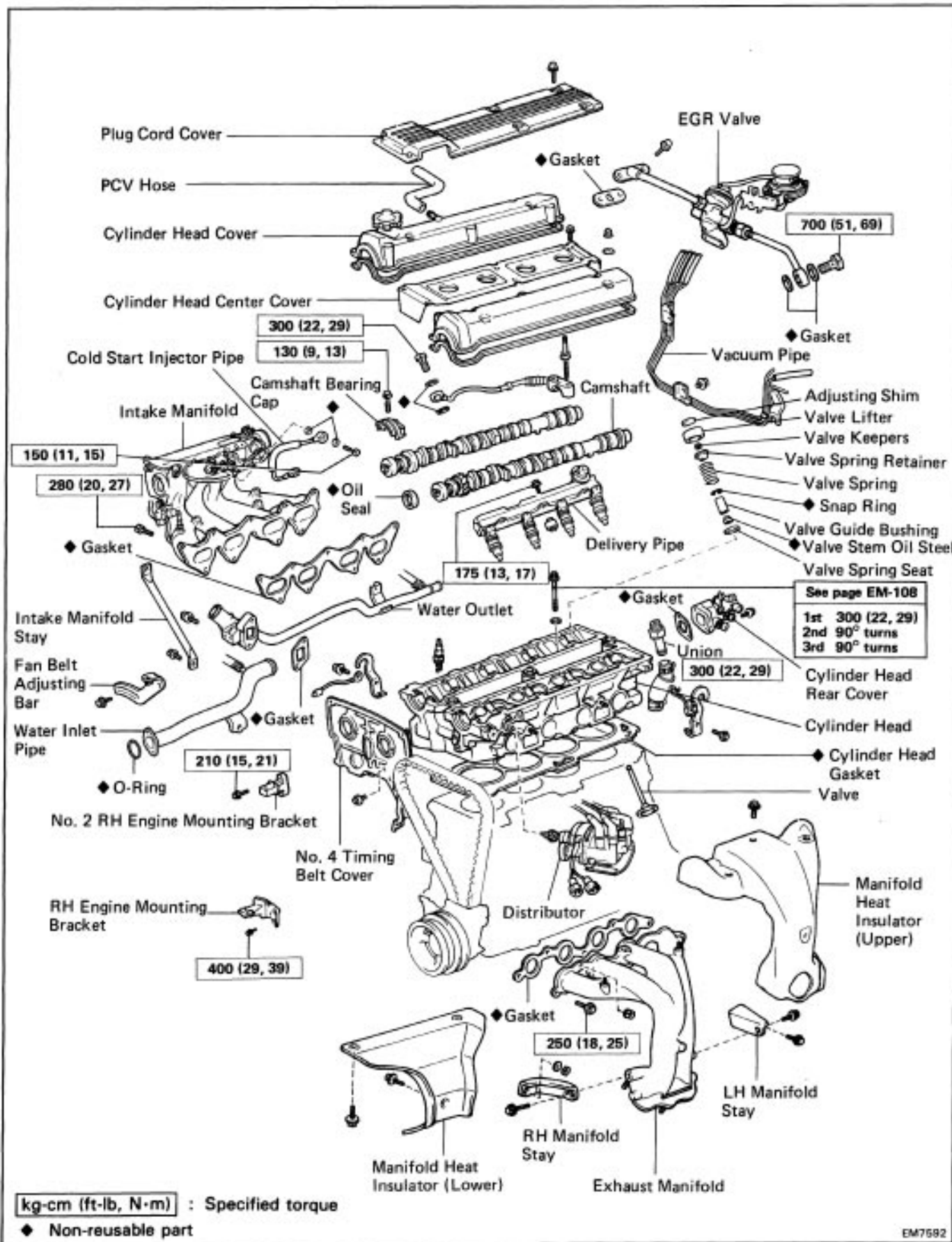


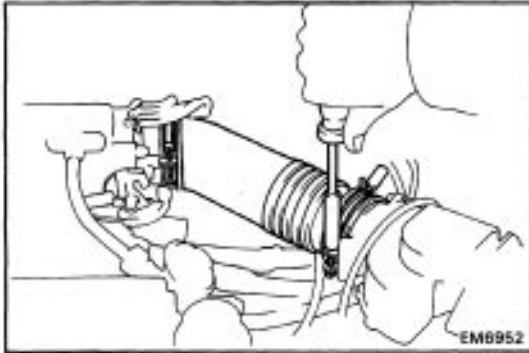
CYLINDER HEAD (4A-GE) COMPONENTS



REMOVAL OF CYLINDER HEAD

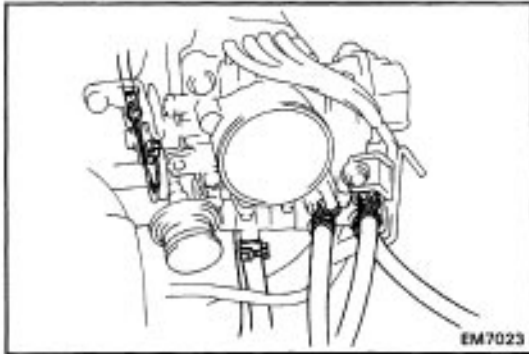
(See page [EM-89](#))

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. REMOVE RH ENGINE UNDER COVER
3. DRAIN ENGINE COOLANT



4. REMOVE AIR CLEANER HOSE

- (a) Disconnect the vacuum hose from the air cleaner hose.
- (b) (with A/C)
Disconnect the air hose.
- (c) Loosen the two clamp bolts and remove the air cleaner hose.



5. (w/ PS)

DISCONNECT AIR HOSES

6. DISCONNECT WATER BY-PASS HOSES

7. DISCONNECT ACCELERATOR WIRE FROM BRACKET

8. REMOVE WASHER TANK

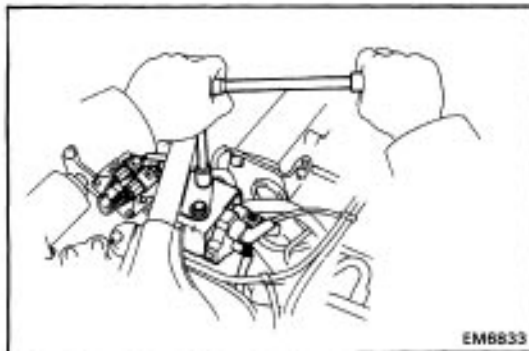
9. DISCONNECT BRAKE VACUUM HOSE

10. (w/ CRUISE CONTROL)

REMOVE CRUISE CONTROL ACTUATOR

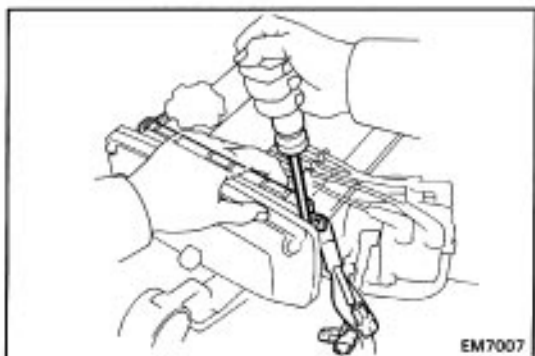
(See step 5 on page [EM-41](#))

11. REMOVE RADIATOR INLET HOSE



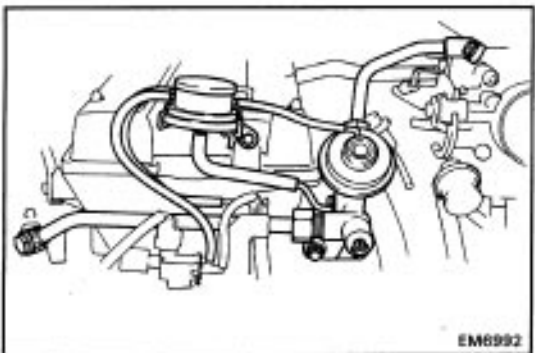
12. REMOVE IGNITION COIL

- (a) Disconnect the ignition coil connectors.
- (b) Disconnect the high-tension cord.
- (c) Remove the two bolts and the ignition coil with bracket.



13. DISCONNECT ENGINE WIRE FROM NO.4 TIMING BELT COVER

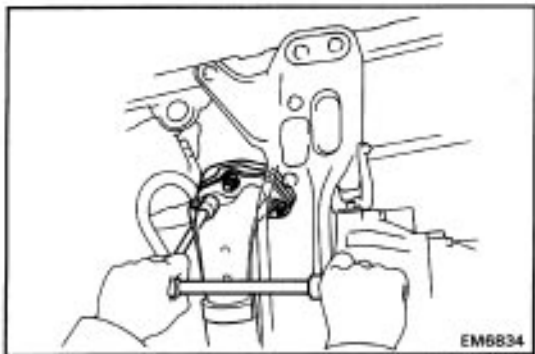
- (a) Disconnect the following connectors:
- Distributor wire connectors
 - Oil pressure sender gauge connector
 - (with A/C)
Compressor connector
- (b) Disconnect the engine wire from the timing belt cover.



14. REMOVE DISTRIBUTOR (See page IG-17)

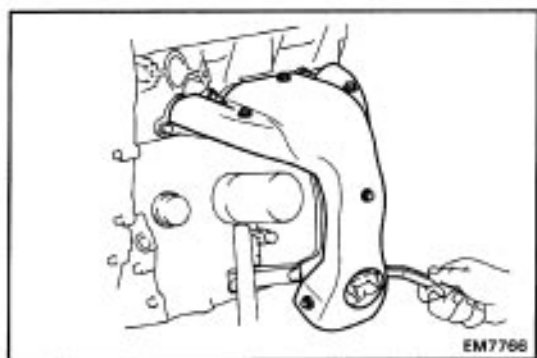
15. REMOVE EGR VALVE AND MODULATOR

- (a) (California)
Disconnect the EGR gas temp. sensor connector.
- (b) Disconnect the vacuum hoses from the vacuum pipe.
- (c) Remove the bolt and EGR vacuum modulator.
- (d) Remove the union bolt, four bolts, the EGR valve, pipe assembly and gaskets.



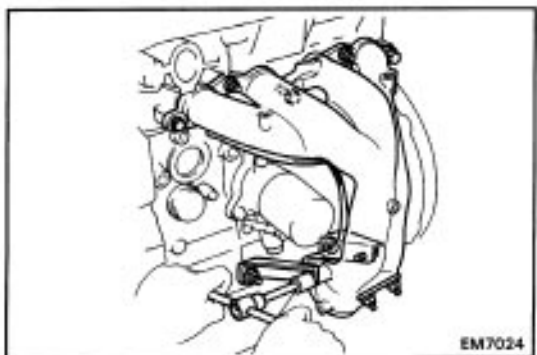
16. REMOVE FRONT EXHAUST PIPE FROM EXHAUST MANIFOLD

- (a) Remove the two bolts from the pipe clamp.
- (b) Remove the three nuts, and disconnect the exhaust pipe from the manifold.

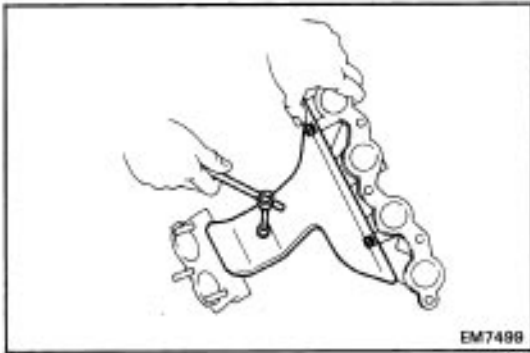


17. REMOVE EXHAUST MANIFOLD

- (a) Remove the six bolts and upper heat insulator.



- (b) Remove the three bolts, nut, RH and LH manifold stays.
- (c) Remove the three bolts, two nuts, exhaust manifold, and gasket.



(d) Remove the three bolts and lower heat insulator.

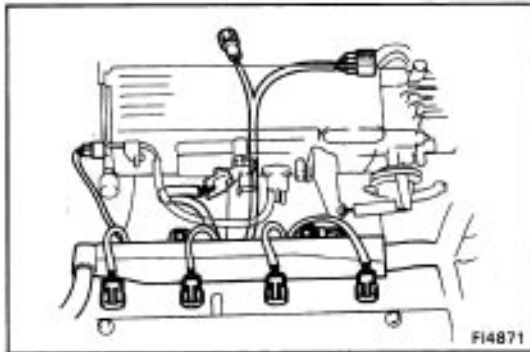
18. REMOVE PCV HOSE

19. REMOVE COLD START INJECTOR PIPE

(See step 3 on page [FI-135](#))

20. REMOVE DELIVERY PIPE AND INJECTORS

(See steps 4 to 6 on page [FI-140](#))

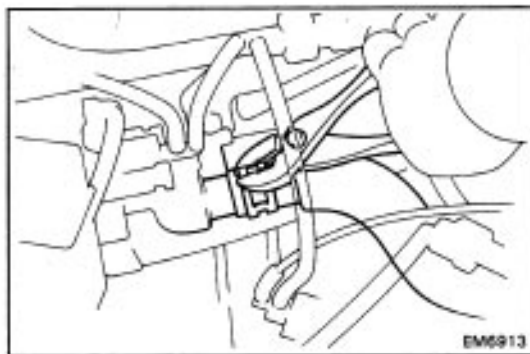


21. DISCONNECT ENGINE WIRE FROM INTAKE MANIFOLD

(a) Disconnect the following connectors:

- Knock sensor connector
- Throttle position sensor connector
- Cold start injector connector
- Fuel pressure VSV connector

(b) Remove the two bolts, and disconnect the engine wire from the intake manifold.



22. REMOVE VACUUM PIPE AND CYLINDER HEAD REAR COVER

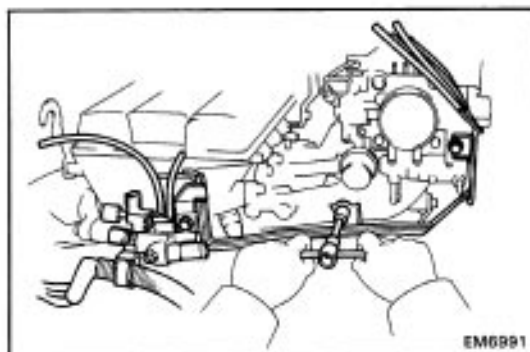
(a) Disconnect heater hose from the cylinder head rear cover.

(b) Disconnect the following connectors:

- Start injector time switch connector
- Water temp. sensor connector
- EGR VSV connector

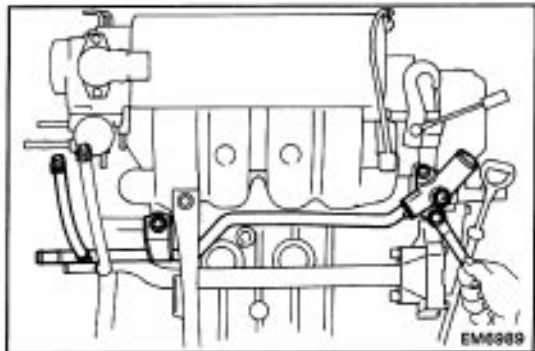
(c) Remove the vacuum hoses from the vacuum pipe.

(d) Remove the four bolts, vacuum pipe, cylinder head rear cover and wire clamp.



23. (w/ PS AND/OR with A/C)
REMOVE PS AND/OR A/C DRIVE BELT
 (See step 10 on page [EM-43](#))

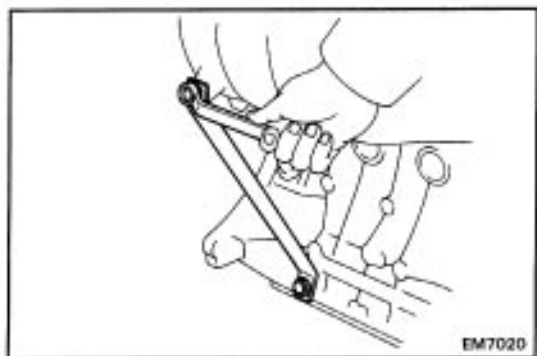
24. **LOOSEN WATER PUMP PULLEY BOLTS AND REMOVE ALTERNATOR DRIVE BELT**
 (See step 11 on page [EM-43](#))



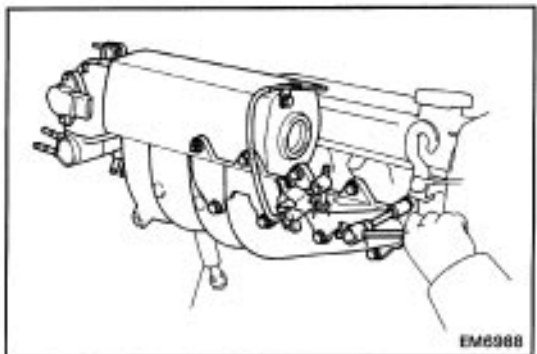
25. **REMOVE WATER OUTLET AND BY-PASS PIPE**
- Remove the three bolts and alternator drive belt adjusting bar.
 - Remove the three bolts, the water outlet, by-pass pipe assembly and gasket.

26. **REMOVE WATER INLET PIPE**
 (See step 6 on page [CO-7](#))

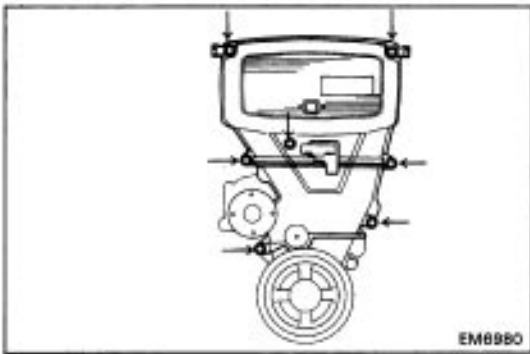
27. **REMOVE RH ENGINE MOUNTING INSULATOR**
 (See step 12 on page [EM-43](#))



28. **REMOVE INTAKE MANIFOLD**
- Remove the two bolts and manifold stay.



- Remove the seven bolts, two nuts, intake manifold and gasket.

**29. REMOVE WATER PUMP PULLEY**

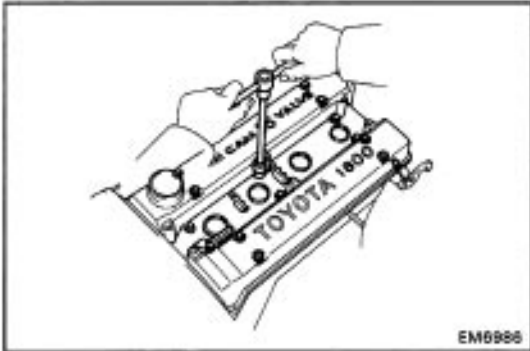
Remove the set bolts and water pump pulley.

30. REMOVE NO.3 AND NO.2 TIMING BELT COVERS

(a) (with A/C)

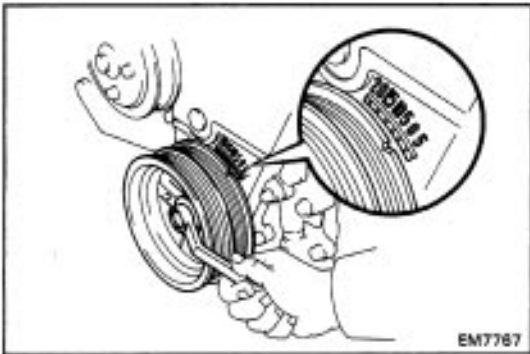
Remove the A/C idle pulley

(b) Remove the seven bolts, cord support plate, No.3 and No.2 belt covers and gaskets.

**31. REMOVE CYLINDER HEAD COVERS**

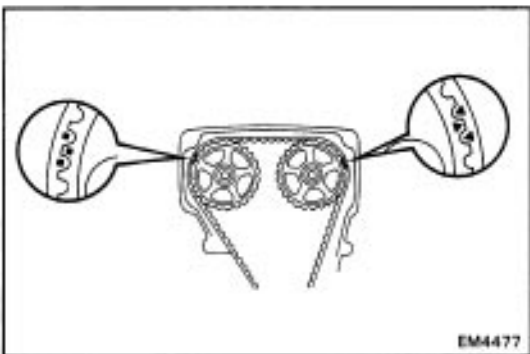
(a) Remove the four bolts, center cover and gasket.

(b) Remove the eight cap nuts, seal washers, two head covers and gaskets.

32. REMOVE SPARK PLUGS (See page IG-10)**33. SET NO. 1 CYLINDER TO TDC/COMPRESSION**

(a) Turn the crankshaft pulley and align its groove with the timing mark "0" of the No.1 timing belt cover.

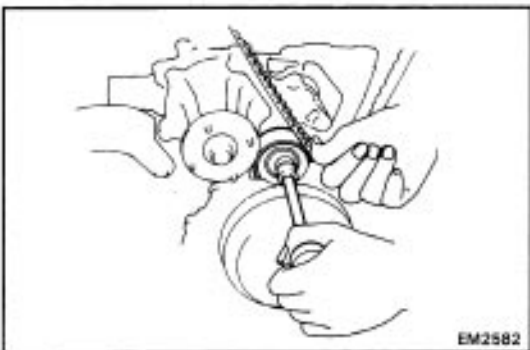
(b) Check that the valve lifters on the No.1 cylinder are loose and valve lifters on the No.4 cylinder are tight. If not, turn the crankshaft one revolution (360°).

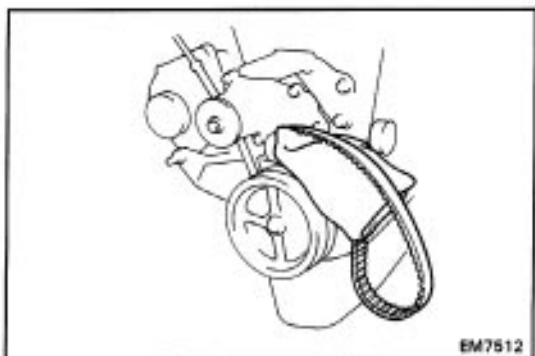
**34. DISCONNECT TIMING BELT FROM CAMSHAFT TIMING PULLEYS**

(a) Place matchmarks on the camshaft timing pulleys and timing belt.

(b) Loosen the idler pulley bolt and shift the pulley toward the left as far as it will go, temporarily tighten it.

(c) Remove the timing belt from the camshaft timing pulleys.

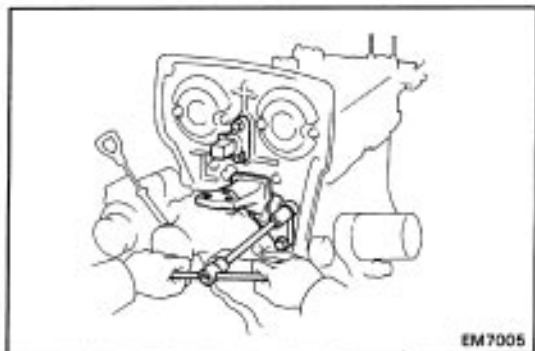


**NOTICE:**

- Support the belt so that the meshing of the crankshaft timing pulley and timing belt does not shift.
- Be careful not to drop anything inside the timing belt cover.
- Do not allow the belt to come into contact with oil, water or dust.

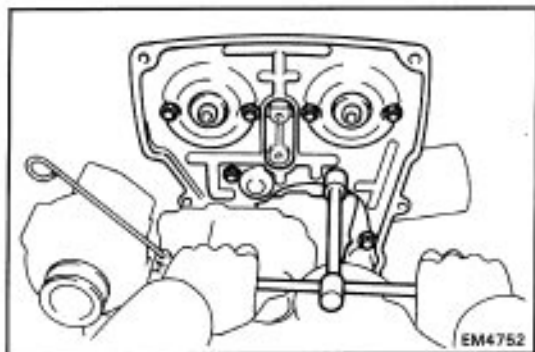
35. REMOVE CAMSHAFT TIMING PULLEYS

(See step 20 on page [EM-45](#))



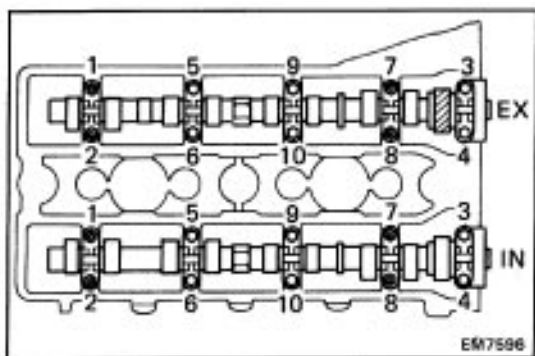
36. REMOVE RH MOUNTING BRACKETS

- Remove the three bolts and bracket.
- Remove the two bolts and No.2 bracket.



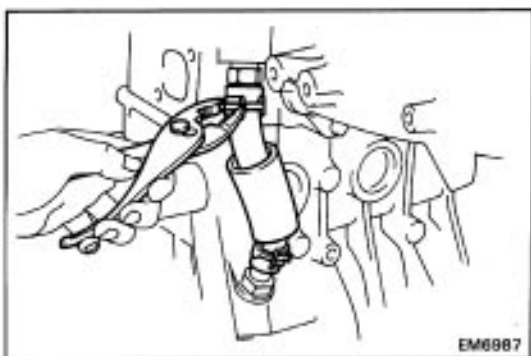
37. REMOVE NO.4 TIMING BELT COVER

Remove the seven bolts and belt cover.



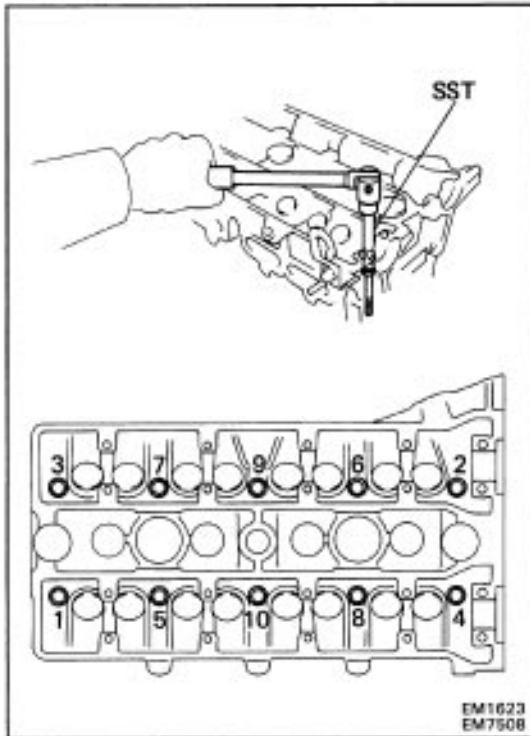
38. REMOVE CAMSHAFTS

- Uniformly loosen and remove the bearing cap bolts in several passes in the sequence shown.
 - Remove the bearing caps, oil seal and camshaft.
- HINT: Arrange the intake and exhaust camshafts.



39. REMOVE NO.2 PCV HOSE

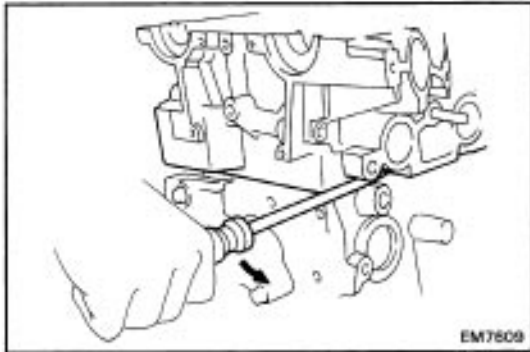
Remove the two clamps and disconnect the PCV hose from the cylinder head.



40. REMOVE CYLINDER HEAD

- (a) Using SST, uniformly loosen and remove the ten cylinder head bolts in several passes in the sequence shown.
SST 09205-16010

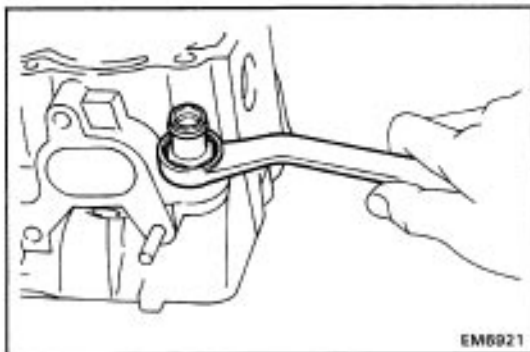
NOTICE: Head warpage or cracking could result from removing bolts in incorrect order.



- (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 saliences.

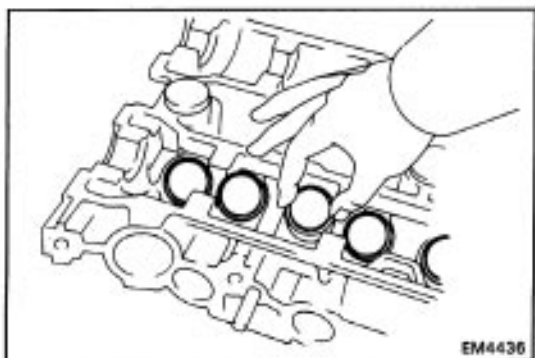
NOTICE: Be careful not to damage the cylinder head and cylinder block surfaces of the cylinder head gasket side.



41. REMOVE ENGINE HANGERS

Remove the two bolts, ground strap connector, and two hangers.

42. REMOVE UNION

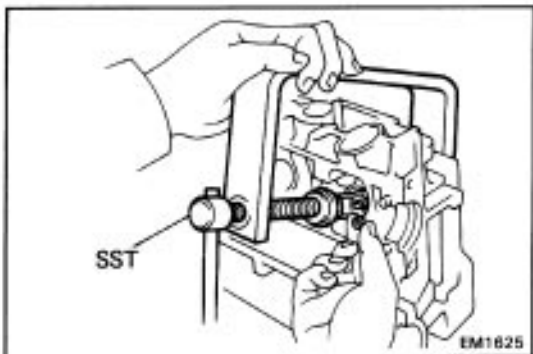
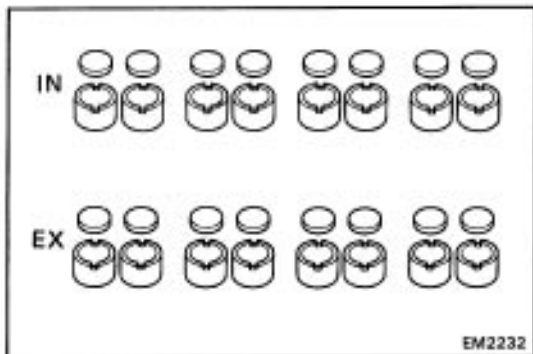


DISASSEMBLY OF CYLINDER HEAD

(See page [EM-89](#))

1. REMOVE VALVE LIFTERS AND SHIMS

HINT: Arrange the valve lifters and shims in correct order.



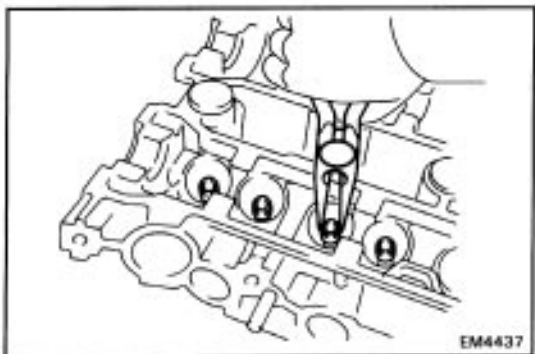
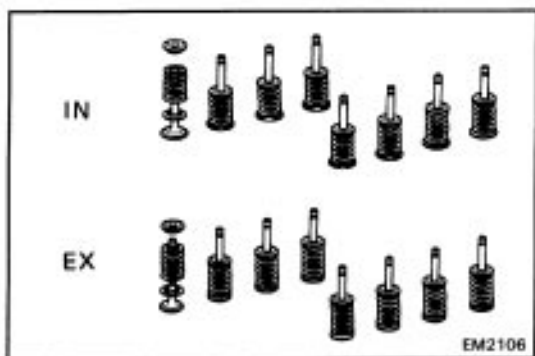
2. REMOVE VALVES

(a) Using SST, compress the valve spring and remove the two keepers.

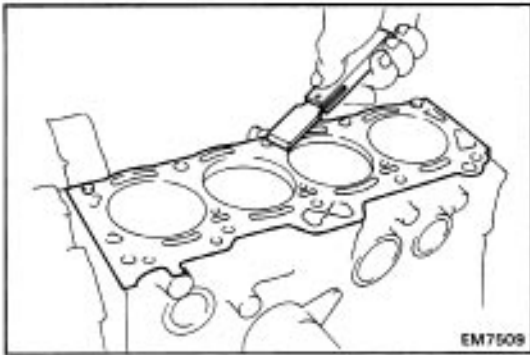
SST 09202-70010

(b) Remove the spring retainer, valve spring, valve and spring seat.

HINT: Arrange the valves, valve springs, spring seats and spring retainers in correct order.



(c) Using needle-nose pliers, remove the oil seal.



INSPECTION, CLEANING AND REPAIR OF CYLINDER HEAD COMPONENTS

1. CLEAN TOP OF PISTONS AND TOP OF BLOCK

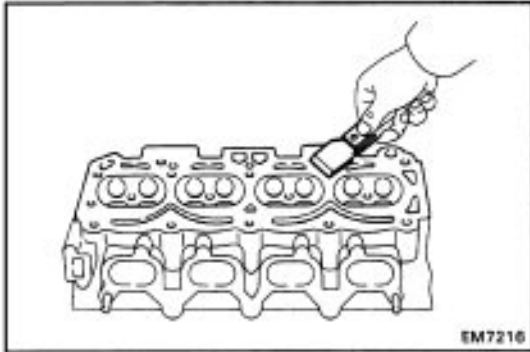
- (a) Turn the crankshaft and bring each piston to top dead center (TDC). Using a gasket scraper, remove all the carbon from the piston top.
- (b) Remove all the gasket material from the top of the cylinder block.
- (c) Using compressed air, blow carbon and oil from the bolt holes.

CAUTION: Protect your eyes when using high pressure air.

2. REMOVE GASKET MATERIAL

Using a gasket scraper, remove all the gasket material from the manifold and cylinder head surface.

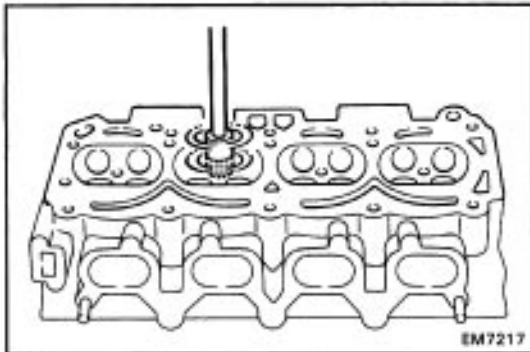
NOTICE: Be careful not to scratch the surfaces.



3. CLEAN COMBUSTION CHAMBERS

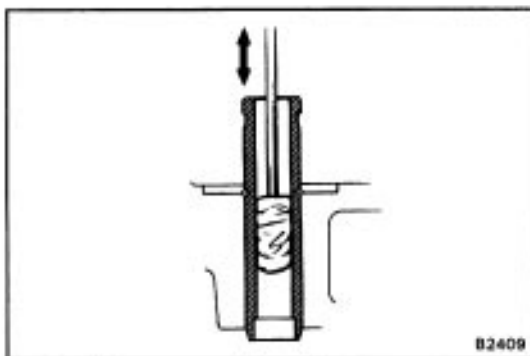
Using a wire brush, remove all the carbon from the combustion chambers.

NOTICE: Be careful not to scratch the head gasket contact surface.



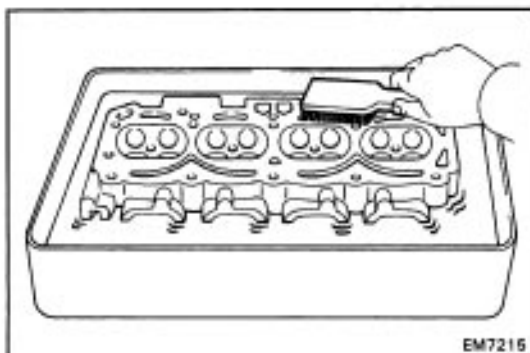
4. CLEAN VALVE GUIDE BUSHINGS

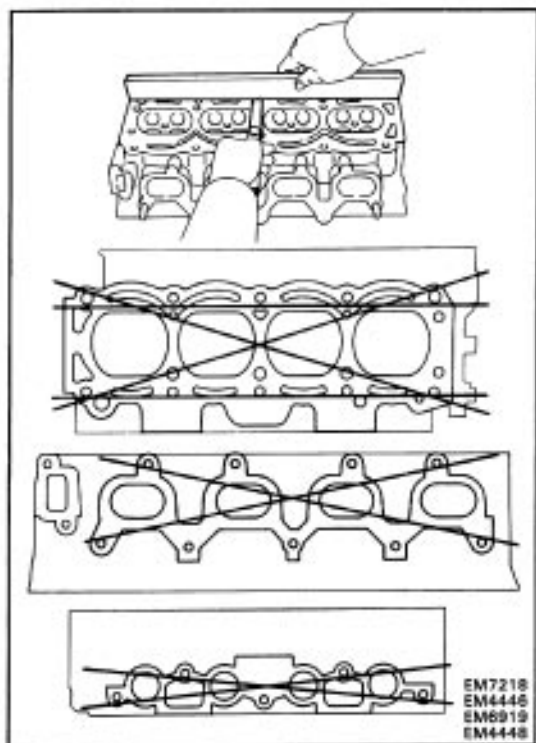
Using a valve guide bushing brush and solvent, clean all the guide bushings.



5. CLEAN CYLINDER HEAD

Using a soft brush and solvent, thoroughly clean cylinder head.





6. INSPECT CYLINDER HEAD FOR FLATNESS

Using a precision straight edge and feeler gauge, measure the surfaces contacting the cylinder block manifolds for warpage.

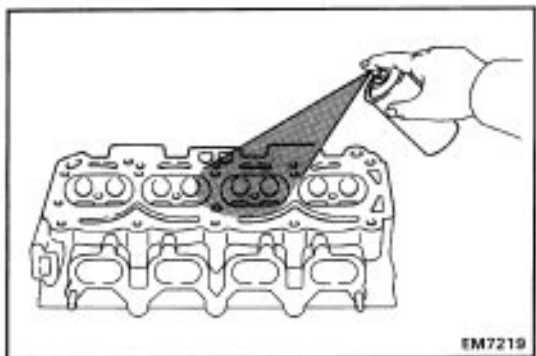
Maximum warpage:

Cylinder block side 0.05 mm (0.0020 in.)

Intake manifold side 0.05 mm (0.0020 in.)

Exhaust manifold side 0.10 mm (0.0039 in.)

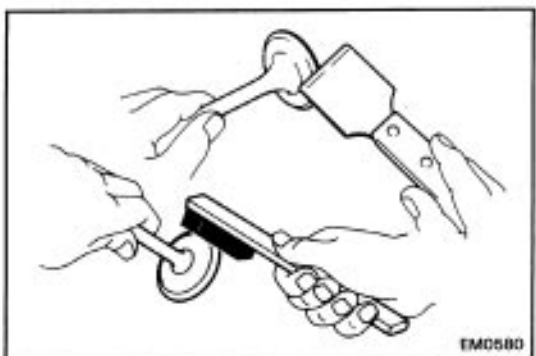
If warpage is greater than maximum, replace the cylinder head.



7. INSPECT CYLINDER HEAD FOR CRACKS

Using a dye penetrant, check the combustion chambers, intake and exhaust ports, head surface and the top of the head for cracks.

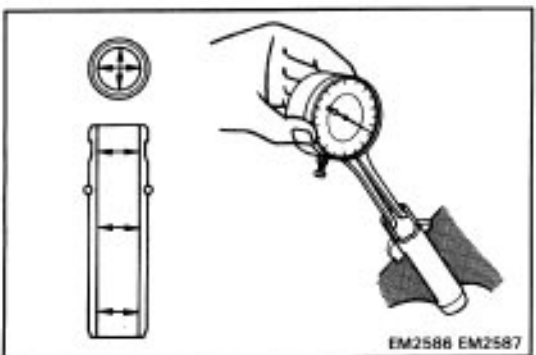
If cracked, replace the cylinder head.



8. CLEAN VALVES

(a) Using a gasket scraper, chip off any carbon from the valve head.

(b) Using a wire brush, thoroughly clean the valve.

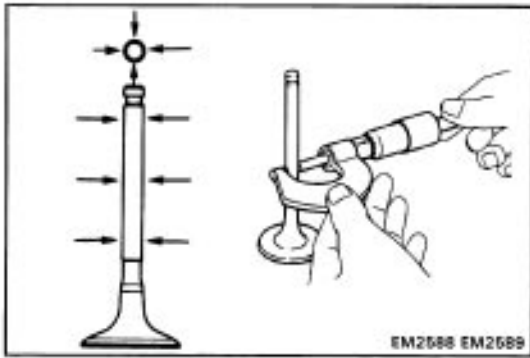


9. INSPECT VALVE STEMS AND GUIDE BUSHINGS

(a) Using a caliper gauge, measure the inside diameter of the guide bushing.

Bushing inside diameter:

6.01 – 6.03 mm (0.2366 – 0.2374 in.)



(b) Using a micrometer, measure the diameter of the valve stem.

Valve stem diameter:

Intake 5.970 – 5.985 mm

(0.2350 – 0.2356 in.)

Exhaust 5.965 – 5.980 mm

(0.2348 – 0.2354 in.)

(c) Subtract the valve stem diameter measurement from the guide bushing inside diameter measurement.

Standard oil clearance:

Intake 0.025 – 0.060 mm

(0.0010 – 0.0024 in.)

Exhaust 0.030 – 0.065 mm

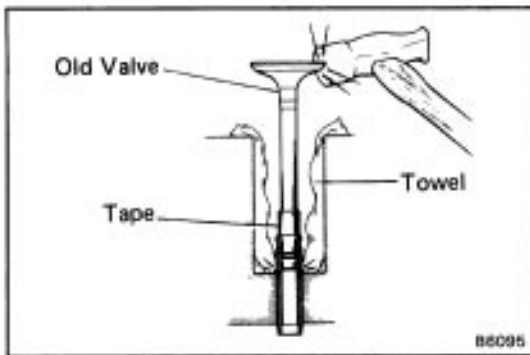
(0.0030 – 0.0026 in.)

Maximum oil clearance:

Intake 0.08 mm (0.0031 in.)

Exhaust 0.10 mm (0.0039 in.)

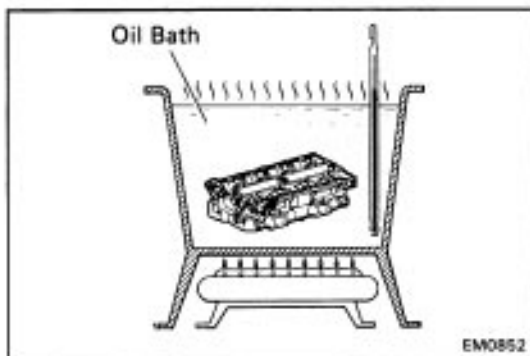
If the clearance is greater than maximum, replace the valve and guide bushing.



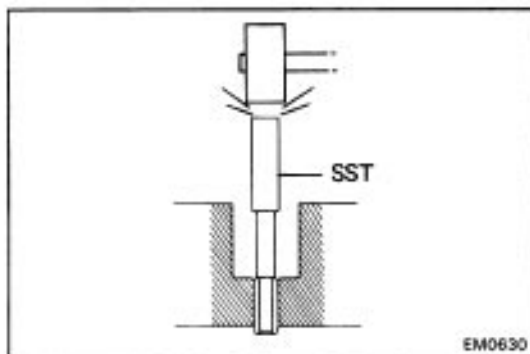
10. IF NECESSARY, REPLACE VALVE GUIDE BUSHINGS

(a) Insert an old valve wrapped with tape into the valve guide bushing, and break off the valve guide bushing by hitting it with a hammer.

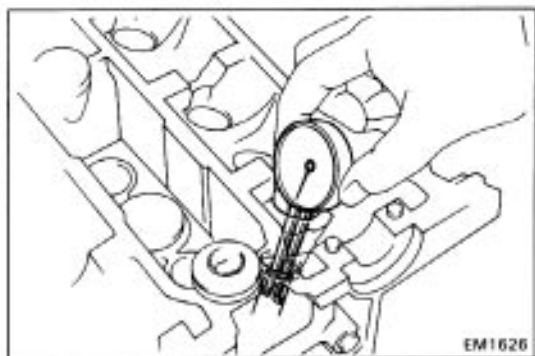
NOTICE: Be careful not to damage the lifter hole.



(b) Gradually heat the cylinder head to 80 – 100°C (176 – 212°F).



(c) Using SST and a hammer, tap out the guide bushing.
SST 09201-70010



(d) Using a caliper gauge, measure the bushing bore diameter of the cylinder head.

Standard valve guide bore (Cold):

11.000 – 11.027 mm (0.4331 – 0.4341 in.)

Both intake and exhaust

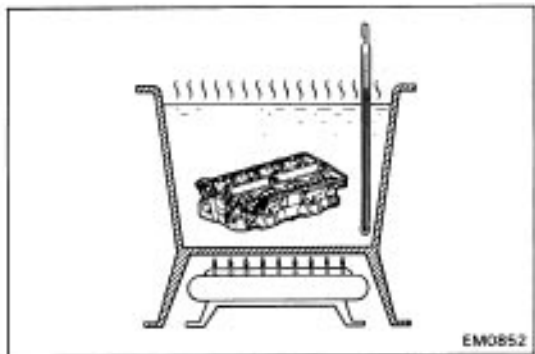
Bushing bore mm (in.)	Bushing size
11.000 – 11.027 (0.4331 – 0.4341)	Used STD
11.050 – 11.077 (0.4350 – 0.4361)	Used O/S 0.05

(e) Select a new guide bushing (STD size or O/S 0.05).
If the bushing bore diameter of the cylinder head is greater than 11.027 mm (0.4341 in.), machine the bushing bore to the following dimension:

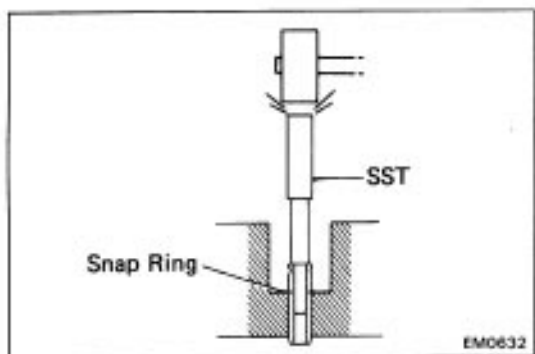
Rebored cylinder head bushing bore dimension:

11.050 – 11.077 mm (0.4350 – 0.4361 in.)

If the bushing bore diameter of the cylinder head is greater than 11.077 mm (0.4361 in.), replace the cylinder head.

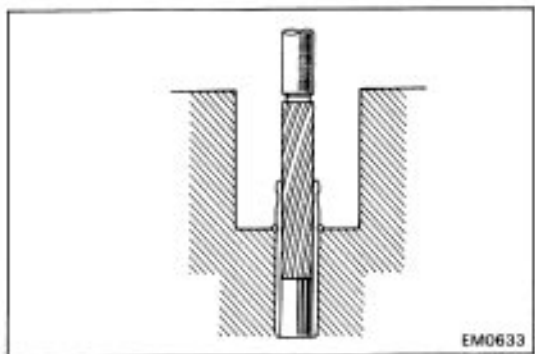


(f) Gradually heat the cylinder head to 80 – 100°C (176 – 212°F).

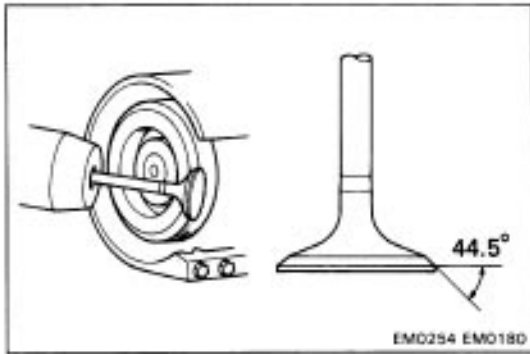


(g) Using SST and a hammer, tap in a new guide bushing until the snap ring makes contact with the cylinder head.

SST 09201-70010



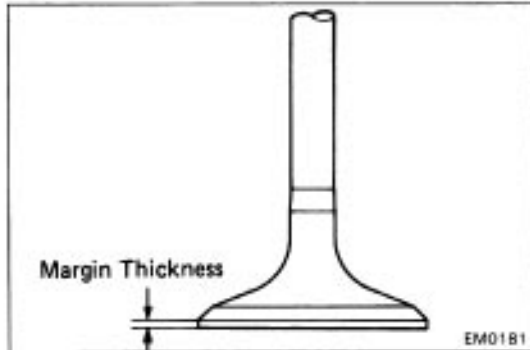
(h) Using a sharp 6 mm reamer, ream the guide bushing to obtain the standard specified clearance (See page [EM-100](#)) between the guide bushing and valve stem.



11. INSPECT AND GRIND VALVES

- (a) Grind the valve enough to remove pits and carbon.
- (b) Check that the valve is ground to the correct valve face angle.

Valve face angle: 44.5°



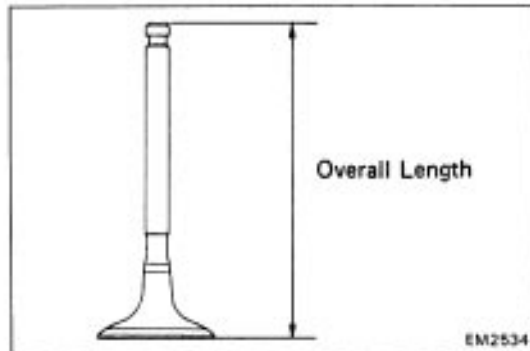
- (c) Check the valve head margin thickness.

Standard margin thickness: 0.8 – 1.2 mm

(0.031 – 0.047 in.)

Minimum margin thickness: 0.5 mm (0.020 in.)

If the margin thickness is less than minimum, replace the valve.



- (d) Check the valve overall length.

Standard overall length:

Intake 99.60 mm (3.9213 in.)

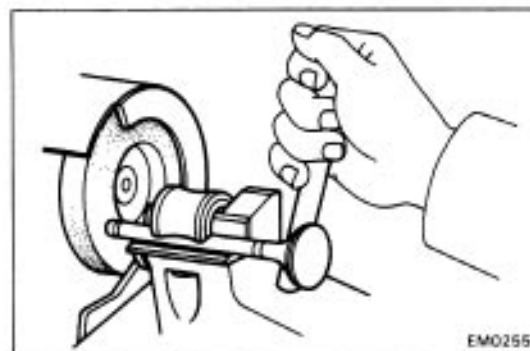
Exhaust 99.75 mm (3.9272 in.)

Minimum overall length:

Intake 99.10 mm (3.9016 in.)

Exhaust 99.25 mm (3.9075 in.)

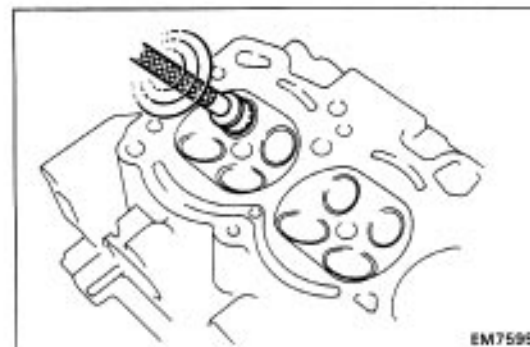
If the overall length is less than minimum, replace the valve.



- (e) Check the surface of the valve stem tip for wear.

If the valve stem tip is worn, resurface the tip with a grinder or replace the valve.

NOTICE: Do not grind off more than the minimum overall length.



12. INSPECT AND CLEAN VALVE SEATS

- (a) Using a 45° carbide cutter, resurface the valve seats.
Remove only enough metal to clean the seats.



(b) Check the valve seating position.

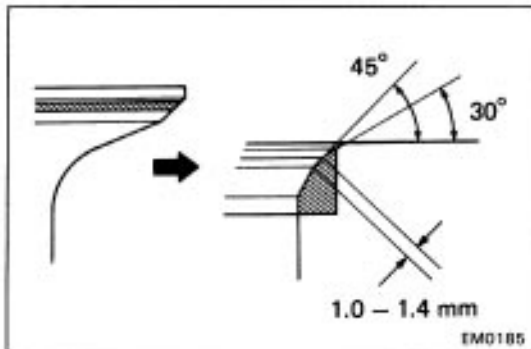
Apply a light coat of prussian blue (or white lead) to the valve face. Install the valve. Lightly press the valve against the seat. Do not rotate the valve.

(c) Check the valve face and seat for the following:

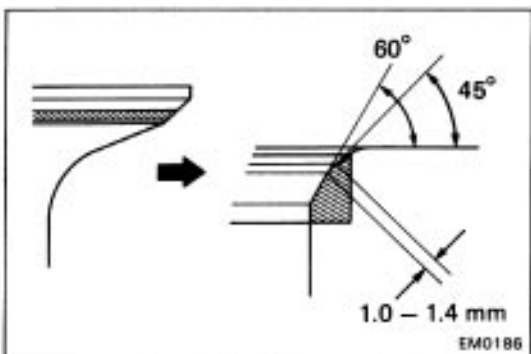
- If blue appears 360° around the face, the valve is concentric. If not, replace the valve.
- If blue appears 360° around the valve seat, the guide and seat are concentric. If not, resurface the seat.
- Check that the seat contact is on the middle of the valve face with the following width.

1.0 – 1.4 mm (0.039 – 0.055 in.)

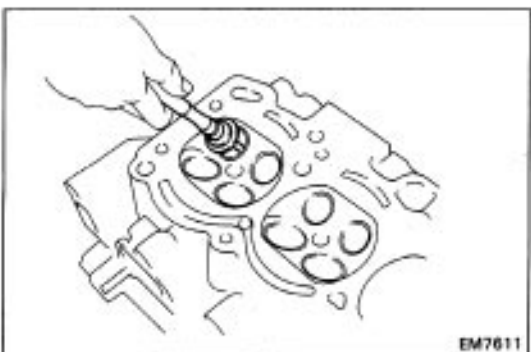
If not, correct the valve seats as follows:



- (1) If the seating is too high on the valve face, use 30° and 45° cutters to correct the seat.

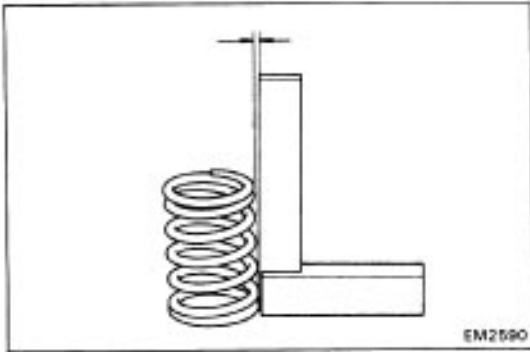


- (2) If the seating is too low on the valve face, use 60° and 45° cutters to correct the seat.



(d) Hand-lap the valve and valve seat with an abrasive compound.

(e) After hand-lapping, clean the valve and valve seat.

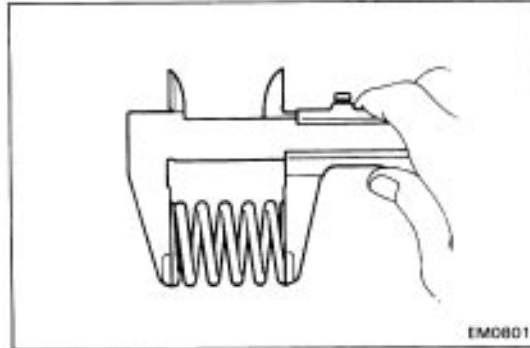


13. INSPECT VALVE SPRINGS

- (a) Using a steel square, measure the squareness of the valve spring.

Maximum squareness: 1.8 mm (0.071 in.)

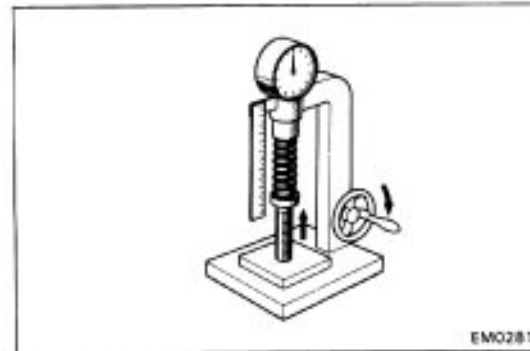
If squareness is greater than maximum, replace the valve spring.



- (b) Using calipers, measure the free length of the valve spring.

Free length: 41.09 mm (1.6177 in.)

If the free length is not as specified, replace the valve spring.



- (c) Using a spring tester, measure the tension of the valve spring at the specified installed length.

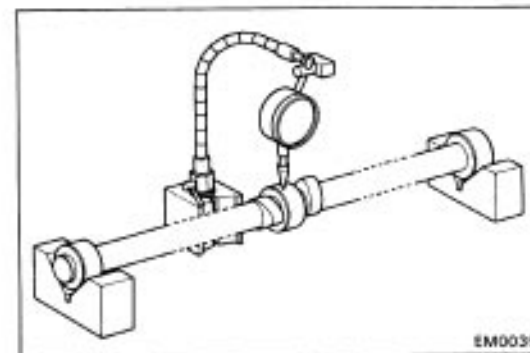
Standard installed tension:

15.8 kg (34.8 lb, 155 N) at 34.7 mm (1.366 in.)

Minimum installed tension:

14.6 kg (32.2 lb, 143 N) at 34.7 mm (1.366 in.)

If the tension is less than minimum, replace the valve spring

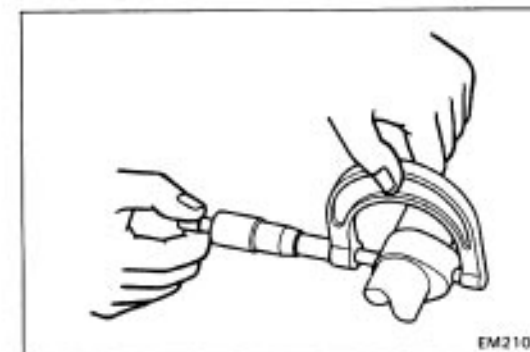


14. INSPECT CAMSHAFTS AND BEARING CAPS

- (a) Place the camshaft on V-blocks and, using a dial indicator, measure the circle runout at the center journal

Maximum circle runout: 0.04 mm (0.0016 in.)

If the circle runout is greater than maximum, replace the camshaft.



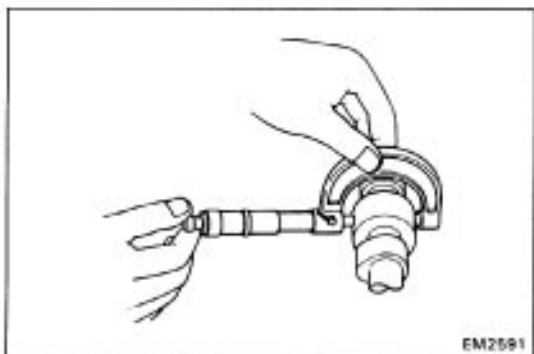
- (b) Using a micrometer, measure the cam lobe height.

Standard cam lobe height: 35.410 – 35.510 mm

(1.3823 – 1.3980 in.)

Minimum cam lobe height: 35.21 mm (1.3862 in.)

If the cam lobe height is less than minimum, replace the camshaft.

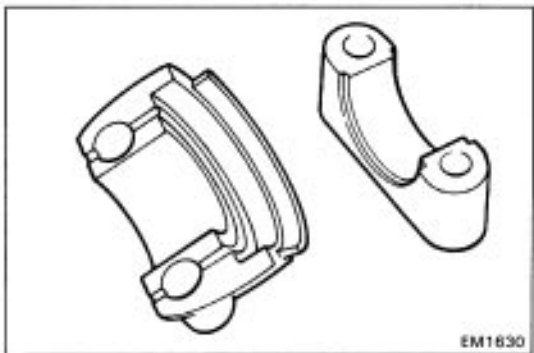


(c) Using a micrometer, measure the journal diameter.

Standard diameter: 26.949 – 26.965 mm

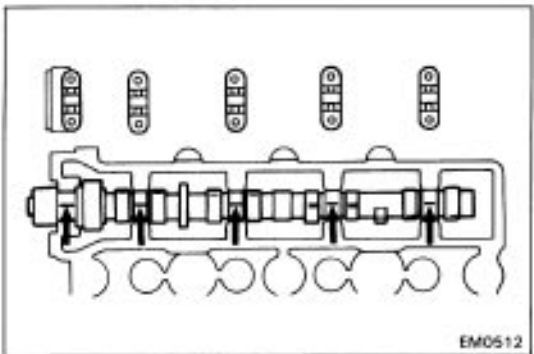
(1.0610 – 1.0616 in.)

If the journal diameter is less than specified, replace the camshaft.



(d) Check the bearings for flaking or scoring.

If bearings are damaged, replace the bearing caps and cylinder head as a set.

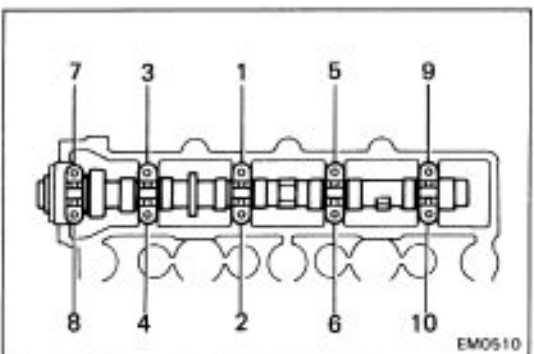


15. INSPECT CAMSHAFT OIL CLEARANCE

(a) Clean the bearing caps and camshaft journal.

(b) Place the camshaft on the cylinder head.

(c) Lay a strip of Plastigage across each journal.

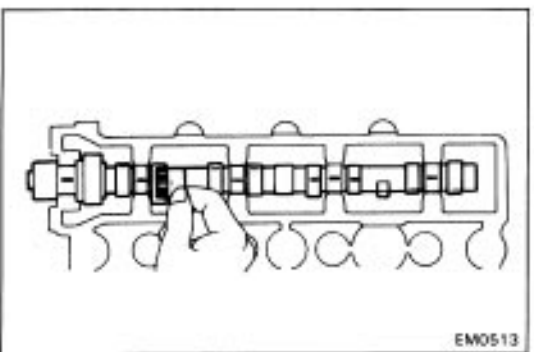


(d) Place the bearing caps on each journal with the arrows pointing toward the front.

(e) Install and torque the cap bolts gradually from the inside in three passes.

Torque: 130 kg-cm (9 ft-lb, 13 N-m)

HINT: Do not turn the camshaft while the Plastigage is in place.



(f) Remove the caps and measure the Plastigage at its widest point.

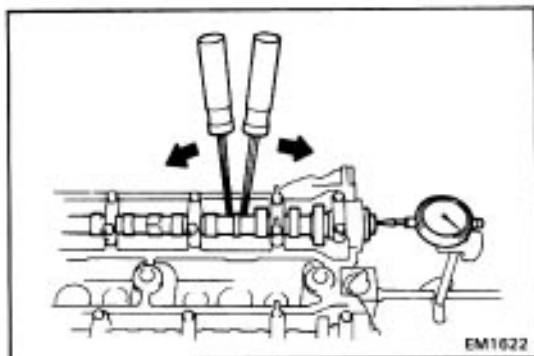
Standard oil clearance: 0.035 – 0.072 mm

(0.0014 – 0.0028 in.)

Maximum oil clearance: 0.10 mm (0.0039 in.)

If clearance is greater than maximum, replace the cylinder head and/or camshaft.

(g) Clean out the pieces of Plastigage from the bearing caps and journals.



16. INSPECT CAMSHAFT THRUST CLEARANCE

(a) Install the camshafts.

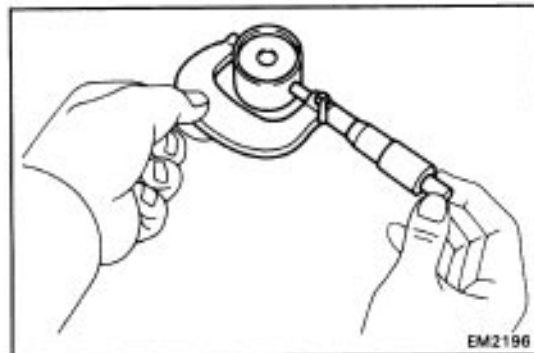
(See step 5 on pages [EM-109](#) and [EM-110](#))

(b) Using a dial indicator, measure the thrust clearance while moving the camshaft back and forth.

Standard thrust clearance: 0.080 – 0.190 mm
(0.0031 – 0.0075 in.)

Maximum thrust clearance: 0.25 mm (0.0098 in.)

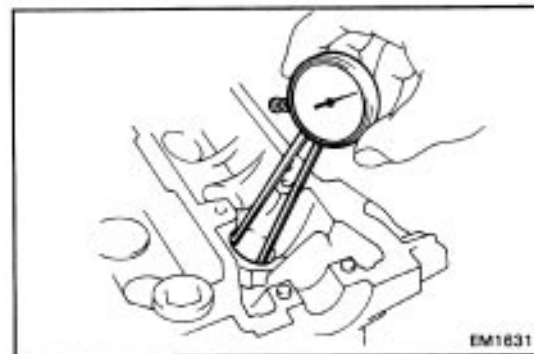
If the thrust clearance is greater than maximum, replace the camshaft. If necessary, replace the bearing caps and cylinder head as a set.



17. INSPECT VALVE LIFTERS AND LIFTER BORES

(a) Using a micrometer, measure the lifter diameter.

Lifter diameter: 27.975 – 27.985 mm
(1.1014 – 1.1018 in.)



(b) Using a caliper gauge, measure the lifter bore diameter of the cylinder head.

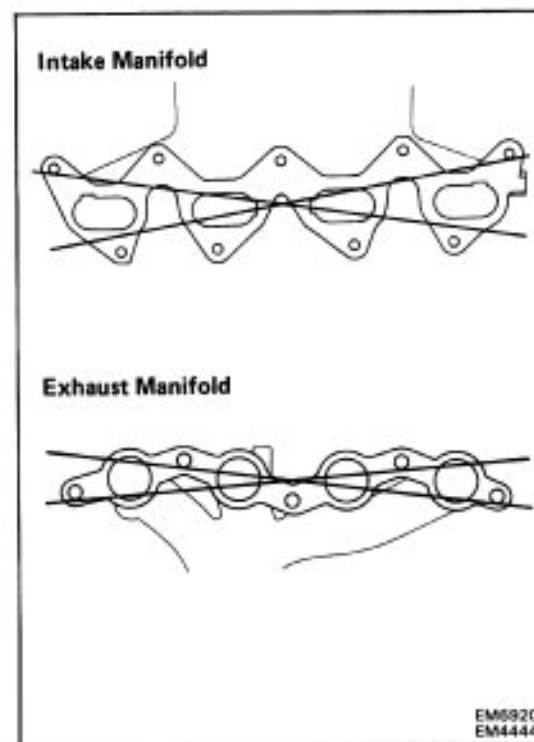
Lifter bore diameter: 28.000 – 28.021 mm
(1.1024 – 1.1032 in.)

(c) Subtract the lifter diameter measurement from the lifter bore diameter measurement.

Standard oil clearance: 0.015 – 0.046 mm
(0.0006 – 0.0018 in.)

Maximum oil clearance: 0.10 mm (0.0039 in.)

If the oil clearance is greater than maximum, replace the lifter. If necessary, replace the cylinder head.



18. INSPECT INTAKE AND EXHAUST MANIFOLDS

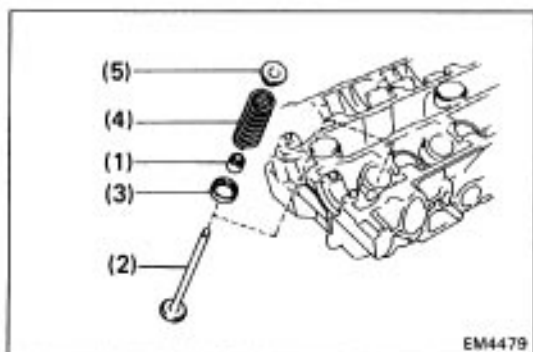
Using a precision straight edge and feeler gauge, measure the surface contacting the cylinder head for warpage.

Maximum warpage:

Intake manifold 0.05 mm (0.0020 in.)

Exhaust manifold 0.30 mm (0.0118 in.)

If warpage is greater than maximum, replace the manifold,

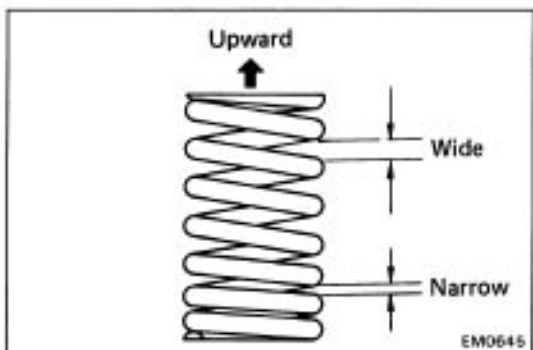


ASSEMBLY OF CYLINDER HEAD

(See page EM-89)

HINT:

- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply new engine oil to all sliding and rotating surfaces.
- Replace all gaskets and oil seals with new ones.

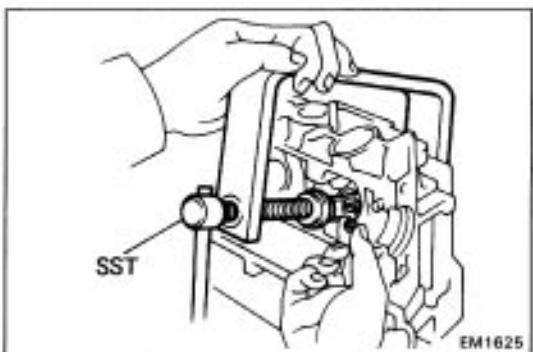


1. INSTALL VALVES

(a) Install the following parts:

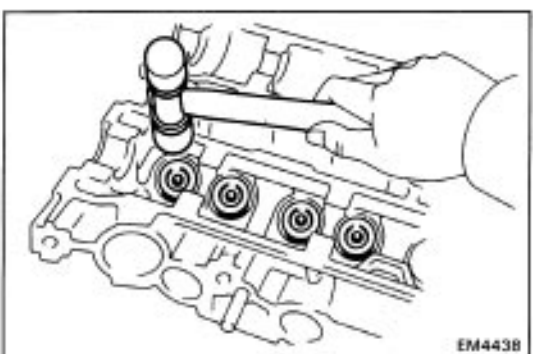
- (1) New oil seal
- (2) Valve
- (3) Spring seat
- (4) Valve spring
- (5) Spring retainer

NOTICE: Confirm the correct direction of the valve spring.

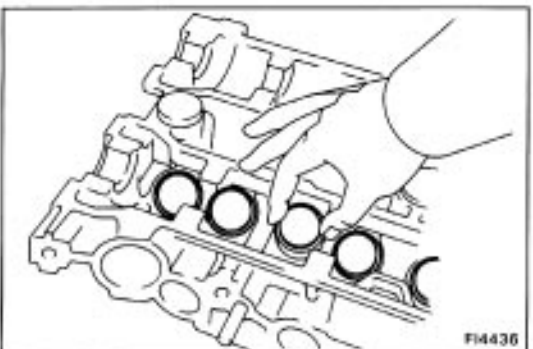


(b) Using SST, compress the valve spring and place the two keepers around the valve stem.

SST 09202-70010



(c) Using a plastic-faced hammer, lightly tap the valve stem tip to assure proper fit.

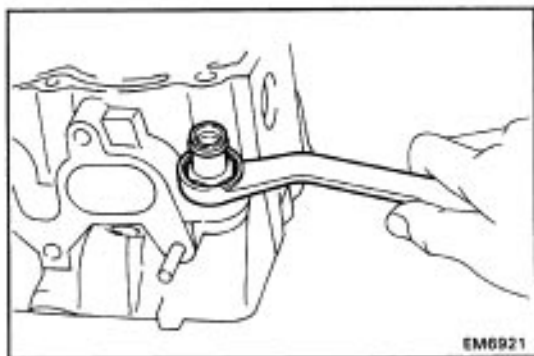


2. INSTALL VALVE LIFTERS AND SHIMS

(a) Install the valve lifter and shim.

(b) Check that the valve lifter rotates smoothly by hand.

HINT: Make sure that the valve lifters with their shims are installed in correct order.



INSTALLATION OF CYLINDER HEAD

(See page [EM-89](#))

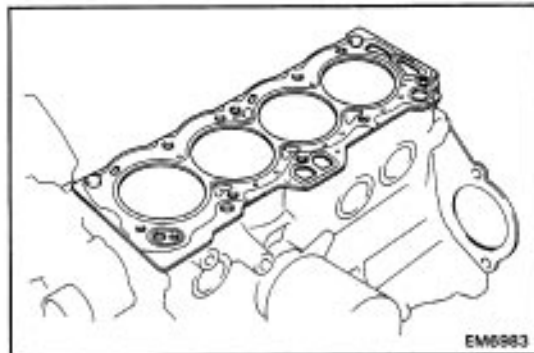
1. INSTALL UNION

(a) Apply adhesive to two or three threads.

Adhesive: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Install and torque the union.

Torque: 300 kg-cm (22 ft-lb, 29 N-m)



2. INSTALL ENGINE HANGERS

Install the engine hanger and ground strap connector with the bolt. Install the two engine hangers.

Torque: 250 kg-cm (18 ft-lb, 25 N-m)

3. INSTALL CYLINDER HEAD

HINT:

- The cylinder head bolts are tightened in three progressive steps.

- If any of the bolts break or deform, replace them.

(a) Place the cylinder head with a new cylinder head gasket on the cylinder block.

NOTICE: Be careful of the installation direction.

(b) Place the cylinder head in position on the cylinder head gasket.

HINT: Apply a light coat of engine oil on the bolt threads and under the bolt head before installing.

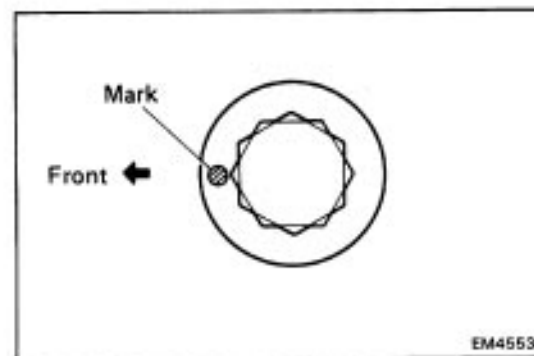
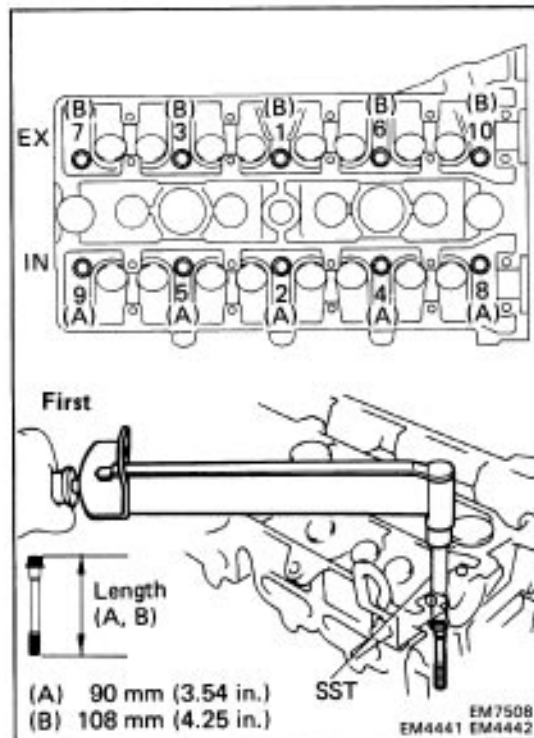
(c) First, using SST, install and uniformly tighten the ten cylinder head bolts in several passes in the sequence shown.

SST 09205-16010

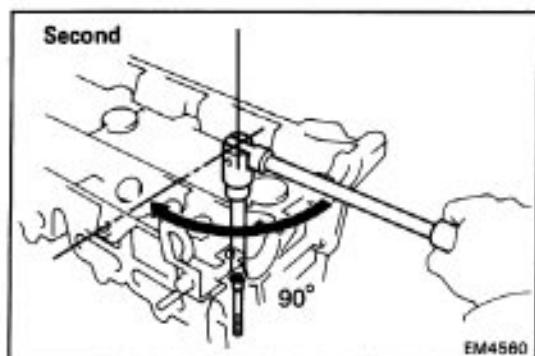
Torque: 300 kg-cm (22 ft-lb, 29 N-m)

HINT: Each bolt length is indicated in the illustration.

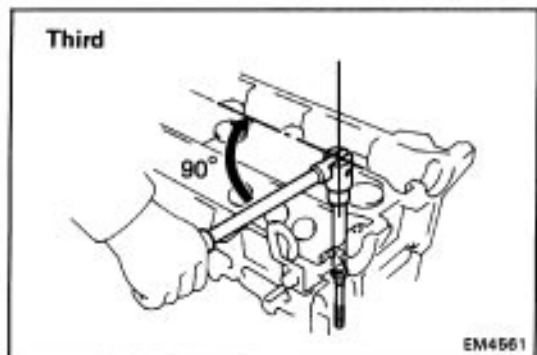
If any one of the bolts does not meet the torque specification, replace the bolt.



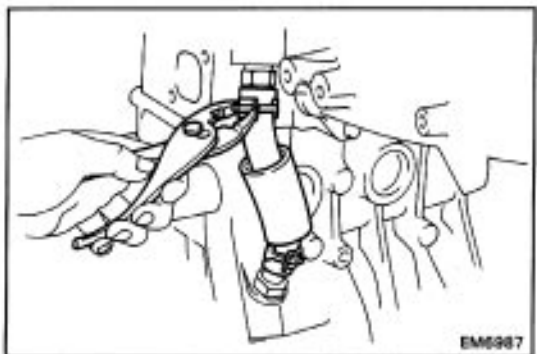
(d) Mark the front of the cylinder head bolt with paint.



- (e) Second, retighten the ten cylinder head bolts 90° in the numerical order shown.

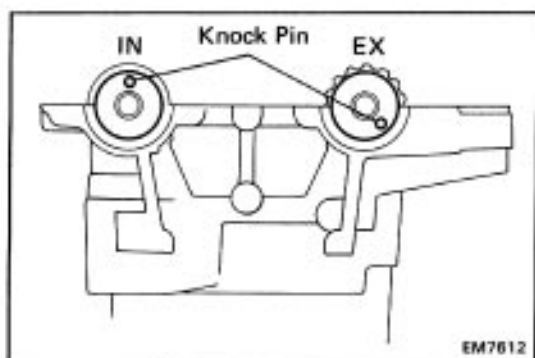


- (f) Third, retighten the ten cylinder head bolts by an additional 90°.
 (g) Check that the paint mark is now facing rearward.



4. INSTALL NO.2 PCV HOSE

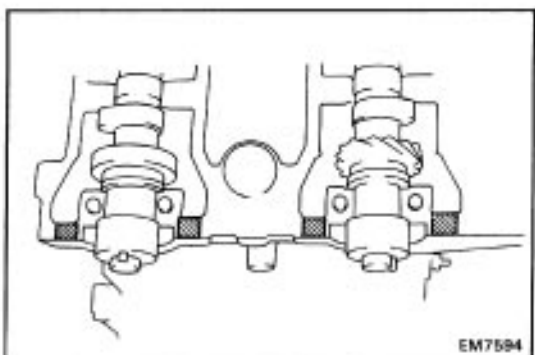
Connect the PCV hose to the cylinder head. Install the two clamps.



5. INSTALL CAMSHAFTS AND BEARING CAPS

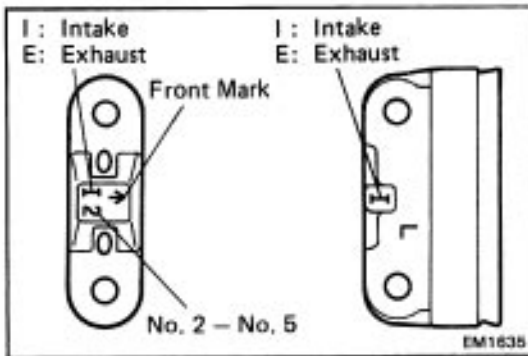
- (a) Place the camshafts on the cylinder head as shown in the illustration.

HINT: The exhaust camshaft has a distributor drive gear.

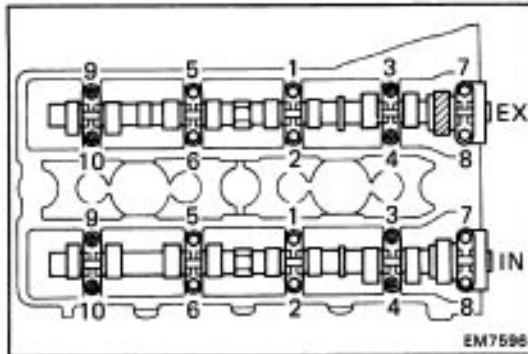


- (b) Apply seal packing to the head as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent



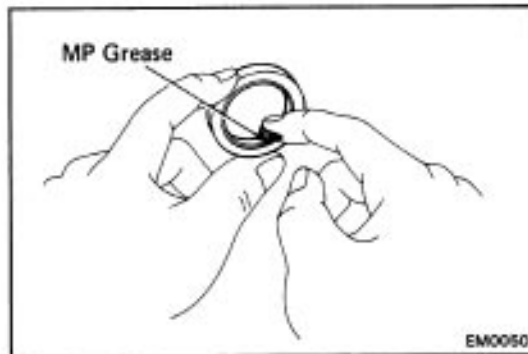
(c) Install the bearing caps in their proper locations.
HINT: Each bearing cap has a number and front mark.



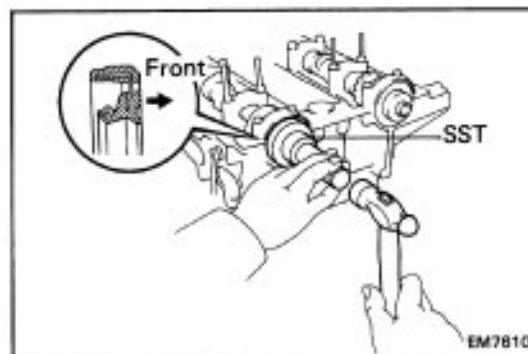
(d) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.

(e) Install and uniformly tighten the bearing cap bolts in several passes in the sequence shown.

Torque: 130 kg-cm (9 ft-lb, 13 N-m)



(f) Apply MP grease to the new camshaft oil seal lip.

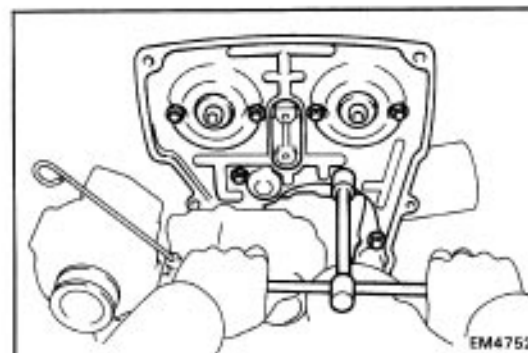


(g) Using SST, tap in new camshaft oil seals.

SST 09223-50010

HINT:

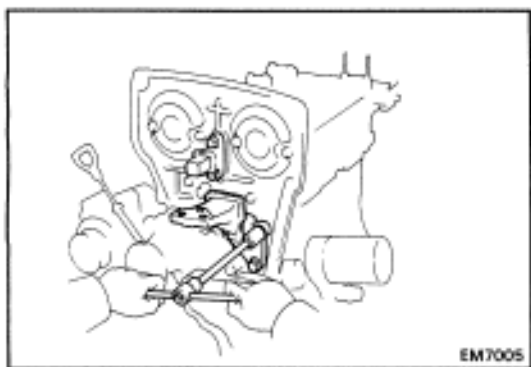
- Do not install the oil seal with the lip facing the wrong direction.
- Insert the oil seal into the deepest part of the cylinder head.



6. INSTALL NO.4 TIMING BELT COVER

Install the belt cover with the seven bolts.

Torque: 95 kg-cm (82 in-lb, 9.3 N-m)



7. INSTALL RH MOUNTING BRACKETS

- (a) Install the bracket with the three bolts.
Torque: 400 kg-cm (29 ft-lb, 39 N-m)
 (b) Install the No.2 bracket with the two bolts.
Torque: 210 kg-cm (15 ft-lb, 21 N-m)

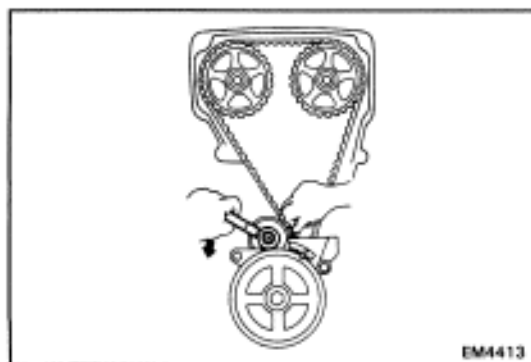
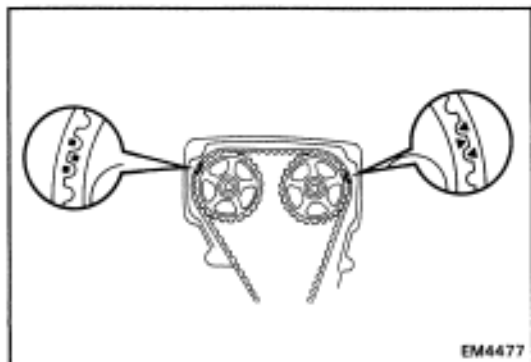
8. INSTALL CAMSHAFT TIMING PULLEYS

- (See step 1 on page [EM-48](#))
Torque: 600 kg-cm (43 ft-lb, 59 N-m)

9. INSTALL TIMING BELT

Align the matchmarks of the camshaft timing pulleys and timing belt, and install the timing belt.

NOTICE: Be careful not to shift the meshing of the crankshaft timing pulley and timing belt.

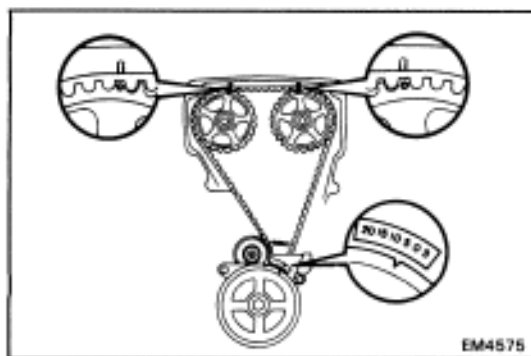
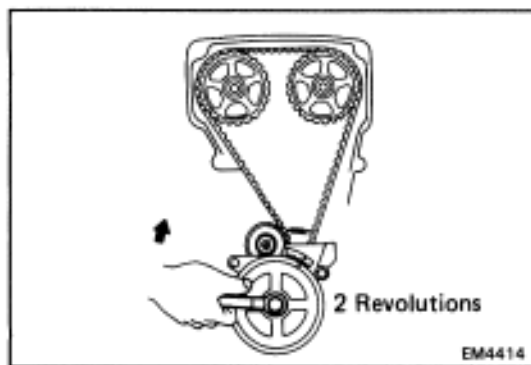


10. CHECK VALVE TIMING AND TIMING BELT DEFLECTION

- (a) Slowly loosen the idler pulley bolt.

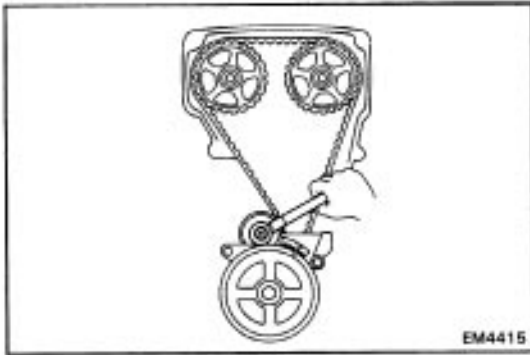
- (b) Turn the crankshaft pulley two revolutions from TDC to TDC.

HINT: Always turn the crankshaft clockwise.

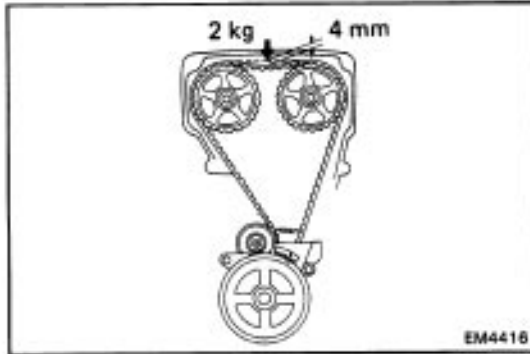


- (c) Check that each pulley aligns with the timing marks as shown in the illustration.

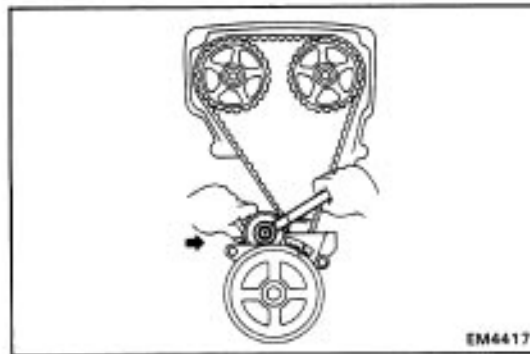
If the marks do not align, shift the meshing of the timing belt and timing pulley and readjust according to steps 9 and 10.



- (d) Torque the idler pulley bolt.
Torque: 375 kg-cm (27 ft-lb, 37 N-m)

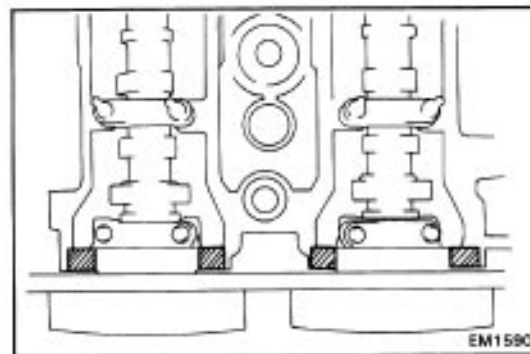


- (e) Check that there is belt deflection at the position indicated in the illustration.
Deflection: 4 mm (0.16 in.)
at 2 kg (4.4 lb, 20 N)



If the deflection is not as specified, adjust with the idler pulley.

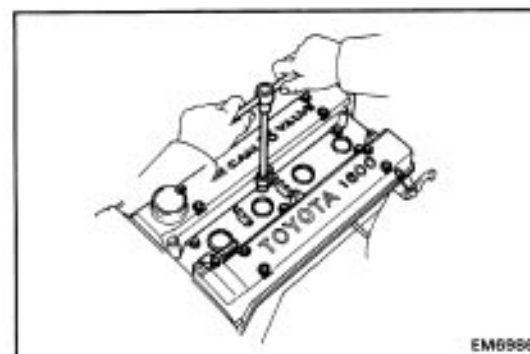
- 11. INSTALL SPARK PLUGS (See page IG-12)**
Torque: 180 kg-cm (13 ft-lb, 18 N-m)



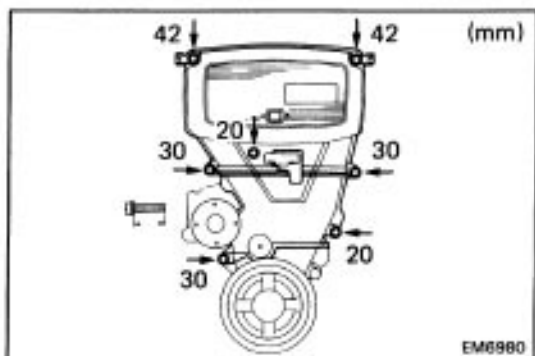
12. INSTALL CYLINDER HEAD COVERS

- (a) Apply seal packing to the cylinder head as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent



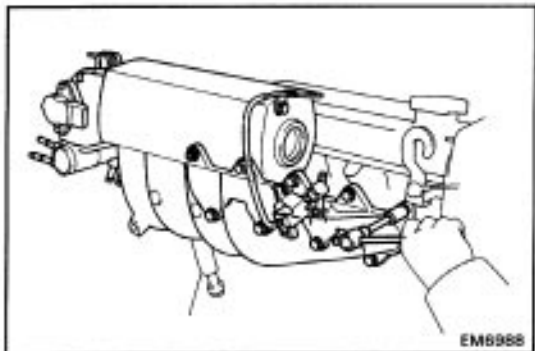
- (b) Install the gaskets to the head covers.
 (c) Install the two head covers with the four seal washers and cap nuts.
Torque: 130 kg-cm (9 ft-lb, 13 N-m)
 (d) Install the gasket to the center cover.
 (e) Install the center cover with the four bolts.

**13. INSTALL NO.2 AND NO.3 TIMING BELT COVERS**

- (a) Install the gaskets to the belt covers.
- (b) Install the No.2 and No.3 belt covers and cord support plate with the seven bolts.

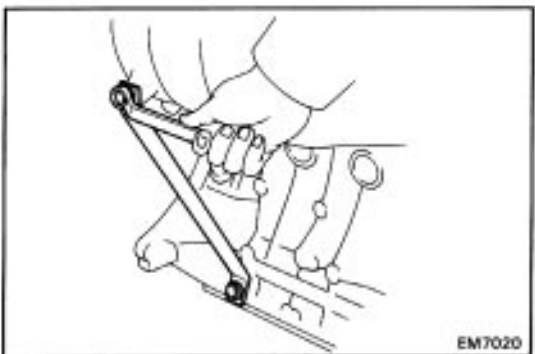
HINT: Each bolt length is indicated in the illustration.

- (c) (A/C)
Install the A/C idler pulley.

14. TEMPORARILY INSTALL WATER PUMP PULLEY**15. INSTALL INTAKE MANIFOLD**

- (a) Install a new gasket and the intake manifold with the seven bolts and two nuts.

Torque: 280 kg-cm (20 ft-lb, 27 N-m)



- (b) Install the manifold stay with the two bolts.

Torque:

14 mm head bolt 400 kg-cm (29 ft-lb, 39 N-m)

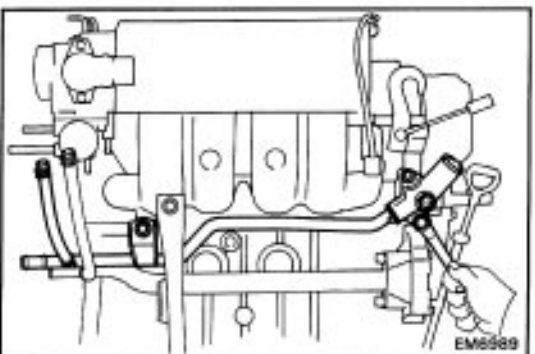
12 mm head bolt 220 kg-cm (16 ft-lb, 22 N-m)

16. INSTALL RH ENGINE MOUNTING INSULATOR

(See step 12 on page [EM-51](#))

17. INSTALL WATER INLET PIPE

(See step 4 on page [CO-9](#))

**18. INSTALL WATER OUTLET AND BY-PASS PIPE**

- (a) Install a new gasket, the water outlet and by-pass pipe assembly with the three bolts.

Torque:

Cylinder head side

280 kg-cm (20 ft-lb, 27 N-m)

Intake manifold side

130 kg-cm (9 ft-lb, 13 N-m)

- (b) Install the alternator drive belt adjusting bar with the three bolts.

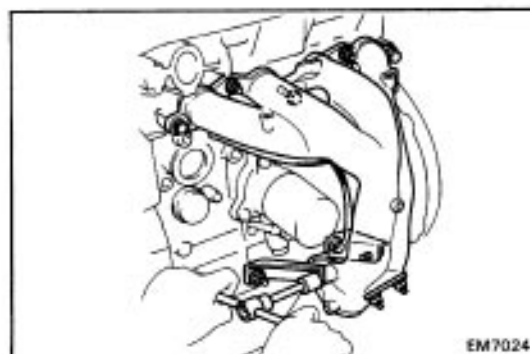
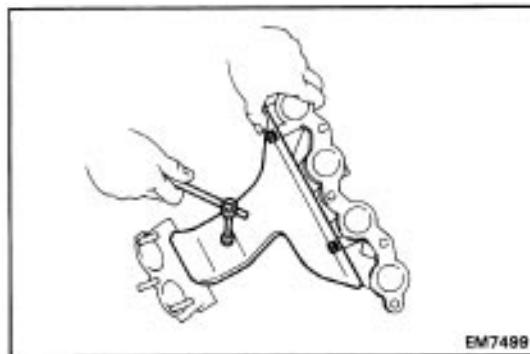
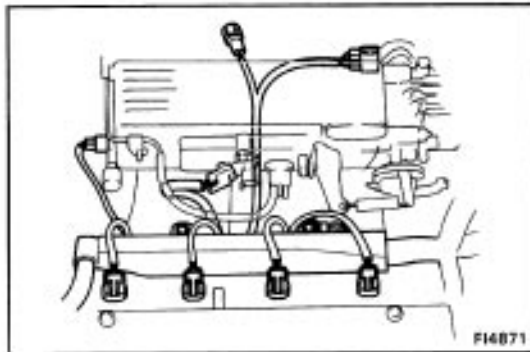
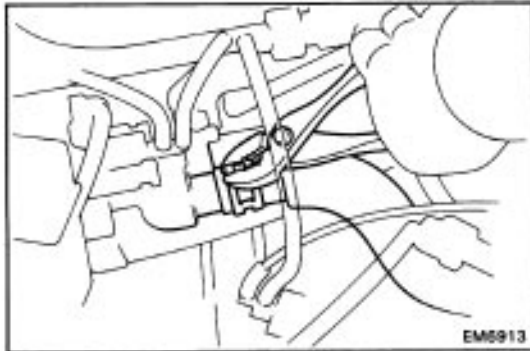
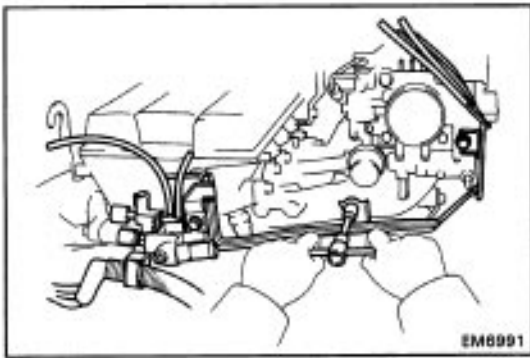
Torque: 185 kg-cm (13 ft-lb, 18 N-m)

19. (w/ PS AND/OR with A/C)

INSTALL PS AND/OR A/C DRIVE BELT

(See step 15 on page [EM-52](#))

20. INSTALL ALTERNATOR DRIVE BELT AND TIGHTEN WATER PUMP PULLEY BOLTS



21. INSTALL CYLINDER HEAD REAR COVER AND VACUUM PIPE

- (a) Using a new gasket, temporarily install the cylinder head rear cover and wire clamp.
- (b) Install the vacuum pipe, and tighten the four bolts.
- (c) Connect the vacuum hoses to the vacuum pipe.
- (d) Connect the following connectors:
 - Start injector time switch connector
 - Water temp. sensor connector
 - (w/ EGR system)
EGR VSV connector
- (e) Connect the heater hose to the cylinder head rear cover.

22. CONNECT ENGINE WIRE TO INTAKE MANIFOLD

- (a) Connect the engine wire to the intake manifold with the two bolts.
- (b) Connect the following connectors:
 - Fuel pressure VSV connector
 - Cold start injector connector
 - Throttle position sensor connector
 - Knock sensor connector

23. INSTALL INJECTOR AND DELIVERY PIPE (See steps 1 to 4 on pages [FI-143](#) and [FI-144](#))

24. INSTALL COLD START INJECTOR PIPE (See step 2 on page [FI-137](#))

25. INSTALL PCV HOSE

26. INSTALL EXHAUST MANIFOLD

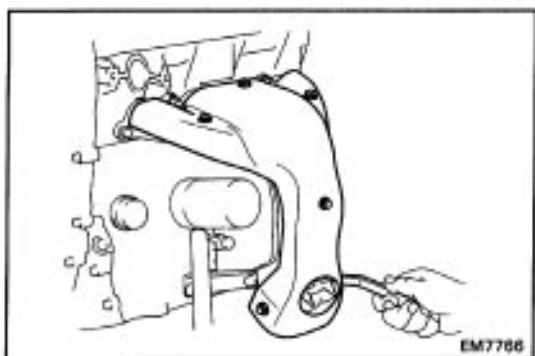
- (a) Install the lower heat insulator to the manifold with the three bolts.

- (b) Install a new gasket and the manifold with the three bolts and two nuts.

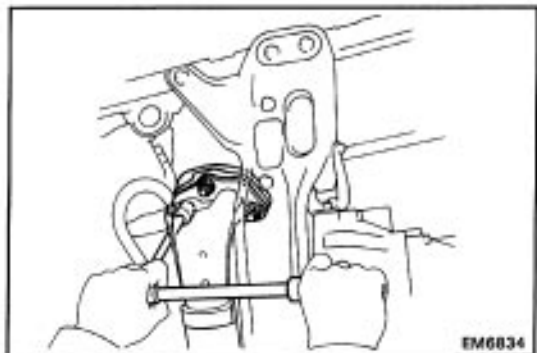
Torque: 250 kg-cm (18 ft-lb, 25 N-m)

- (c) Install the RH and LH manifold stays with the three bolts and nut.

Torque: 400 kg-cm (29 ft-lb, 39 N-m)



(d) Install the upper heat insulator with the six bolts.



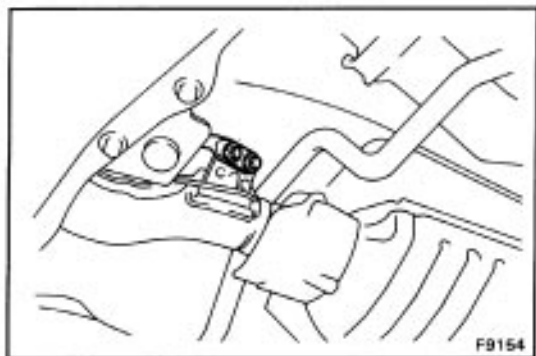
27. CONNECT EXHAUST PIPE TO EXHAUST MANIFOLD

(a) Install two new gaskets to the exhaust pipe.

(b) Connect the exhaust pipe to the manifold.

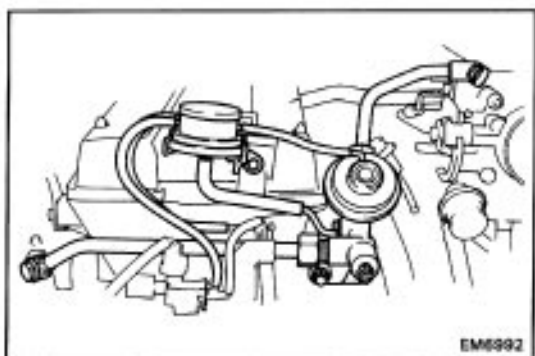
Install and torque with three new nuts.

Torque: 630 kg-cm (46 ft-lb, 62 N-m)



(c) Install the two bolts to the pipe clamp.

Torque: 195 kg-cm (14 ft-lb, 19 N-m)



28. INSTALL EGR VALVE AND MODULATOR

(a) Install a new gasket, the EGR valve and pipe assembly with the four bolts.

Torque:

Union bolt 700 kg-cm (51 ft-lb, 69 N-m)

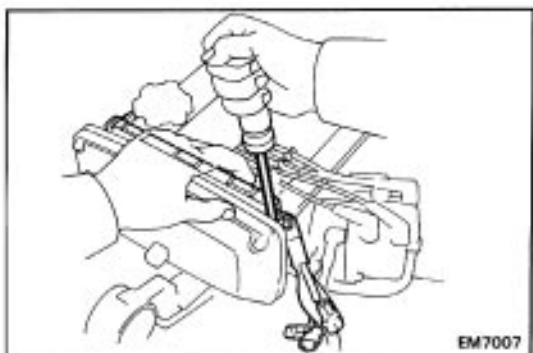
Bolt 190 kg-cm (14 ft-lb, 19 N-m)

(b) Install the EGR vacuum modulator with the bolt.

(c) Install the vacuum hoses.

(d) (California)

Connect the EGR gas temp. sensor connector.



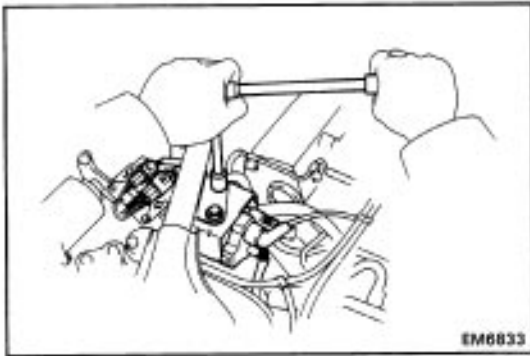
29. INSTALL DISTRIBUTOR (See page IG-18)

30. CONNECT ENGINE WIRE TO NO.4 TIMING BELT COVER

(a) Connect the engine wire to the timing belt cover.

(b) Connect the following connectors:

- Oil pressure sender gauge connector
- Distributor wire connectors
- (with A/C)
Compressor connector

**31. INSTALL IGNITION COIL**

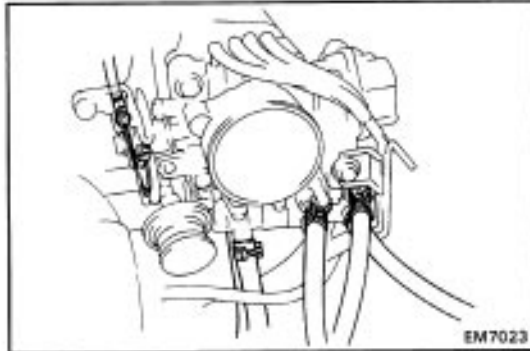
- (a) Install the ignition coil with the bracket and two bolts.
- (b) Connect the high-tension wire.
- (c) Connect the two ignition connectors.

32. INSTALL RADIATOR INLET HOSE**33. (w/ CRUISE CONTROL)**

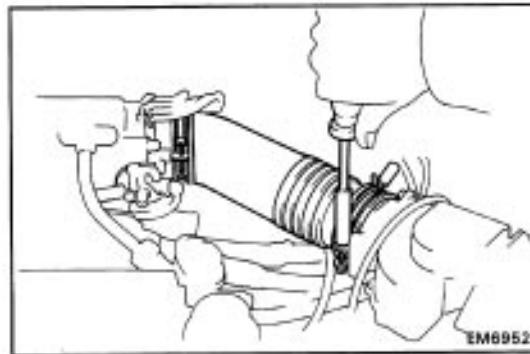
- INSTALL CRUISE CONTROL ACTUATOR**
- (See step 19 on page [EM-53](#))

34. CONNECT BRAKE VACUUM HOSE**35. INSTALL WASHER TANK****36. CONNECT ACCELERATOR WIRE TO BRACKET****37. CONNECT WATER BY-PASS HOSES****38. (w/ PS)**

- CONNECT AIR HOSES**

**39. INSTALL AIR CLEANER HOSE**

- (a) Install the air cleaner hose with the two clamp bolts.
- (b) (with A/C)
Connect the air hose.
- (c) Connect the vacuum hose to the air cleaner hose.

**40. REFILL WITH COOLANT (See page [CO-5](#))**

Capacity (w/ Heater):

6.0 liter (6.3 US qts, 5.3 Imp. qts)

41. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**42. START ENGINE AND CHECK FOR LEAKS**

Warm up the engine and inspect for leaks.

43. INSTALL RH ENGINE UNDER COVER**44. CHECK IGNITION TIMING (See page [IG-19](#))**

Ignition timing:

10 ° BTDC @ idle

(w/ Terminals TE1 and E1 connected)

45. RECHECK ENGINE COOLANT LEVEL AND OIL LEVEL