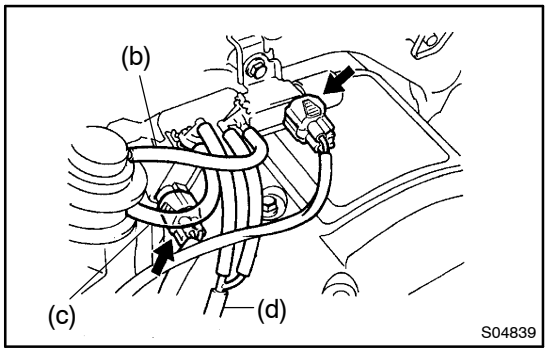
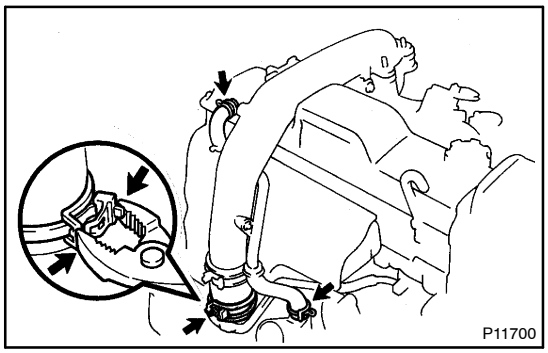
EM15D–01

REMOVAL

1. DRAIN ENGINE COOLANT



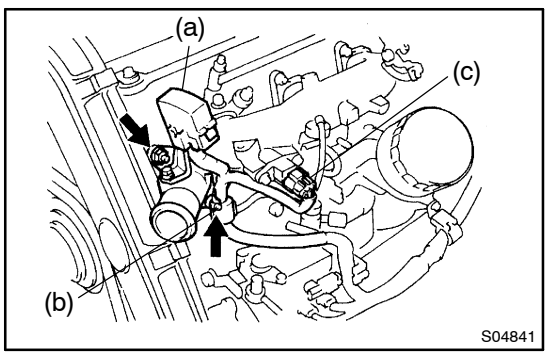


2. REMOVE INTAKE PIPE

(a) Disconnect the VSV for the No.1 and No.2 intake constrictor control connectors.
(b) Disconnect the vacuum hose from the actuator of the chamber A
(c) Disconnect the vacuum hose from the actuator of the chamber B
(d) Disconnect the vacuum hose from the 3–way (from vacuum pump)
(e) Remove the 4 nuts and 4 seal washers.
(f) Use pliers to pinch the ends of the clamp together until the lock plate engages the catch.
Make sure the lock plate and catch are engaged securely.
(g) Remove the intake pipe, PCV hose and gasket.
(h) Remove the accelerator cable bracket from the intake pipe.
(i) Remove the VSV for the No.1 and No.2 intake constrictor control. (See page ED–13)
(j) Remove the bolt and vacuum hose clamp from the cylinder head.

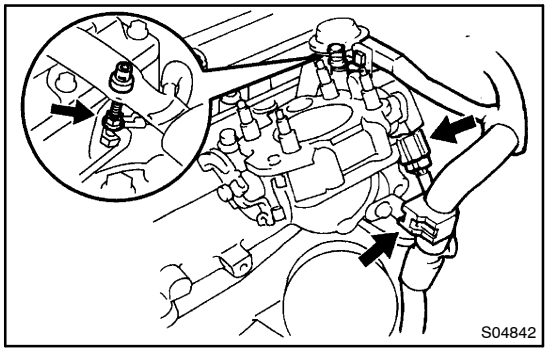
3. REMOVE TURBOCHARGER (See page TC–6)

4. REMOVE INJECTION PIPES (See page FU–5)



5. REMOVE WATER OUTLET

(a) Disconnect the check connector.
(b) Disconnect the engine wire clamp.
(c) Disconnect the turbo pressure sensor connector.
(d) Disconnect the water temperature sender gauge connector.
(e) Remove the 2 nuts, water outlet and gasket.

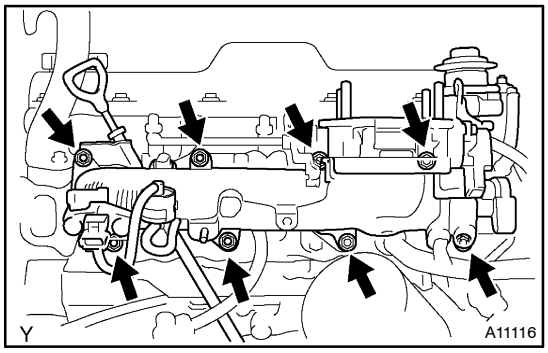


6. REMOVE INTAKE MANIFOLD

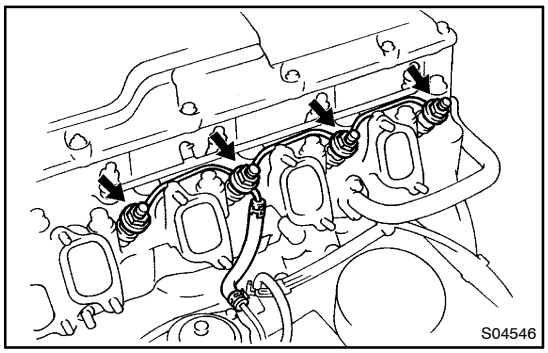
(a) Disconnect the throttle position sensor connector.

(b) Remove the grommet and nut, and disconnect the glow plug wire.

(c) Disconnect the engine wire clamp from the venturi.



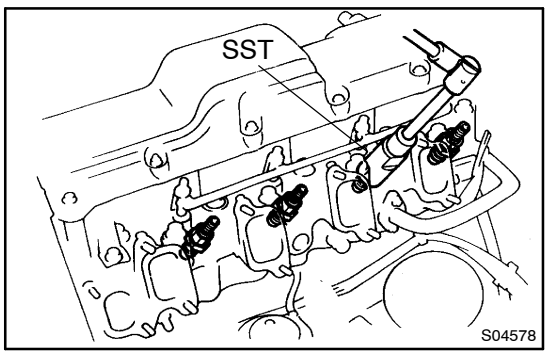
(d) Remove the 8 nuts, oil dipstick guide assembly, intake manifold and 4 gaskets.



7. REMOVE NOZZLE LEAKAGE PIPE

(a) Disconnect the fuel hose from the return pipe.

(b) Remove the 4 nuts, nozzle leakage pipe and 4 gaskets.



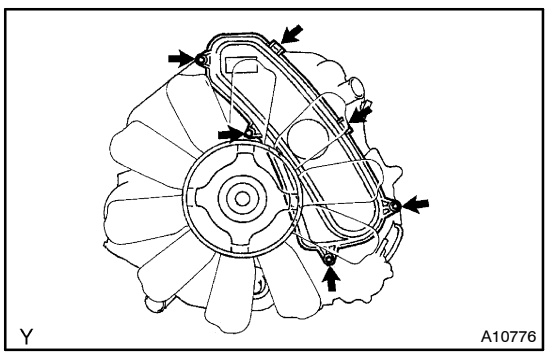
8. REMOVE INJECTION NOZZLES

Using SST, remove the 4 injection nozzles, gaskets and seats.

SST 09268–64010 (09268–64020)

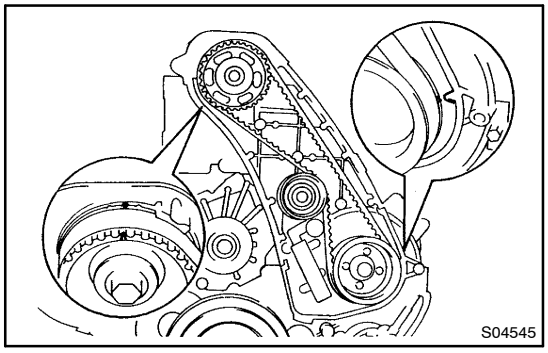
HINT:

Arrange the injection nozzles in correct order.



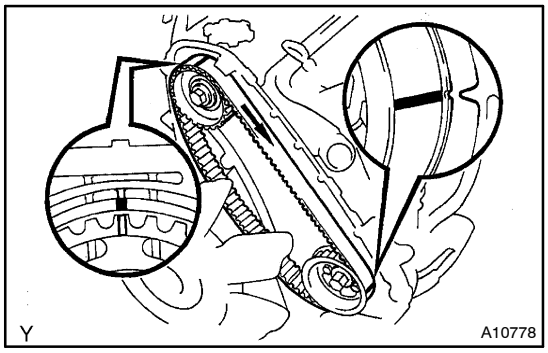
9. REMOVE TIMING BELT COVER

Remove the 4 bolts, 4 seal washers, 2 clips, timing belt cover and gasket.



10. SET NO.4 CYLINDER TO TDC / COMPRESSION

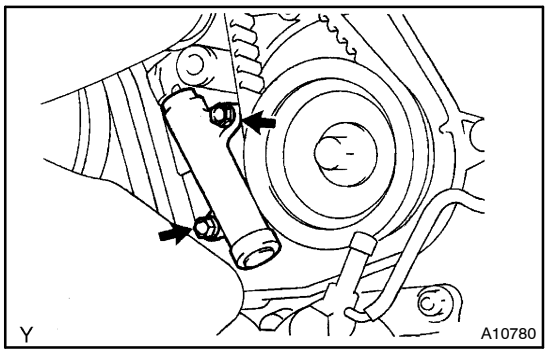
Turn the crankshaft pulley clockwise, set both No.1 and No.2 camshaft pulley grooves at TDC marks.



11. IF RE–USING TIMING BELT, MARK TIMING BELT

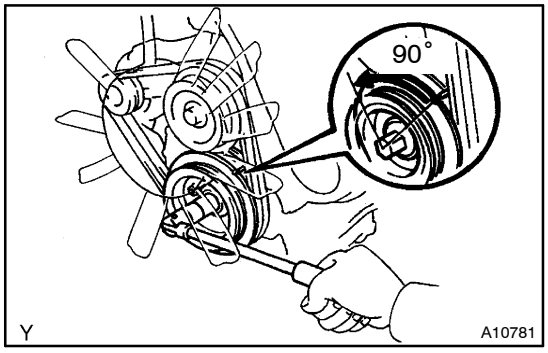
HINT:

If reusing the timing belt, draw a direction arrow on the belt (in the direction of engine revolution), and place matchmarks on the pulleys and belt as shown in the illustration.



12. REMOVE TIMING BELT TENSIONER

Alternately loosen the 2 bolts, remove them and timing belt tensioner.



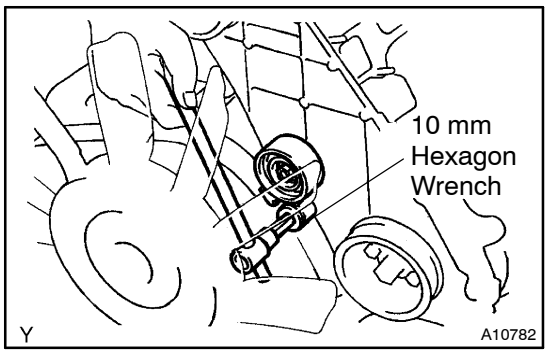
13. REMOVE TIMING BELT

(a) Turn the crankshaft 90° counterclockwise.

NOTICE:

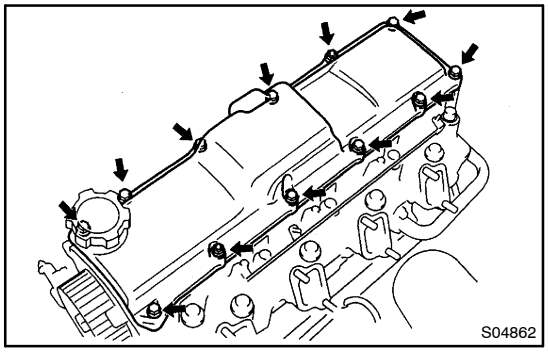
If the timing belt is disengaged, having the crankshaft pulley at the wrong angle can cause the piston head and valve head to come into contact with each order when you remove the No.1 camshaft timing pulley (step 16), causing damage. So always set the crankshaft pulley at the correct angle.

(b) Remove the timing belt.



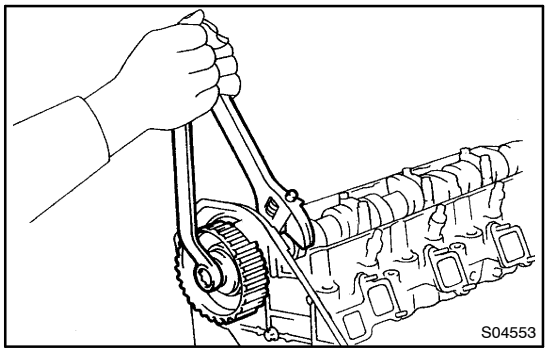
14. REMOVE TIMING BELT IDLER PULLEY

Using a 10 mm hexagon wrench, remove the bolt, timing belt idler pulley and washer.



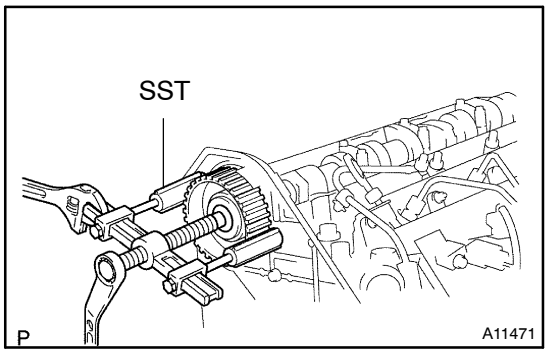
15. REMOVE CYLINDER HEAD COVER

Remove the 10 bolts, 2 nuts, cylinder head cover and gasket.



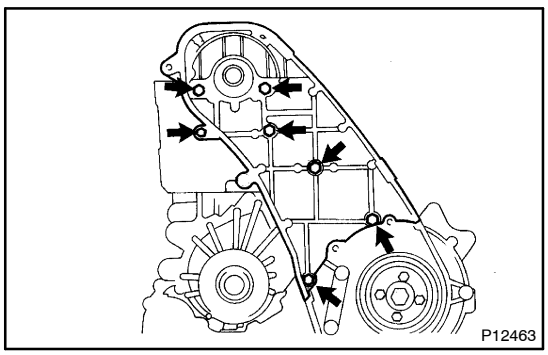
16. REMOVE NO.1 CAMSHAFT TIMING PULLEY

(a) Hold the hexagonal wrench head portion of the camshaft with a wrench, and remove the camshaft timing pulley bolt.



(b) Using SST, remove the timing pulley.
SST 09950–40011 (09951–04010, 09952–04010, 09953–04020, 09954–04010, 09955–04061)

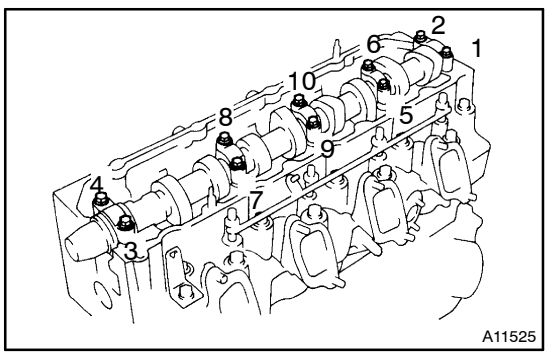
(c) Remove the set key.



17. REMOVE CAMSHAFT OIL SEAL RETAINER

(a) Remove the 7 bolts holding the camshaft oil seal retainer to the cylinder head.

(b) Pry out the camshaft oil seal retainer.



18. REMOVE CAMSHAFT

(a) Uniformly loosen and remove the 10 bearing cap bolts in several passes in the sequence shown.

(b) Remove the 5 bearing caps and camshaft.

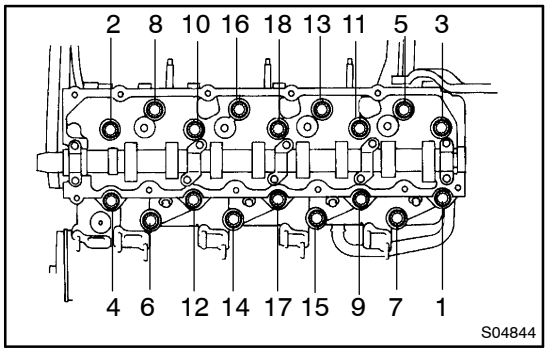
HINT:

Arrange the bearing caps in correct order.

19. REMOVE GLOW PLUG CONNECTOR AND GLOW PLUGS (See page ST–4)

NOTICE:

This engine uses ceramic glow plugs. To prevent damage to the glow plugs, do not remove them unless necessary.

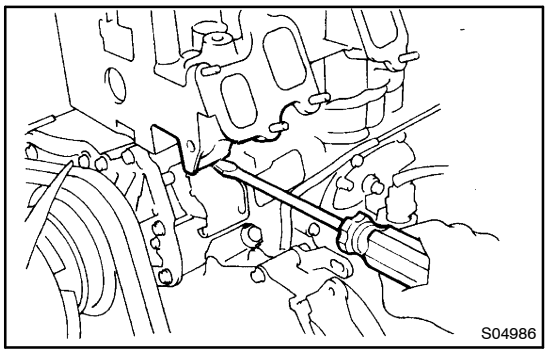


20. REMOVE CYLINDER HEAD

(a) Uniformly loosen and remove the 18 cylinder head bolts, in several passes, in the sequence shown.

NOTICE:

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 head on wooden blocks on a bench.

HINT:

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

NOTICE:

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