

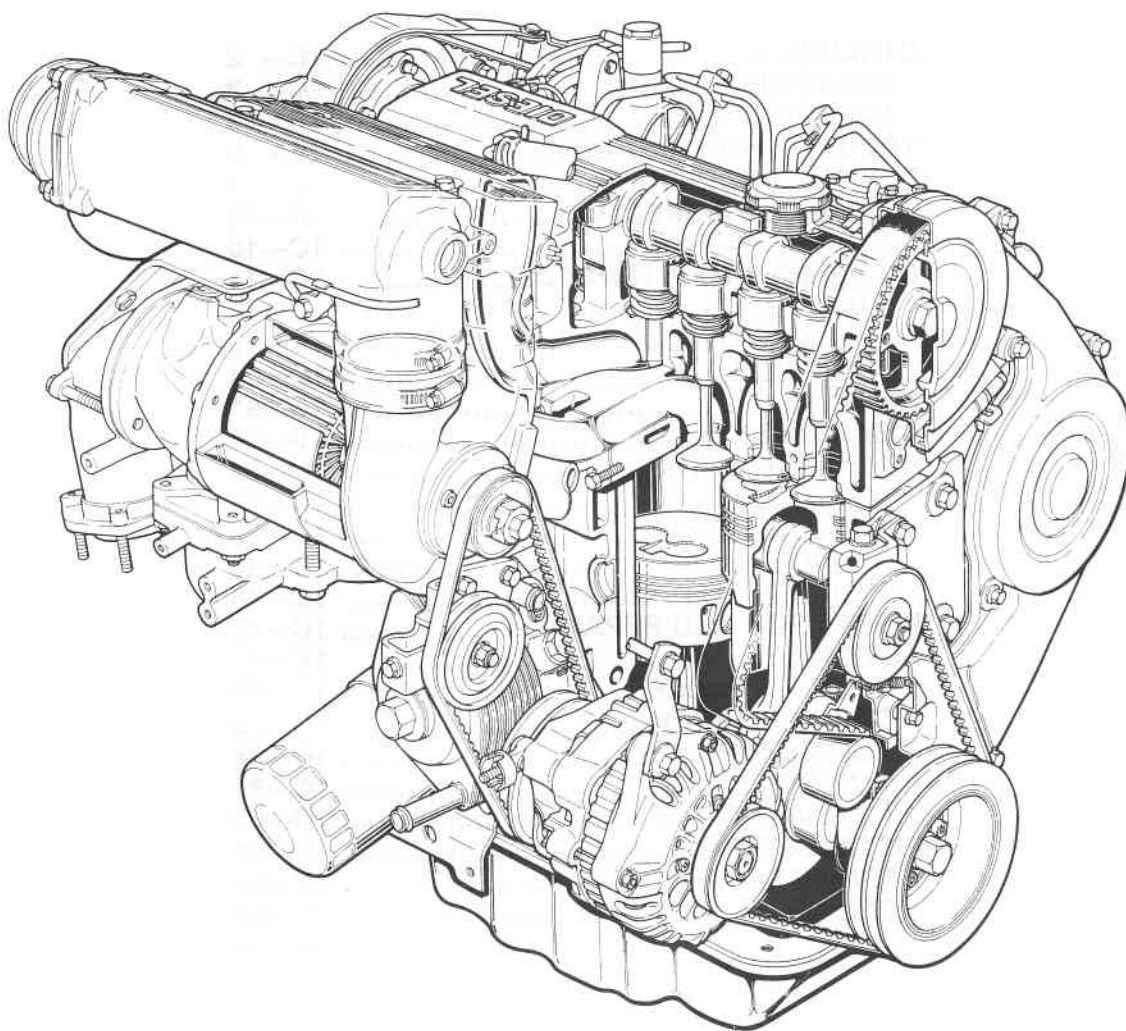
## ENGINE (DIESEL)

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# 1C OUTLINE

## OUTLINE

### STRUCTURAL VIEW



4BG01A-002

## SPECIFICATIONS

| Engine model                                               |                    |            |      | RF-CX                               | RF-N     |
|------------------------------------------------------------|--------------------|------------|------|-------------------------------------|----------|
| Item                                                       |                    |            |      |                                     |          |
| Type                                                       |                    |            |      | Diesel, 4 cycle                     |          |
| Cylinder arrangement and number                            |                    |            |      | In line, 4 cylinders                |          |
| Combustion chamber                                         |                    |            |      | Swirl chamber                       |          |
| Valve system                                               |                    |            |      | OHC, belt driven                    |          |
| Displacement                                               |                    | cc (cu in) |      | 1,998 (121.9)                       |          |
| Bore and stroke                                            |                    | mm (in)    |      | 86.0 x 86.0 (3.39 x 3.39)           |          |
| Compression ratio                                          |                    |            |      | 21.1 : 1                            | 22.7 : 1 |
| Compression pressure<br>kPa (kg/cm <sup>2</sup> , psi)-rpm |                    | Standard   |      | 2.943 (30, 427)-200                 |          |
|                                                            |                    | Minimum    |      | 2.649 (27, 384)-200                 |          |
| Valve timing                                               | IN                 | Open       | BTDC | 13°                                 | 13°      |
|                                                            |                    | Close      | ABDC | 15°                                 | 39°      |
|                                                            | EX                 | Open       | BBDC | 60°                                 | 60°      |
|                                                            |                    | Close      | ATDC | 8°                                  | 8°       |
| Valve clearance mm (in)                                    | Cold               | IN         |      | 0.25 (0.010)                        |          |
|                                                            |                    | EX         |      | 0.35 (0.014)                        |          |
|                                                            | Warm<br>(for ref.) | IN         |      | 0.30 (0.012)                        |          |
|                                                            |                    | EX         |      | 0.40 (0.016)                        |          |
| Idle speed (MTX in neutral)                                |                    | rpm        |      | 720 <sup>+30</sup> / <sub>-20</sub> |          |
| Injection timing                                           |                    |            |      | ATDC 1°                             | TDC 0°   |
| Injection order                                            |                    |            |      | 1—3—4—2                             |          |

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## TROUBLESHOOTING GUIDE

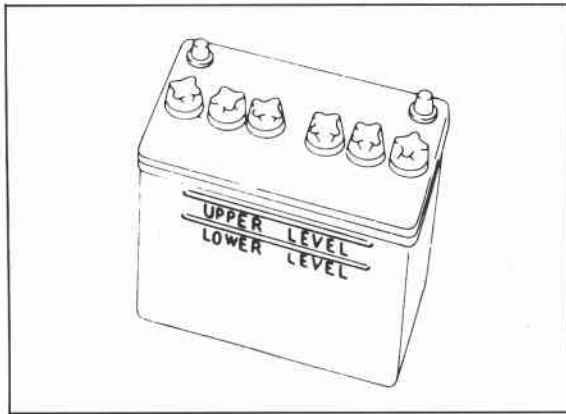
| Problem                          | Possible Cause                                                                                                                                 | Remedy                                  | Page                       |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------|
| <b>Difficult starting</b>        | <b>Malfunction of engine-related components</b><br>Burned valve<br>Worn piston, piston ring, or cylinder<br>Failed cylinder head gasket        | Replace<br>Replace or repair<br>Replace | 1C—48<br>1C—55,56<br>1C—16 |
|                                  | <b>Malfunction of fuel system</b>                                                                                                              | Refer to Section 4D                     |                            |
|                                  | <b>Malfunction of Comprex supercharger</b>                                                                                                     | Refer to Section 4D                     |                            |
|                                  | <b>Malfunction of electrical system</b>                                                                                                        | Refer to Section 5                      |                            |
| <b>Poor idling</b>               | <b>Malfunction of engine-related components</b><br>Improper valve clearance<br>Poor valve to valve seat contact<br>Failed cylinder head gasket | Adjust<br>Repair or replace<br>Replace  | 1C—85<br>1C—50<br>1C—16    |
|                                  | <b>Malfunction of fuel system</b>                                                                                                              | Refer to Section 4D                     |                            |
|                                  | <b>Malfunction of Comprex supercharger</b>                                                                                                     | Refer to Section 4D                     |                            |
| <b>Excessive oil consumption</b> | <b>Oil working up</b><br>Worn piston ring groove or sticking piston ring<br>Worn piston or cylinder                                            | Replace<br>Replace or repair            | 1C—57<br>1C—55,56          |
|                                  | <b>Oil working down</b><br>Worn valve seal<br>Worn valve stem or guide                                                                         | Replace<br>Replace                      | 1C—24<br>1C—48             |
|                                  | <b>Oil leakage</b>                                                                                                                             | Refer to Section 2B                     |                            |

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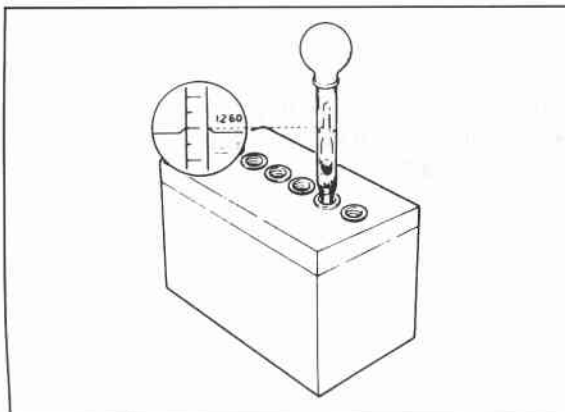
# 1C TROUBLESHOOTING GUIDE

| Problem                    | Possible Cause                                                                                                                                                                                                                                                                                  | Remedy                                                                             | Page                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Insufficient power</b>  | <b>Insufficient compression</b><br>Improper valve clearance<br>Compression leakage from valve seat<br>Seized valve stem<br>Weak or broken valve spring<br>Failed cylinder head gasket<br>Cracked or distorted cylinder head<br>Sticking, damaged, or worn piston ring<br>Cracked or worn piston | Adjust<br>Repair<br>Replace<br>Replace<br>Replace<br>Replace<br>Replace<br>Replace | 1C—85<br>1C—50<br>1C—48<br>1C—52<br>1C—16<br>1C—47<br>1C—57<br>1C—56 |
|                            | <b>Malfunction of fuel system</b>                                                                                                                                                                                                                                                               | Refer to Section 4D                                                                |                                                                      |
|                            | <b>Malfunction of Comprex supercharger</b>                                                                                                                                                                                                                                                      | Refer to Section 4D                                                                |                                                                      |
|                            | <b>Others</b><br>Slipping clutch<br>Dragging brakes<br>Wrong size tires                                                                                                                                                                                                                         | Refer to Section 6<br>Refer to Section 11<br>Refer to Section 12                   |                                                                      |
|                            |                                                                                                                                                                                                                                                                                                 |                                                                                    |                                                                      |
| <b>Abnormal combustion</b> | <b>Malfunction of engine-related components</b><br>Improper valve clearance<br>Sticking or burned valve<br>Weak or broken valve spring<br>Carbon accumulation in combustion chamber                                                                                                             | Adjust<br>Replace<br>Replace<br>Eliminate carbon                                   | 1C—85<br>1C—48<br>1C—52<br>—                                         |
|                            | <b>Malfunction of fuel system</b>                                                                                                                                                                                                                                                               | Refer to Section 4D                                                                |                                                                      |
|                            | <b>Malfunction of Comprex supercharger</b>                                                                                                                                                                                                                                                      | Refer to Section 4D                                                                |                                                                      |
| <b>Engine noise</b>        | <b>Crankshaft or bearing related parts</b><br>Excessive main bearing oil clearance<br>Main bearing seized or heat-damaged<br>Excessive crankshaft end play<br>Excessive connecting rod bearing oil clearance<br>Connecting rod bearing seized or heat-damaged                                   | Replace or repair<br>Replace<br>Replace or repair<br>Replace or repair<br>Replace  | 1C—64<br>1C—64<br>1C—65<br>1C—66<br>1C—66                            |
|                            | <b>Piston related parts</b><br>Worn cylinder<br>Worn piston or piston pin<br>Seized piston<br>Damaged piston ring<br>Bent connecting rod                                                                                                                                                        | Replace or repair<br>Replace<br>Replace<br>Replace<br>Replace                      | 1C—55<br>1C—58<br>1C—56<br>1C—57<br>1C—59                            |
|                            | <b>Valves or timing related parts</b><br>Excessive valve clearance<br>Broken valve spring<br>Excessive valve guide clearance<br>Malfunction of timing belt tensioner                                                                                                                            | Adjust<br>Replace<br>Replace<br>Replace                                            | 1C—85<br>1C—52<br>1C—48<br>1C—61                                     |
|                            | <b>Malfunction of cooling system</b>                                                                                                                                                                                                                                                            | Refer to Section 3B                                                                |                                                                      |
|                            | <b>Malfunction of fuel system</b>                                                                                                                                                                                                                                                               | Refer to Section 4D                                                                |                                                                      |
|                            | <b>Malfunction of Comprex supercharger</b>                                                                                                                                                                                                                                                      | Refer to Section 4D                                                                |                                                                      |
|                            | <b>Others</b><br>Malfunction of water pump bearing<br>Improper drive-belt tension<br>Malfunction of alternator bearing<br>Exhaust gas leakage                                                                                                                                                   | Replace<br>Adjust<br>Replace<br>Repair                                             | —<br>1C—7<br>—<br>1C—47                                              |
|                            |                                                                                                                                                                                                                                                                                                 |                                                                                    |                                                                      |
|                            |                                                                                                                                                                                                                                                                                                 |                                                                                    |                                                                      |
|                            |                                                                                                                                                                                                                                                                                                 |                                                                                    |                                                                      |

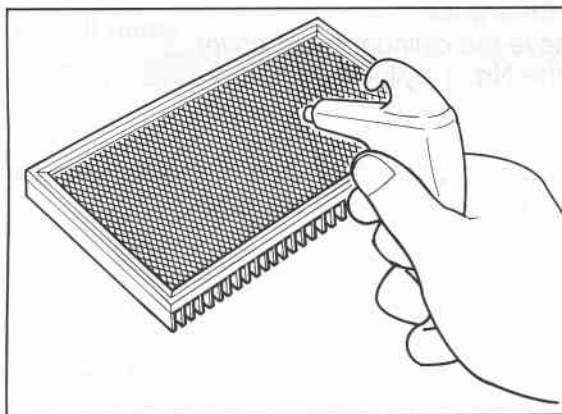
76G01C-004



4BG01B-006



4BG01B-007



76G01C-237



4BG01B-009

## TUNE-UP PROCEDURE

Turn the engine according to the procedures described below.

### Battery

1. Check for corrosion on the terminals, or loose cable connections.  
If necessary, clean the clamps and tighten firmly.
2. Check the electrolyte level.  
If the level is too low, add distilled water to the "UPPER LEVEL" mark.

3. Check the specific gravity by using a hydrometer.  
If the specific gravity reading is **1.200 or less**, recharge the battery, by referring to Section 5.

### Air Cleaner Element

Visually check the air cleaner element for being excessively dirty, damaged or oil.  
Clean or replace it if necessary.

#### Caution

**(Wet type)**

**Do not clean the air cleaner element with compressed air, replace if necessary.**

**(Dry type)**

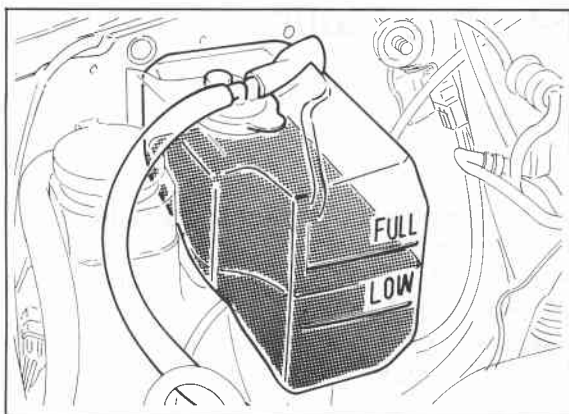
**When cleaning the air cleaner element, blow dust off from the inside first, then blow off the outside.**

### Engine Oil

Check the engine oil level and condition with the oil level gauge.

Add oil, or change it, if necessary.

# 1C TUNE-UP PROCEDURE



4BG01B-010

## Coolant Level

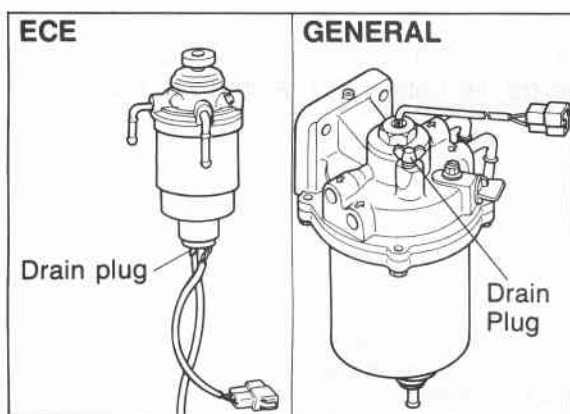
Check that the coolant level is near the radiator inlet port, and that the level in the reserve tank is between the FULL and LOW marks.

Add coolant up if the level is low.

## Warning

**Never remove the radiator cap when the engine is hot.**

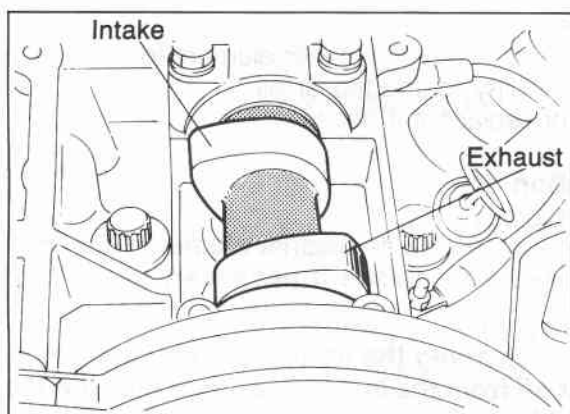
**Wrap a thick cloth around cap and carefully remove the cap.**



76G01C-005

## Water Draining

1. Drain the water from the sedimenter or fuel filter. If it is difficult to drain the water from the drain plug, loosen the air bleeding plug.
2. Bleed the air from the sedimenter or fuel filter. (Refer to Section 4D)



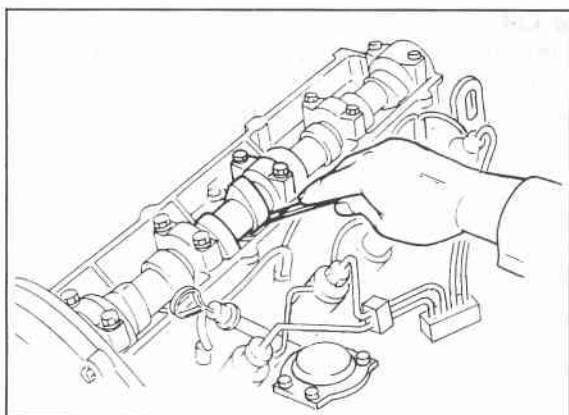
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## Valve Clearance

1. Remove the cylinder head cover.
2. Set the No. 1 cylinder to compression TDC.

## Note

**Turn the crankshaft so that the intake and exhaust cam lobes face upward.**



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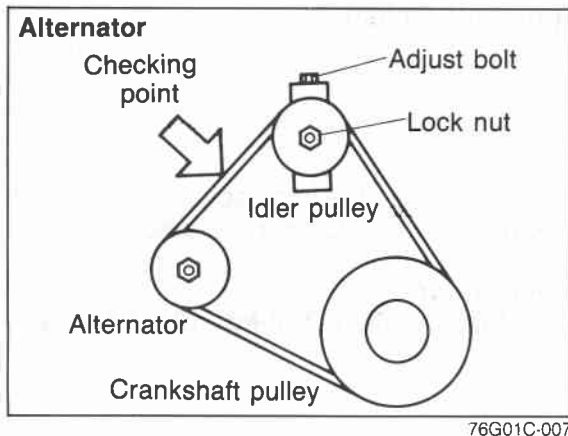
3. Measure the valve clearance of No. 1 cylinder by using a thickness gauge.

## Valve clearance (cold engine)

**0.20—0.30 mm (0.008—0.012 in)**

**0.30—0.40 mm (0.012—0.016 in)**

If necessary, adjust the valve clearance referring to the page 1C—85.



## Drive Belt

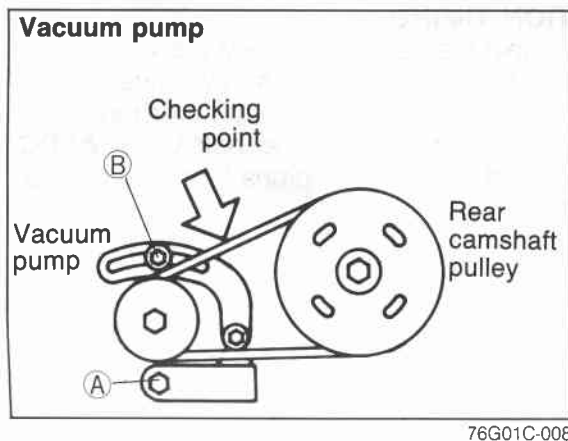
1. Check the drive belt for wear, cracks, or fraying. Replace if necessary.
2. Check the drive belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys.

## Alternator

Deflection mm (in)

|      |                      |
|------|----------------------|
| New  | 8.0—10.0 (0.31—0.39) |
| Used | 9.0—11.0 (0.35—0.43) |

If necessary, loosen the idler lock nut and adjust the belt deflection by turning the adjust bolt.



## Tightening torque:

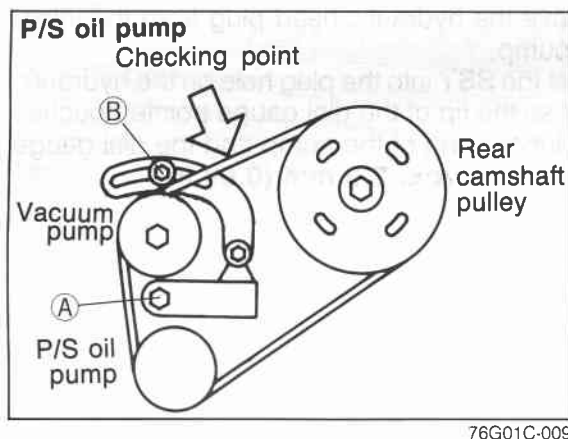
**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

## Vacuum pump and P/S oil pump

Deflection mm (in)

|              |      |                     |
|--------------|------|---------------------|
| Vacuum pump  | New  | 7.5—8.5 (0.30—0.33) |
|              | Used | 8.5—9.5 (0.33—0.37) |
| P/S oil pump | New  | 6.5—7.5 (0.26—0.30) |
|              | Used | 7.0—8.0 (0.28—0.31) |

If necessary, adjust the belt deflection as follows.



- (1) Loosen the vacuum pump bolts (A) and (B).
- (2) Lever the vacuum pump outward and apply tension to the belt.
- (3) Tighten the adjust bolt (B).

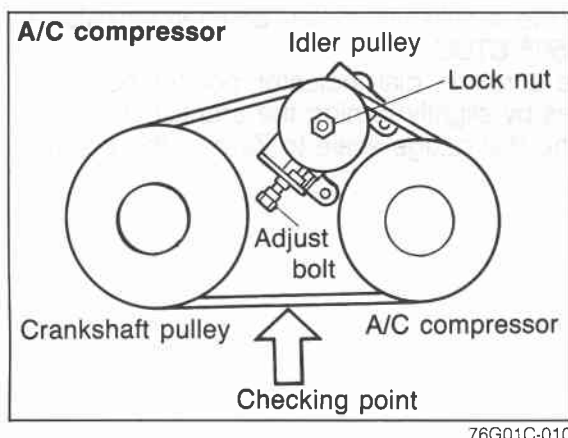
## Tightening torque:

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

- (4) Tighten the mounting bolt (A).

## Tightening torque:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**



## A/C compressor

Deflection mm (in)

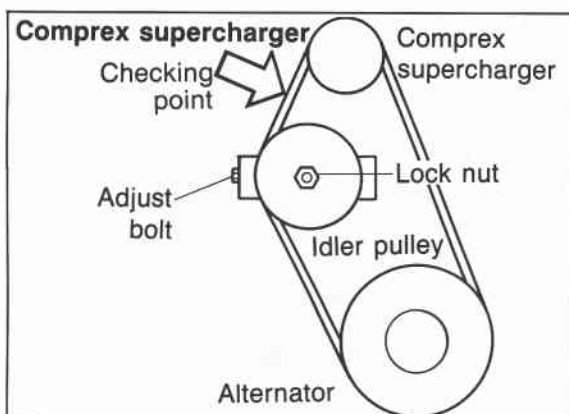
|      |                      |
|------|----------------------|
| New  | 8.5—9.5 (0.33—0.37)  |
| Used | 9.5—10.5 (0.37—0.41) |

If necessary, loosen the idler lock nut and adjust the belt deflection by turning the adjust bolt.

## Tightening torque:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

# 1C TUNE-UP PROCEDURE



76G01C-011

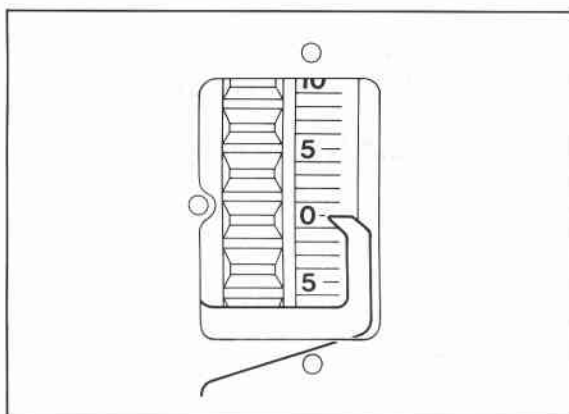
## Comprex supercharger

| Deflection | mm (in)              |
|------------|----------------------|
| New        | 4.0—6.0 (0.16—0.23)  |
| Used       | 8.0—10.0 (0.31—0.39) |

If necessary, loosen the idler lock nut and adjust the belt deflection by turning the adjust bolt.

## Tightening torque:

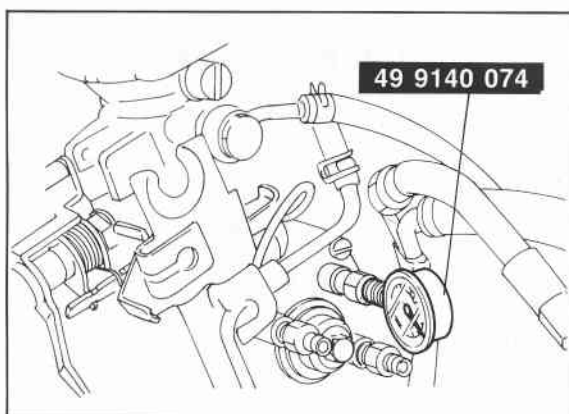
**16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)**



76G04D-008

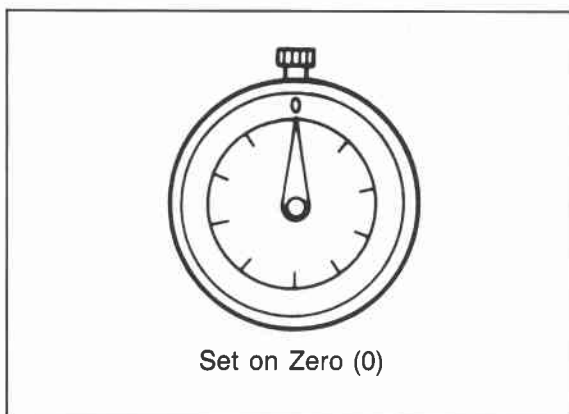
## INJECTION TIMING

1. Disconnect the negative battery cable.
2. Release the CSD using the screw driver.
3. Remove the cover on the clutch housing.
4. Turn the flywheel and set the indicator at **ATDC**.
5. Disconnect the injection pipes from the injection pump.



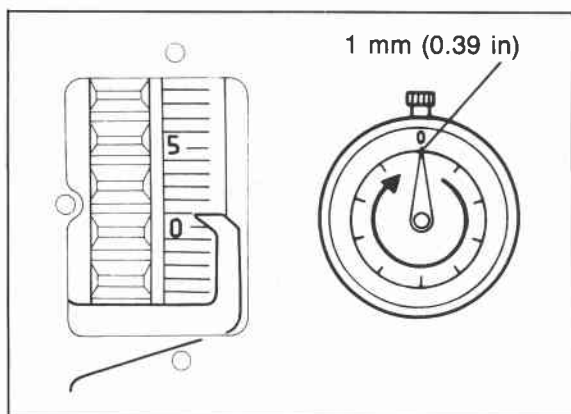
76G04D-009

6. Remove the hydraulic head plug from the injection pump.
7. Mount the **SST** into the plug hole on the hydraulic head so the tip of the dial gauge pointer touches the plunger end of the pump and the dial gauge indicates **approx. 2.0 mm (0.08 in)**.



76G04D-010

8. Turn the crankshaft slowly counterclockwise to 30—50° BTDC.
9. Make sure the dial indicator pointer no longer moves by slightly turning the crankshaft.
10. Set the dial gauge scale to Zero at the pointer.

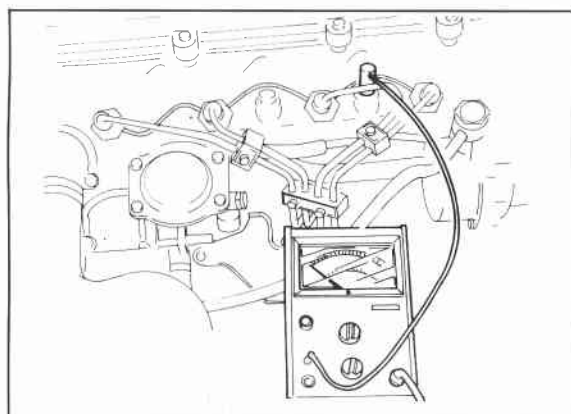


76G04D-011

11. Turn the crankshaft clockwise to align the indicator pin at **ATDC 1° (RF-CX)**, **ATDC 2° (RF-N)**.
12. Read the dial gauge.

**Cam lift: 0.98—1.02 mm (0.038—0.040 in)**

13. If not within the specification, adjust the injection timing. (Refer to page 4D—24.)



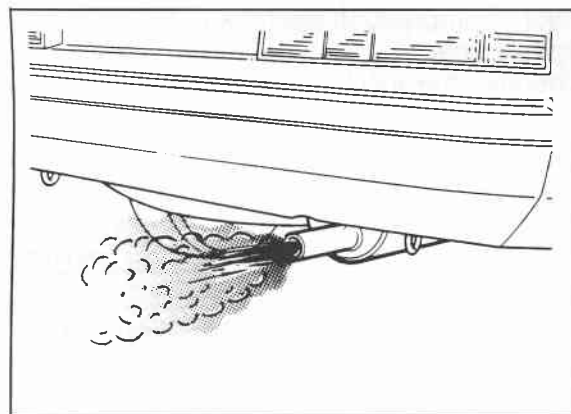
76G01C-014

## Idle Speed

1. Warm up the engine to normal operating temperature.
2. Be sure the A/C switch is OFF.
3. Connect a tachometer and check the engine speed.

**Idle speed: 720  $\pm$  30 rpm**

If the idle speed is not within the specification, adjust the idle speed referring to Section 4D.

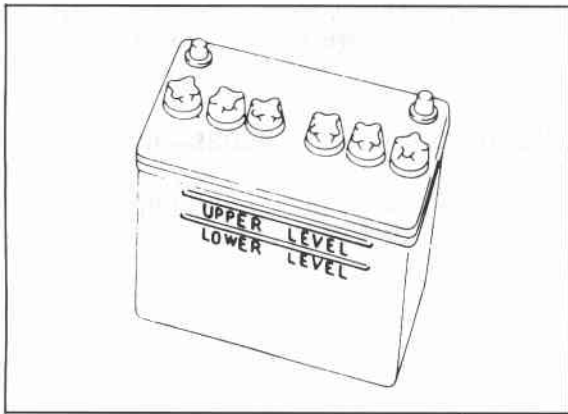


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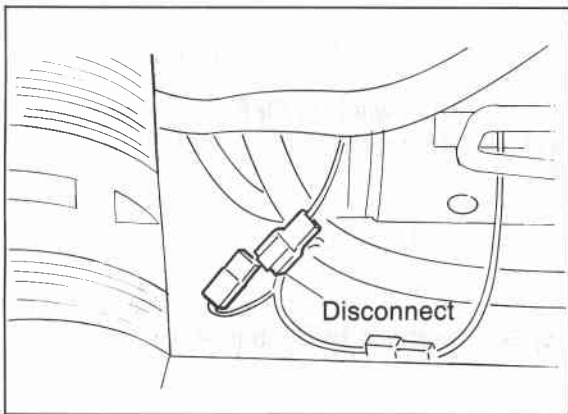
## Exhaust Smoke

Increase and decrease the engine speed several times and check that black smoke is not emitted. If there is, refer to Section 4D for the appropriate procedure.

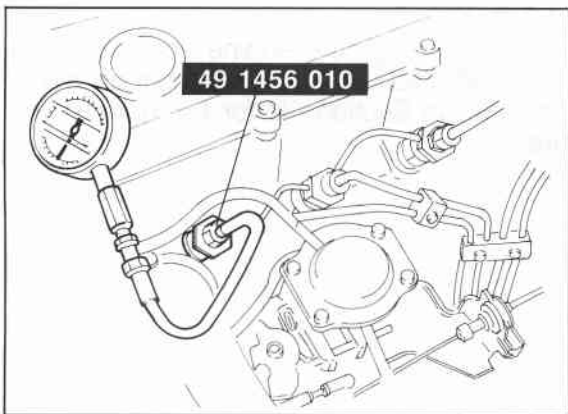
# 1C ON-VEHICLE INSPECTION



76G01C-016



76G01C-017



76G01C-018

## ON-VEHICLE INSPECTION

If the engine exhibits low power, poor fuel economy, or poor idle, check the following:

1. Compression
2. Fuel system (Refer to Section 4D)

### COMPRESSION

1. Check that the battery is fully charged. Recharge it if necessary.

2. Warm up the engine to the normal operating temperature.
3. Turn it off for about 10 minutes to allow the exhaust manifold to cool.
4. Remove all the fuel injection pipes, nozzles, washers, and corrugate washers.
5. Disconnect the fuel cut valve connector.

### Caution

**If this is not done, fuel will be injected from the injection pump while cranking.**

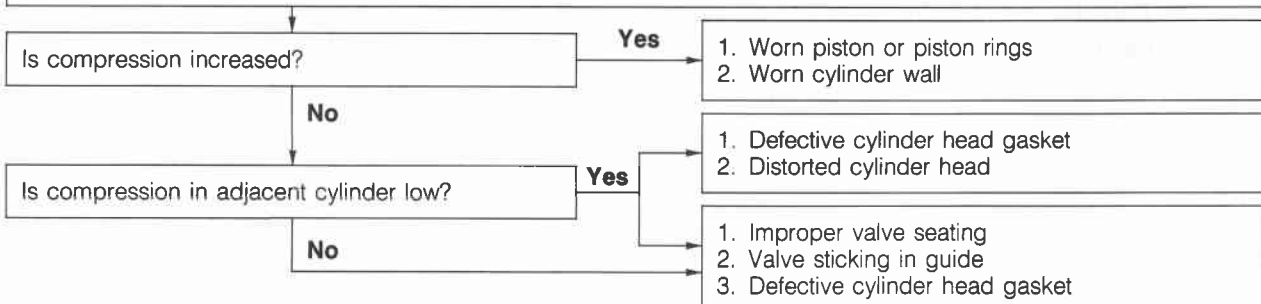
6. Connect a suitable cap to the fuel return pipe on the injection pump.
7. Connect a compression gauge with **SST** to injection nozzle hole.
8. Fully depress the accelerator pedal and crank the engine.
9. Note the maximum gauge reading.
10. Check each cylinder.

### Compression pressure

| kPa (kg/cm <sup>2</sup> , psi)-rpm |                     |
|------------------------------------|---------------------|
| Standard                           | Minimum             |
| 2.943 (30, 427)—200                | 2.649 (27, 384)—200 |

### Possible Cause

If compression is low, pour heavy oil into the cylinder and turn the crankshaft several times  
Check compression once more



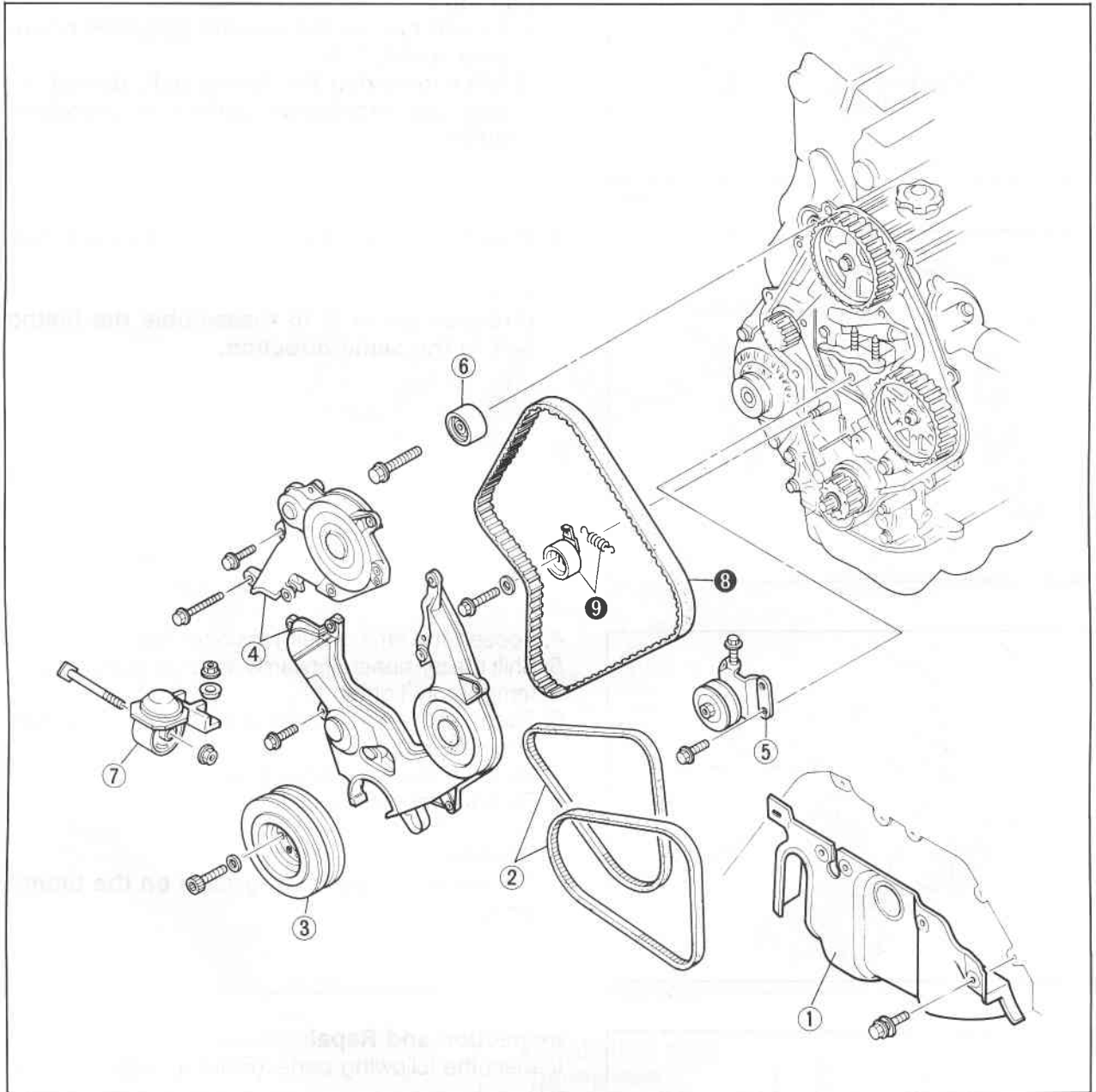
86U01X-022

## ON-VEHICLE MAINTENANCE

### TIMING BELT

#### Removal

1. Disconnect the negative battery cable.
2. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.



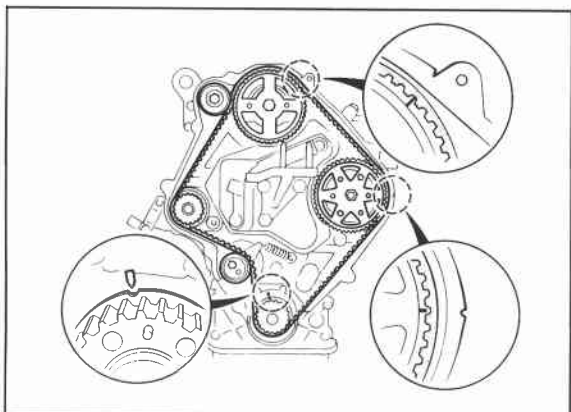
76G01C-019

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| 1. Engine side cover                | 6. Idler pulley                     |
| 2. A/C and alternator drive belt    | 7. No.3 engine mount                |
| 3. Crankshaft pulley                | 8. Timing belt                      |
| 4. Left and right timing belt cover | 9. Timing belt tensioner and spring |
| 5. Alternator idle pulley           |                                     |

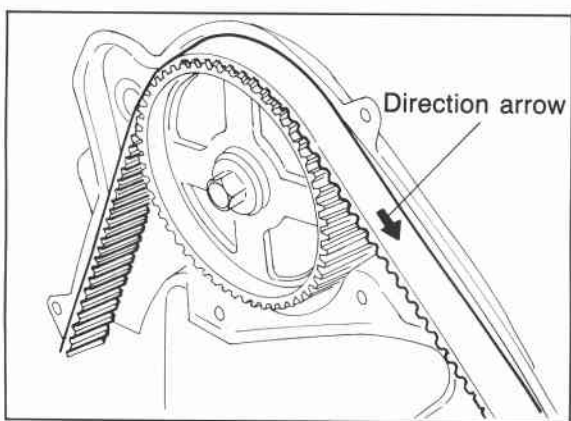
#### Note

**Loosen the No.3 engine mount nuts and lower the engine to remove the crankshaft pulley.**

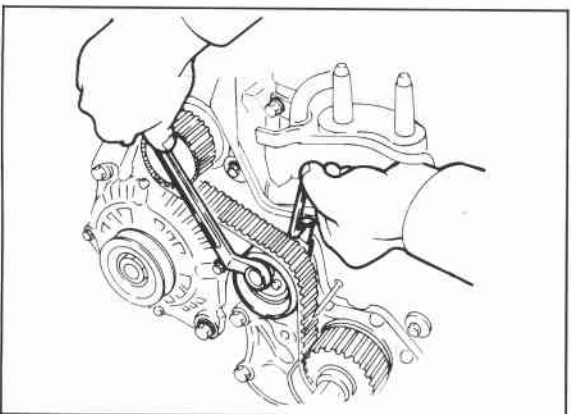
# 1C ON-VEHICLE MAINTENANCE (TIMING BELT)



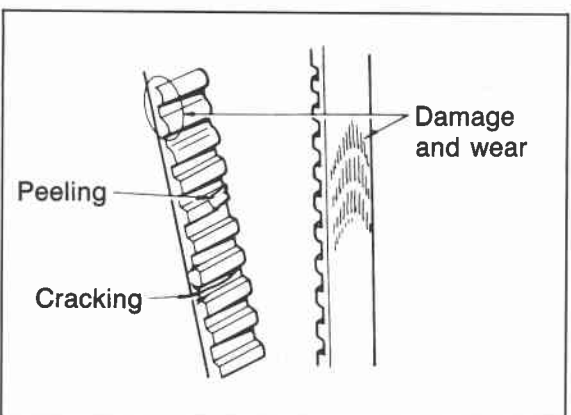
76G01C-020



76G01C-238



76G01C-021



76G01C-022

## Removal note

### Timing belt

1. Align the timing marks of each pulleys.
2. Affix the injection pump pulley to the bracket using two bolts (35—40 mm, 1.4—1.6 in).

### Caution

- a) Do not turn in the reverse direction of engine revolution.
- b) After removing the timing belt, do not rotate the crankshaft pulley or camshaft pulley.

3. Make the forward direction arrow on the timing belt.

### Note

**Direction arrow is to reassemble the timing belt in the same direction.**

4. Loosen the timing belt tensioner bolt.
5. Shift the tensioner outwards as far as possible, and temporarily tighten it.
6. Suspend the engine with chain block on the front engine hanger.
7. Remove the No.3 engine mount.
8. Remove the timing belt.

### Caution

**Do not allow any oil or grease on the timing belt.**

## Inspection and Repair

Inspect the following parts. (Refer to page 1C—60, 61).

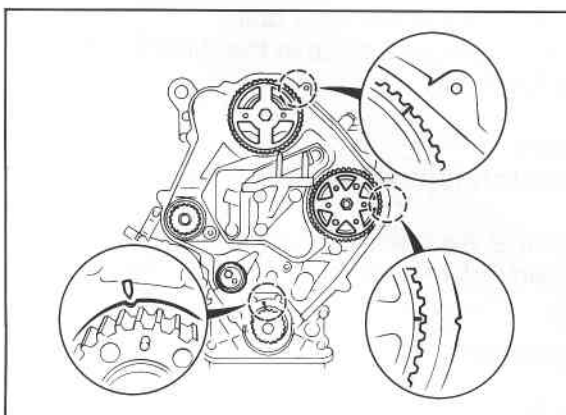
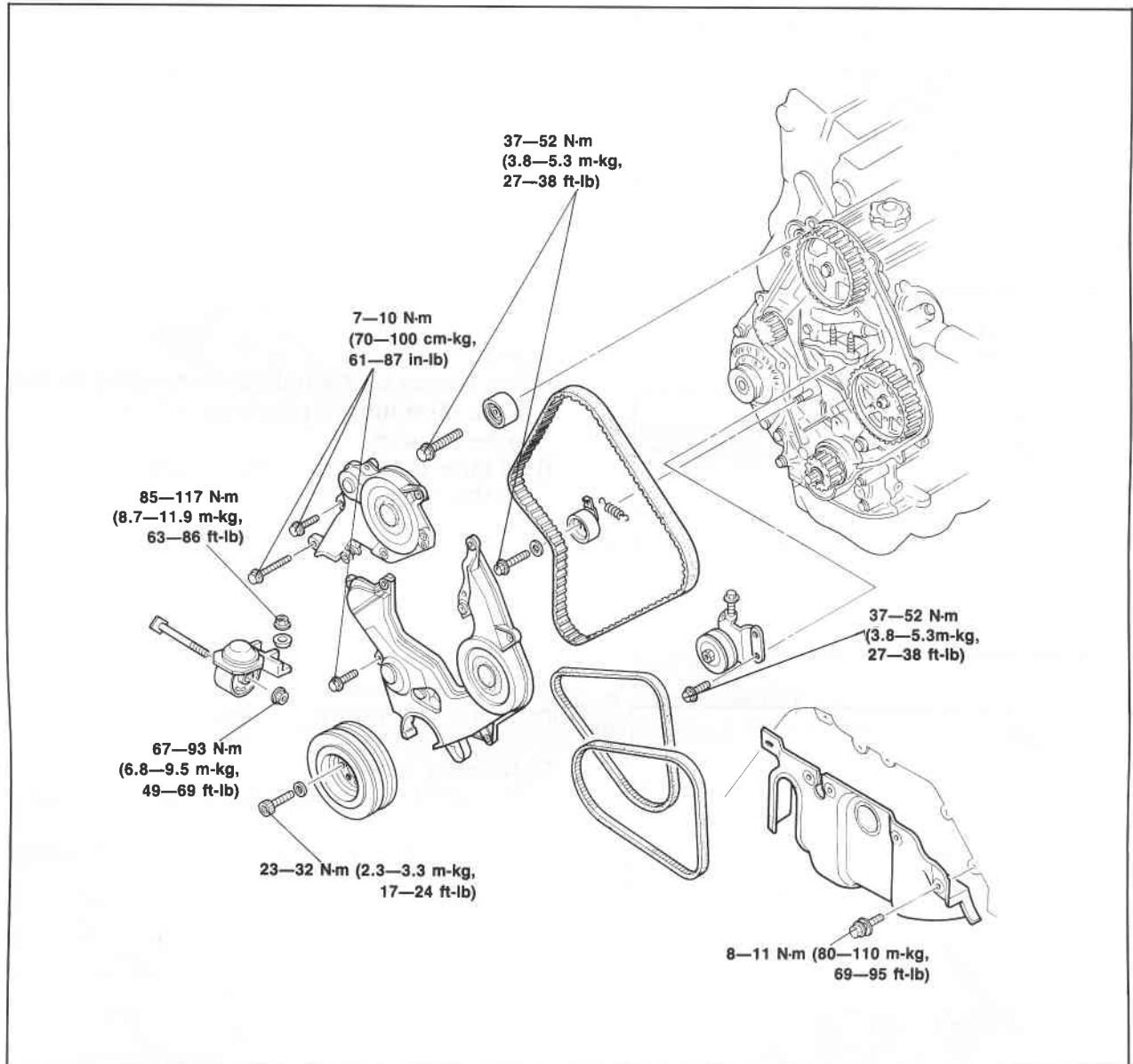
1. Timing belt
2. Timing belt tensioner and spring
3. Timing belt idler pulley
4. Timing belt pulley

## Installation

Install in the reverse order of removal referring to the installation note.

## Torque Specifications

76G01C-239



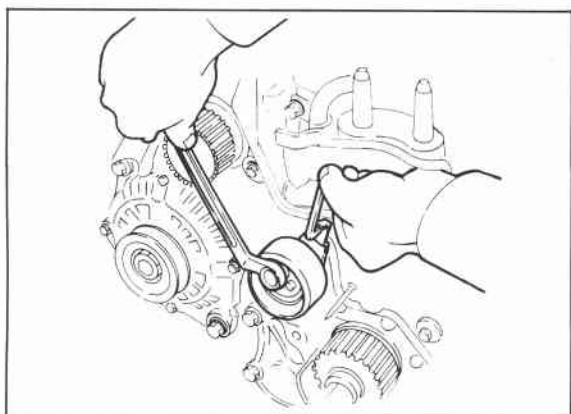
76G01C-023

## Installation note

### Timing belt

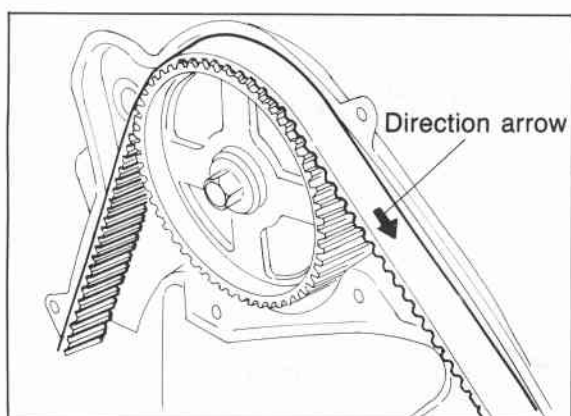
1. Check that the timing marks of camshaft pulley, timing belt pulley and injection pump pulley align with the timing marks.

## 1C ON-VEHICLE MAINTENANCE (TIMING BELT)



63G01D-330

2. Install the timing belt tensioner and spring.
3. Temporarily secure the tensioner with it shifted outwards.

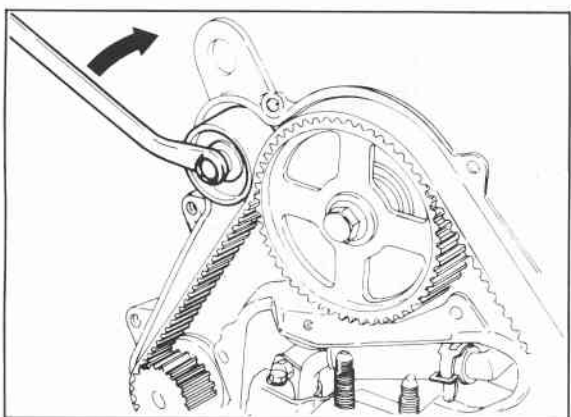


76G01C-024

4. Install the timing belt.

### Caution

- a) The timing belt must be reinstalled in the same direction of previous rotation, if it is to be reused.
- b) Be sure that there is no oil, grease, or dirt on the timing belt.



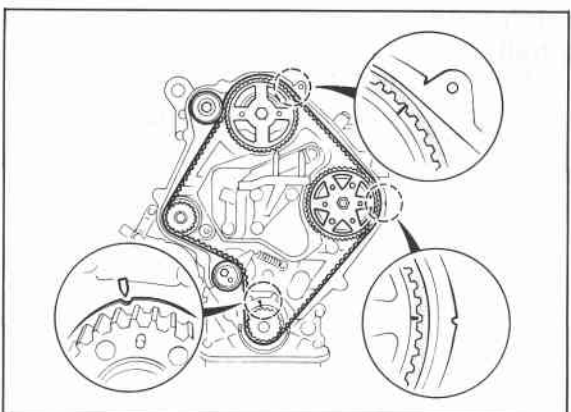
76G01C-025

5. Install the idler pulley.

### Tightening torque:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

6. Remove the affixing bolts from the injection pulley.



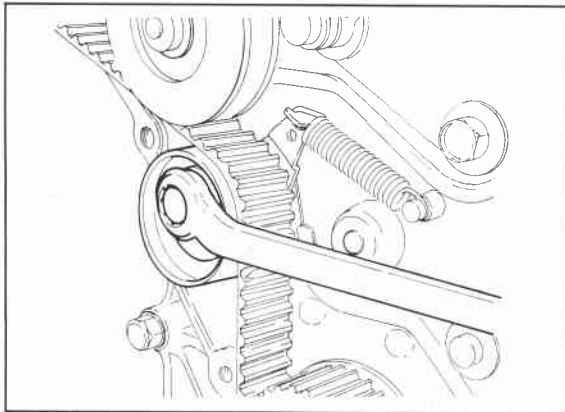
76G01C-026

7. Loosen the tensioner lock bolt.
8. Turn the crankshaft twice in the direction of rotation (clockwise).

### Caution

**Do not rotate reverse direction.**

9. Check that each timing mark is correctly aligned. If not aligned, remove the timing belt. Repeat step 1—8.

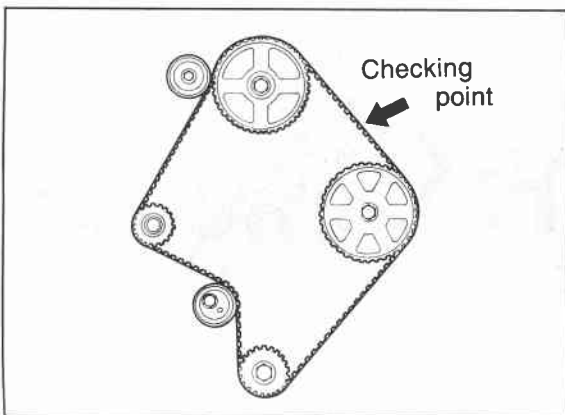


76G01C-027

10. Tighten the timing belt tensioner lock bolt.

**Tightening torque:**

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**



76G01C-028

11. Check the timing belt tension.

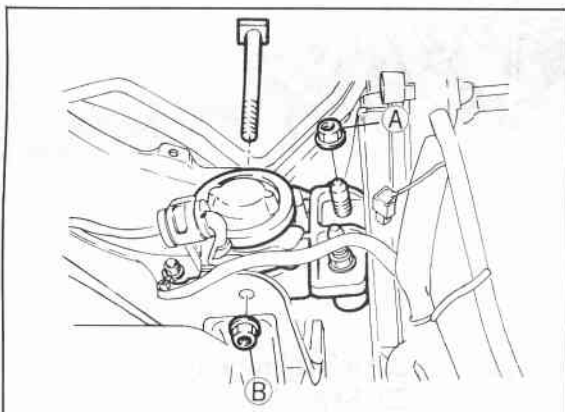
If the tension is not correct, loosen the tensioner lock bolt and repeat step 7—10, or replace the tensioner spring.

**Deflection: 9.0—11.5 mm**

**(0.35—0.45 in) / 98 N (10 kg, 22 lb)**

**Caution**

**Be sure not to apply tension other than that of the tensioner spring.**



76G01C-029

**No.3 engine mount**

Install the No.3 engine mount.

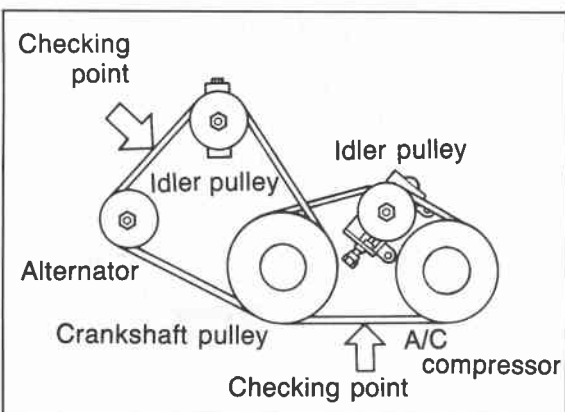
**Tightening torque:**

**Nut A: 85—117 N·m**

**(8.7—11.9 m·kg, 63—86 ft·lb)**

**Nut B: 67—93 N·m**

**(6.8—9.5 m·kg, 49—69 ft·lb)**



76G01C-030

**Drive belt**

Install each drive belt, and check the belt deflection. (Refer to page 1C—7.)

**Steps after installation**

Perform the necessary engine adjustment. (Refer to TUNE-UP PROCEDURE.)

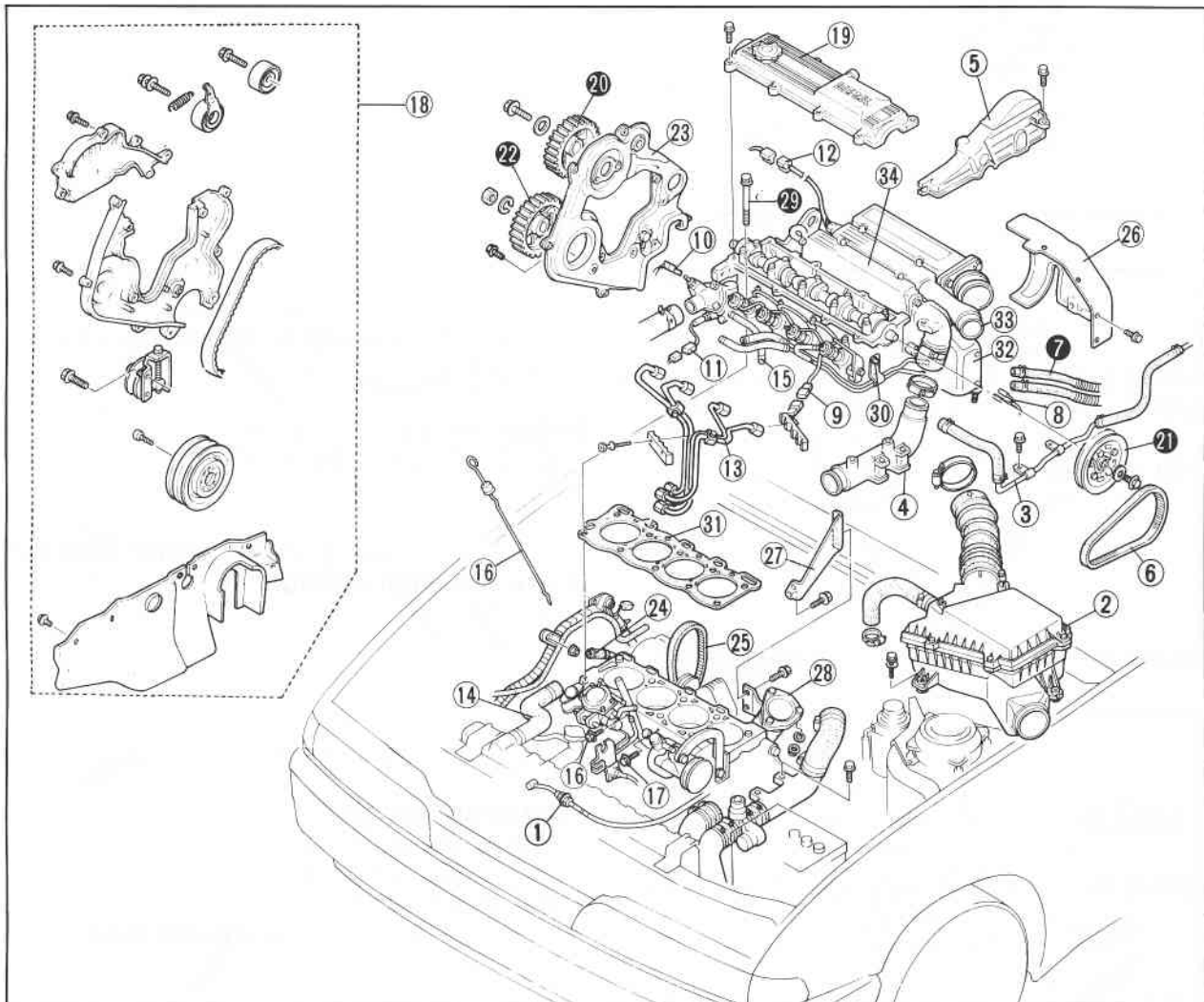
# 1C ON-VEHICLE MAINTENANCE (CYLINDER HEAD)

## CYLINDER HEAD

### Removal

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.

76G01C-031

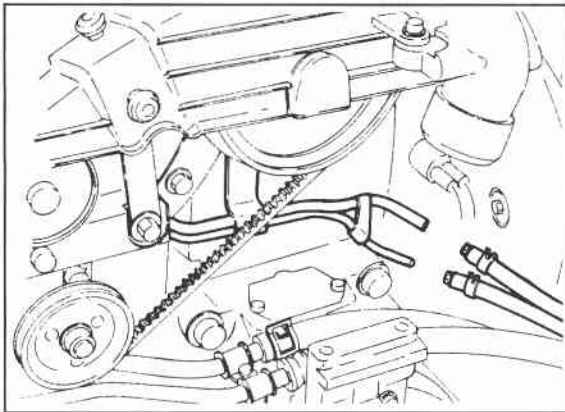


76G01C-032

- |                                       |                                             |                                      |
|---------------------------------------|---------------------------------------------|--------------------------------------|
| 1. Accelerator cable                  | 12. Boost air temperature sensor connector* | 22. Injection pump pulley            |
| 2. Air cleaner                        | 13. Injection pipes                         | 23. Seal plate                       |
| 3. Brake vacuum pipe                  | 14. Upper radiator hose                     | 24. Water hose and pipe              |
| 4. Intercooler pipe and hose*         | 15. Water hose (thermostat—FIP)             | 25. Compres supercharger drive belt* |
| 5. Drive belt cover                   | 16. Oil level gauge and stay bolt           | 26. Heat insulator*                  |
| 6. Vacuum pump drive belt             | 17. Oil pipe bolt                           | 27. Exhaust manifold stay            |
| 7. Fuel hose                          | 18. Timing belt (Refer to page 1C—11)       | 28. Front exhaust pipe               |
| 8. Water temperature switch connector | 19. Cylinder head cover                     | 29. Cylinder head bolt               |
| 9. Glow plug connector                | 20. Camshaft pulley                         | 30. Cylinder head                    |
| 10. Water thermo switch connector     | 21. Rear camshaft pulley                    | 31. Cylinder head gasket             |
| 11. Heat gauge unit connector         |                                             | 32. Compres supercharger*            |
|                                       |                                             | 33. Exhaust manifold                 |
|                                       |                                             | 34. Intake manifold                  |

### Note

\* marked parts are equipped only for the RF-CX.



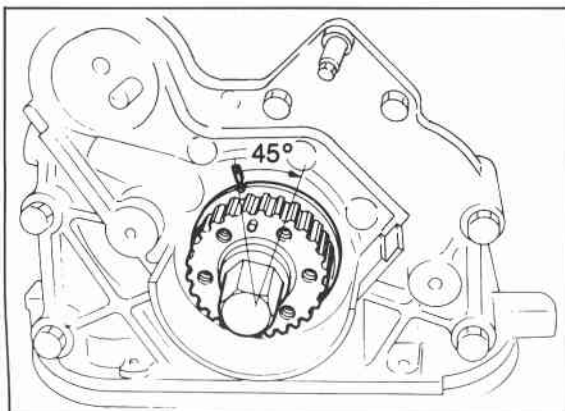
76G01C-240

## Removal note Fuel hose

### Warning

- Cover the hose with a rag because fuel will spray out when disconnecting.
- Keep fire and open flame away from the fuel area.

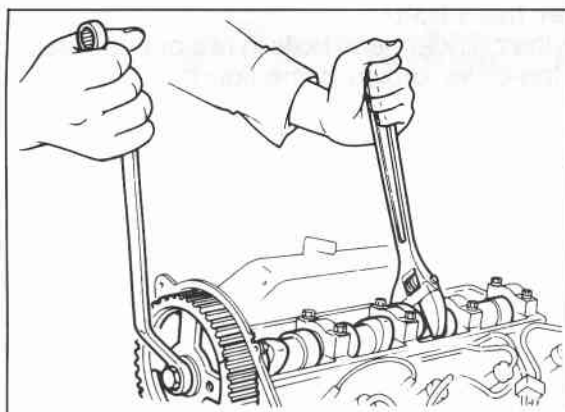
Plug the disconnected hoses to avoid fuel leakage.



76G01C-033

## Camshaft pulley

- After removing the timing belt, turn the crankshaft 45° clockwise.

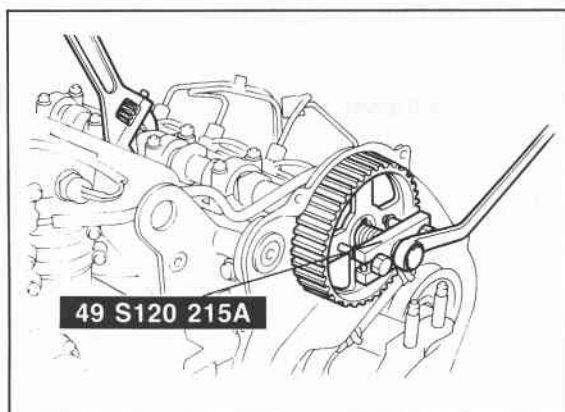


4BG01B-044

- Hold the camshaft with a wrench (29 mm, 1.14 in) and loosen the camshaft pulley lock bolt.

### Caution

Do not damage the cylinder head edge with the wrench.



76G01C-034

- Separate the camshaft pulley from the camshaft with the **SST**.

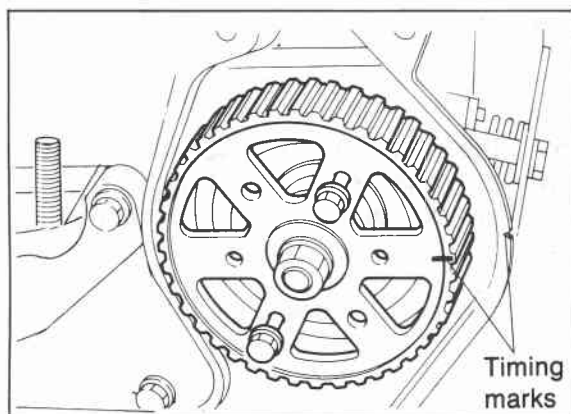
### Caution

Do not hit the camshaft pulley with a hammer.

## Rear camshaft pulley

Remove the rear camshaft pulley in the same manner used for camshaft pulley.

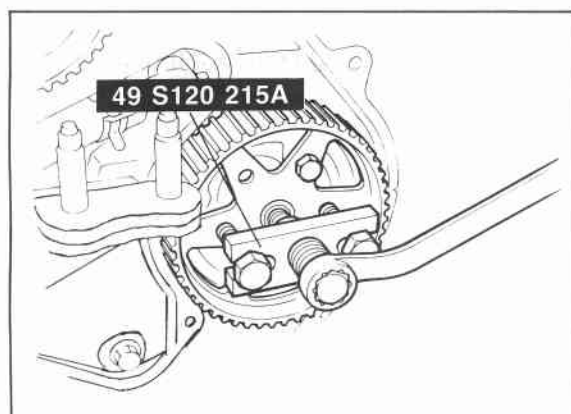
## 1C ON-VEHICLE MAINTENANCE (CYLINDER HEAD)



76G01C-241

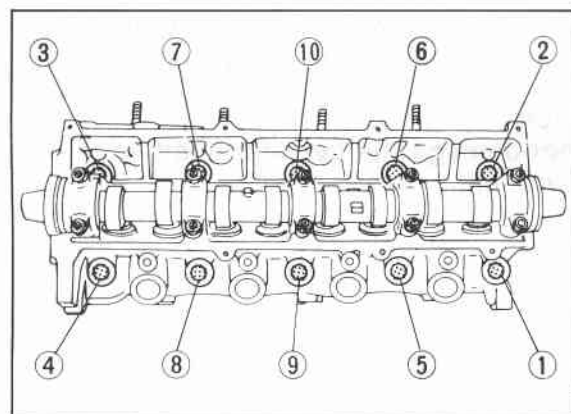
### Injection pump pulley

1. Put two bolts of 35—40 mm (1.4—1.6 in) length into the arms of the injection pump pulley and affix them in the threaded hole of the injection pump bracket.
2. Loosen the injection pump pulley lock bolt.



76G01C-035

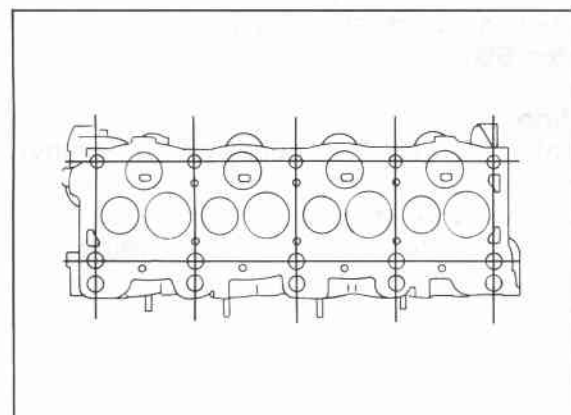
3. Separate the injection pump pulley from the injection pump shaft with the **SST**.



69G01A-031

### Cylinder head bolt

Loosen the cylinder head bolts in two or three steps, and in the order shown in the figure.



76G01C-036

### Disassembly of Cylinder Head

Refer to page 1C—40.

### Inspection of Cylinder Head

Refer to page 1C—47.

### Assembly of Cylinder Head

Refer to page 1C—73.

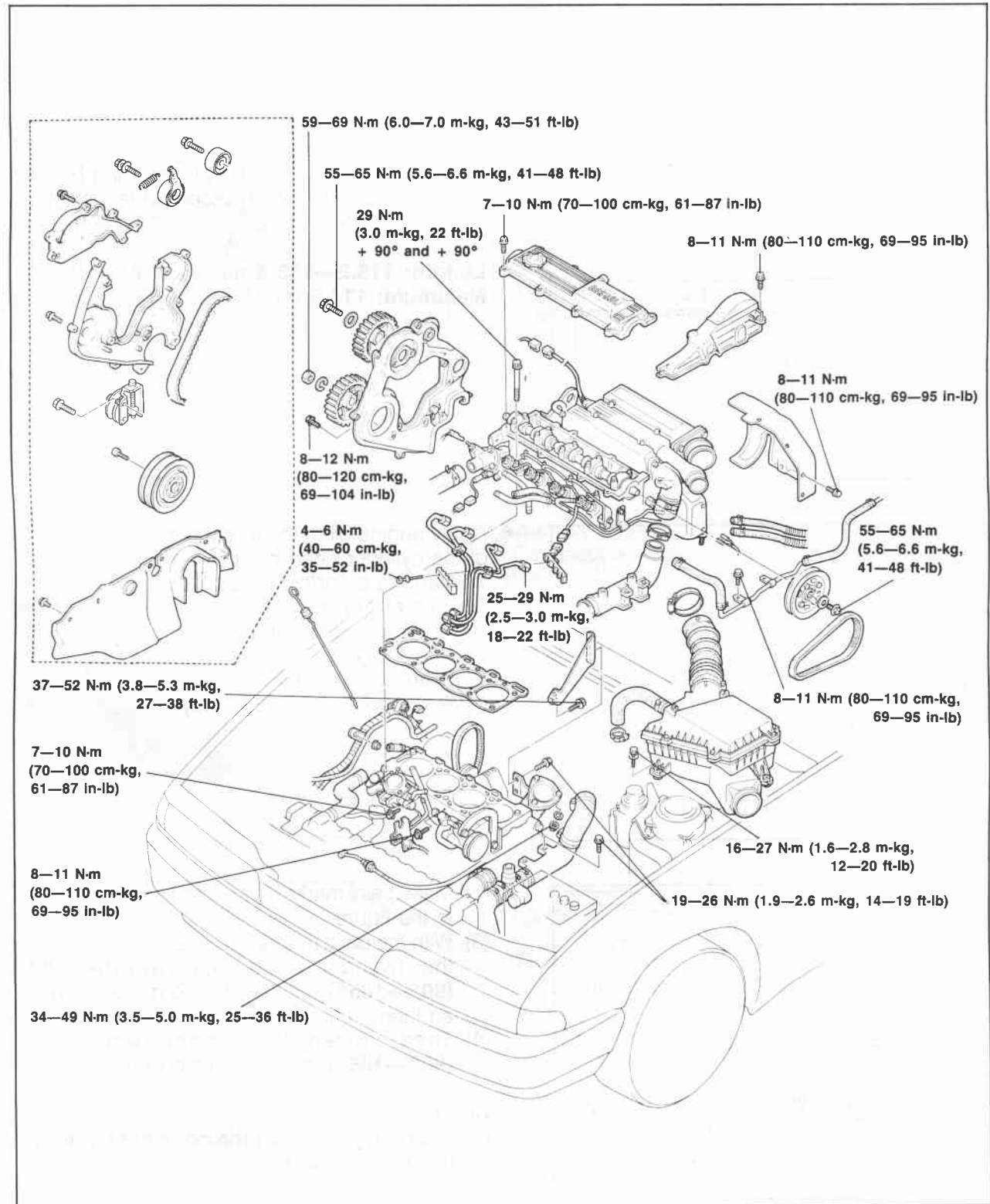
## Installation

Install in the reverse order of removal referring to the installation note.

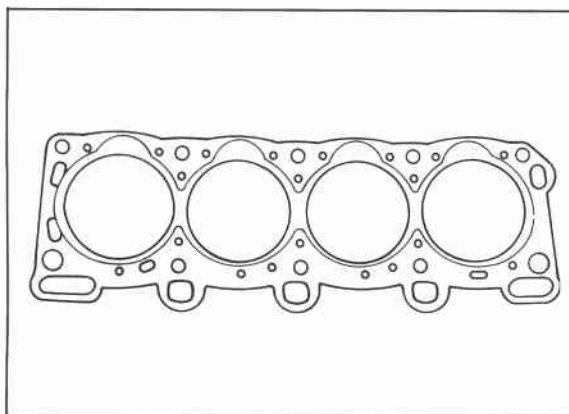
### Note

- Position the hose clamp in the original location on the hose.
- Squeeze the clamp lightly with large pliers to ensure a good fit.

## Torque Specifications



# 1C ON-VEHICLE MAINTENANCE (CYLINDER HEAD)

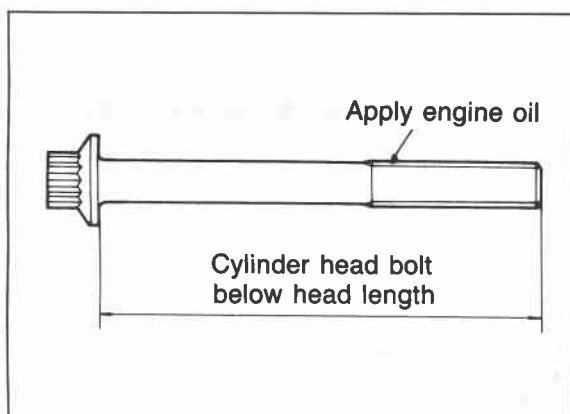


76G01C-037

## Installation

### Cylinder head

1. Thoroughly remove all dirt and grease from the top of the cylinder block with a rag.
2. Place the new cylinder head gasket in position.
3. Remove any dirt and grease from the bottom surface of the cylinder head.
4. Place the cylinder head in position.

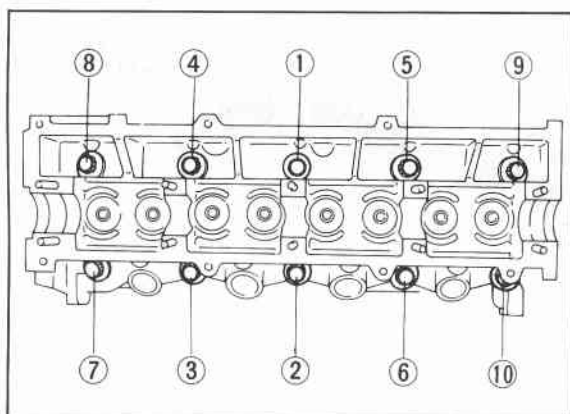


76G01C-038

5. Measure the length of the cylinder head bolt below the head. If the length exceeds the maximum, replace the bolt.

**Length: 113.2—113.8 mm (4.457—4.480 in)**

**Maximum: 114.5 mm (4.508 in)**

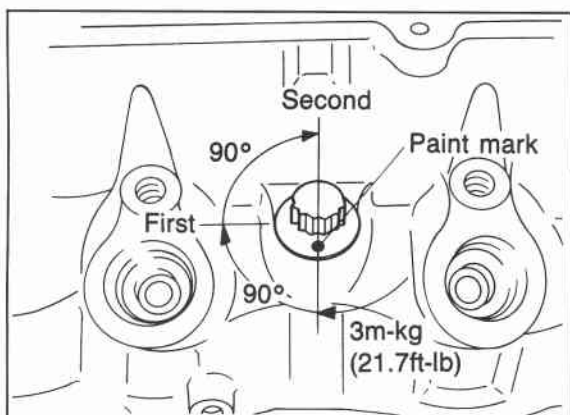


76G01C-039

6. Apply engine oil to the threads and the seat face of the cylinder head bolts.
7. Tighten the cylinder head bolts.
  - (1) Tighten the bolts to the specified torque, in the order shown in the figure.

### Tightening torque:

**29 N·m (3.0 m·kg, 22 ft·lb)**

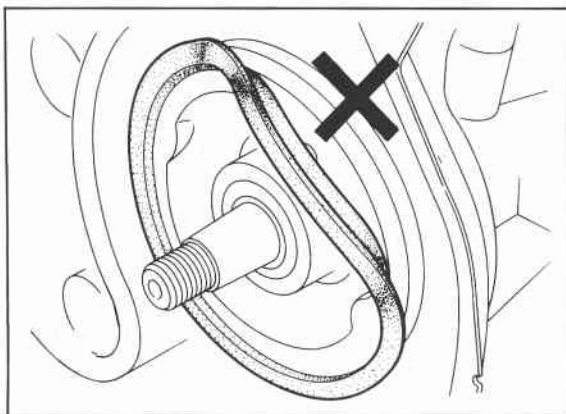


76G01C-040

- (2) Make paint marks on the bolt heads, as shown in the figure.
- (3) With the paint marks as a reference point, turn the cylinder head bolts **another 90° (90°—105°)** in the tightening direction. Tighten them in the order.
- (4) Then tighten them **once again 90° (90°—105°)** in the tightening order.

### Caution

**Be absolutely sure that the bolts are tightened in the proper order.**



76G01C-041

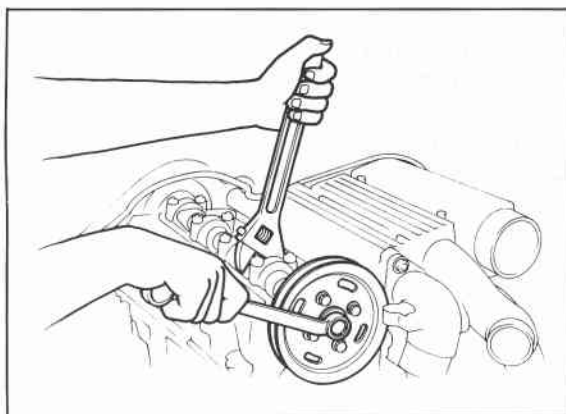
## Seal plate

1. Install the seal plate.

## Tightening torque:

**8—12 N·m (80—120 cm·kg, 69—104 in·lb)**

2. Check that the seal plate sealing rubbers are installed in position.



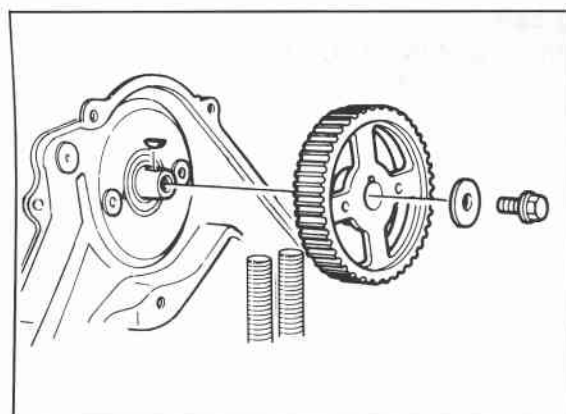
76G01C-042

## Rear camshaft pulley

1. Install the rear camshaft pulley.
2. Hold the camshaft with a wrench (29 mm, 1.14 in), and tighten to the specification.

## Tightening torque:

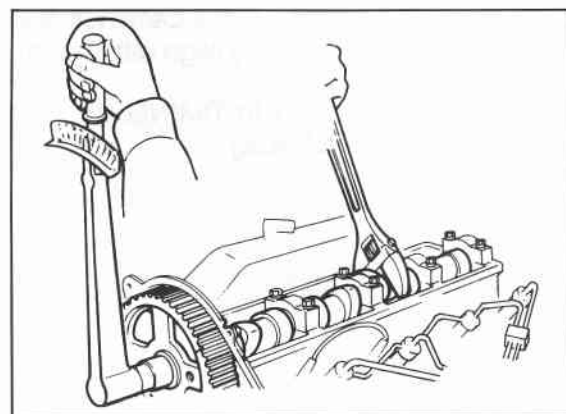
**55—65 N·m (5.6—6.6 m·kg, 41—48 ft·lb)**



76G01C-043

## Camshaft pulley

1. Connect the camshaft pulley onto the camshaft with the semicircular (woodruff) key.



76G01C-044

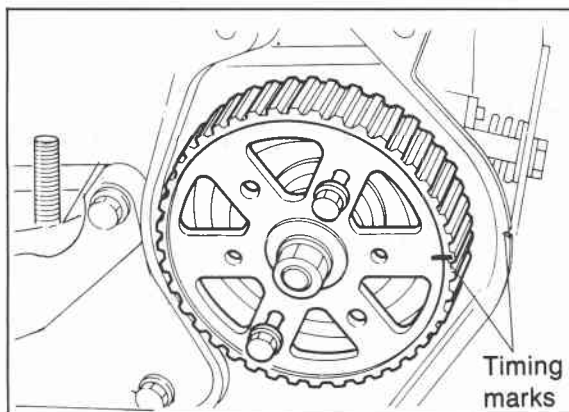
2. Hold the camshaft with a wrench (29 mm, 1.14 in), tighten the camshaft pulley lock bolt.

## Tightening torque:

**55—65 N·m (5.6—6.6 m·kg, 41—48 ft·lb)**

3. Align the mark on the camshaft pulley with the mark on the seal plate.

# 1C ON-VEHICLE MAINTENANCE (CYLINDER HEAD)



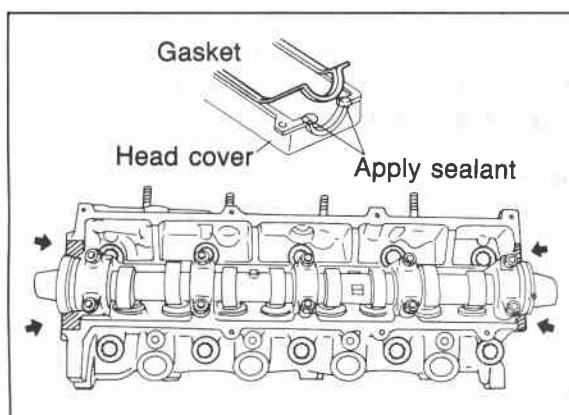
76G01C-045

## Injection pump pulley

1. Install the injection pump pulley with the semicircular (woodruff) key to the injection pump shaft.
2. Rotate the injection pump pulley until the timing marks are aligned.
3. Affix the injection pump pulley to the bracket using two bolts (35—40 mm, 1.4—1.6 in).
4. Tighten the lock nut.

## Tightening torque:

59—69 N·m (6.0—7.0 m·kg, 43—51 ft·lb)



76G01C-046

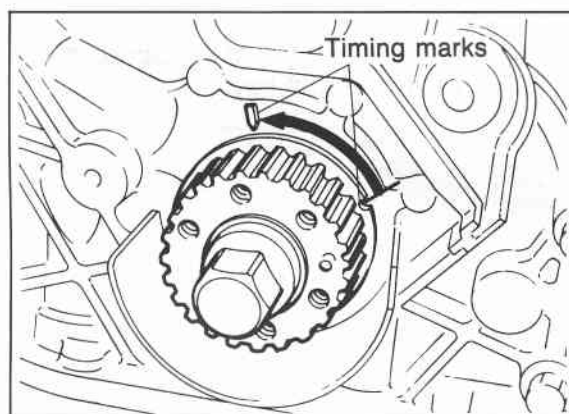
## Cylinder head cover

1. Apply sealant to the shaded areas.
2. Install the cylinder head cover.

## Tightening torque:

7—10 N·m (70—100 cm·kg, 61—87 in·lb)

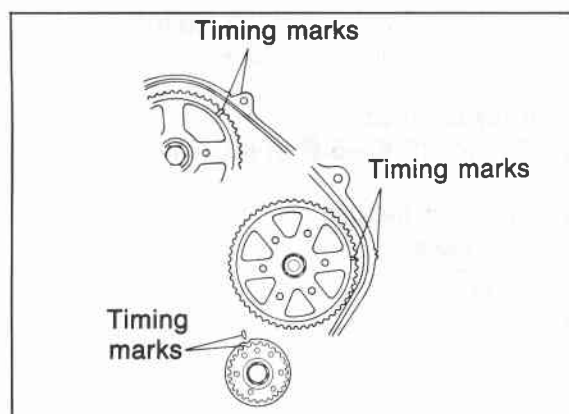
3. Install the PCV hose.



76G01C-047

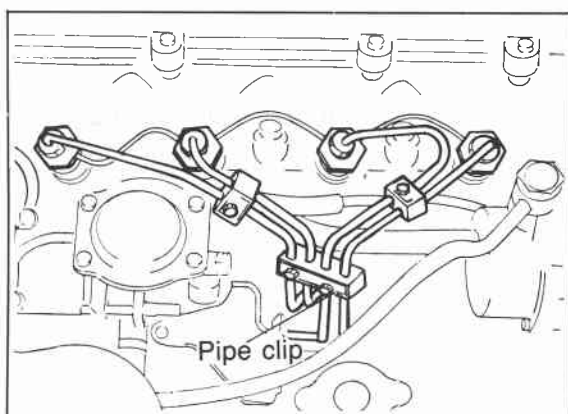
## Timing belt

1. Return the crankshaft about 45° to the timing mark on the oil pump housing.



76G01C-048

2. Check that the timing marks of the camshaft pulley and the injection pump pulley align with the timing marks on the seal plate.
3. Install the timing belt. (Refer to TIMING BELT of ON-VEHICLE MAINTENANCE)



76G01C-049

## Injection pipe

1. Check that no dirt or other foreign material is on the pipe coupling.
2. Install the injection pipes.

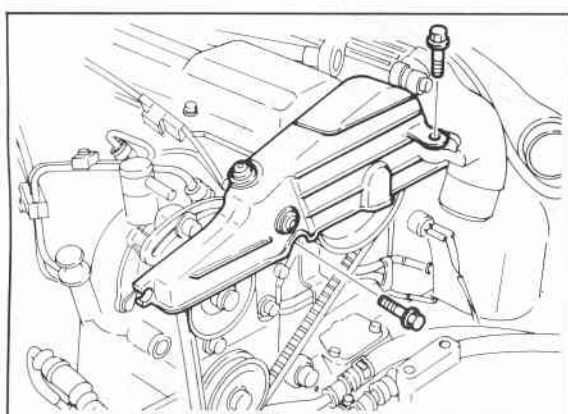
## Tightening torque:

**25—29 N·m (2.5—3.0 m·kg, 18—22 ft·lb)**

3. Install the pipe clip.

## Tightening torque:

**4—6 N·m (40—60 cm·kg, 35—52 in·lb)**



76G01C-050

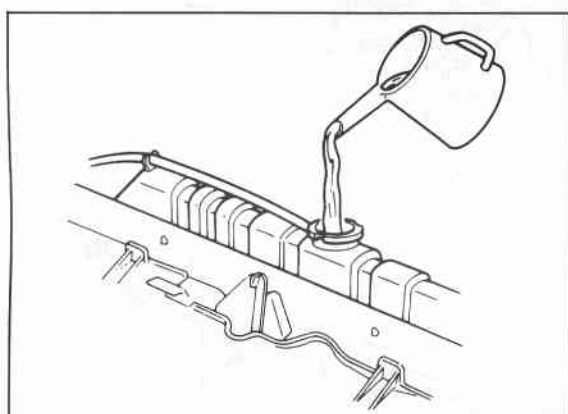
## Vacuum pump drive belt

1. Install the vacuum pump drive belt, and adjust the belt deflection. (Refer to 1C—7)
2. Install the drive belt cover.

## Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

3. Connect the vacuum hose securely and squeeze the clamp lightly with pliers to ensure a good fit.



76G01C-051

## Steps after installation

1. Fill the radiator with the specified amount and type of coolant.
2. Perform the necessary engine adjustments. (Refer to TUNE-UP PROCEDURE.)

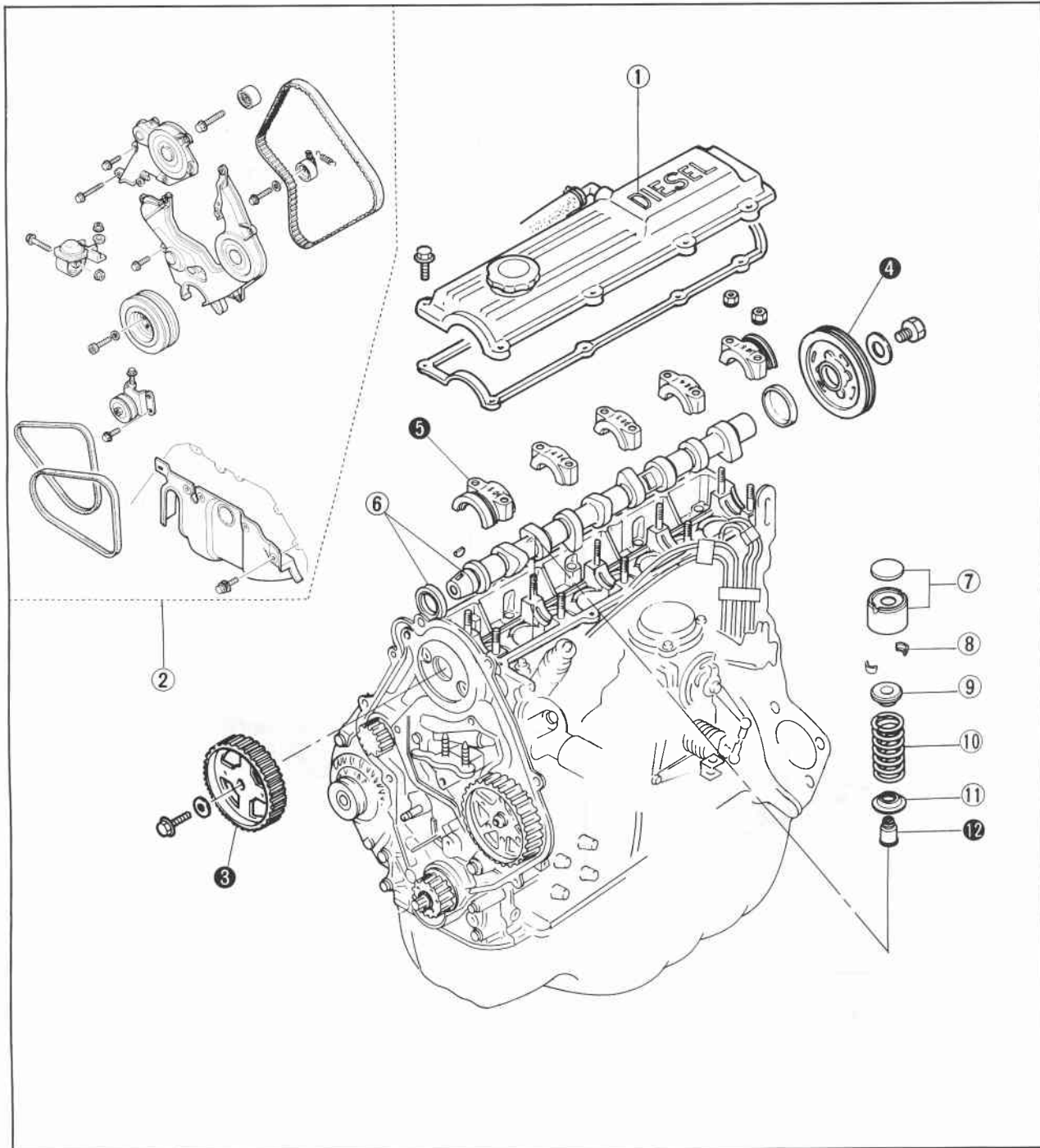
# 1C ON-VEHICLE MAINTENANCE (VALVE SEAL)

## VALVE SEAL

### Removal

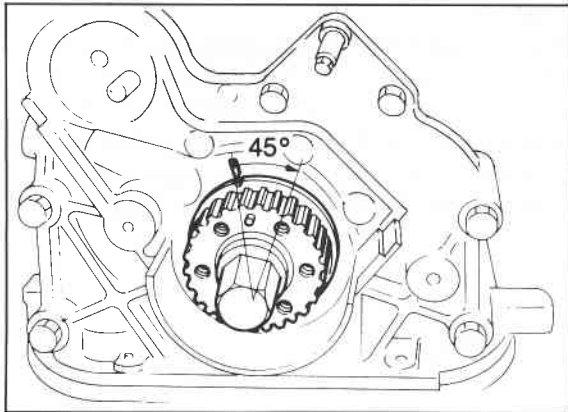
1. Disconnect the negative battery cable.
2. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.

76G01C-052



76G01C-053

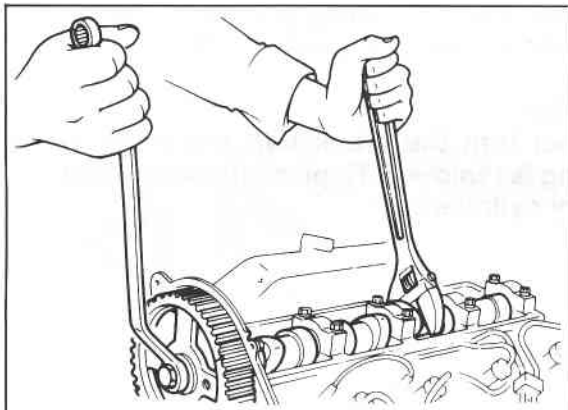
- |                                      |                              |
|--------------------------------------|------------------------------|
| 1. Cylinder head cover               | 7. Tappet and adjusting disc |
| 2. Timing belt (Refer to page 1C—11) | 8. Valve keeper              |
| 3. Camshaft pulley                   | 9. Upper valve spring seat   |
| 4. Rear camshaft pulley              | 10. Valve spring             |
| 5. Camshaft cap                      | 11. Lower valve spring seat  |
| 6. Camshaft and oil seal             | 12. Valve seal               |



76G01C-054

## Removal note Camshaft pulley

1. After removing the timing belt, turn the crankshaft 45° clockwise.

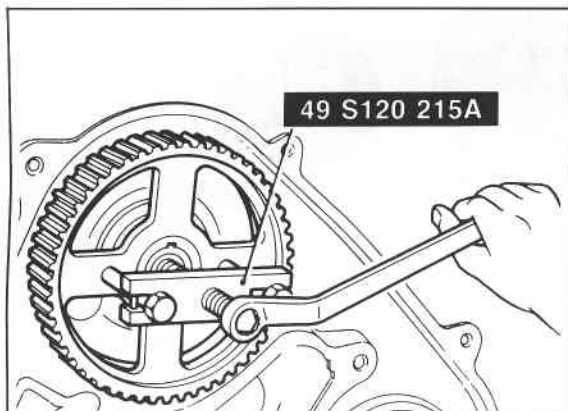


4BG01B-044

2. Hold the camshaft with a wrench (29 mm, 1.14 in) and loosen the camshaft pulley lock bolt.

## Caution

**Do not damage the cylinder head edge with the wrench.**



76G01C-055

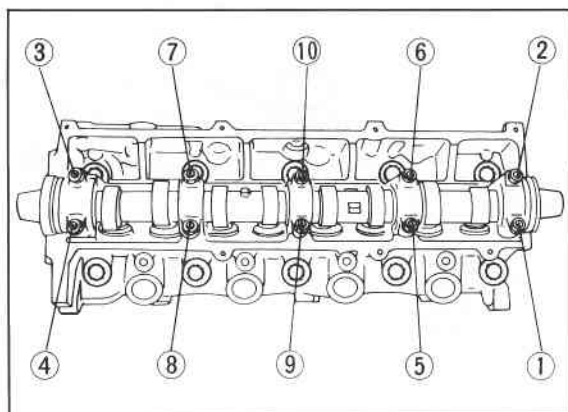
3. Separate the camshaft pulley from the camshaft with the **SST**.

## Caution

**Do not hit the camshaft pulley with a hammer.**

## Rear camshaft pulley

Remove the rear camshaft pulley in the same manner used for camshaft pulley.

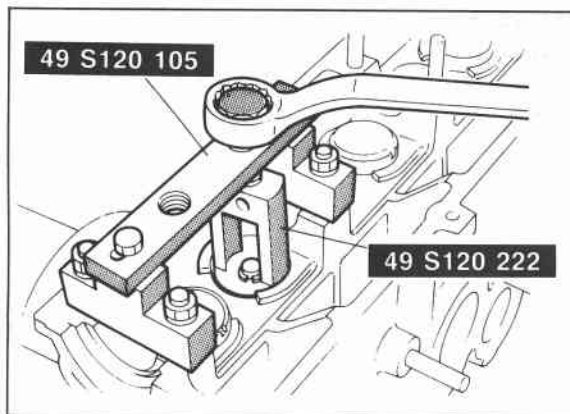


76G01C-056

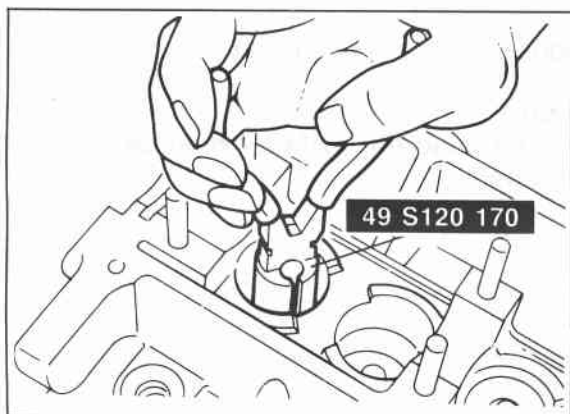
## Camshaft cap

Loosen the camshaft nuts in two or three steps in the order shown in the figure.

# 1C ON-VEHICLE MAINTENANCE (VALVE SEAL)



76G01C-057



76G01C-058

## Valve seal

1. Plug the oil drain hole with a rag to prevent the possibility of the valve keepers from falling into the oil pan.
2. Turn the crankshaft to position the piston of the valve seal to be replaced at top dead center.
3. Remove the valve keepers with the **SST**.

4. Remove the valve spring and spring seats.
5. Remove the valve seal with the **SST**.

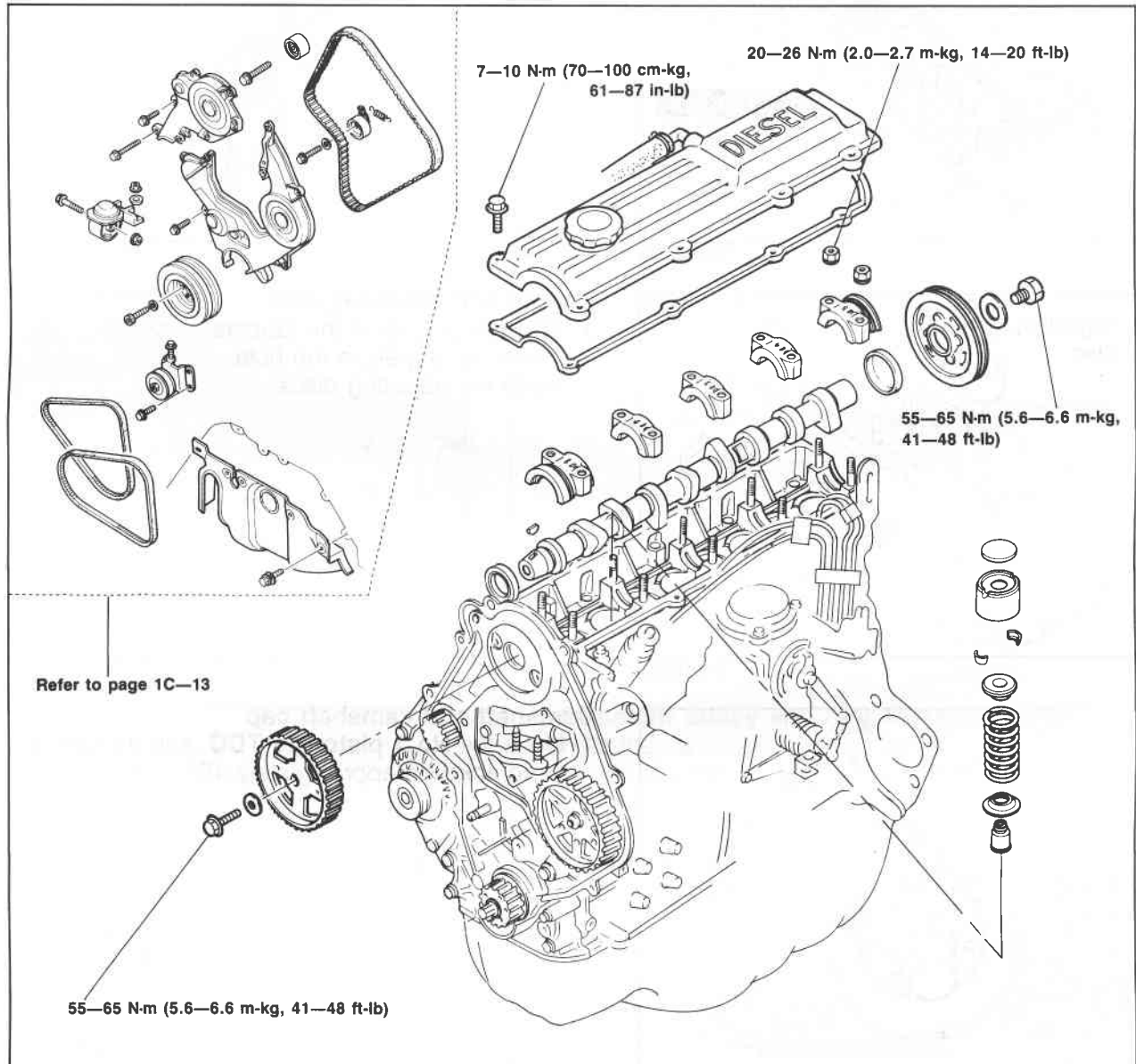
## Caution

**Do not turn the crankshaft while the valve spring is removed. Replace the valve seals at every cylinders.**

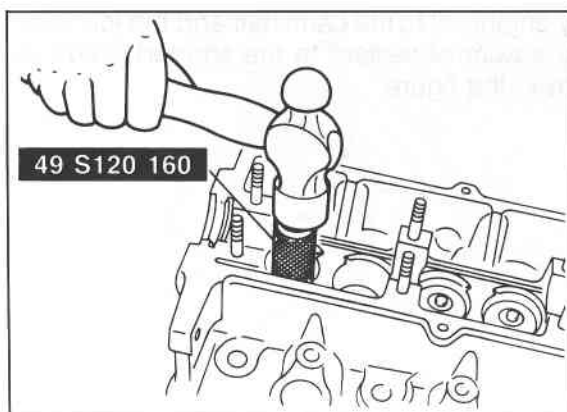
## Installation

Install in the reverse order of removal referring to the installation note.

## Torque Specifications



76G01C-243



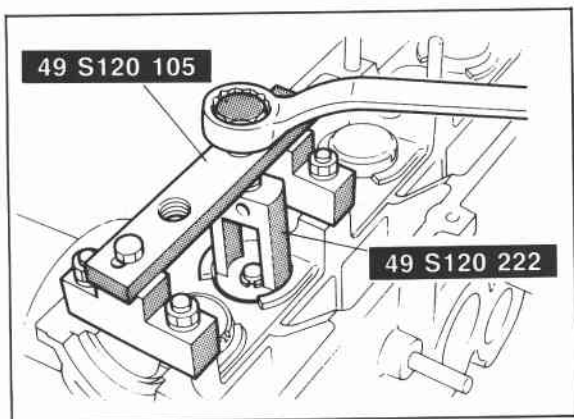
86U01X-049

## Installation note

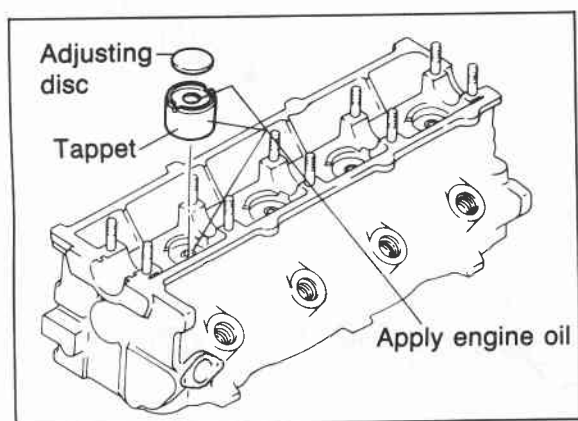
### Valve seal

1. Apply engine oil to the inside of the new valve seal.
2. Push it on gently with the **SST**.

# 1C ON-VEHICLE MEINTENANCE (VALVE SEAL)

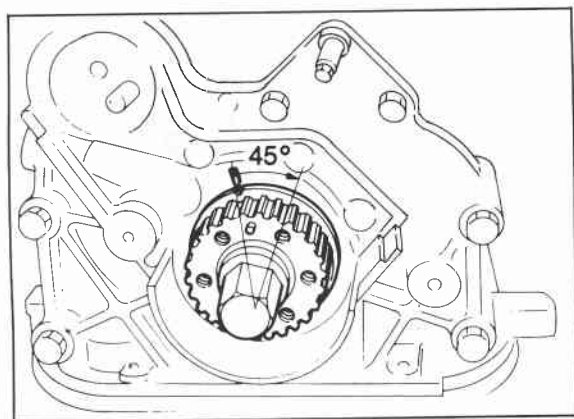


3. Install the spring seat, valve springs and valve keepers with the **SST**.



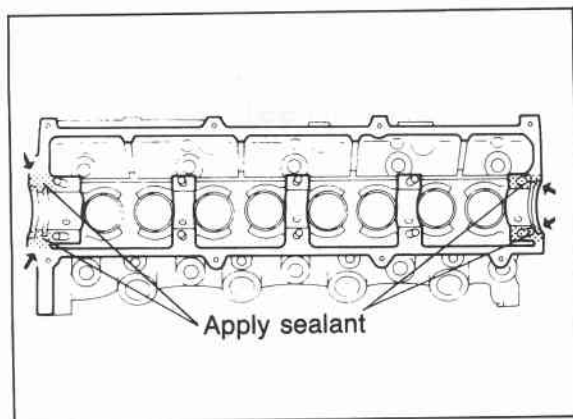
## Tappet and adjusting disc

1. Apply engine oil to the tappets.
2. Install the tappets in the hole.
3. Install the adjusting discs.

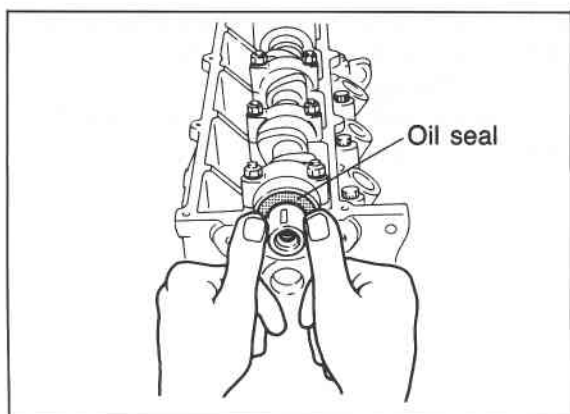


## Camshaft and camshaft cap

1. Move the **No.1 piston to TDC**, and then rotate the crankshaft approximately  $45^\circ$

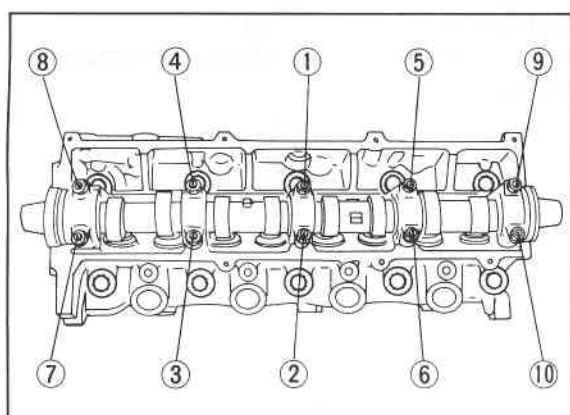


2. Apply engine oil to the camshaft and the journals.
3. Apply a coat of sealant to the shaded areas as shown in the figure.



76G01C-063

4. Set the camshaft and camshaft cap so that the key groove faces directly upward.  
And tighten the cap nuts loosely.
5. Apply a coat of engine oil to the new oil seal lip and insert it.

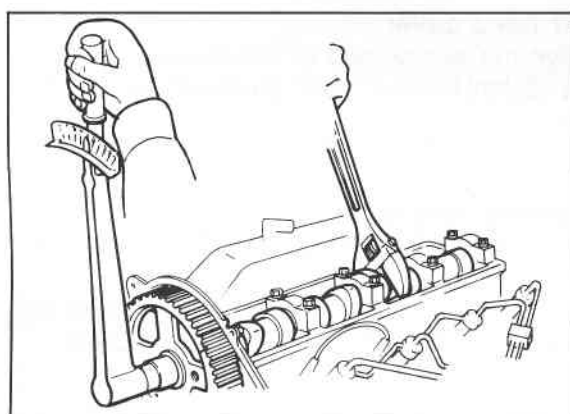


76G01C-064

6. Tighten the camshaft cap nuts gradually and in the order shown in the figure.

## **Tightening torque:**

**20—26 N·m (2.0—2.7 m·kg, 14—20 ft·lb)**



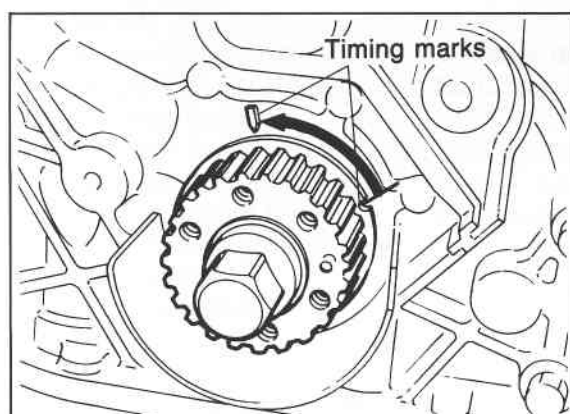
76G01C-065

## **Camshaft pulley and rear camshaft pulley**

Hold the camshaft with a wrench (29 mm, 1.14 in), tighten the camshaft pulley and rear camshaft pulley lock bolts.

## **Tightening torque:**

**55—65 N·m (5.6—6.6 m·kg, 41—48 ft·lb)**

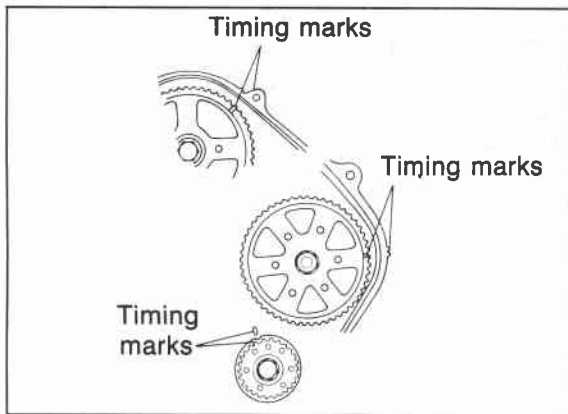


76G01C-066

## **Timing belt**

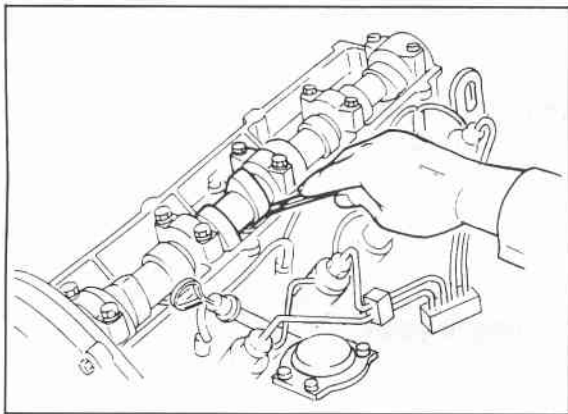
1. Return the crankshaft about 45° to the timing mark on the oil pump housing.

# 1C ON-VEHICLE MAINTENANCE (VALVE SEAL)



76G01C-067

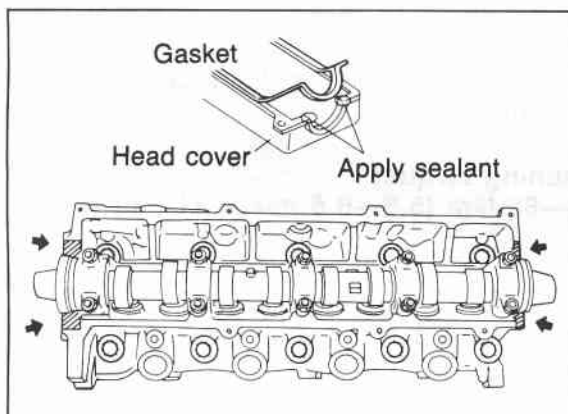
2. Check that the timing marks of the camshaft pulley and the injection pump pulley align with the timing marks on the seal plate.
3. Install the timing belt. (Refer to TIMING BELT of ON-VEHICLE MAINTENANCE)



76G01C-068

## Valve clearance

Measure the valve clearance, and adjust if necessary. (Refer to page 1C—85).



76G01C-069

## Cylinder head cover

1. Remove the rag plugged oil return hole.
2. Apply sealant to the shaded areas as shown in the figure.
3. Install the cylinder head cover.

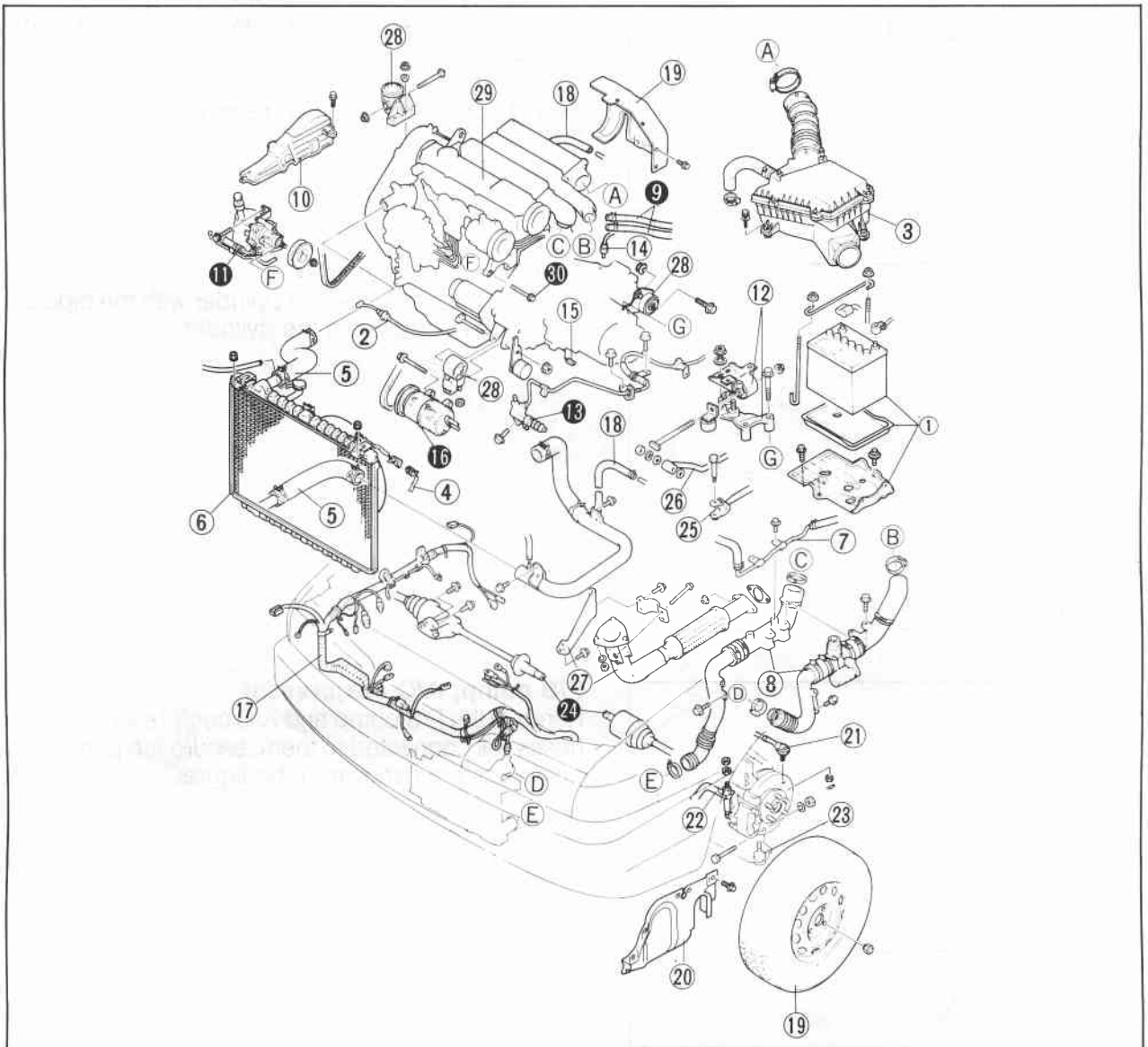
## Tightening torque:

**7—10 N·m (70—100 cm·kg, 61—87 in·lb)**

4. Perform the necessary engine adjustments by referring to TUNE-UP PROCEDURE section.

## REMOVAL

1. Disconnect the negative battery cable.
2. Drain the engine oil and coolant.
3. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.



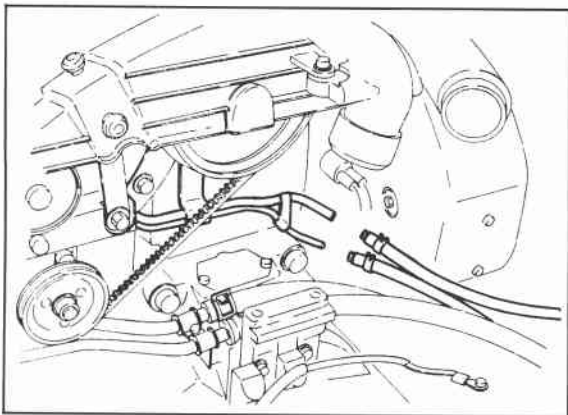
76G01C-071

- |                                |                             |                            |
|--------------------------------|-----------------------------|----------------------------|
| 1. Battery and battery carrier | 11. P/S pump                | 21. Tie-rod end            |
| 2. Accelerator cable           | 12. No.4 engine mount       | 22. Stabilizer control rod |
| 3. Air cleaner assembly        | 13. Clutch release cylinder | 23. Lower arm bushing      |
| 4. Radiator harness            | 14. Speedometer cable       | 24. Driveshaft             |
| 5. Radiator hose               | 15. Transaxle harness       | 25. Change rod             |
| 6. Radiator and cooling fan    | 16. A/C compressor          | 26. Extension bar          |
| 7. Brake vacuum hose           | 17. Engine harness          | 27. Exhaust pipe and stay  |
| 8. Intercooler pipe and hose*  | 18. Heater hose             | 28. Engine mount           |
| 9. Fuel hose                   | 19. Front wheel             | 29. Engine and transaxle   |
| 10. Drive belt cover           | 20. Engine side cover       | 30. Transaxle              |

### Note

\* marked parts are equipped only for RF-CX.

# 1C REMOVAL



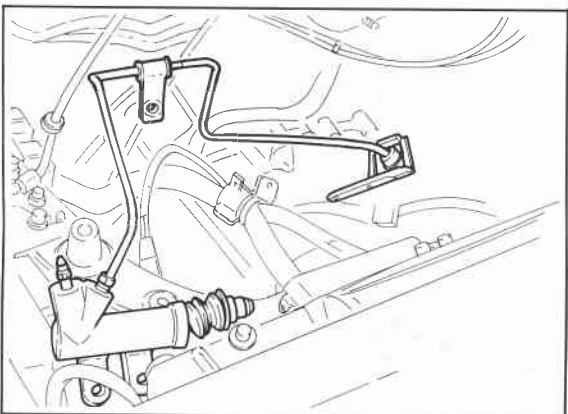
76G01C-244

## Removal Note Fuel hose

### Warning

- a) Cover the hose with a rag because fuel will spray out when disconnecting.
- b) Keep fire and open flame away from the fuel area.

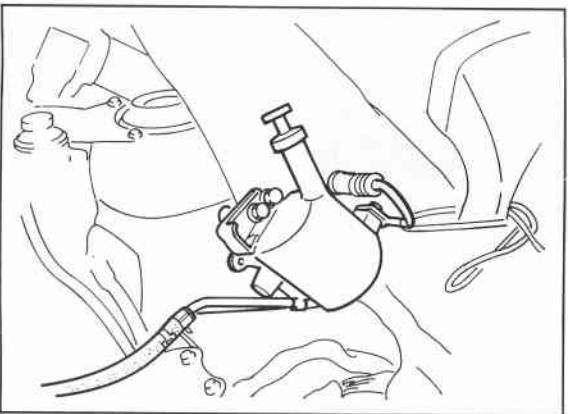
After disconnecting the fuel hoses, plug them to avoid fuel leakage.



76G01C-072

## Clutch release cylinder

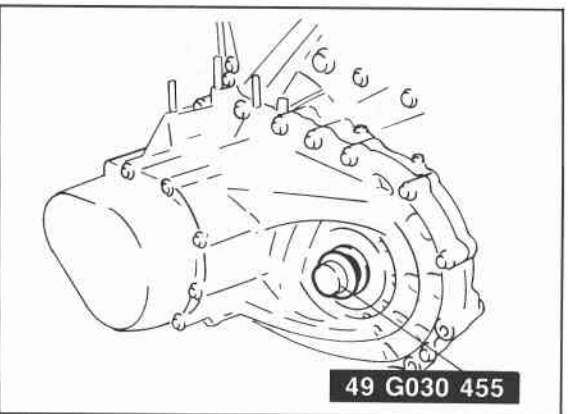
Remove the clutch release cylinder with the pipe still connected; then avoid the cylinder.



67U01X-029

## P/S pump, A/C compressor

Remove the P/S pump and A/C compressor with the hoses still connected to them, secure the pump and compressor as shown in the figure.



49 G030 455

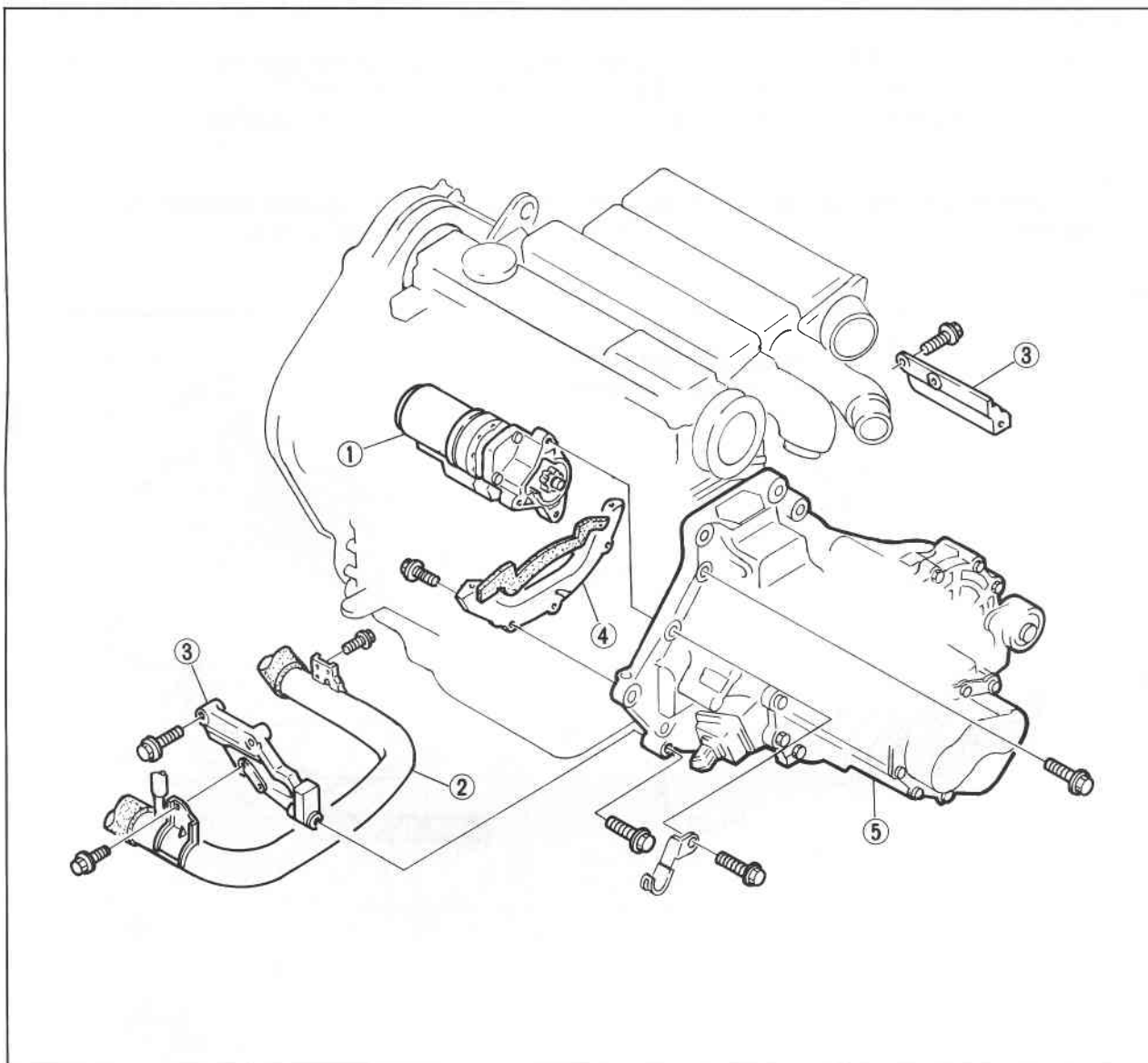
86U01X-060

## Driveshaft

Remove the driveshafts. (Refer to Section 9.) Slide the **SST** into the transaxle.

## Transaxle

Separate the transaxle from the engine in the sequence shown in the figure.



76G01C-073

1. Starter
2. Water pipe
3. Gusset plate

4. Clutch under cover
5. Transaxle

# 1C DISASSEMBLY (AUXILIARY PARTS)

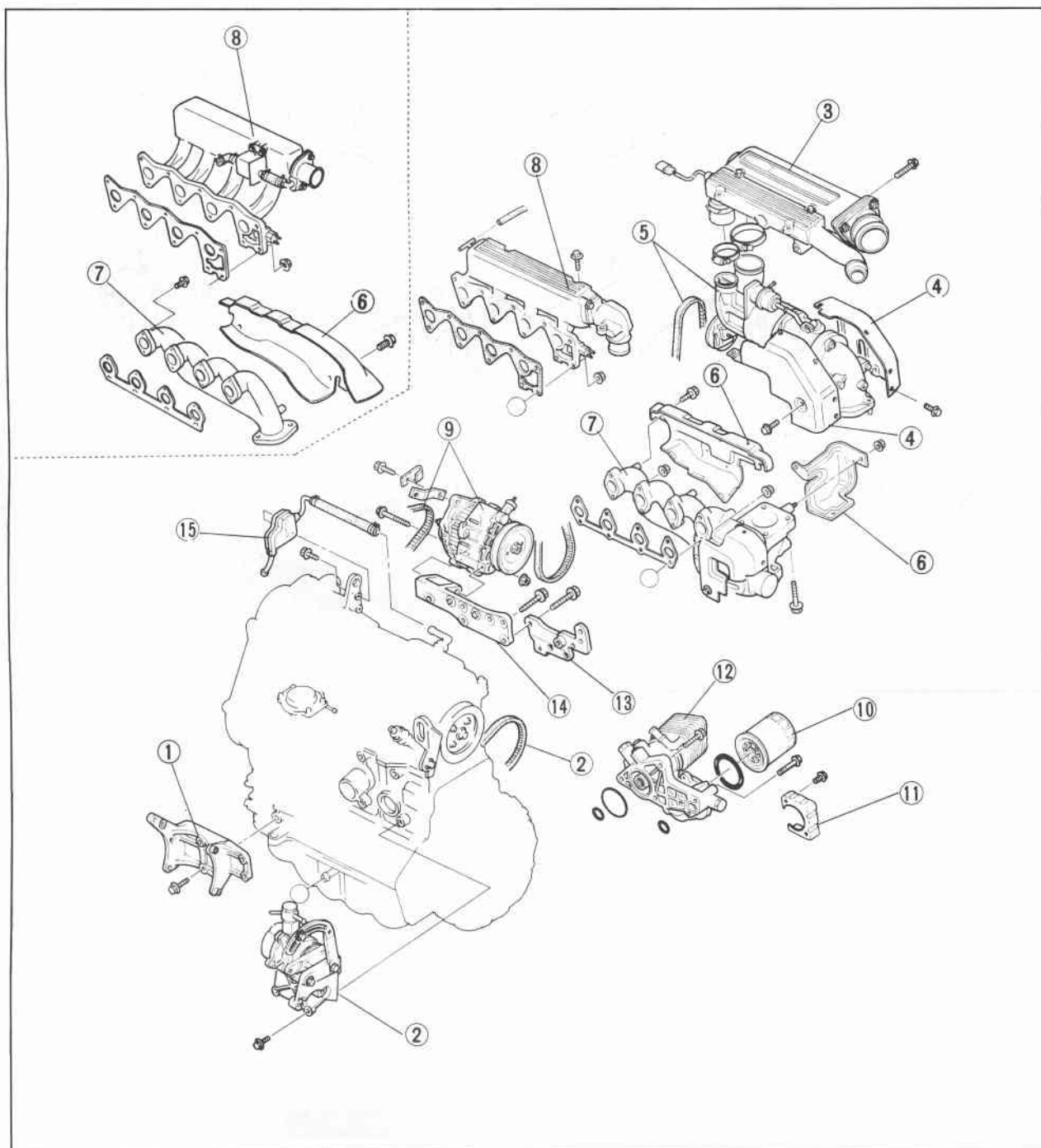
## DISASSEMBLY

1. Remove in the sequence shown in the figure referring to the disassembly note for specially marked parts.
2. Code all identical parts (such as pistons, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
3. Clean the parts with steam, blow off any remaining water with compressed air.

### Note

Care should be taken during the disassembly of any part or system to study its order of assembly. Any deformation, wear, or damage should also be noted.

## AUXILIARY PARTS

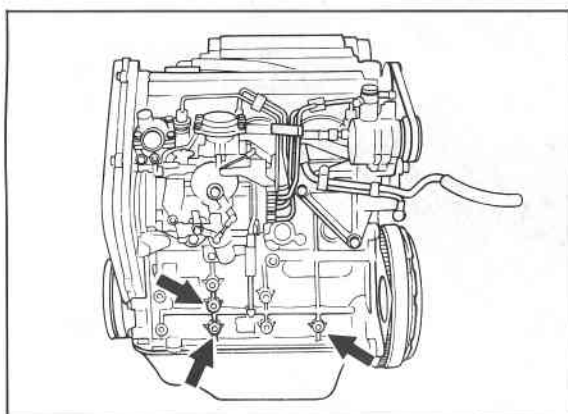


76G01C-245

## DISASSEMBLY (AUXILIARY PARTS) 1C

1. A/C compressor bracket
2. Vacuum pump and drive belt
3. Air funnel assembly
4. Comprex supercharger insulator
5. Comprex supercharger and drive belt
6. Exhaust manifold insulator
7. Exhaust manifold
8. Intake manifold
9. Alternator and drive belt
10. Oil filter
11. Oil filter cover
12. Oil cooler assembly
13. Exhaust pipe bracket
14. Alternator bracket
15. Blow-by chamber

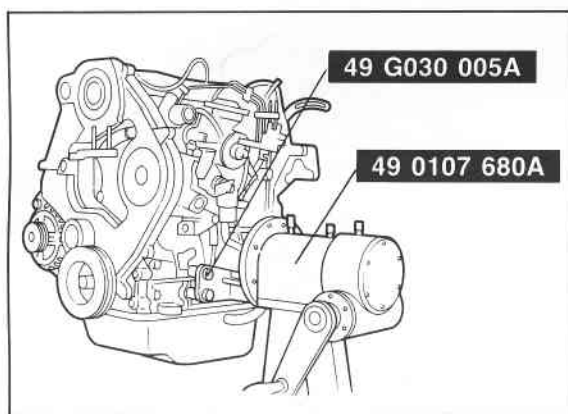
76G01C-074



76G01C-075

### Disassembly Note Engine hanger

1. Remove the CSD hose.
2. Loosen the vacuum pump oil pipe bolts.

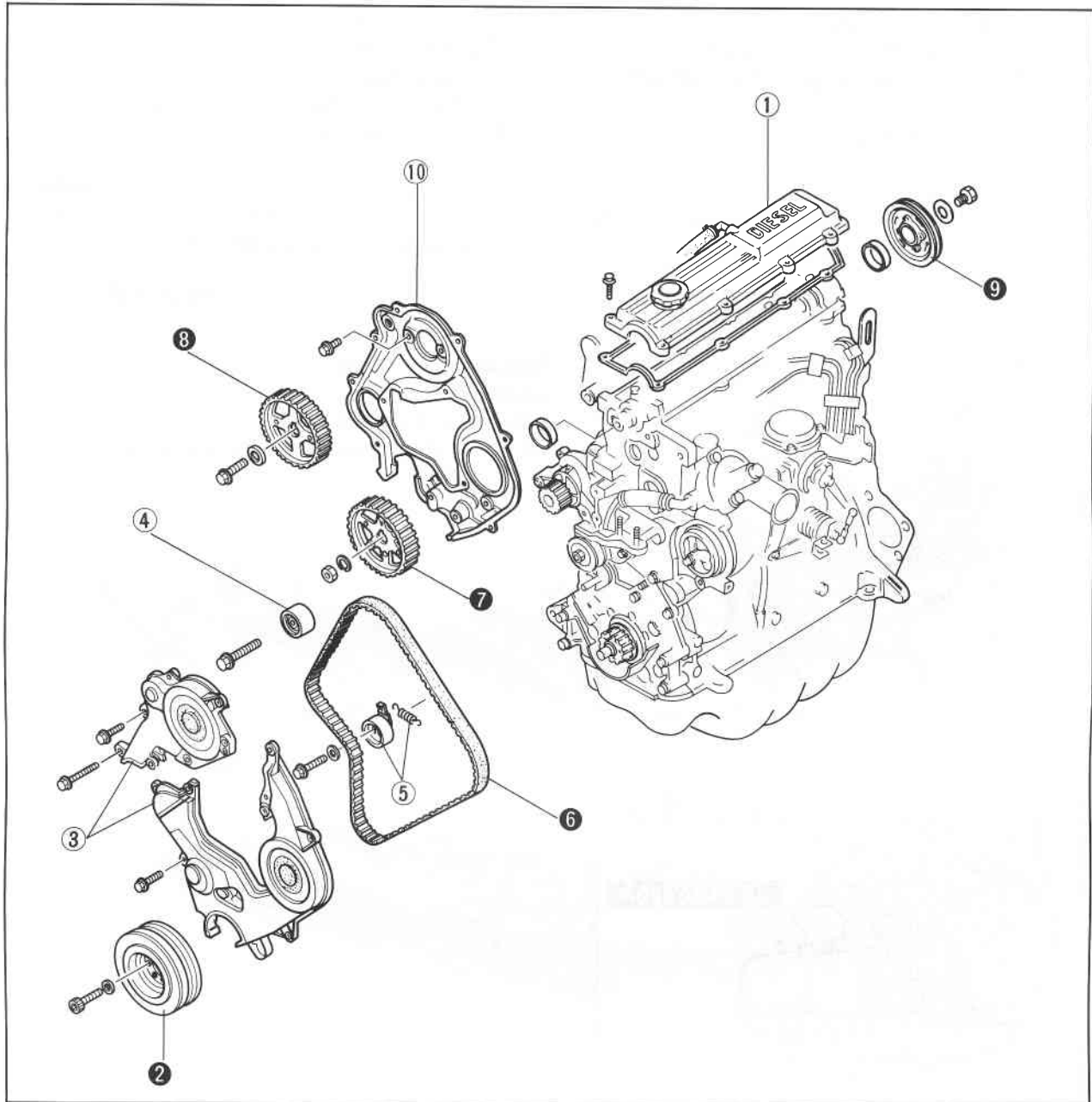


76G01C-076

3. Install the engine on the **SST**.

# 1C DISASSEMBLY (TIMING BELT)

## TIMING BELT

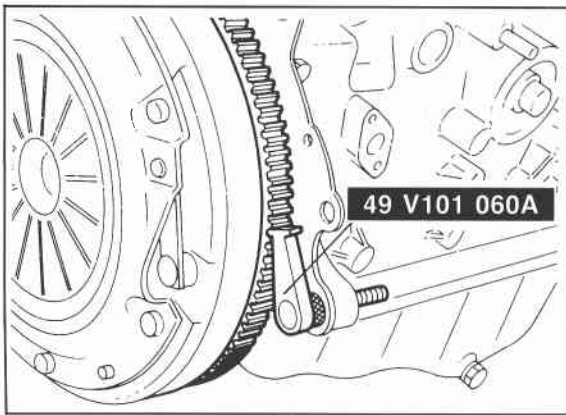


76G01C-077

1. Cylinder head cover
2. Crankshaft pulley
3. Left and right timing belt covers
4. Idler pulley
5. Timing belt tensioner and spring

6. Timing belt
7. Injection pump pulley
8. Camshaft pulley
9. Rear camshaft pulley
10. Seal plate

## DISASSEMBLY (TIMING BELT) 1C

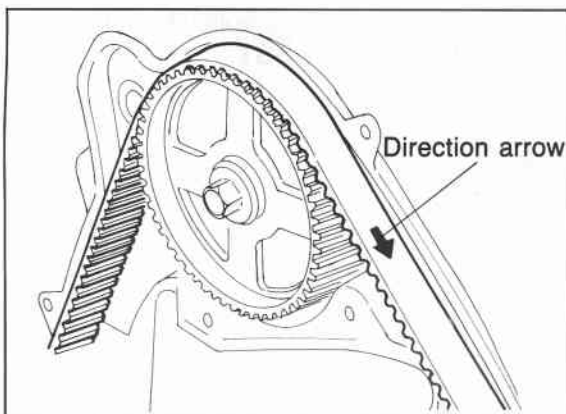


76G01C-246

### Disassembly Note

#### Crankshaft pulley

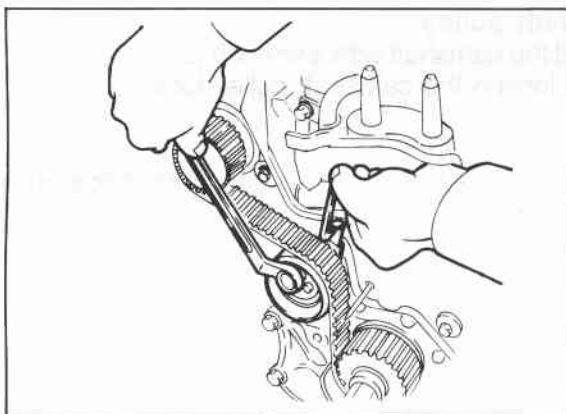
1. Set the **SST** against the flywheel.
2. Remove the crankshaft pulley.



76G01C-078

### Timing belt

1. Draw a direction arrow in the direction of engine revolution on the timing belt, if the timing belt is to be reused.

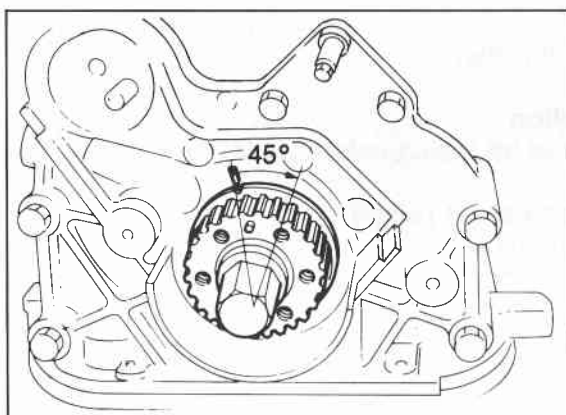


76G01C-247

2. Loosen the timing belt tensioner bolt.
3. Shift the tensioner outward as far as possible and temporarily tighten it.
4. Remove the timing belt, tensioner and spring.

### Caution

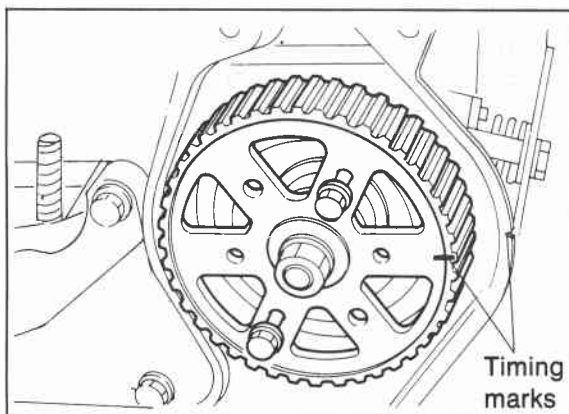
**Do not allow any oil or grease on the timing belt.**



76G01C-079

5. Turn the crankshaft about 45° from the timing mark which is marked on the oil pump housing.

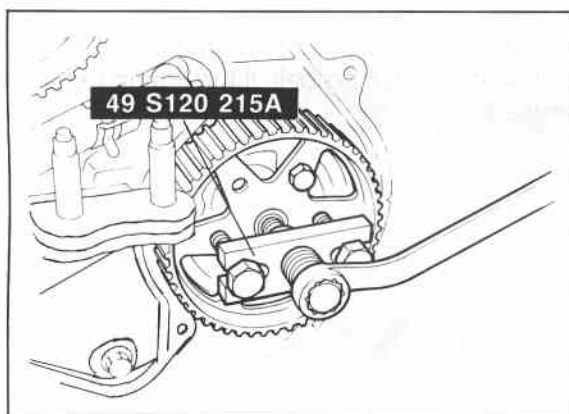
# 1C DISASSEMBLY (TIMING BELT)



76G01C-248

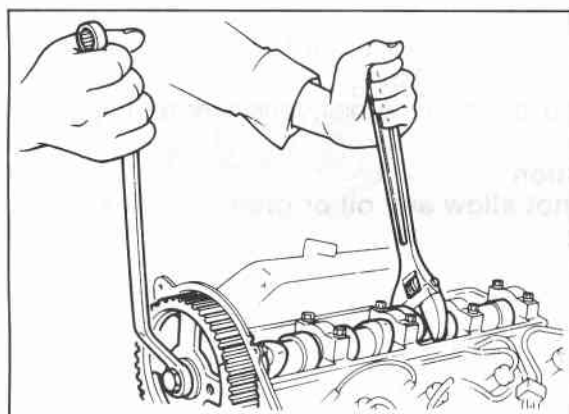
## Injection pump pulley

1. Put two bolts of 35—40 mm (1.4—1.6 in) length into the arms of the injection pump pulley and affix them in the threaded hole of the injection pump bracket.
2. Loosen the injection pump pulley lock bolt.



76G01C-080

3. Separate the injection pump pulley from the injection pump shaft with the **SST**.



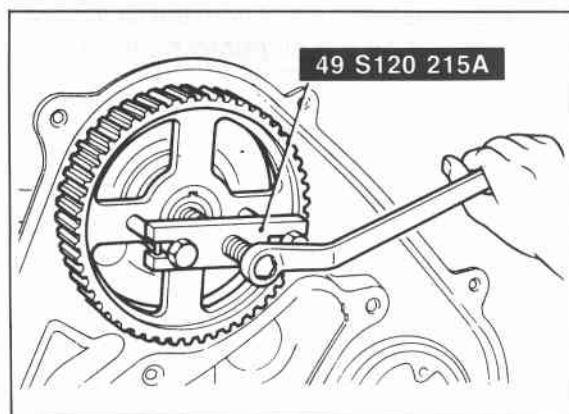
4BG01B-087

## Camshaft pulley

1. Hold the camshaft with a wrench (29 mm, 1.14 in) and loosen the camshaft pulley lock bolt.

### Caution

**Do not damage the cylinder head edge with the wrench.**



76G01C-081

2. Separate the camshaft pulley from the camshaft with the **SST**.

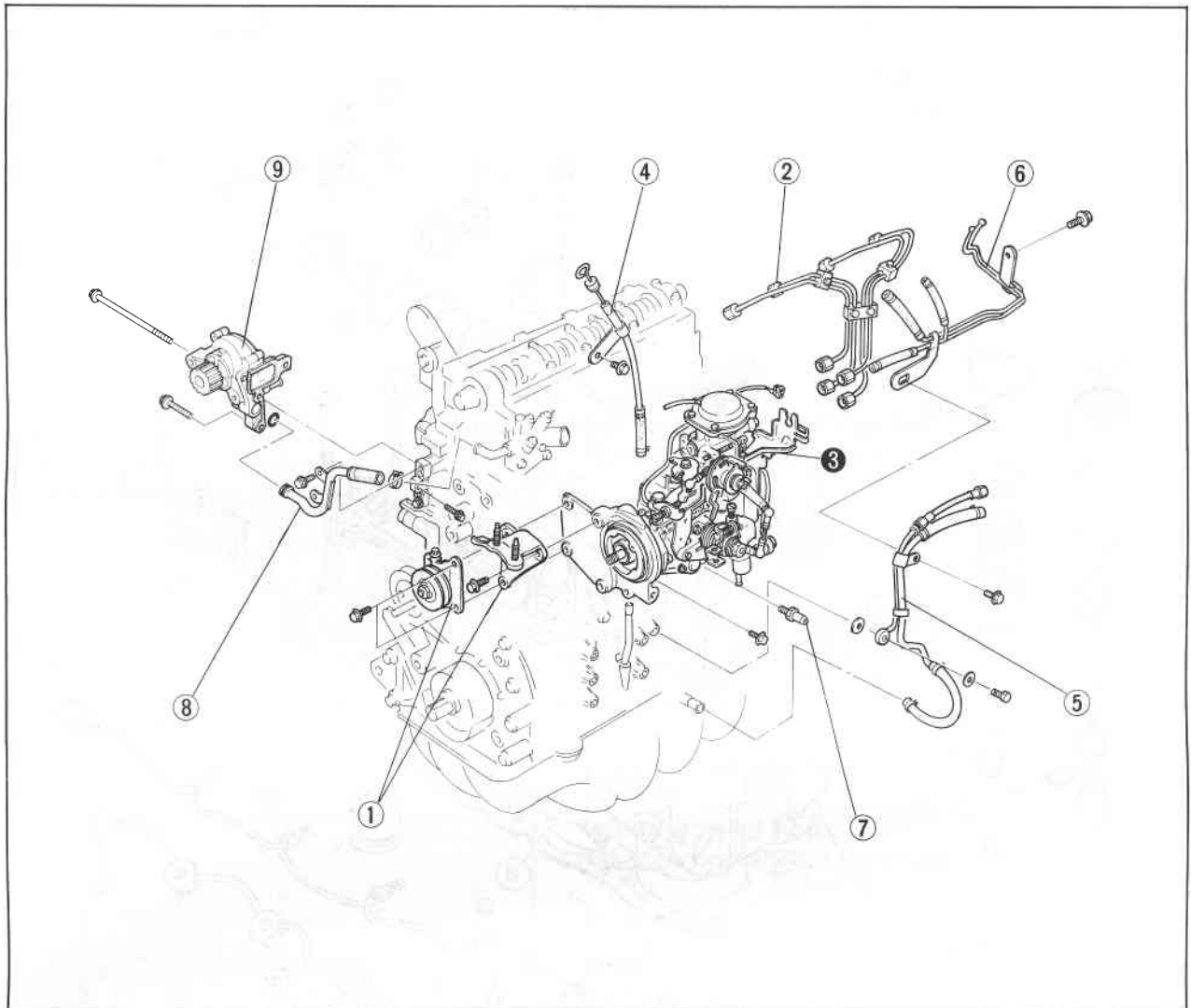
### Caution

**Do not hit the camshaft pulley with a hammer.**

## Rear camshaft pulley

Remove the rear camshaft pulley in the same manner used for camshaft pulley.

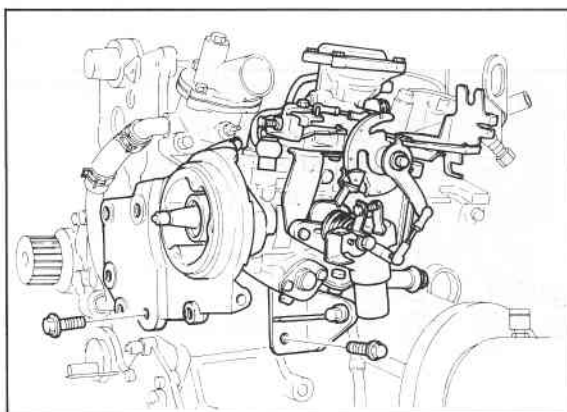
## INJECTION PUMP



76G01C-082

1. No.3 engine mount and idler
2. Injection pipe
3. Injection pump
4. Oil level gauge and stay
5. Oil pipe

6. Fuel feed pipe
7. Oil pressure switch
8. Water pipe
9. Water pump



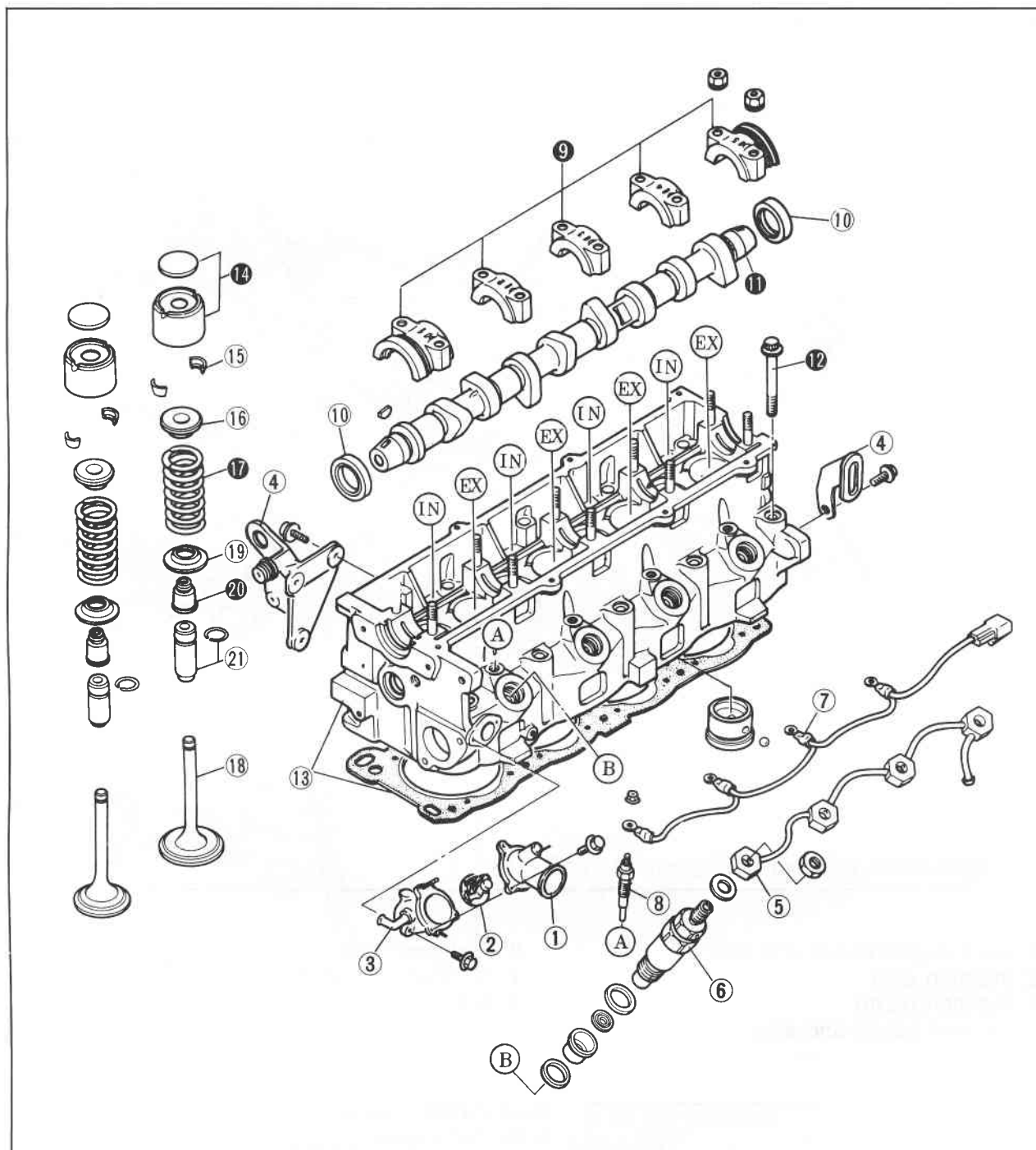
76G01C-083

### Disassembly Note Injection pump

Remove the injection pump with its brackets.  
If separate them, adjust the injection timing after installing the timing belt referring to Section 4D.

# 1C DISASSEMBLY (CYLINDER HEAD)

## CYLINDER HEAD



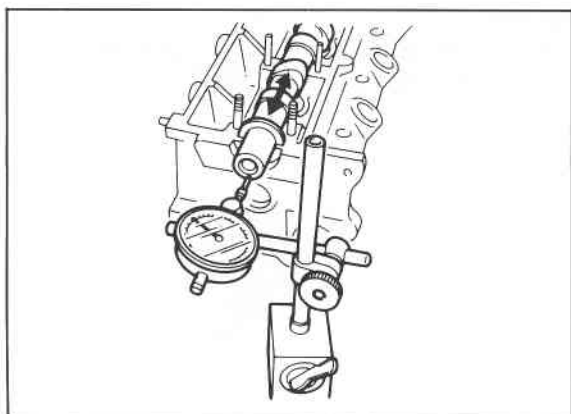
76G01C-079

1. Thermostat cover
2. Thermostat
3. Thermostat case
4. Front and rear engine hanger
5. Fuel leak pipe
6. Injection nozzle
7. Glow cord

8. Glow plug
9. Camshaft cap
10. Oil seal
11. Camshaft
12. Cylinder head bolt
13. Cylinder head and gasket
14. Tappet and adjusting disc

15. Valve keepers
16. Upper spring seat
17. Valve spring
18. Valve
19. Lower spring seat
20. Valve seal
21. Valve guide and clip

## DISASSEMBLY (CYLINDER HEAD) 1C



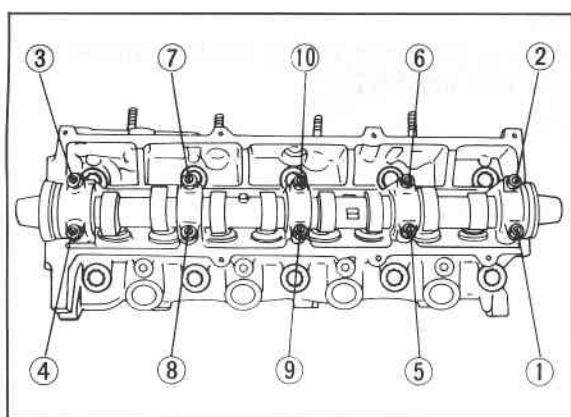
76G01C-085

### Disassembly Note

#### Camshaft

During disassembly, clean the bearings and journals, and measure the following:

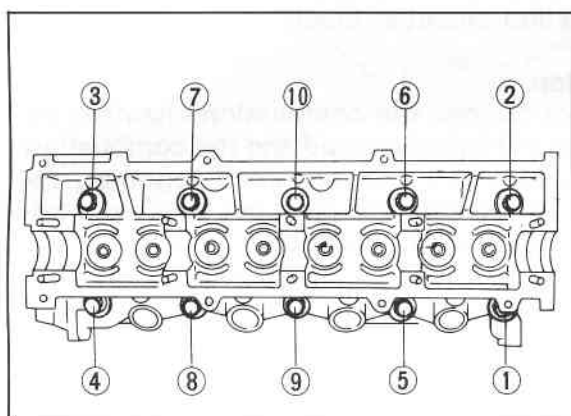
1. Camshaft end play. (Refer to page 1C—55)
2. Camshaft journal oil clearance. (Refer to page 1C—54)



76G01C-086

#### Camshaft cap

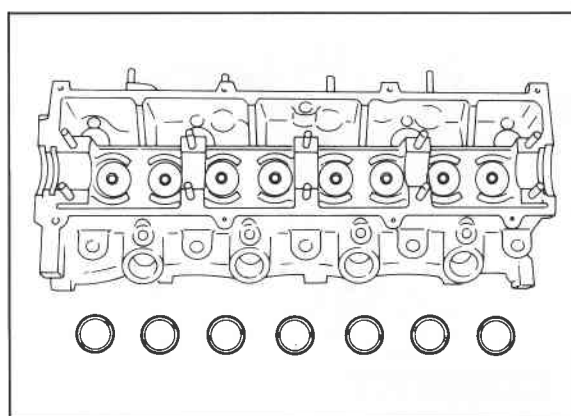
Loosen the camshaft cap nuts in two or three steps in the order shown in the figure.



76G01C-087

#### Cylinder head bolt

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head by tapping the cylinder head with a plastic hammer.



4BG01B-094

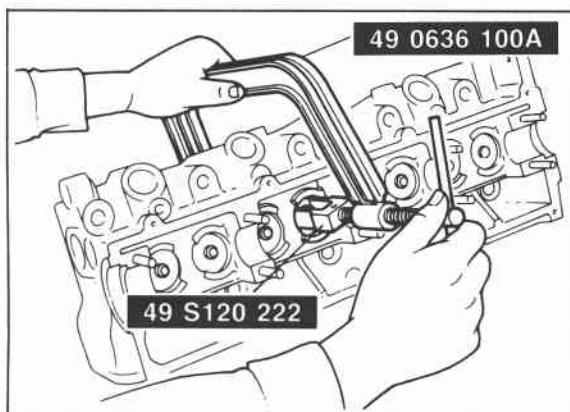
#### Adjusting disc and tappet

Remove the adjusting discs and tappets as a set.

#### Caution

All adjusting discs and tappets should be disassembled in a way so that correct reassembly can be performed.

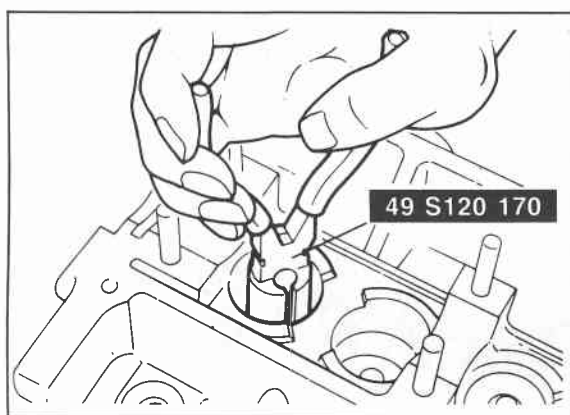
# 1C DISASSEMBLY (CYLINDER HEAD)



76G01C-088

## Valve spring

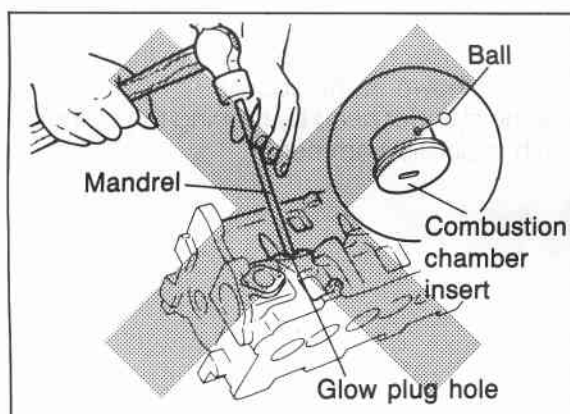
Remove the valve, spring seats and valve keepers from the cylinder head with the **SST**.



76G01C-089

## Valve seal

After removing the lower spring seats, remove the valve seals with the **SST**.



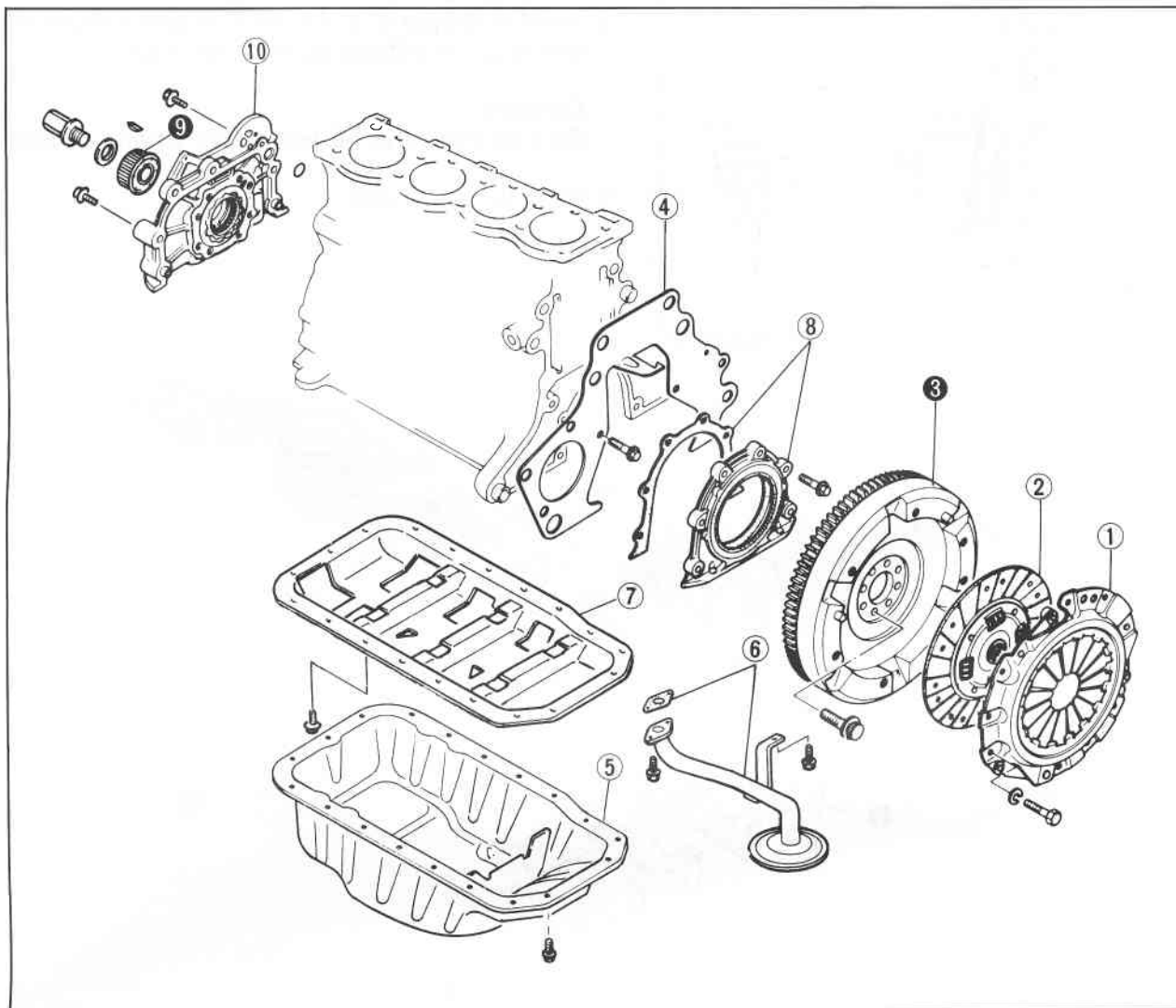
76G01C-090

## Combustion chamber insert

### Caution

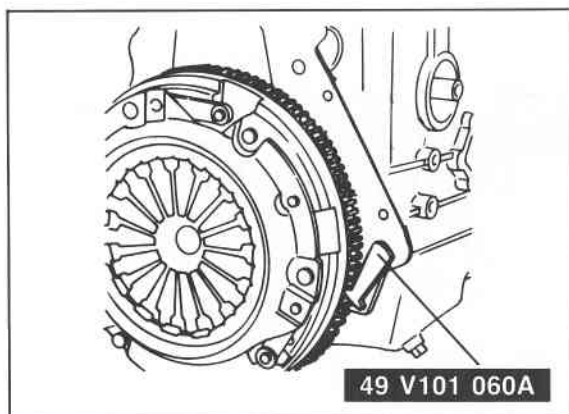
Do not remove the combustion chamber insert as the cylinder head and the combustion chamber insert are machined together, replace the combustion chamber insert and cylinder head as an assembly.

## CYLINDER BLOCK—I



76G01C-091

- |                 |                      |                       |
|-----------------|----------------------|-----------------------|
| 1. Clutch cover | 5. Oil pan           | 8. Rear cover         |
| 2. Clutch disc  | 6. Oil strainer      | 9. Timing belt pulley |
| 3. Flywheel     | 7. Stiffener (RF-CX) | 10. Oil pump assembly |
| 4. End plate    |                      |                       |



76G01C-092

### Flywheel

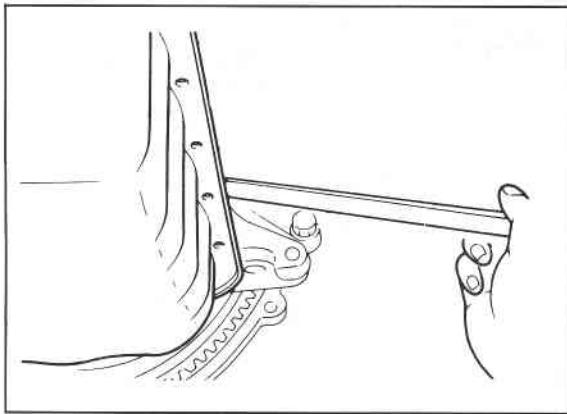
1. Install the **SST** to the flywheel.
2. Remove the clutch cover, clutch disc and flywheel.

### Timing belt pulley

1. Reverse the direction of the **SST**.
2. Remove the timing belt pulley.

## 1C DISASSEMBLY (CYLINDER BLOCK)

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86U01X-072

### Oil pan

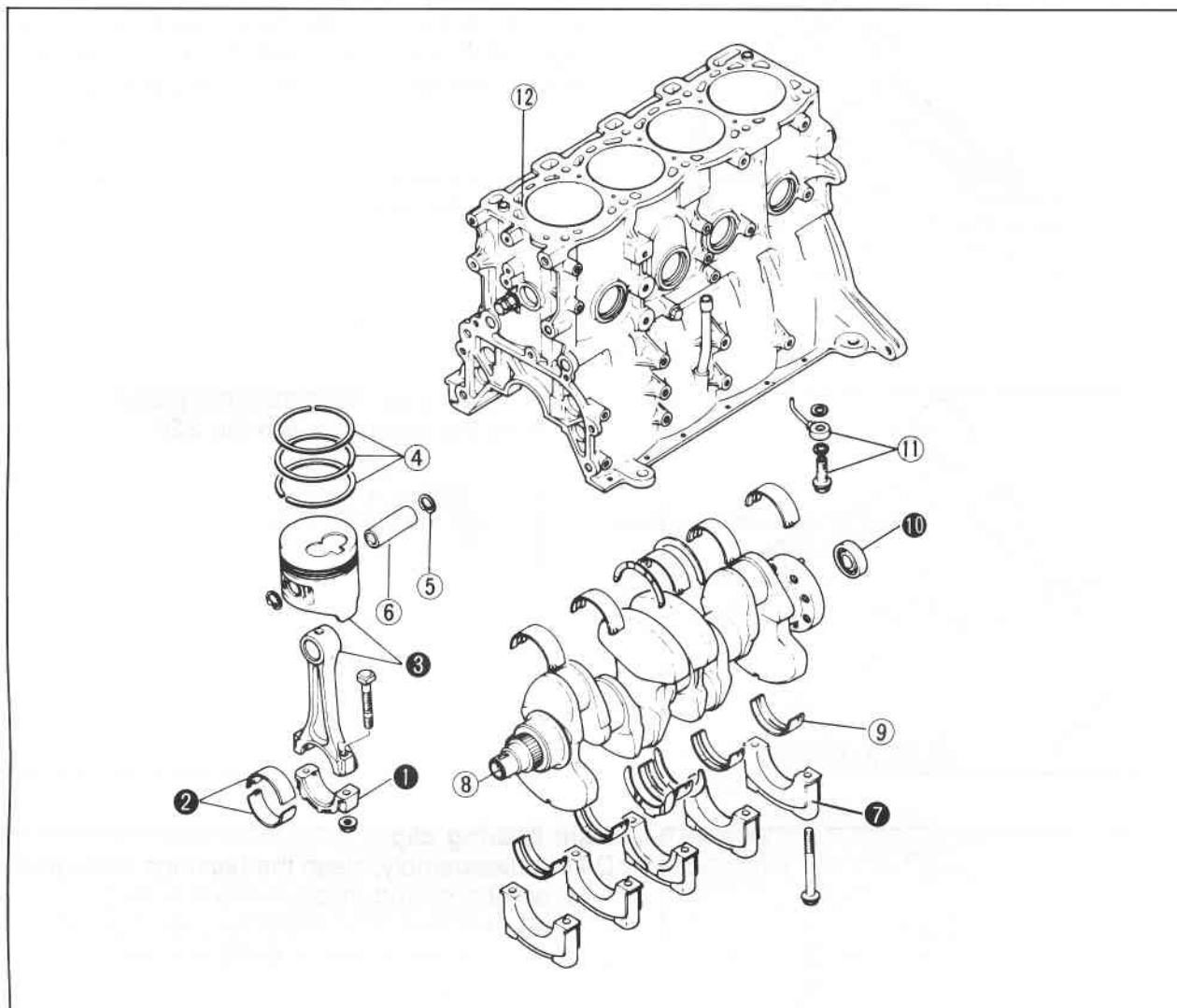
1. Remove the oil pan mounting bolts.
2. Insert a scraper or a suitable tool between the oil pan and the stiffener to separate them.

### Caution

**Do not bend the oil pan when prying loose.**

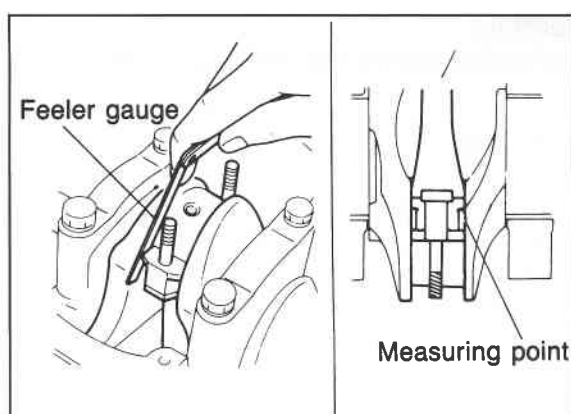
3. Remove the oil pan.

## CYLINDER BLOCK—II



76G01C-093

- |                              |                     |                    |
|------------------------------|---------------------|--------------------|
| 1. Connecting rod cap        | 5. Snap ring        | 9. Main bearing    |
| 2. Connecting rod bearing    | 6. Piston pin       | 10. Pilot bearing  |
| 3. Connecting rod and piston | 7. Main bearing cap | 11. Oil jet        |
| 4. Piston ring               | 8. Crankshaft       | 12. Cylinder block |



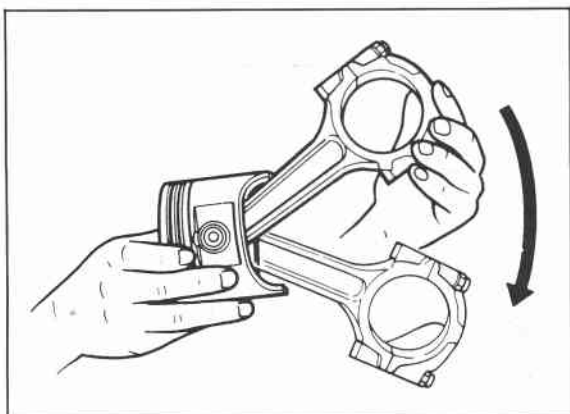
76G01C-094

### Disassembly Note Connecting rod and cap

During disassembly, clean the bearing, connecting rod, and crankpin, and measure the following:

1. Connecting rod side clearance. (Refer to page 1C—67.)
2. Crankpin oil clearance. (Refer to page 1C—66.)

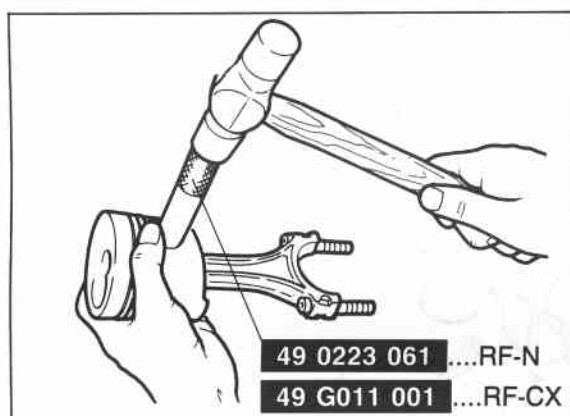
# 1C DISASSEMBLY (CYLINDER BLOCK)



76G01C-095

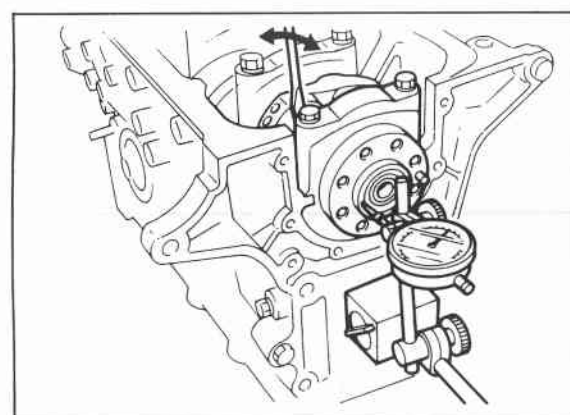
## Piston and connecting rod

1. Before disassembling the piston and connecting rod, check the oscillation torque as shown in the figure. If the large end does not drop by its own weight, replace the piston or the piston pin.



76G01C-249

2. Remove the snap rings from the piston.
3. Remove the piston pin with the **SST**.

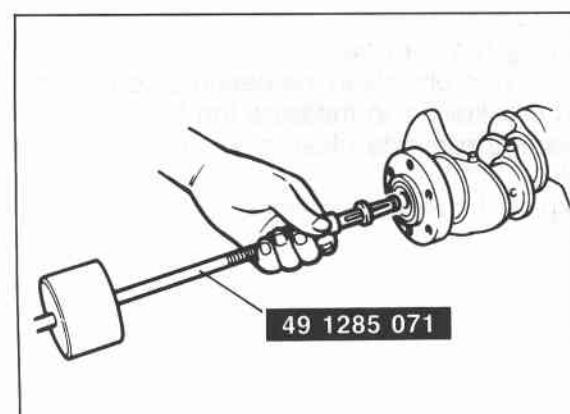


76G01C-096

## Main bearing cap

During disassembly, clean the bearings, main journals, and caps, and measure the following:

1. Crankshaft end play. (Refer to page 1C—65.)
2. Main journal oil clearance. (Refer to page 1C—64.)



76G01C-097

## Pilot bearing

Remove the pilot bearing from the crankshaft with the **SST**.

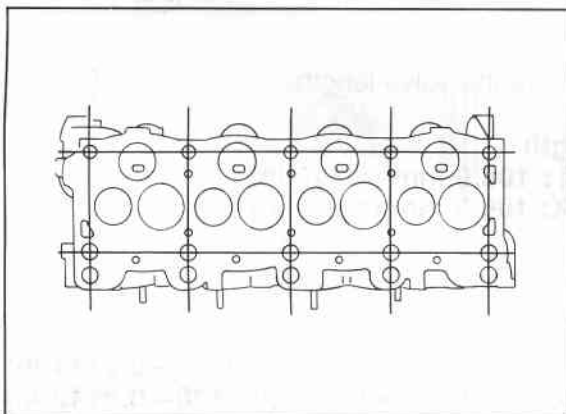
**INSPECTION AND REPAIR**

1. Clean all parts, taking care to remove any gasket fragments, dirt, oil or grease, carbon, moisture residue, or other foreign materials.
2. Inspect and repair must be performed in the order specified.

**Caution**

**Be careful not to damage the joints or friction surfaces of aluminum alloy components (such as the cylinder head or pistons).**

86U01X-077

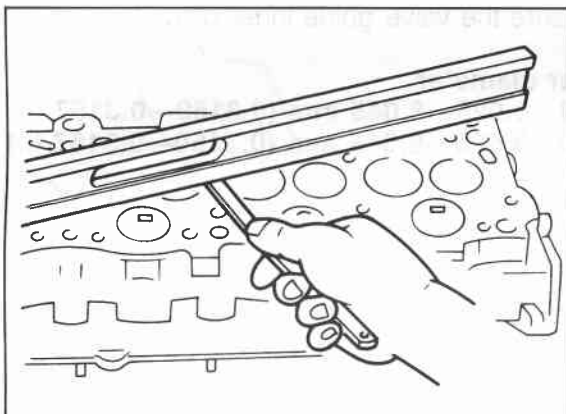


76G01C-098

**Cylinder Head**

1. Inspect the cylinder head for damage, cracks, and leakage of water or oil. Replace if necessary.
2. Measure the cylinder head distortion in the seven directions shown in the figure.

**Distortion: 0.10 mm (0.004 in) max.**



76G01C-099

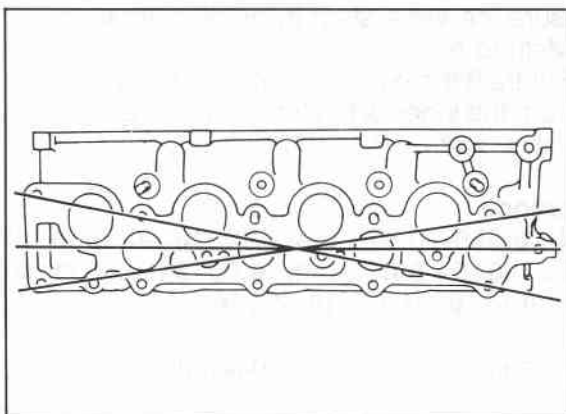
3. If the cylinder head distortion exceeds specification replace the cylinder head.

**Height:**

**133.9—134.1 mm (5.272—5.280 in)**

**Caution**

**Do not attempt to repair a cylinder head by milling or grinding.**

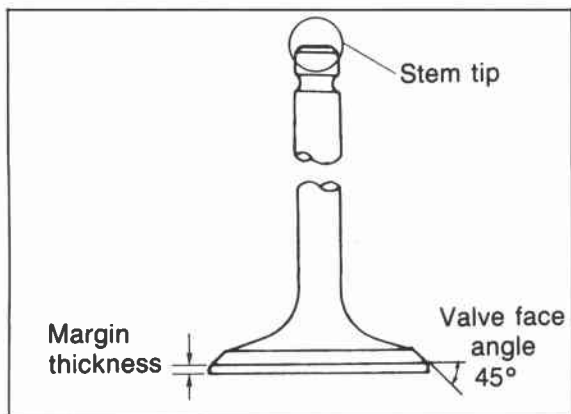


76G01C-100

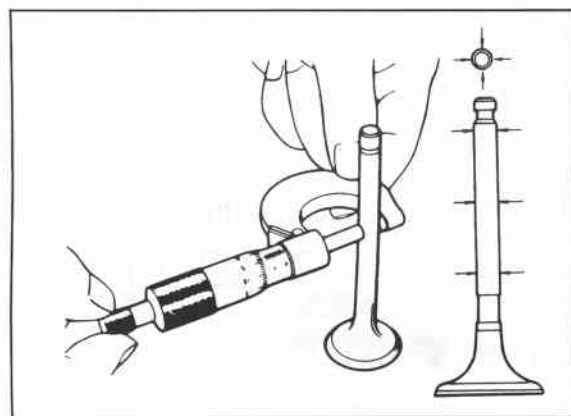
4. Measure the manifold contact surface distortion in the three directions shown in the figure.

**Distortion: 0.20 mm (0.008 in) max.**

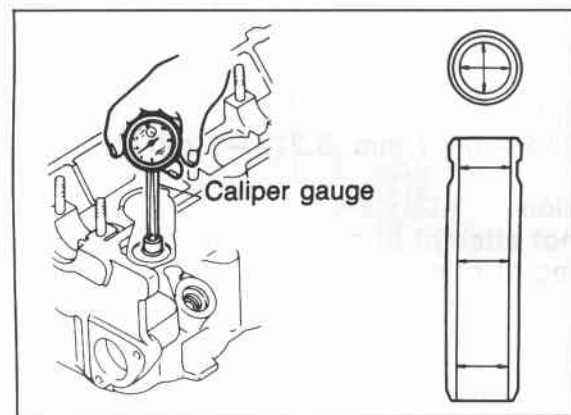
5. If distortion exceeds specification replace the cylinder head.



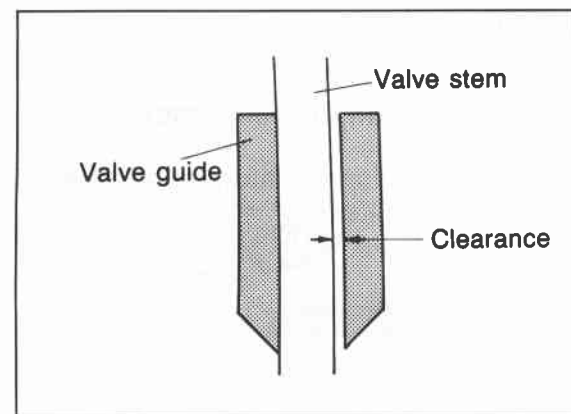
76G01C-101



76G01C-102



76G01C-103



76G01C-104

## Valve and Valve Guide

1. Inspect each valve for the following. Replace or resurface if necessary.
  - (1) Damaged or bent stem
  - (2) Roughness or damage to face
  - (3) Damage or uneven wear of stem tip
2. Check the valve head margin thickness. Replace if necessary.

### Margin thickness

mm (in)

|       |    |              |
|-------|----|--------------|
| RF-CX | IN | 1.80 (0.071) |
|       | EX | 1.65 (0.065) |
| RF-N  | IN | 0.80 (0.031) |
|       | EX | 0.80 (0.031) |

3. Measure the valve length.

### Length

**IN : 106.9 mm (4.209 in)**

**EX: 106.8 mm (4.205 in)**

4. Measure the valve stem diameter.

### Diameter

**IN : 7.970—7.985 mm (0.3138—0.3144 in)**

**EX: 7.965—7.980 mm (0.3136—0.3142 in)**

5. Measure the valve guide inner diameter.

### Inner diameter

**IN : 8.025—8.045 mm (0.3159—0.3167 in)**

**EX: 8.025—8.045 mm (0.3159—0.3167 in)**

6. Measure the valve stem to guide clearance.

### (1) Method No. 1

Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

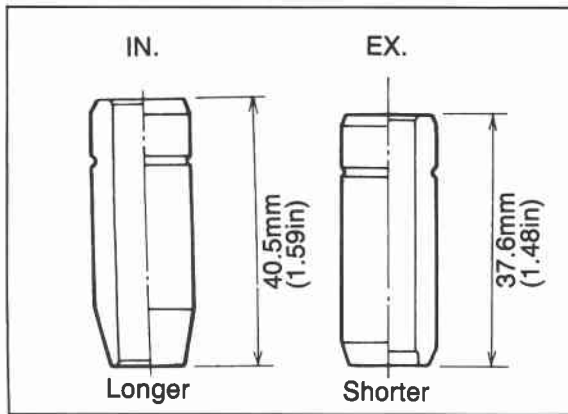
### Clearance

**IN : 0.040—0.075 mm (0.0016—0.0030 in)**

**EX: 0.045—0.080 mm (0.0018—0.0031 in)**

**Maximum: 0.10 mm (0.004 in)**

7. If the clearance exceeds the maximum, replace the valve and/or valve guide.



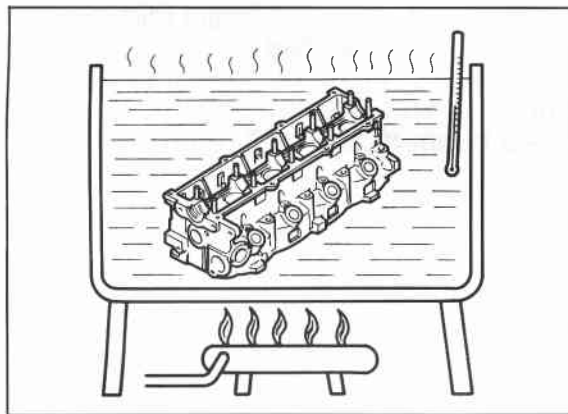
76G01C-105

### Replacement of valve guide

#### Caution

When the valve guide is replaced, check the gap between the valve and guide once again. The valve seal should be installed after inspection and repair of the valve seat. Don't misassemble the valve guides because intake and exhaust valve guides have a different seat.

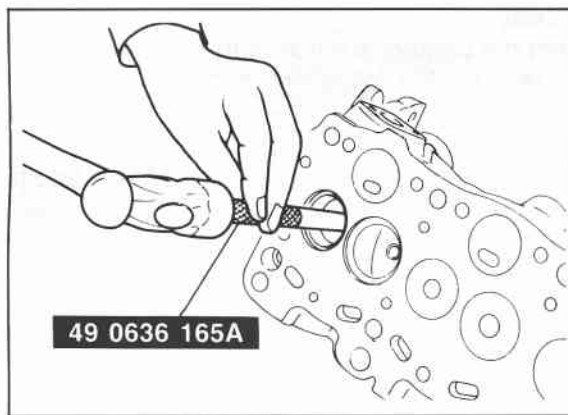
Intake side valve guide ..... longer  
Exhaust side valve guide ..... shorter



76G01C-106

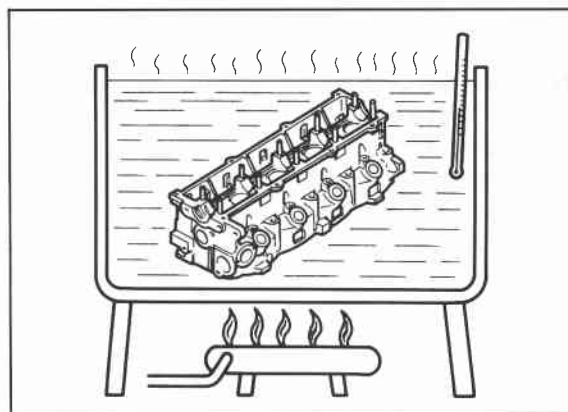
#### Removal

1. Gradually heat the cylinder head in water to **approx. 90°C (194°F)**.



86U01X-084

2. Remove the valve guide from the side opposite the combustion chamber with the **SST**.

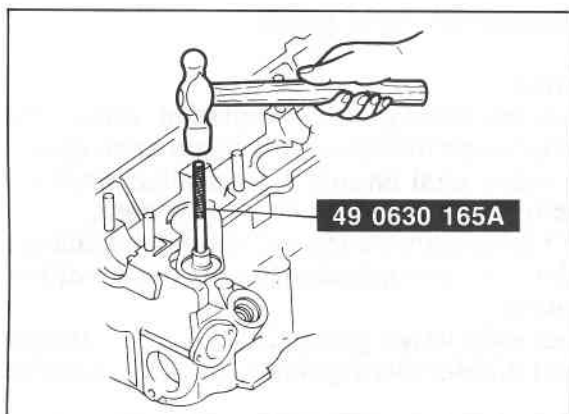


76G01C-107

#### Installation

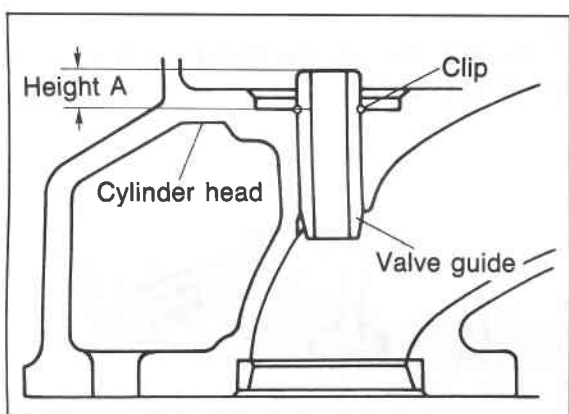
1. Gradually heat the cylinder head in water to **approx. 90°C (194°F)**.

# 1C INSPECTION AND REPAIR



76G01C-103

2. Fit the clip onto the valve guide.
3. Tap the valve guide in from the side opposite the combustion chamber with the **SST** until the clip contacts the cylinder head.

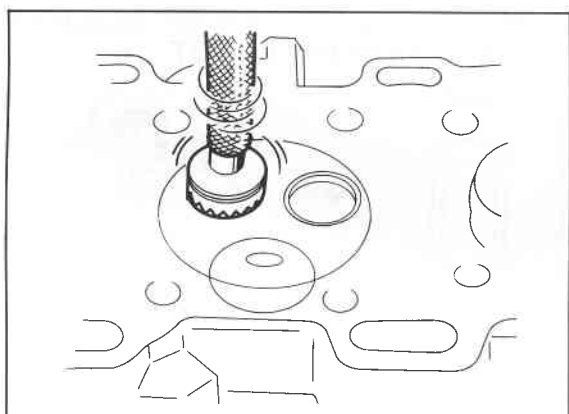


76G01C-104

4. Check the guide protrusion height (dimension A in the figure) is as specified.

## Height:

**8.3—8.8 mm (0.327—0.346 in)**



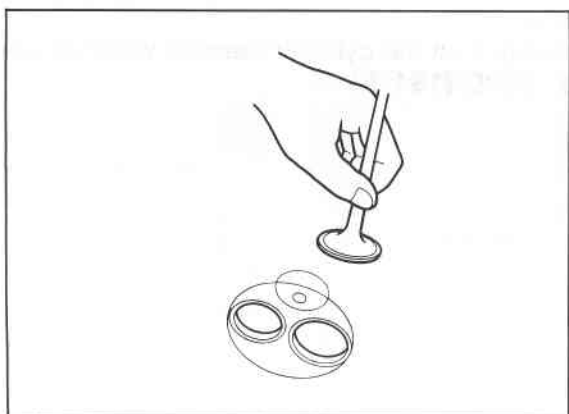
76G01C-110

## Valve Seat

1. Inspect the contact surface of the valve seat and valve face for the following.
  - (1) Roughness
  - (2) Damage
2. If necessary, resurface the valve seat to the specified angle with valve seat cutter and/or resurface the valve face.

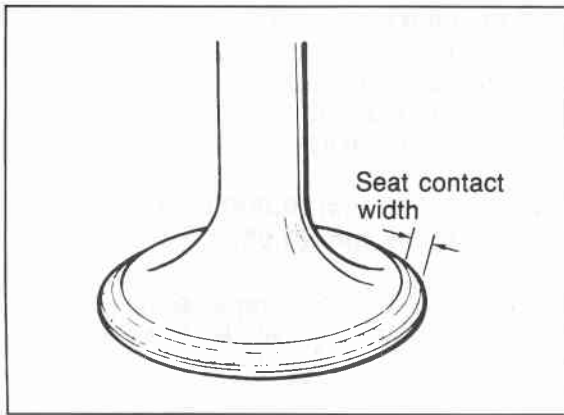
## Angle

|       |    |     |
|-------|----|-----|
| RF-CX | IN | 60° |
|       | EX | 45° |
| RF-N  | IN | 45° |
|       | EX | 45° |



76G01C-111

3. Apply a thin coat of prussian blue to the valve face.
4. Check the valve seating by pressing the valve against the seat.
  - (1) If blue does not appear 360° around the valve face, replace the valve.
  - (2) If blue does not appear 360° around the valve seat, resurface the seat.



76G01C-112

5. Check the seat contact width.

## Width

mm (in)

|       |    |                         |
|-------|----|-------------------------|
| RF-CX | IN | 1.4—1.8 (0.055—0.071)   |
|       | EX | 1.64—2.04 (0.065—0.080) |
| RF-N  | IN | 1.7—2.3 (0.067—0.091)   |
|       | EX | 1.7—2.3 (0.067—0.091)   |

6. Check that the valve seating position is at the center of the valve face.

(1) If the seating position is too high, correct the valve seat as below.

## Angle

|       |    | 1st | 2nd |
|-------|----|-----|-----|
| RF-CX | IN | 75° | 60° |
|       | EX | 60° | 45° |
| RF-N  | IN | 60° | 45° |
|       | EX | 60° | 45° |

(2) If the seating position is too low, correct the valve seat as below.

## Angle

|       |    | 1st | 2nd |
|-------|----|-----|-----|
| RF-CX | IN | 15° | 45° |
|       | EX | 30° | 45° |
| RF-N  | IN | 30° | 45° |
|       | EX | 30° | 45° |

7. Seat the valve to the valve seat with a lapping compound.

## Caution

**Do not let compound adhere to the valve stem.**

8. Measure the receded amount from the cylinder head surface by using a feeler gauge.

## Recession:

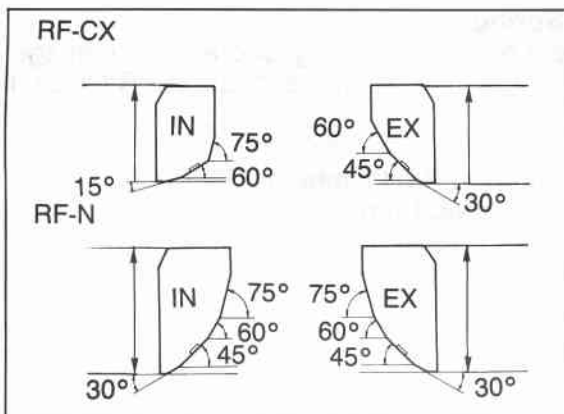
**0.75—1.05 mm (0.030—0.041 in)**

**Maximum: 2.55 mm (0.100 in)**

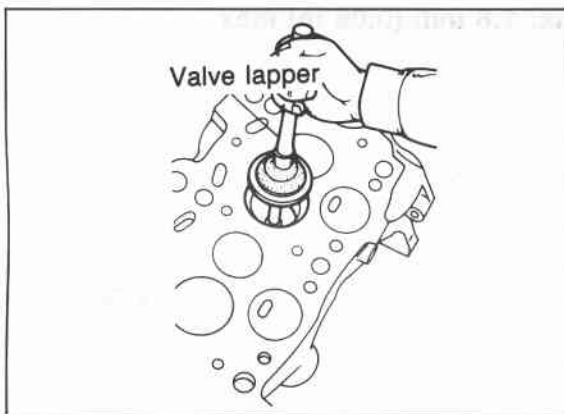
(1) If the receded amount is **1.55—2.55 mm (0.061—0.100 in)**, install the washer into the valve spring seat area.

The washer thickness should be equal to the amount subtracted **1 mm (0.04 in)** from the receded amount.

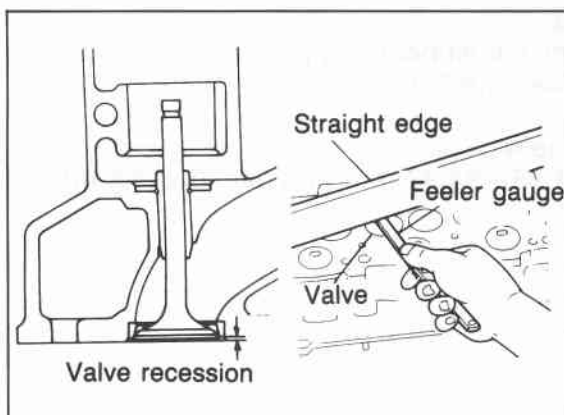
(2) If the receded amount exceeds **2.55 mm (0.100 in)**, replace the cylinder head.



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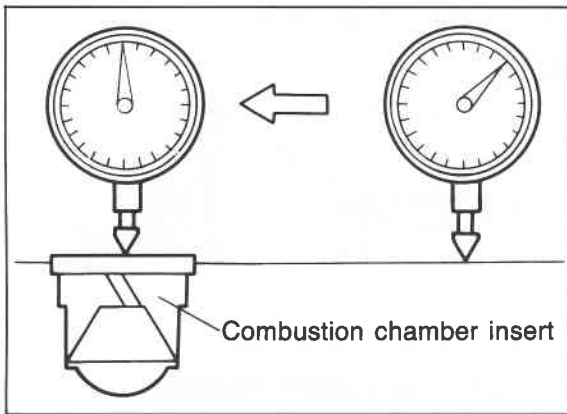


76G01C-114



76G01C-115

# 1C INSPECTION AND REPAIR



76G01C-116

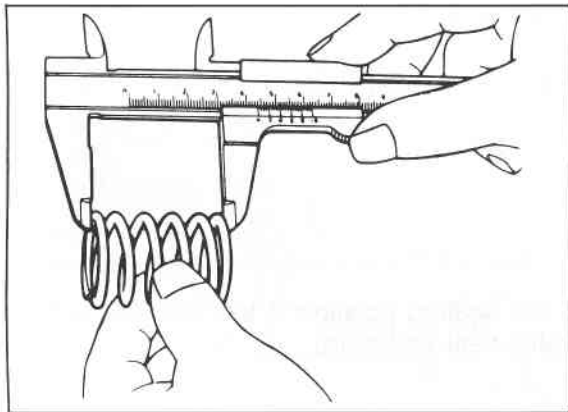
## Combustion Chamber Insert

1. Inspect the combustion chamber insert for damage or crack, replace if necessary.
2. Measure the receded or projected amount of combustion chamber insert from cylinder head surface.

**Recession: 0.020 mm (0.0008 in) max.**

**Projection: 0.005 mm (0.0001 in) max.**

If it exceeds the specification, replace the combustion chamber insert and the cylinder head as an assembly.



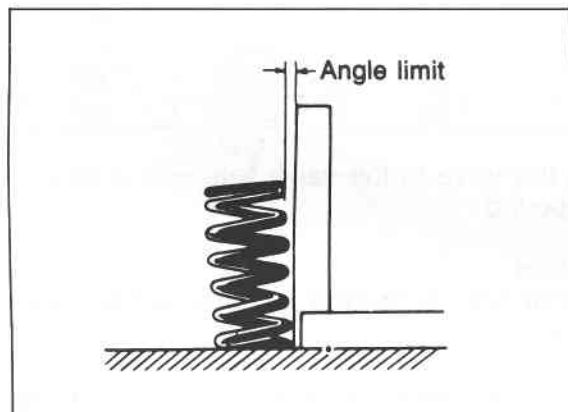
76G01C-117

## Valve Spring

1. Inspect each valve spring for cracks or damage.
2. Check the free length and angle. Replace if necessary.

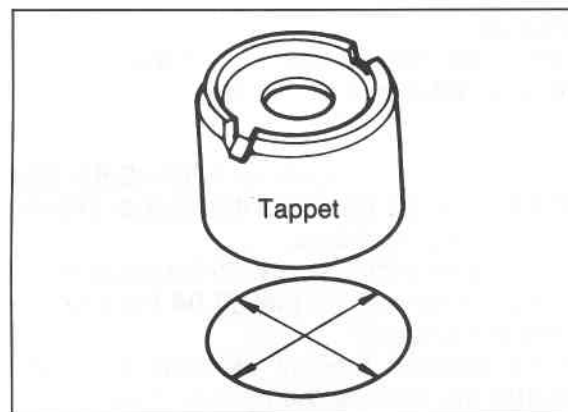
**Free length: 45.11 mm (1.776 in)**

**Minimum: 44.8 mm (1.764 in)**



76G01C-118

**Angle: 1.6 mm (0.06 in) max.**



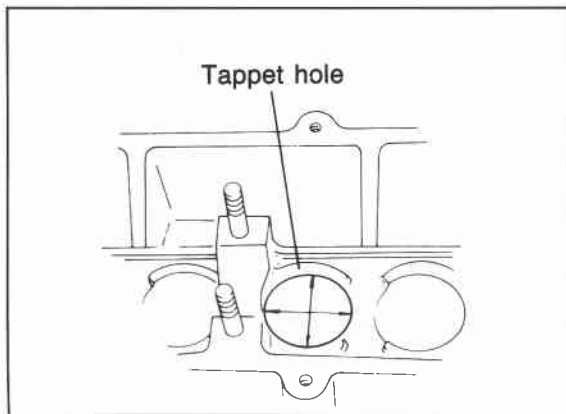
76G01C-119

## Tappet

1. Check the tappet to tappet hole clearance.  
(1) Measure the tappet outer diameter.

**Diameter:**

**34.95—34.97 mm (1.3764—1.3768 in)**



76G01C-120

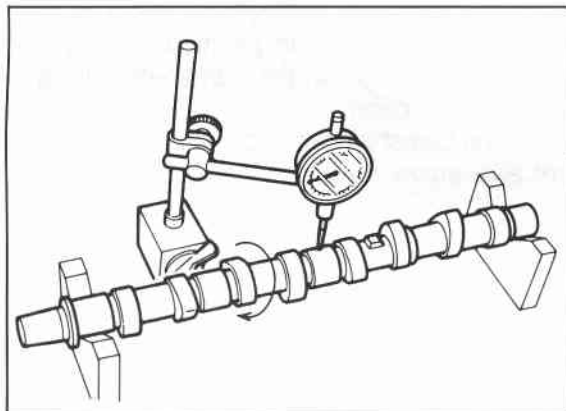
- (2). Measure the inner diameter of the tappet hole in the cylinder head.

**Hole diameter:**

**34.99—35.01 mm (1.3776—1.3787 in)**

2. Calculate the difference (clearance) between the tappet diameter and hole inner diameter. If the clearance exceeds the specification, replace the tappet or the cylinder head.

**Clearance: 0.10 mm (0.004 in) max.**

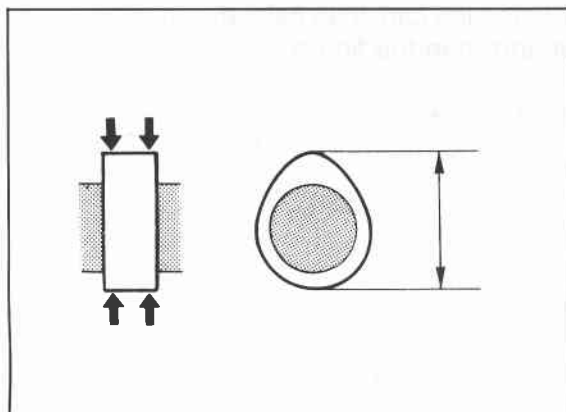


76G01C-121

**Camshaft**

1. Set the front and rear journals on V-blocks. Check the camshaft runout. Replace if necessary.

**Runout: 0.10 mm (0.004 in) max.**



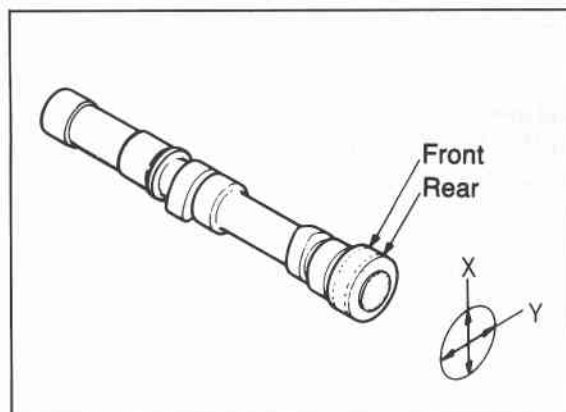
76G01C-122

2. Check the cam for wear or damage. Replace if necessary.
3. Check the cam lobe height at the two points as shown in the figure.

**Height**

mm (in)

|       |    | Standard        | Minimum       |
|-------|----|-----------------|---------------|
| RF-CX | IN | 42.521 (1.6741) | 42.11 (1.658) |
|       | EX | 45.300 (1.7835) | 44.90 (1.768) |
| RF-N  | IN | 44.306 (1.7443) | 43.90 (1.728) |
|       | EX | 45.300 (1.7835) | 44.90 (1.768) |



76G01C-123

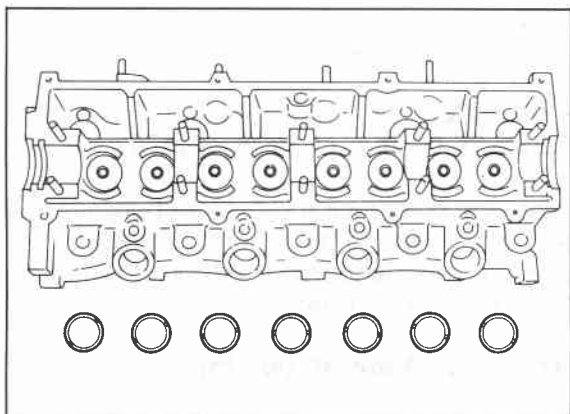
4. Measure wear of the journals in X and Y directions at the two points as shown in the figure.

**Diameter:**

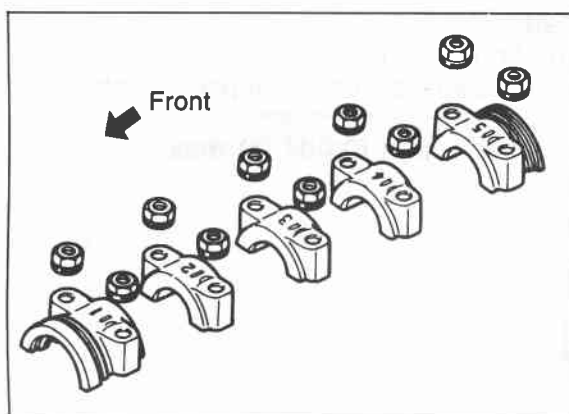
**31.959—31.975 mm (1.2582—1.2589 in)**

**Out-of-round: 0.05 mm (0.002 in) max.**

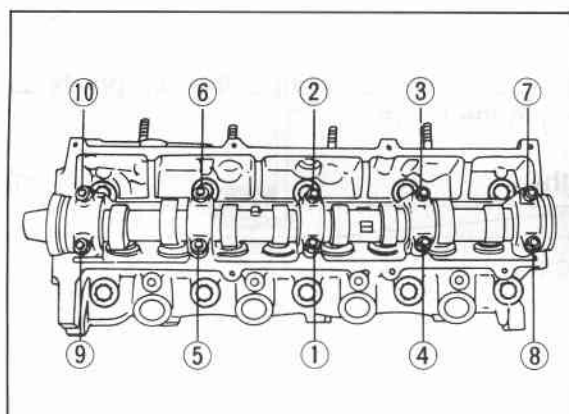
# 1C INSPECTION AND REPAIR



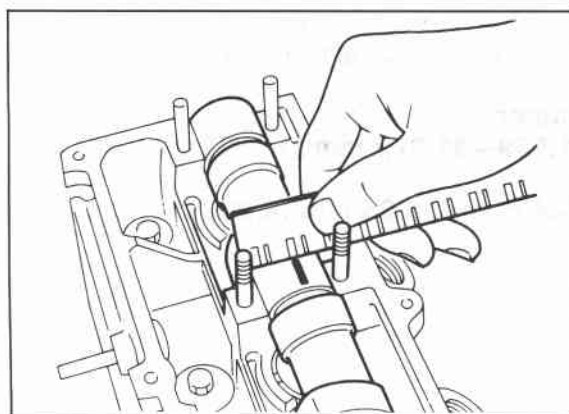
76G01C-124



76G01C-250



76G01C-125



76G01C-126

5. Measure the oil clearance of the camshaft.

- (1) Remove the tappets and adjusting discs from the cylinder head, and separate them by cylinder.

- (2) Clean the camshaft and cylinder head journal.
- (3) Install the camshaft into position.
- (4) Set a Plasti-gauge on the camshaft journal in the axial direction.
- (5) Install the camshaft caps according to the number and arrow marks.

- (6) Tighten the camshaft caps evenly and in order shown in the figure.

**Tighten torque:**

**20—26 N·m (2.0—2.7 m·kg, 14—20 ft·lb)**

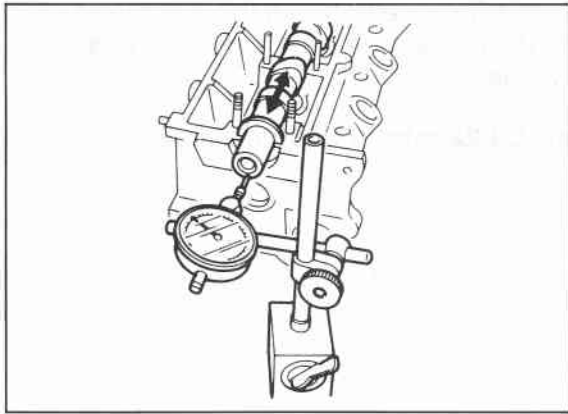
- (7) Remove the camshaft caps and measure the oil clearance.

**Oil clearance:**

**0.025—0.066 mm (0.0010—0.0026 in)**

**Maximum: 0.10 mm (0.004 in)**

- (8) If the oil clearance exceeds the maximum, replace the cylinder head or camshaft.



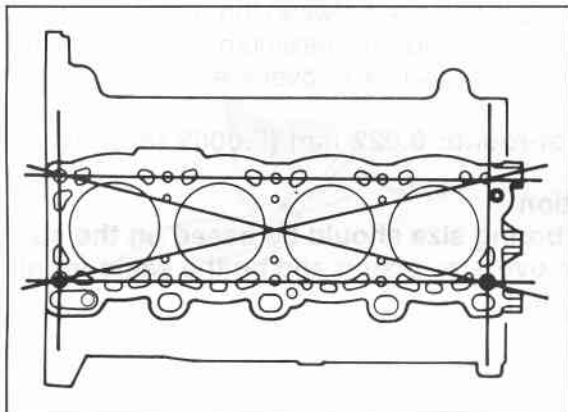
76G01C-127

6. Measure the camshaft end play. If it exceeds the maximum, replace the camshaft and/or the cylinder head.

**End play:**

**0.02—0.15 mm (0.0008—0.0059 in)**

**Maximum: 0.20 mm (0.008 in)**

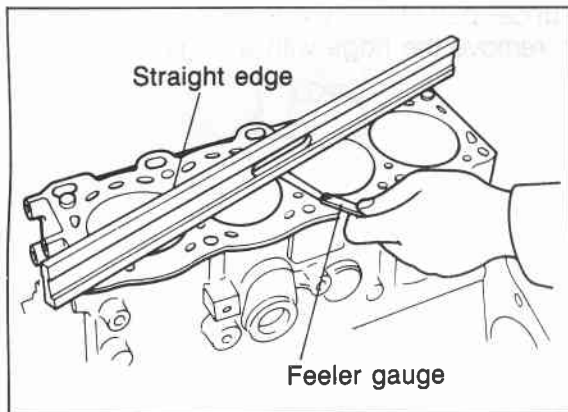


76G01C-128

**Cylinder Block**

1. Check the cylinder block. Repair or replace if necessary.
  - (1) Leakage damage
  - (2) Cracks
  - (3) Scoring of wall
2. Measure the distortion of the top surface of the cylinder block in the six directions as shown in the figure.

**Distortion: 0.10 mm (0.004 in) max.**

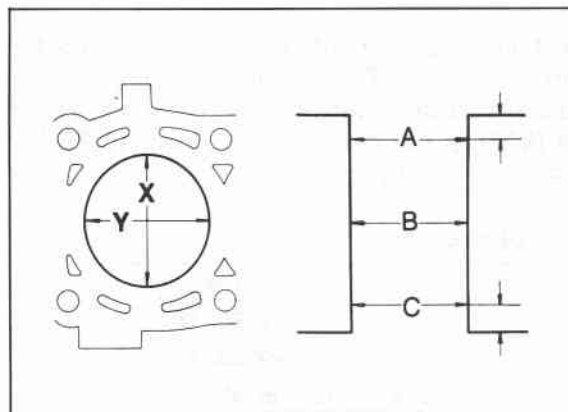


76G01C-129

3. If the distortion exceeds the maximum, replace the cylinder block.

**Caution**

**Do not grind the surface of the cylinder block.**



76G01C-130

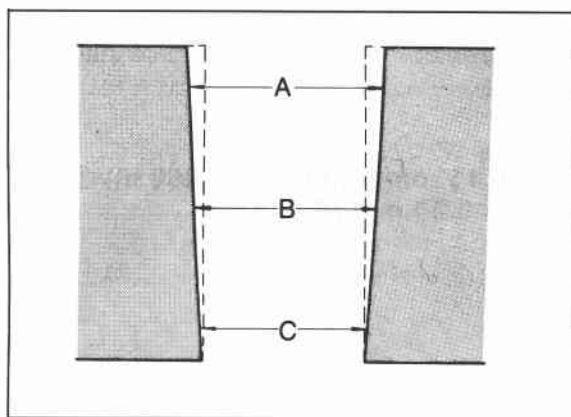
4. Measure the cylinder bore in directions X and Y at three levels in each cylinder as shown.

**Cylinder bore**

mm (in)

| Size                  | Bore                          |
|-----------------------|-------------------------------|
| Standard              | 86.000—86.022 (3.3858—3.3867) |
| 0.25 (0.010) oversize | 86.250—86.272 (3.3957—3.3965) |
| 0.50 (0.020) oversize | 86.500—86.522 (3.4055—3.4064) |

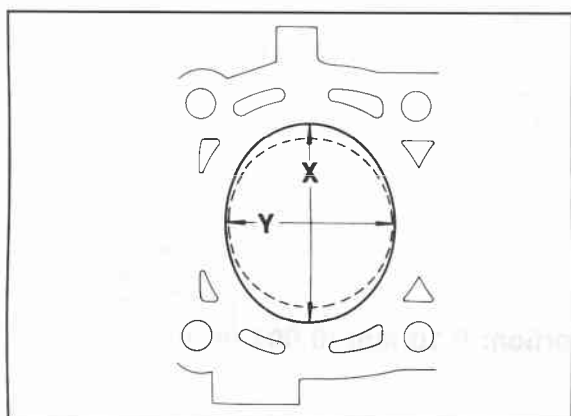
# 1C INSPECTION AND REPAIR



76G01C-131

- (1) If the difference between the measurement A and C exceeds the maximum taper, rebore the cylinder to oversize.

**Taper: 0.022 mm (0.0009 in) max.**



76G01C-132

- (2) If the difference between the measurement X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

**Out-of-round: 0.022 mm (0.0009 in) max.**

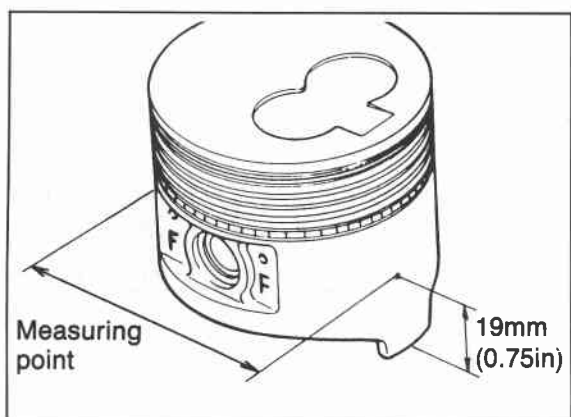
## Caution

**The boring size should be based on the size of an oversize piston and be the same for all cylinders.**



86U01X-102

5. If the upper part of the cylinder wall shows uneven wear, remove the ridge with a ridge reamer.



76G01C-133

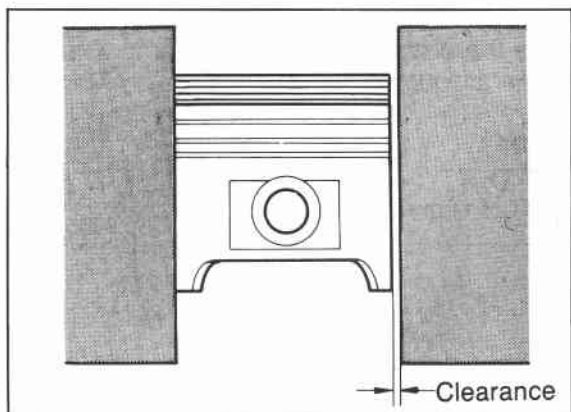
## Piston

1. Inspect the outer circumferences of all pistons for seizure or scoring. Replace if necessary.
2. Measure the outer diameter of each piston at a right angle (90°) to the piston pin, **19 mm (0.75 in)** above the bottom of piston.

## Piston diameter

mm (in)

| Size                  | Diameter                      |
|-----------------------|-------------------------------|
| Standard              | 85.957—85.983 (3.3841—3.3852) |
| 0.25 (0.010) oversize | 86.207—86.233 (3.3940—3.3950) |
| 0.50 (0.020) oversize | 86.457—86.483 (3.4038—3.4048) |



76G01C-134

3. Check the piston to cylinder clearance.

**Clearance:**

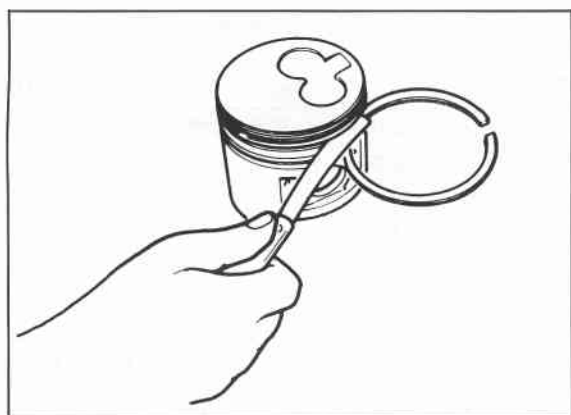
**0.032—0.050 mm (0.0013—0.0020 in)**

**Maximum: 0.15 mm (0.0059 in)**

4. If the clearance exceeds the maximum, replace the piston or rebores the cylinders to fit oversize pistons.

**Note**

**If the piston is replaced, replace the piston rings also.**



69G01A-125

**Piston and Piston Ring**

1. Measure the piston ring to ring land clearance around the entire circumference using a new piston ring.

**Clearance (Top)**

**RF-CX: 0.18—0.22 mm (0.0071—0.0087 in)**

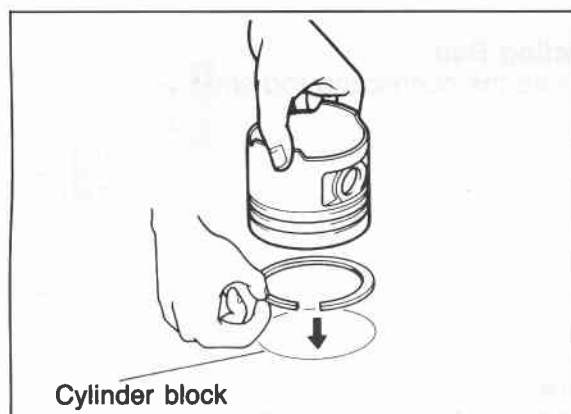
**RF-N : 0.05—0.09 mm (0.0020—0.0035 in)**

**Clearance (Second):**

**0.04—0.08 mm (0.0016—0.0031 in)**

**Maximum: 0.2 mm (0.008 in)**

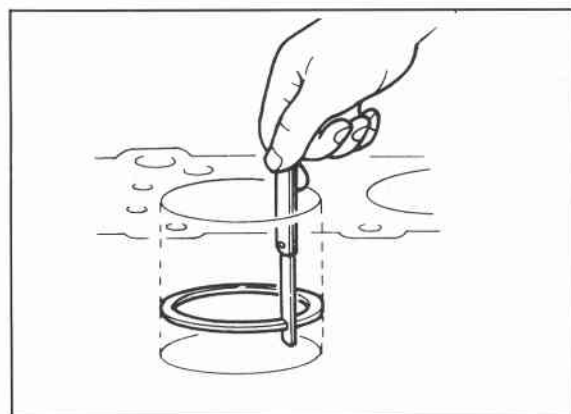
2. If the clearance exceeds the maximum, replace the piston.



Cylinder block

86U01X-104

3. Inspect the piston rings for damage, abnormal wear, or breakage. Replace if necessary.
4. Insert the piston ring into the cylinder by hand and push it to the bottom of the ring travel in using the piston.



76G01C-136

5. Measure each piston ring end gap with a feeler gauge. Replace if necessary.

**End gap (Top and second)**

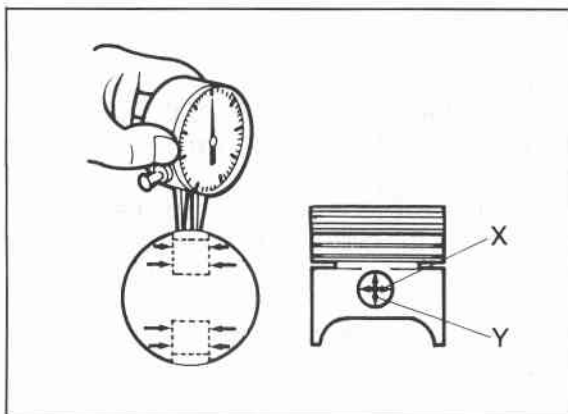
**RF-CX: 0.20—0.35 mm (0.008—0.014 in)**

**RF-N : 0.20—0.40 mm (0.008—0.016 in)**

**End gap (Oil rail):**

**0.20—0.40 mm (0.008—0.016 in)**

**Maximum: 1.0 mm (0.039 in)**



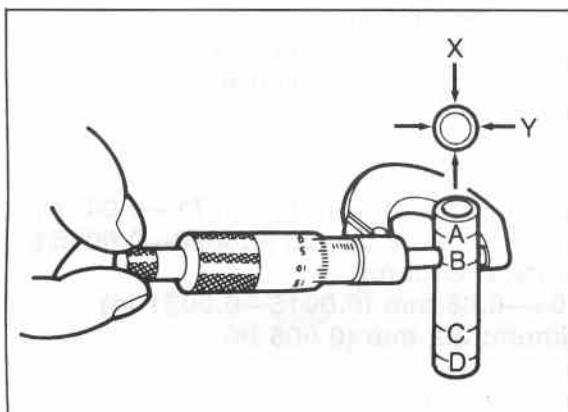
76G01C-137

## Piston and Piston Pin

1. Measure the piston pin hole diameter in X and Y directions at four points.

**Diameter** mm (in)

|       |                               |
|-------|-------------------------------|
| RF-CX | 29.997—30.007 (1.1810—1.1814) |
| RF-N  | 24.997—25.007 (0.9841—0.9845) |



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2. Measure the piston pin diameter.

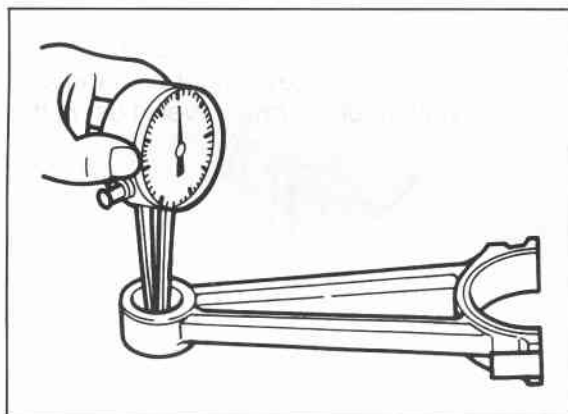
**Diameter** mm (in)

|       |                               |
|-------|-------------------------------|
| RF-CX | 29.994—30.000 (1.1809—1.1811) |
| RF-N  | 24.994—25.000 (0.9840—0.9843) |

3. Determine the piston pin to piston clearance by subtracting the two figures.

**Clearance:**  
**-0.003—0.013 mm (0.0001—0.0005 in)**

4. If the clearance exceeds the specification, replace the piston and/or piston pin.



76G01C-139

## Connecting Rod

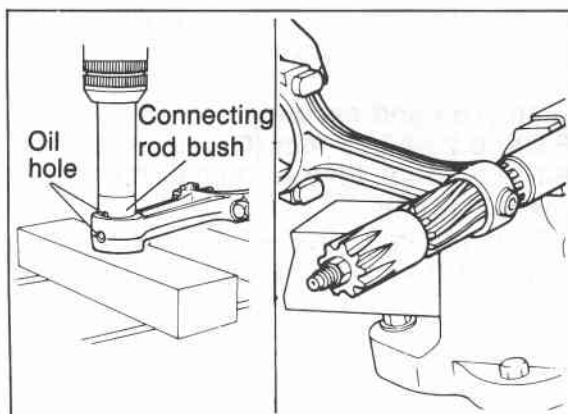
1. Measure the connecting rod small end bore.

**Diameter** mm (in)

|       |                               |
|-------|-------------------------------|
| RF-CX | 30.014—30.030 (1.1817—1.1823) |
| RF-N  | 25.014—25.030 (0.9848—0.9854) |

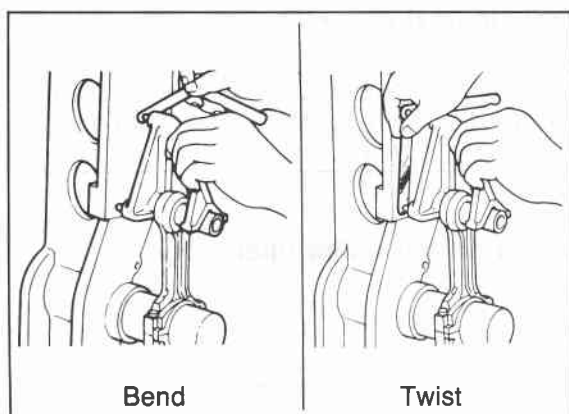
2. Check the clearance between the small end bore and piston pin.

**Clearance:**  
**0.014—0.036 mm (0.0005—0.0015 in)**  
**Maximum: 0.05 mm (0.002 in)**



76G01C-140

3. If the clearance exceeds the maximum, replace the connecting rod bushing.
  - (1) Apply engine oil to the connecting rod and the bushing.
  - (2) Align the oil holes of the connecting rod and the bushing, and press the bushing in.
  - (3) Correct the bushing inner diameter, so that the clearance is within the specification, by using a spiral expansion reamer.



76G01C-141

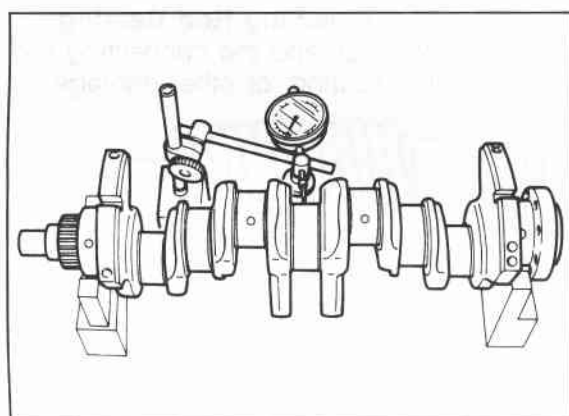
4. Check each connecting rod for bending or twisting. Repair or replace if necessary.

**Bend :**

**0.080 mm (0.0031 in) max.**  
**/50 mm (1.969 in)**

**Twist:**

**0.080 mm (0.0031 in) max.**  
**/50 mm (1.969 in)**

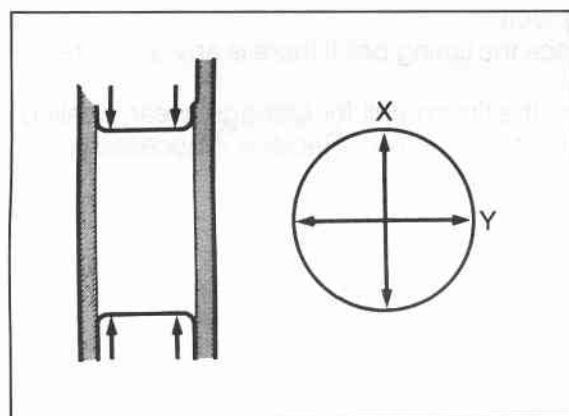


76G01C-142

**Crankshaft**

1. Check the journals and pins for damage, scoring, or oil hole clogging.
2. Set the crankshaft on V-blocks.
3. Check the crankshaft runout at the center journal. Replace if necessary.

**Runout: 0.05 mm (0.002 in) max.**



76G01C-143

4. Measure each journal diameter in X and Y directions at two points.

**Main journal**

**Diameter:**

**59.937—59.955 mm (2.3597—2.3604 in)**  
**Minimum: 59.89 mm (2.358 in)**  
**Out-of-round: 0.05 mm (0.002 in) max.**

**Crankpin journal**

**Diameter:**

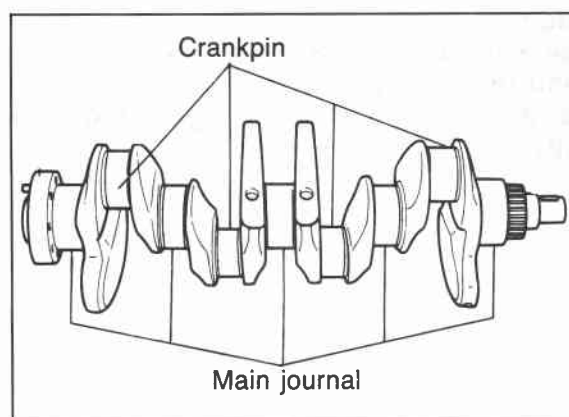
**50.940—50.955 mm (2.0055—2.0061 in)**  
**Minimum: 50.89 mm (2.004 in)**  
**Out-of-round: 0.05 mm (0.002 in) max.**

5. If the diameter is less than the minimum, grind the journals to match undersize bearings.

**Undersize bearing: 0.25 mm (0.010 in),**  
**0.50 mm (0.020 in), 0.75 mm (0.030)**

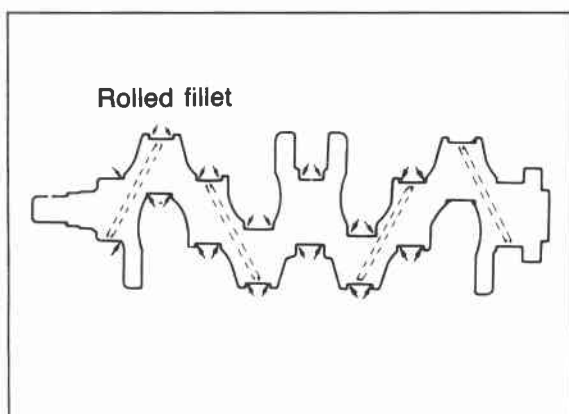
**Main journal diameter undersize mm (in)**

| Bearing size   | Journal diameter              |
|----------------|-------------------------------|
| 0.25 undersize | 59.687—59.705 (2.3499—2.3506) |
| 0.50 undersize | 59.437—59.455 (2.3400—2.3407) |
| 0.75 undersize | 59.187—59.205 (2.3302—2.3309) |



76G01C-144

# 1C INSPECTION AND REPAIR



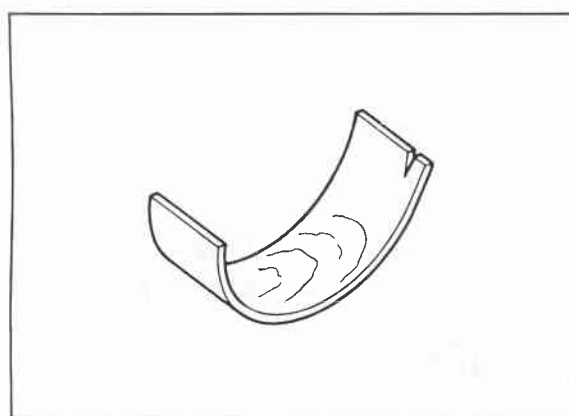
76G01C-145

## Crankpin journal diameter undersize mm (in)

| Bearing size   | Journal diameter              |
|----------------|-------------------------------|
| 0.25 undersize | 50.690—50.705 (1.9957—1.9963) |
| 0.50 undersize | 50.440—50.455 (1.9858—1.9864) |
| 0.75 undersize | 50.190—50.205 (1.9760—1.9766) |

### Caution

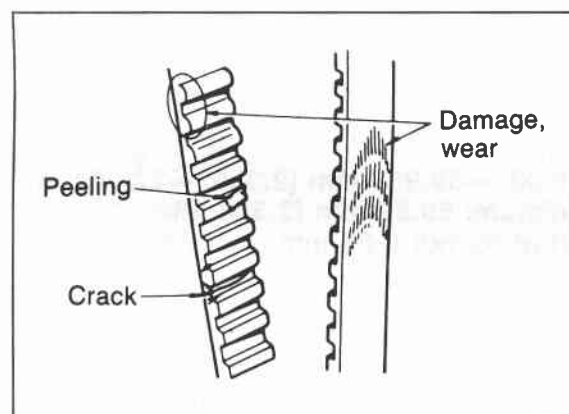
Do not grind the rolled fillet area.



79G01C-077

## Main Bearing and Connecting Rod Bearing

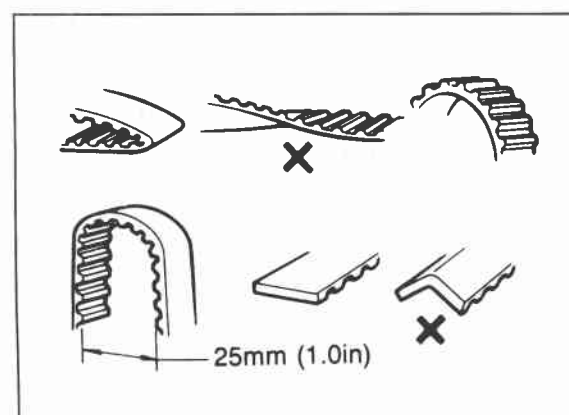
Check the main bearings and the connecting rod bearings for peeling, scoring, or other damage.



86U01X-113

## Timing Belt

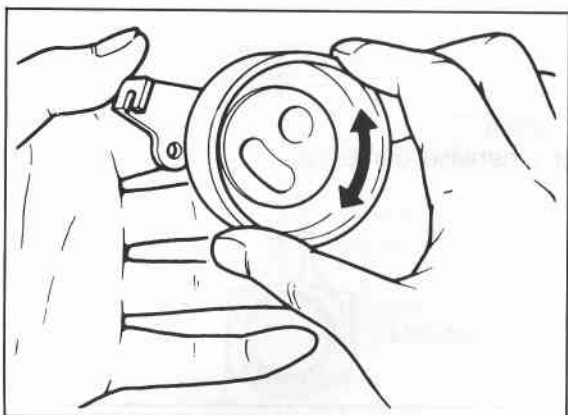
1. Replace the timing belt if there is any oil or grease on it.
2. Check the timing belt for damage, wear, peeling, cracks, or hardening. Replace if necessary.



86U01X-114

### Caution

- a) Never forcefully twist, turn inside out, or bend the timing belt.
- b) Be careful not to allow oil or grease on the belt.



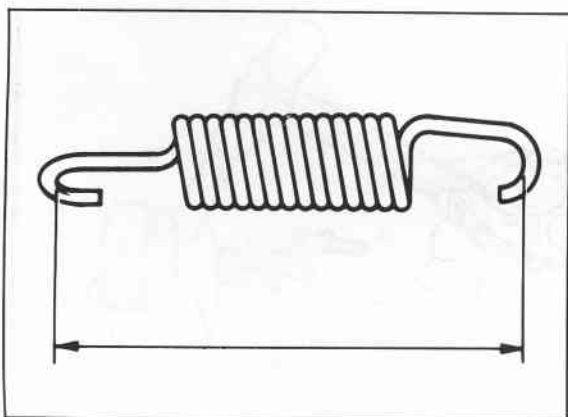
86U01X-115

## Timing Belt Tensioner and Idler Pulley

Check the timing belt tensioner and idler pulley for smooth rotation and abnormal noise. Replace if necessary.

### Caution

**Do not clean the tensioner with cleaning fluids. If necessary, use a soft rag to wipe it clean, and avoid scratching it.**



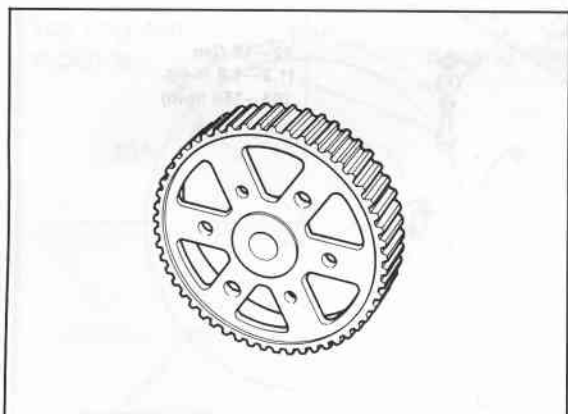
76G01C-251

## Timing Belt Tensioner Spring

Check the free length of the tensioner spring. Replace if necessary.

### Free length:

**52.6 mm (2.071 in)**



76G01C-146

## Timing Belt Pulley and Camshaft Pulley

Inspect the pulley teeth for wear, deformation, or other damage. Replace if necessary.

### Caution

**Do not clean the pulley with cleaning fluids. If necessary, use a rag to wipe it clean.**

## Timing Belt Cover

Inspect the timing belt covers for damage or cracks. Replace if necessary.

# 1C ASSEMBLY (CYLINDER BLOCK)

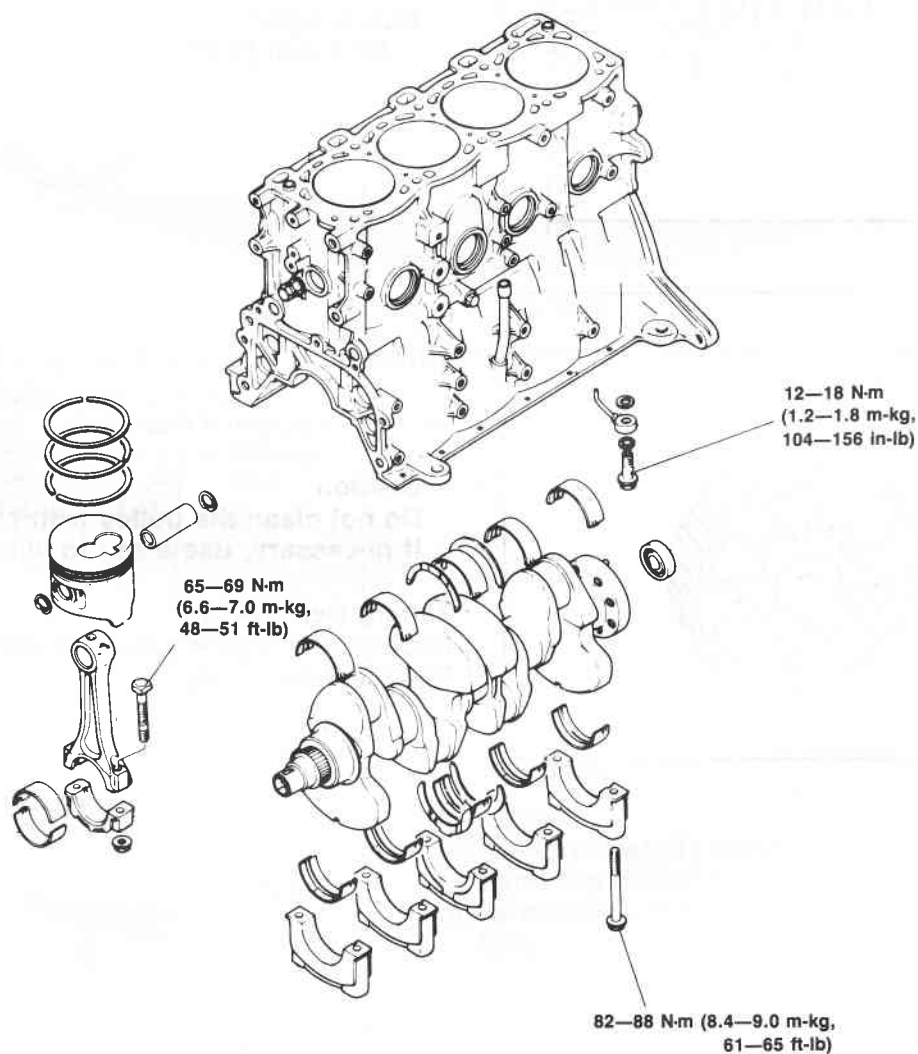
## ASSEMBLY

1. Clean all parts before reinstallation.
2. Apply new engine oil to all sliding and rotating parts.
3. Replace plain bearings if they are peeling, burned, or otherwise damaged.
4. Tighten all bolts and nuts to the specified torques.

### Caution

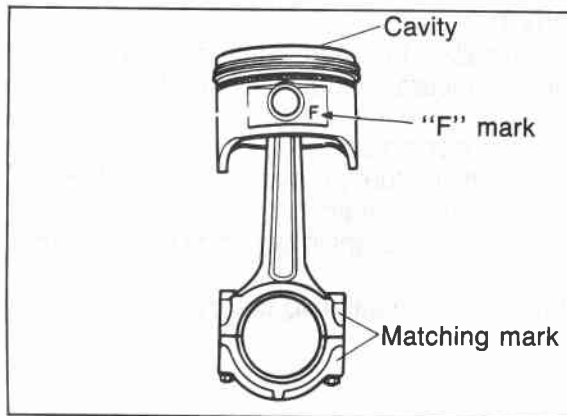
Do not reuse gaskets or oil seals.

### CYLINDER BLOCK—I Torque Specifications

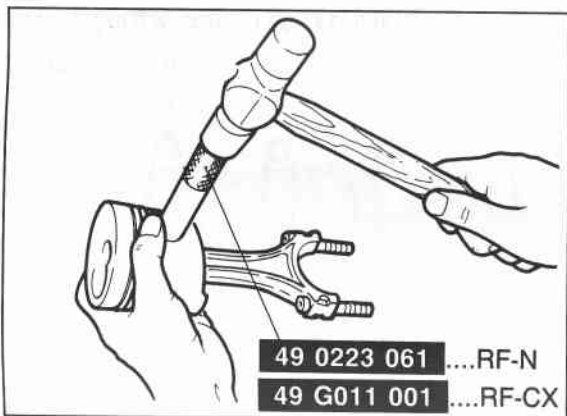


69G01A-139

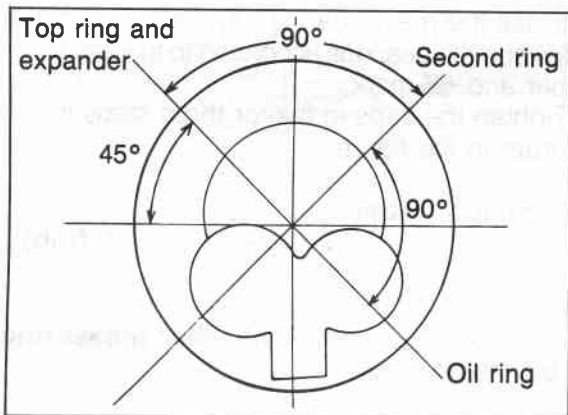
## ASSEMBLY (CYLINDER BLOCK) 1C



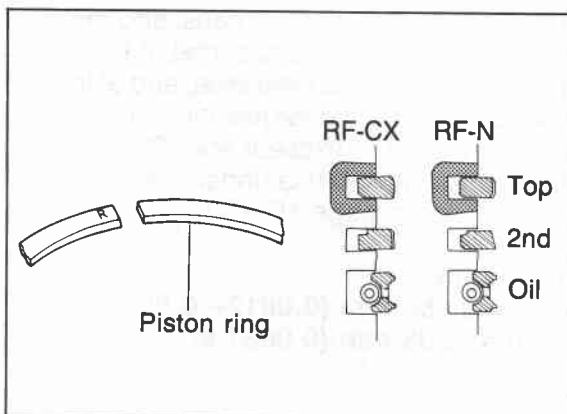
76G01C-147



76G01C-252



4BG01B-153



76G01C-148

### Connecting Rod

1. Align the piston cavity and matching mark in the large end of the connecting rod.
2. Apply engine oil to the circumference of each piston pin and to the small end of each connecting rod.

3. Insert a snap ring into one of the piston pin holes in the piston.
4. Install the piston pin using the **SST**.
5. Connect the piston and connecting rod by the piston pin, and lock the snap ring.

### Note

**Heat the piston to 50—70°C (120—170°F) for installation.**

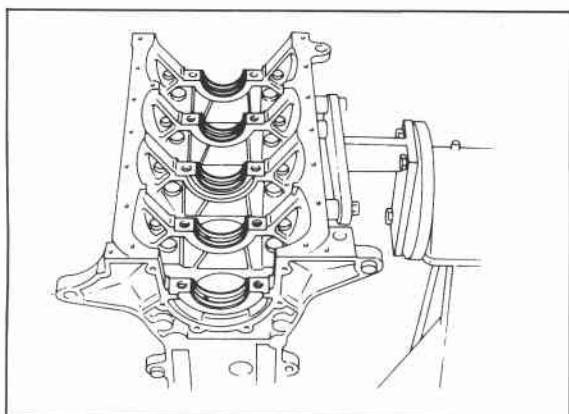
### Piston Ring

1. Apply a liberal coat of engine oil to the piston rings.
2. Install the oil ring expander and the oil ring.
3. Install the second ring.
4. Install the top ring.
5. Align the piston ring end gaps, as shown in the figure.

### Caution

**The rings must be mounted so the "R" or "N" marks face upward.**

# 1C ASSEMBLY (CYLINDER BLOCK)



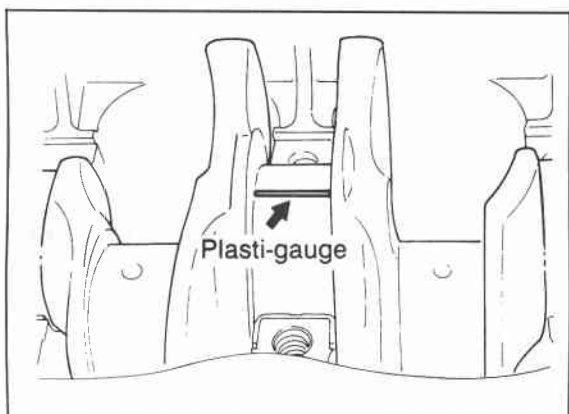
76G01C-149

## Crankshaft

1. Before installing the crankshaft, inspect the main bearing oil clearances as described.

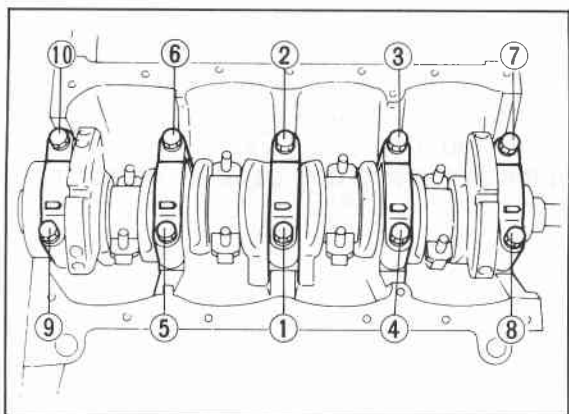
### Oil clearance inspection

- (1) Remove any foreign material and oil from the journal and bearing.
- (2) Install the upper main bearings in the cylinder block.
- (3) Set the crankshaft into the cylinder block.



76G01C-150

- (4) Position the plasti-gauge on top of the journals in the axial direction.



76G01C-151

- (5) Install the main bearing caps along with the lower main bearings according to the cap number and  mark.
- (6) Tighten the caps in two or three steps in the order in the figure.

### Tightening torque:

**82—88 N·m (8.4—9.0 m·kg, 61—65 ft·lb)**

### Caution

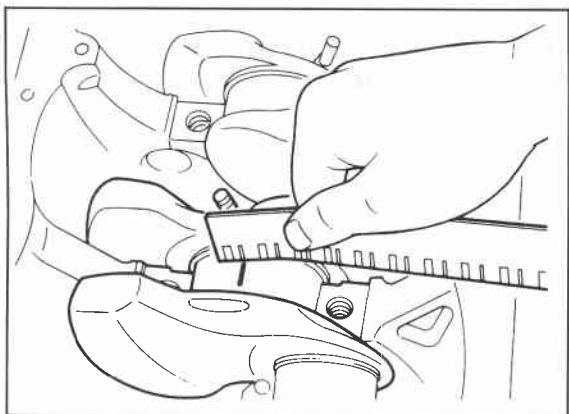
**Do not rotate the crankshaft when measuring the oil clearances.**

- (7) Remove the main bearing caps, and measure the plasti-gauge at each journal at the widest point for the smallest clearance, and at the narrowest point for the largest clearance. If the oil clearance exceeds specification, grind the crankshaft and use undersize main bearings. (Refer to page 1C—59.)

### Oil clearance:

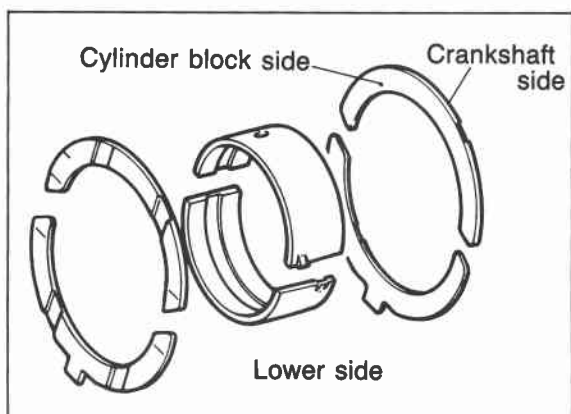
**0.031—0.050 mm (0.0012—0.0020 in)**

**Maximum: 0.08 mm (0.0031 in)**

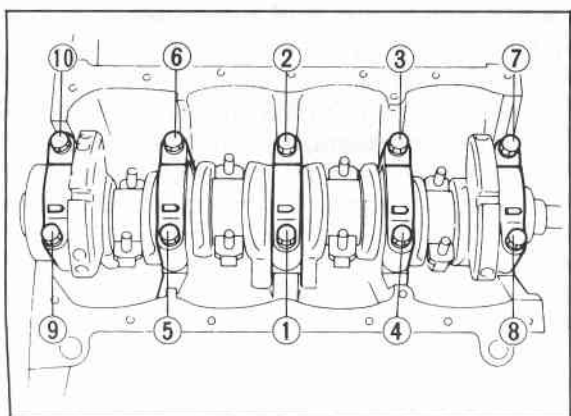


76G01C-152

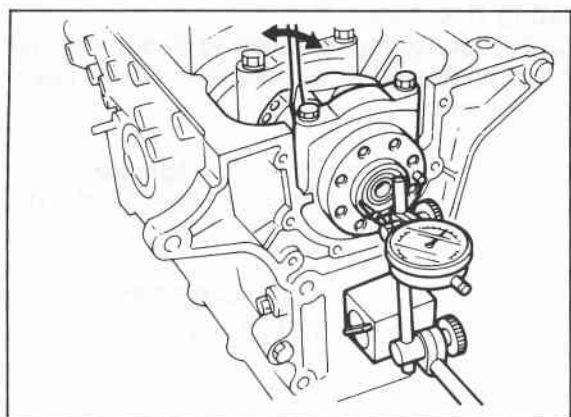
## ASSEMBLY (CYLINDER BLOCK) 1C



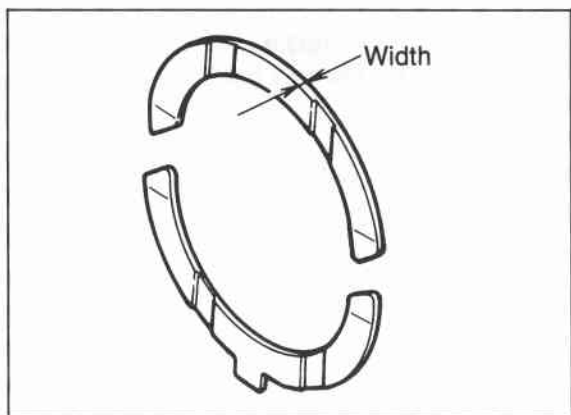
4BG01B-159



76G01C-153



76G01C-154



76G01C-155

2. Apply engine oil to the main bearings and main journals.
3. Install the crankshaft and bearings.

4. Install the main bearing cap according to the cap number and  mark, and tighten it evenly in order shown in the figure.
5. Check that the crankshaft turns easily.

6. Inspect the crankshaft end play.

### End play:

0.040—0.282 mm (0.0016—0.0111 in)

Maximum: 0.30 mm (0.012 in)

7. If the end play is not within the specification, adjust the end play with an oversize thrust bearing.

### Standard width:

2.00—2.05 mm (0.0787—0.0807 in)

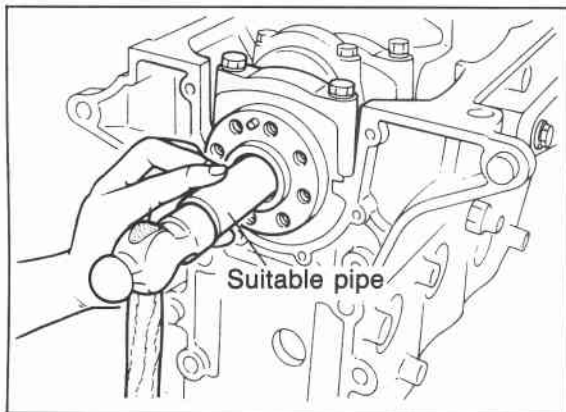
### Oversize width:

2.175—2.225 mm (0.0856—0.0876 in)

### Note

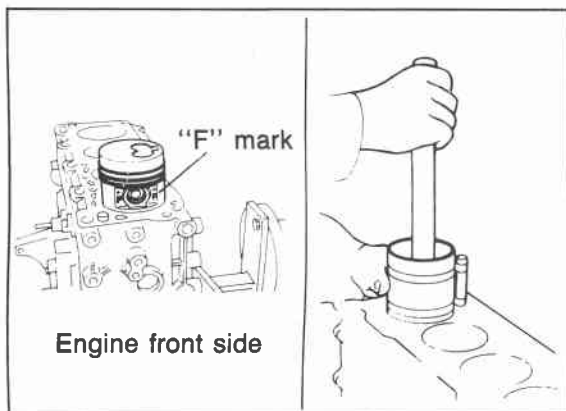
First replace the rear thrust bearings, if still not within the specification, replace the front thrust bearings also.

## 1C ASSEMBLY (CYLINDER BLOCK)



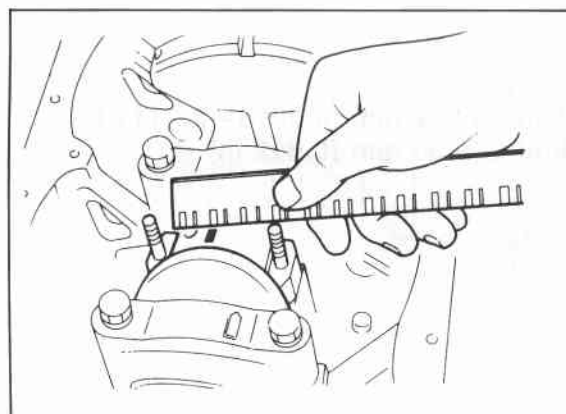
### Pilot Bearing

1. Apply engine oil to the outer circumference of the bearing.
2. Set a piece of pipe (outer diameter 30—34 mm, 1.18—1.34 in) against the outer race of the bearing, then tap it evenly into the crankshaft.
3. Lubricate the bearing with grease.



### Piston and Connecting Rod Assembly

1. Apply a liberal amount of clean engine oil to the cylinder walls, piston, and rings.
2. Check the piston rings for the end gap alignment.
3. Insert each piston assembly into the cylinder block with the "F" mark facing the front of the engine. Use a piston installer tool (commercially available).



### Connecting Rod Cap

1. Check the connecting rod bearing clearances using the same procedure as used for the main bearing oil clearance.

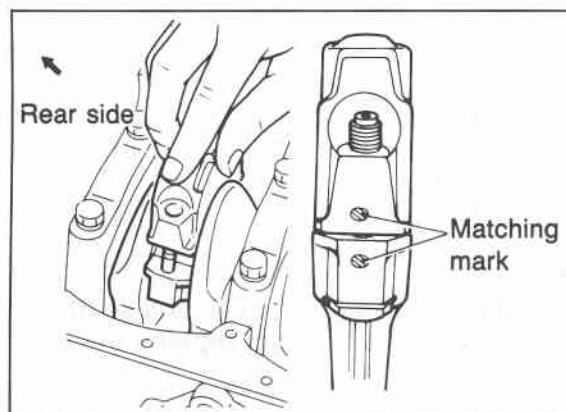
#### Connecting rod cap tightening torque:

65—69 N·m (6.6—7.0 m·kg, 48—51 ft·lb)

#### Oil clearance:

0.027—0.055 mm (0.0011—0.0022 in)

Maximum: 0.08 mm (0.0031 in)

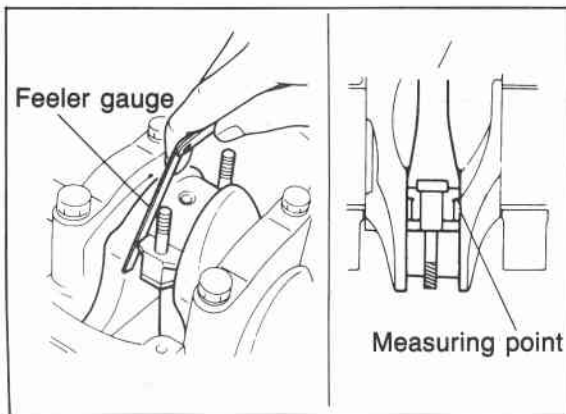


### Caution

**Align the alignment marks on the cap and on the connecting rod when installing the connecting rod cap.**

2. If the oil clearance exceeds the maximum, grind the crankshaft and use undersize bearings. (Refer to page 1C—60.)

## ASSEMBLY (CYLINDER BLOCK) 1C



76G01C-159

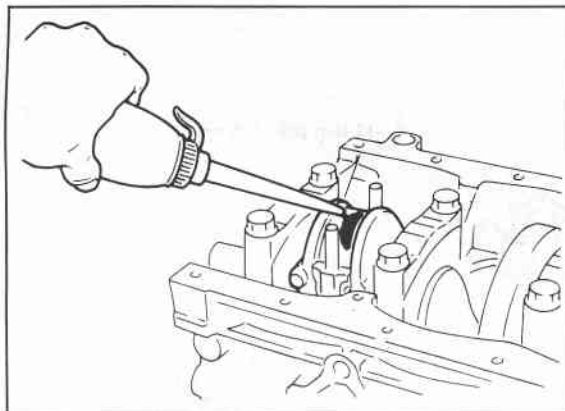
3. Check the side clearance of each connecting rod without the cap installed.

### Side clearance:

**0.11—0.262 mm (0.0043—0.0103 in)**

**Maximum: 0.30 mm (0.012 in)**

If the clearance exceeds the maximum, replace the connecting rod.

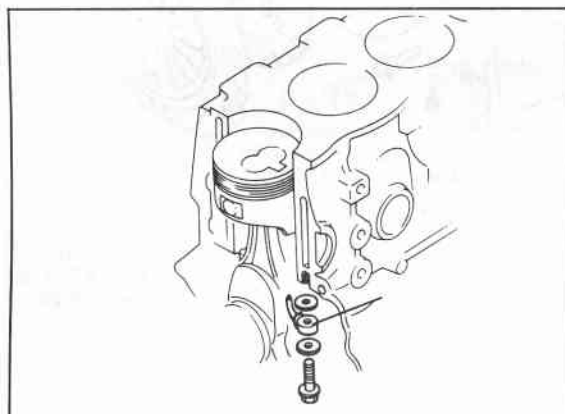


86U01X-130

4. Apply a liberal amount of engine oil to the crankpin journal and connecting rod bearing.
5. Install the connecting rod cap with the alignment marks aligned.

### Tightening torque:

**65—69 N·m (6.6—7.0 m·kg, 48—51 ft·lb)**



76G01C-160

### Oil jet

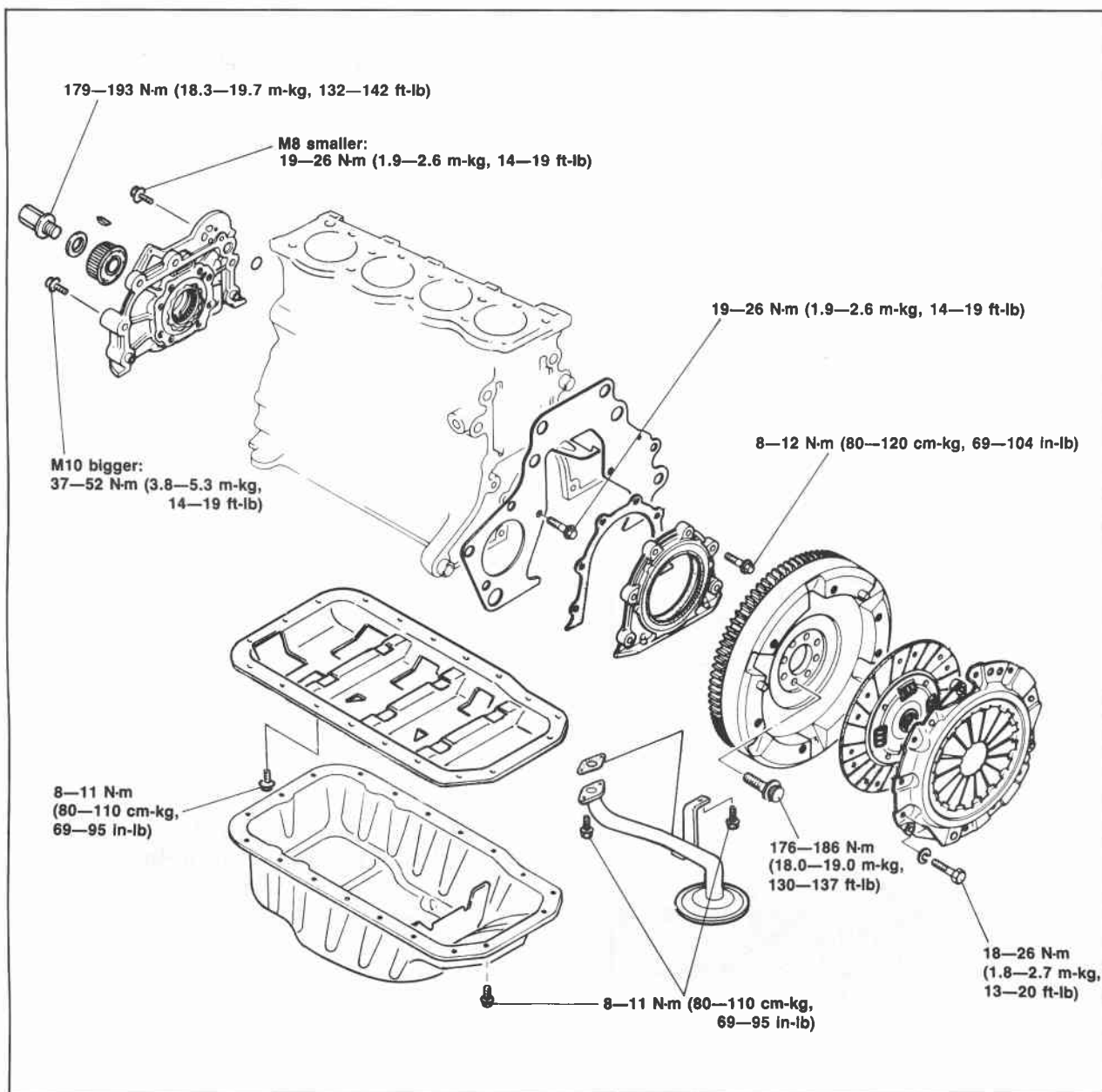
Install the oil jet into the cylinder block.

### Tightening torque: 12—18 N·m

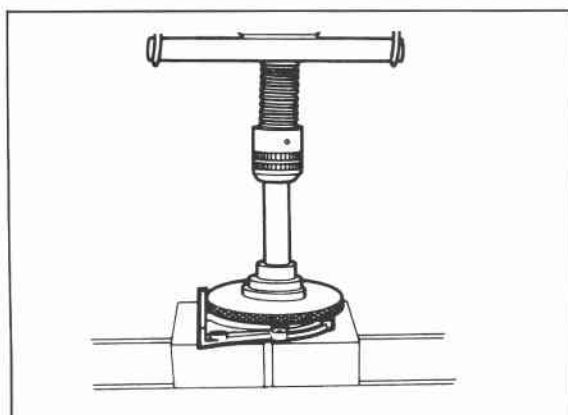
**(1.2—1.8 m·kg, 104—156 in·lb)**

# 1C ASSEMBLY (CYLINDER BLOCK)

## CYLINDER BLOCK—II Torque Specifications



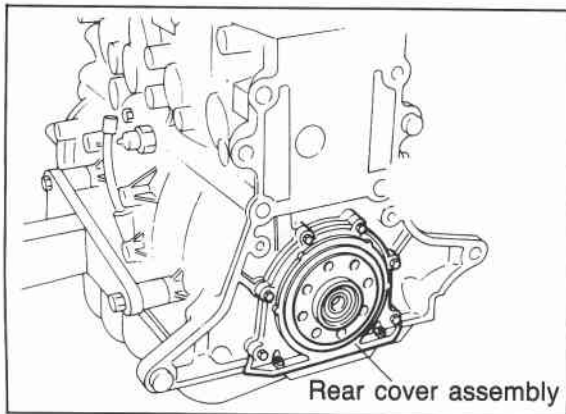
69G01A-166



### Rear Cover

1. Apply engine oil to the rear cover, oil seal and oil seal lip.
2. Press the oil seal into the rear cover.

## ASSEMBLY (CYLINDER BLOCK) 1C

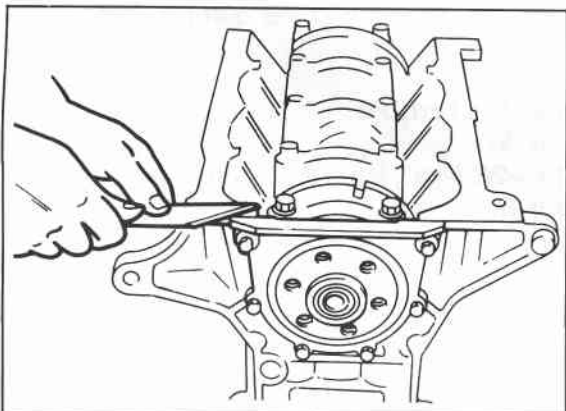


86U01X-131

3. Install the rear cover and a new gasket.

**Tightening torque:**

**8—12 N·m (80—120 cm·kg, 69—104 in·lb)**

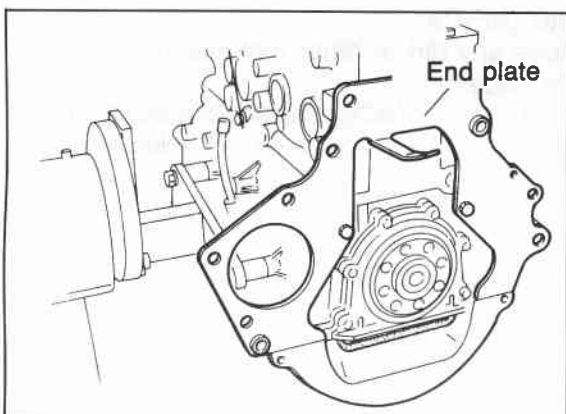


86U01X-132

4. Cut away the portion of the gasket that projects out from the rear cover assembly toward the oil pan side.

**Caution**

**Do not scratch the rear cover assembly.**



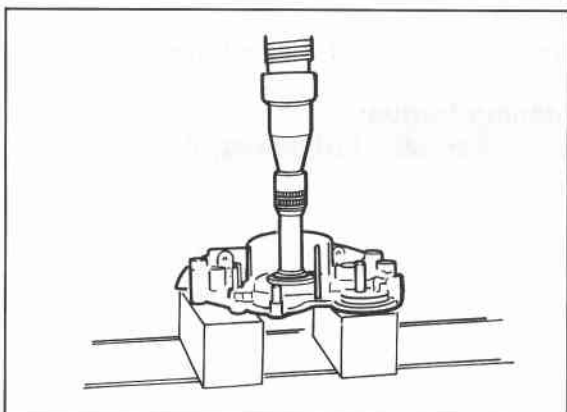
76G01C-161

**End Plate**

Install the end plate.

**Tightening torque:**

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

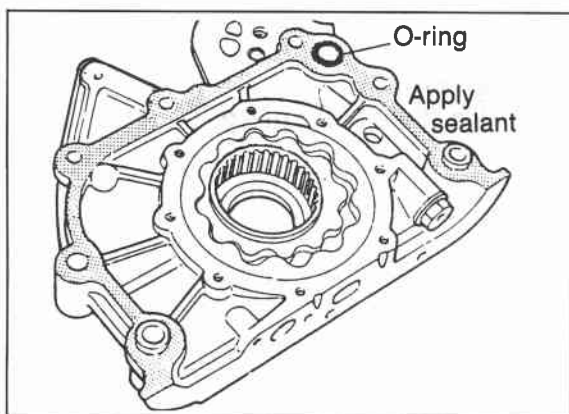


79G01C-085

**Oil Pump**

1. Apply engine oil to a new oil pump oil seal and the oil pump body.
2. Press the oil seal into the oil pump body.

# 1C ASSEMBLY (CYLINDER BLOCK)

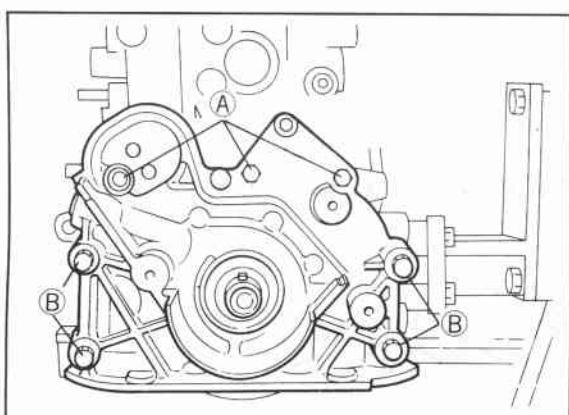


86U01X-133

3. Apply engine oil to the oil seal lip.
4. Remove any dirt or other material from the contact surfaces.
5. Apply a continuous bead of silicon sealant to the contact surface of the oil pump.

## Caution

**Do not allow any sealant to get into the oil hole.**



76G01C-162

6. Install a new O-ring into the pump body.
7. Install the oil pump.

## Tightening torque:

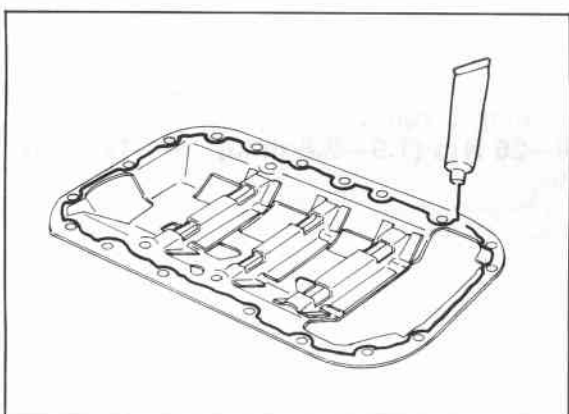
### Bolt A:

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

### Bolt B:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

8. Remove any sealant which has been squeezed out.



76G01C-163

## Stiffener (RF-CX)

1. Remove any dirt or other material from the contact surface.
2. Apply a continuous bead of silicone sealant to the stiffener along the inside of the bolt holes, and overlap the ends.
3. Install the stiffener.

## Tightening torque:

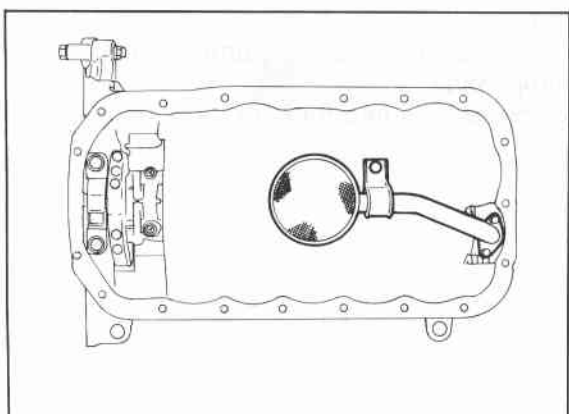
**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

## Oil Strainer

Install the oil strainer and a new gasket.

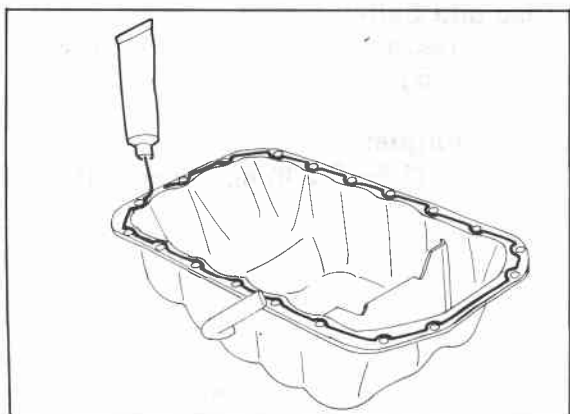
## Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



76G01C-164

## ASSEMBLY (CYLINDER BLOCK) 1C



76G01C-165

### Oil Pan

Remove any old sealant from the bolts and bolt holes. If old sealant can not be removed from the bolt, replace it.

### Without gasket

- (1) Remove any dirt or grease from the contact surfaces with a rag.
- (2) Apply continuous bead of silicon sealant to the oil pan along the inside of the bolt holes, and overlap the ends.
- (3) Install the oil pan.

### Tightening torque:

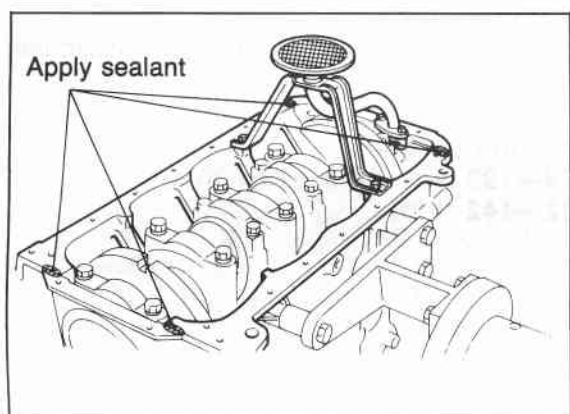
**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

### With gasket

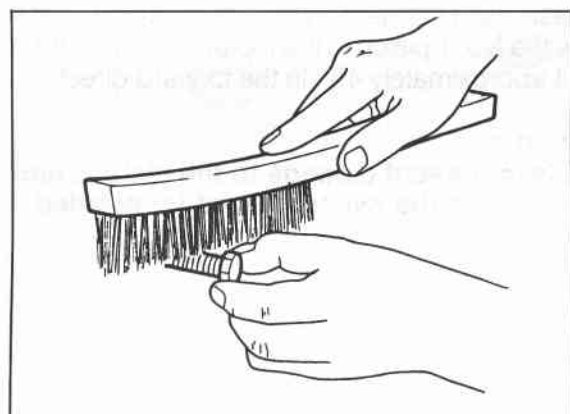
- (1) Apply sealant to the shaded areas in the figure.
- (2) Install the gasket and the oil pan.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



76G01C-166



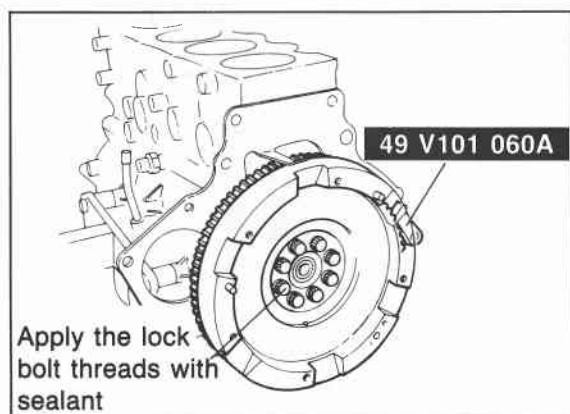
76G01C-167

### Flywheel

1. Remove any old sealant from the bolts and bolt holes. If old sealant can not be removed from the bolt, replace it.
2. Apply sealant to the bolt threads.

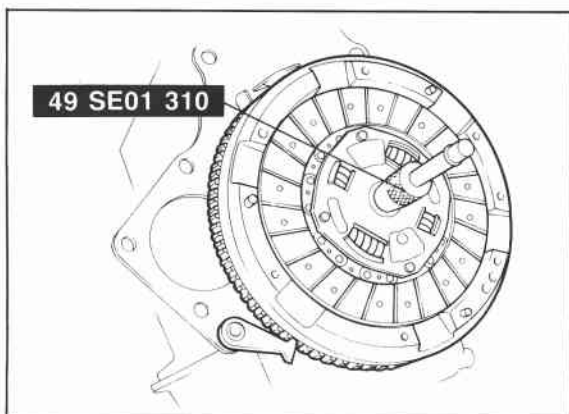
3. Install, and tighten the flywheel with the **SST**.

**Tightening torque: 176—186 N·m  
(18.0—19.0 m·kg, 130—137 ft·lb)**



76G01C-168

# 1C ASSEMBLY (CYLINDER BLOCK)



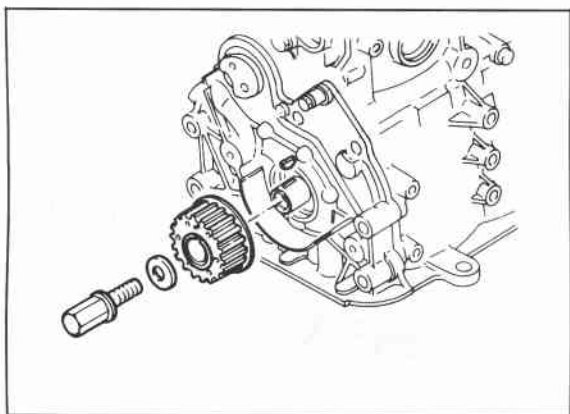
76G01C-169

## Clutch Disc and Clutch Cover

Install the clutch disc and clutch cover using the **SST**.  
(Refer to Section 6.)

### Tightening torque:

**18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)**



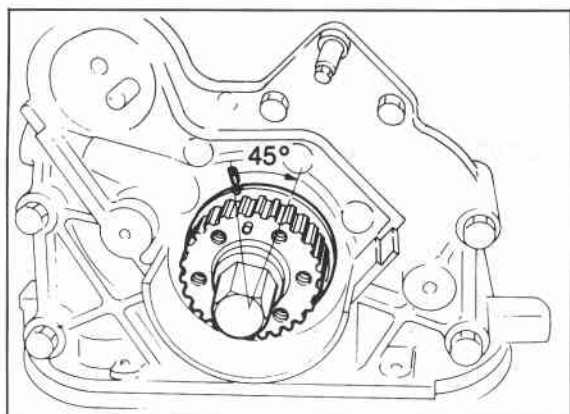
4BG01B-180

## Timing Belt Pulley

1. Install the timing belt pulley with the semicircular (woodruff) key.

### Tightening torque:

**179—193 N·m (18.3—19.7 m·kg,  
132—142 ft·lb)**



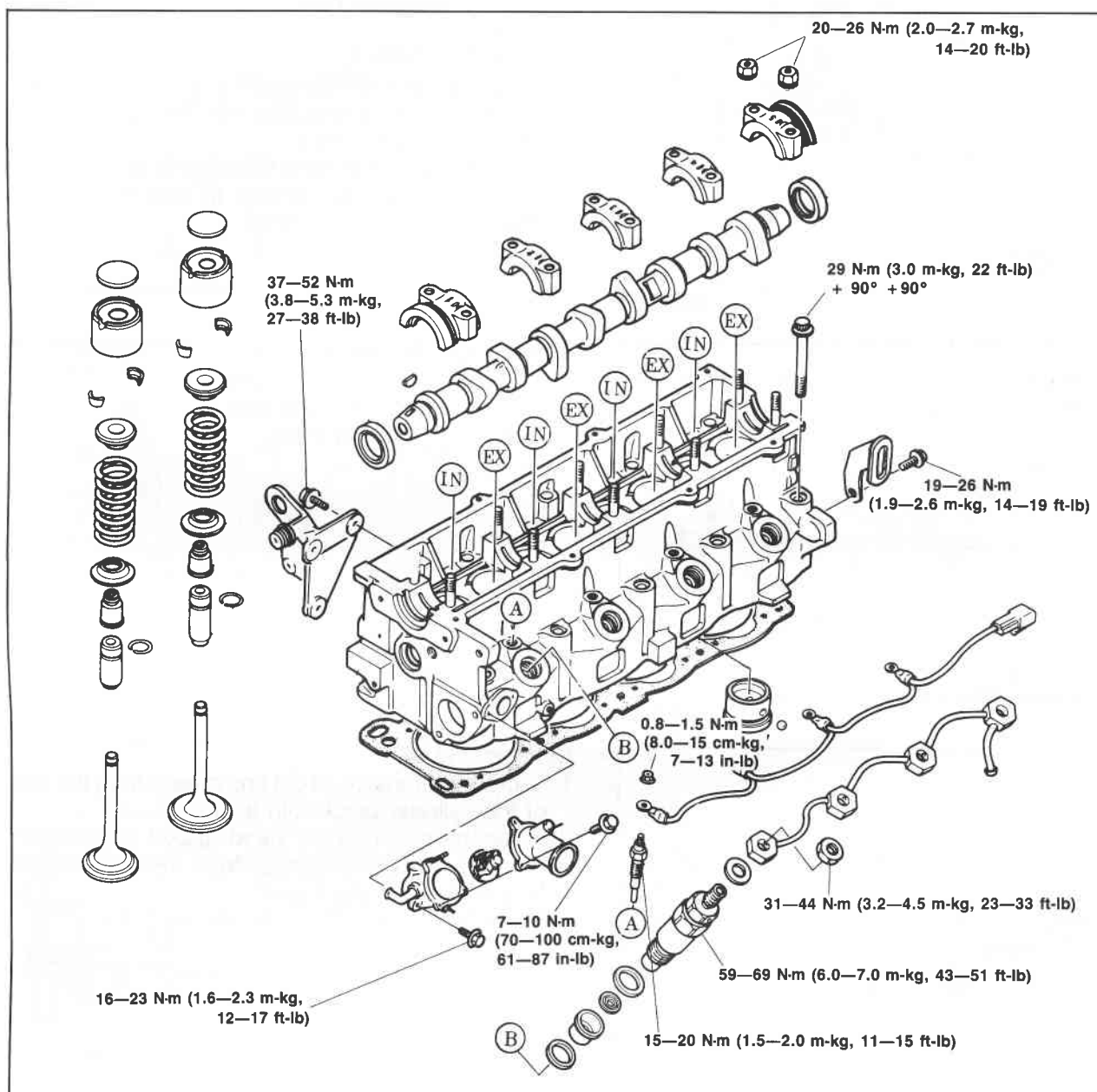
4BG01B-181

2. Release the ring gear brake, turn the flywheel, move the No. 1 piston to the top position, and then turn it approximately 45° in the forward direction.

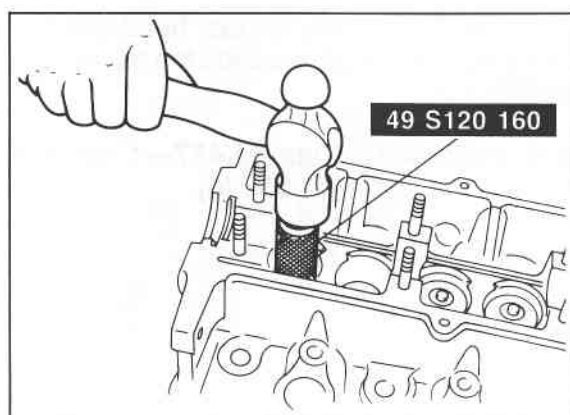
### Caution

**This is to prevent damage to the pistons and valves when the cylinder head is installed.**

## CYLINDER HEAD Torque Specifications



69G01B-152

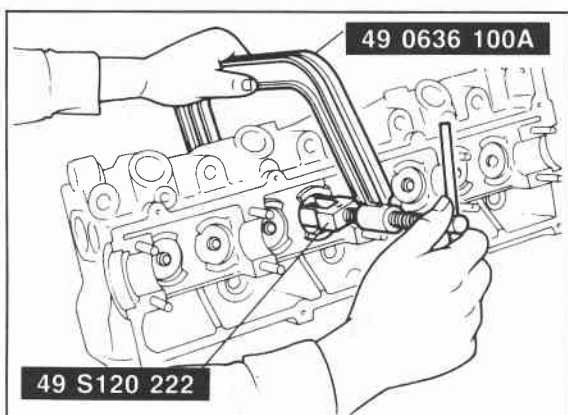


86U01X-143

### Valve Seal

1. Apply engine oil to the inside of the new valve seal.
2. Install the valve seal onto the valve guide with the SST.

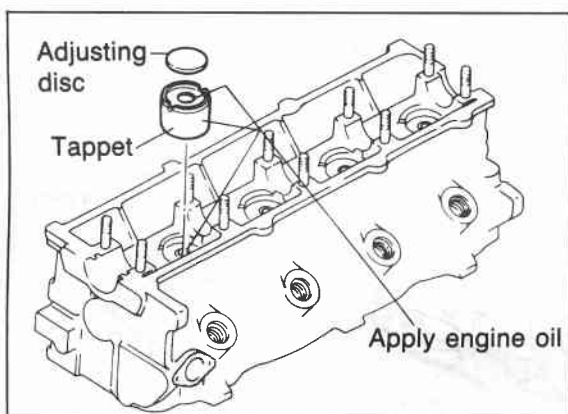
# 1C ASSEMBLY (CYLINDER HEAD)



76G01C-170

## Valve and Valve Spring

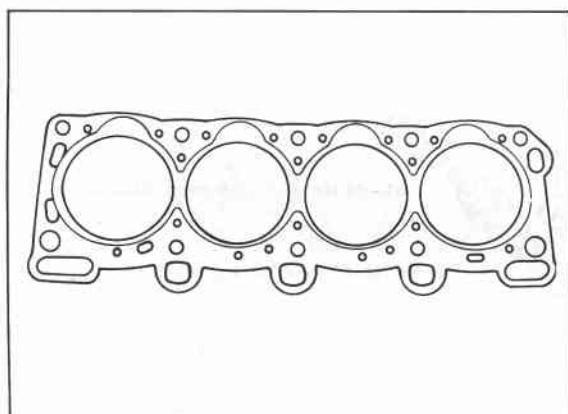
1. Install the lower spring seat.
2. Apply molybdenum disulphide grease to the valve stem.
3. Install the valve.
4. Install the valve springs and the upper spring seat.
5. Compress the valve spring with the **SST**; then install the valve keepers.
6. Tap the end of the valve stem lightly two or three times with a plastic hammer to confirm that the keepers are all fully seated.



4BG01B-150

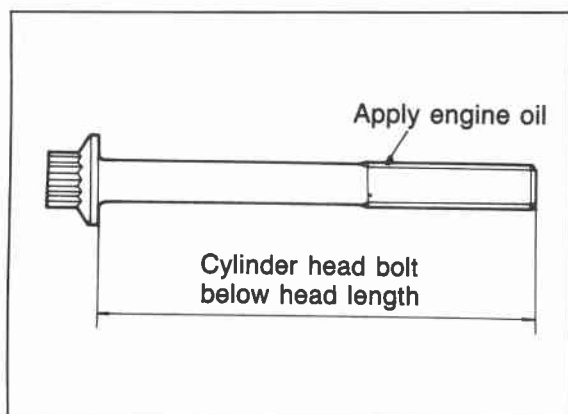
## Tappet and Adjusting Disc

1. Apply engine oil to the tappets.
2. Install the tappets in the hole.
3. Install the adjusting discs.



## Cylinder Head

1. Thoroughly remove all dirt and grease from the top of the cylinder block with a rag.
2. Place the new cylinder head gasket in position.
3. Remove any dirt or grease from the bottom surface of the cylinder head.
4. Place the cylinder head in position.

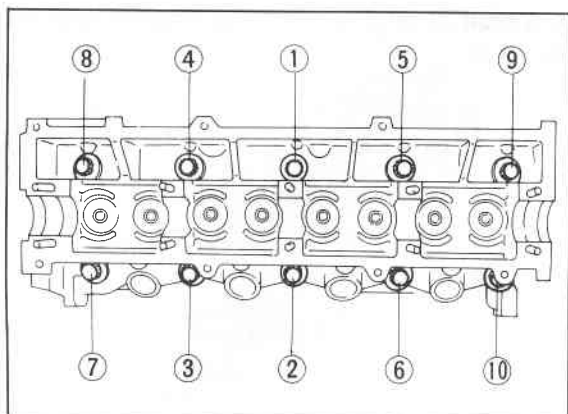


76G01C-171

5. Measure the length of the cylinder head bolt below the head. If the length exceeds the maximum, replace the bolt.

**Length: 113.2—113.8 mm (4.457—4.480 in)**  
**Maximum: 114.5 mm (4.508 in)**

## ASSEMBLY (CYLINDER HEAD) 1C



4BG01B-184

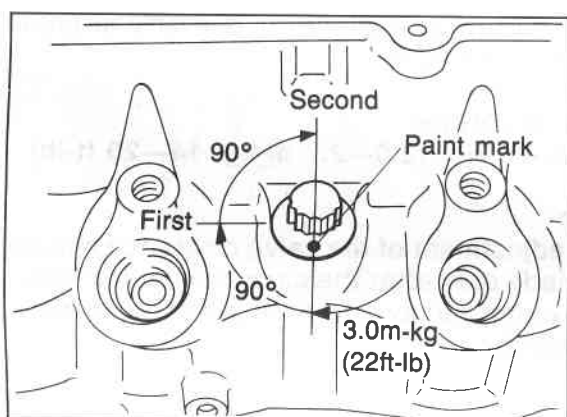
6. Apply engine oil to the cylinder head bolts.

7. Tighten the cylinder head bolts.

(1) Tighten the bolts to the specified torque, in order shown in the figure.

### Tightening torque:

**29 N·m (3.0 m·kg, 22 ft·lb)**



4BG01B-185

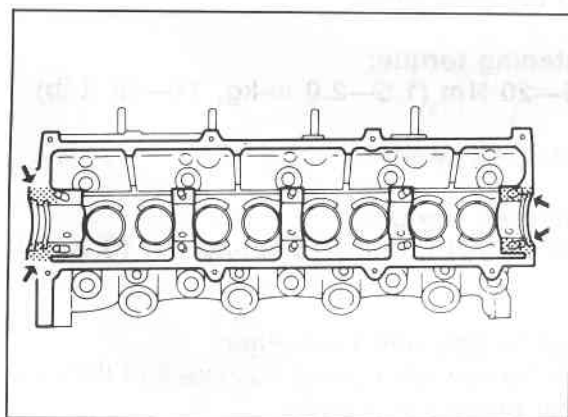
(2) Make paint marks on the bolt heads, as shown in the figure.

(3) With the paint marks as a reference point, turn the cylinder head bolts **another 90° (90°—105°)** in the tightening direction. Tighten them in the order.

(4) Then tighten them **once again 90° (90°—105°) in the tightening order.**

### Caution

**Be absolutely sure to tighten all bolts in the order.**



4BG01B-186

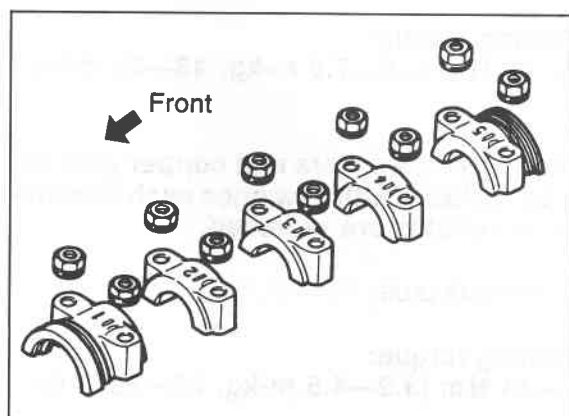
### Camshaft

1. Apply engine oil to the camshaft and journal part of the cylinder head.

2. Set the seal cap.

3. Apply a coat of sealant (1016 77 739) to the area shown in the figure.

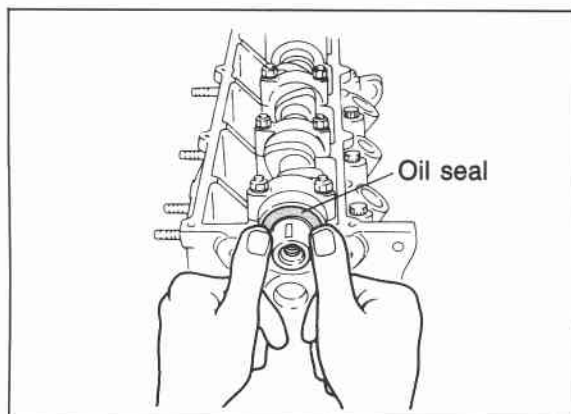
4. Install the camshaft so that the key groove faces directly upward.



76G01C-172

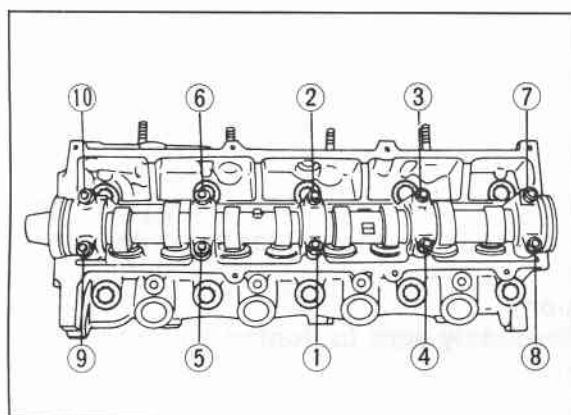
5. Install the camshaft caps according to the number and  mark, and loosely tighten the camshaft cap nuts.

# 1C ASSEMBLY (CYLINDER HEAD)



76G01C-253

6. Apply a coat of engine oil to the new oil seal lip and insert it.



76G01C-173

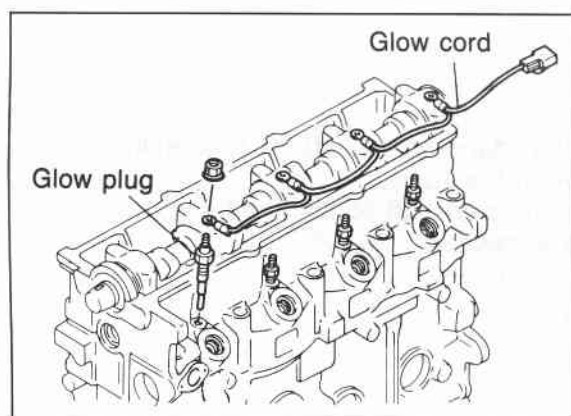
7. Tighten the camshaft cap nuts evenly in order shown in the figure.

## Tighten torque:

20—26 N·m (2.0—2.7 m·kg, 14—20 ft·lb)

## Note

The adjustment of the valve clearance should be made only after the camshaft pulley injection pump pulley and timing belt have been installed.



76G01C-174

## Glow Plug and Glow Cord

1. Install the glow plugs.

## Tightening torque:

15—20 N·m (1.5—2.0 m·kg, 11—15 ft·lb)

2. Install the glow cord.

## Tightening torque:

0.8—1.5 N·m (8.0—15 cm·kg, 7—13 in·lb)

## Injection Nozzle and Leak Pipe

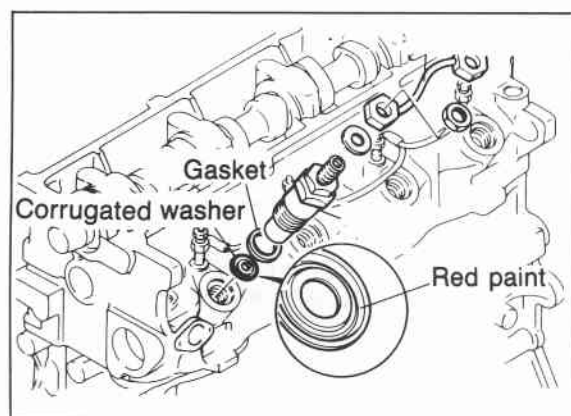
1. Install the new corrugated washers and the new copper gaskets in position.
2. Install the injection nozzles.

## Tightening torque:

59—69 N·m (6.0—7.0 m·kg, 43—51 ft·lb)

## Note

The corrugated washers and copper gaskets must be replaced with new ones each time the injection nozzles are removed.

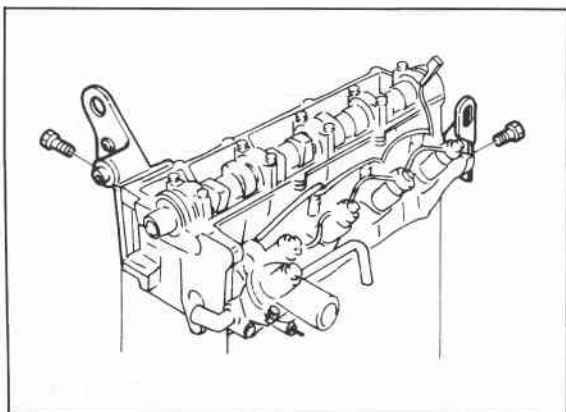


76G01C-175

3. Install the leak pipe.

## Tightening torque:

31—44 N·m (3.2—4.5 m·kg, 23—33 ft·lb)



76G01C-176

### Engine Hanger

Install the front and rear engine hanger.

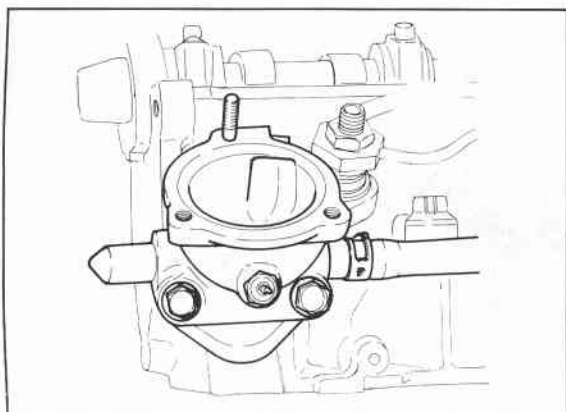
#### Tightening torque:

Front: 37—52 N·m

(3.8—5.3 m·kg, 27—38 ft·lb)

Rear : 19—26 N·m

(1.9—2.6 m·kg, 14—19 ft·lb)



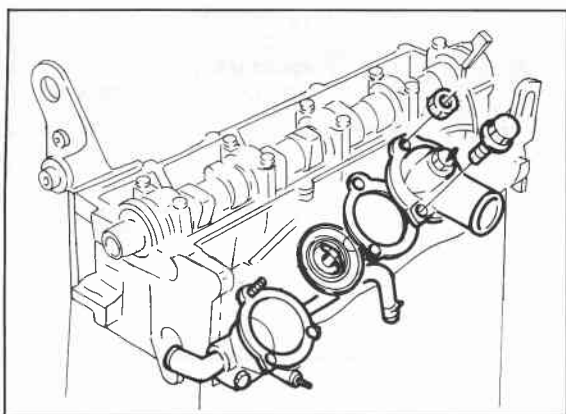
76G01C-177

### Thermostat Case

Install the thermostat case with gasket.

#### Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



76G01C-178

### Thermostat and Thermostat Cover

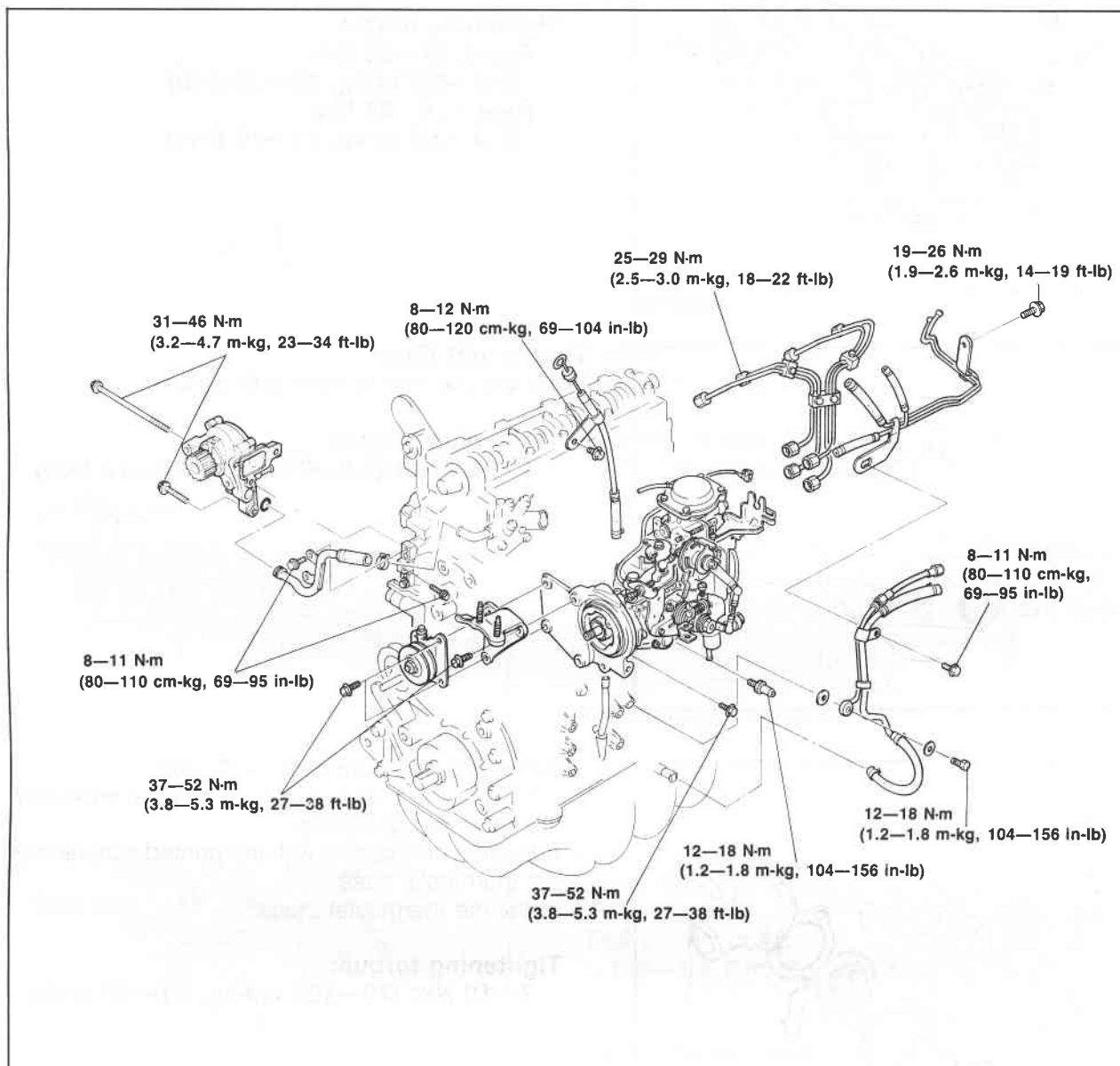
1. Install the thermostat into the thermostat case with the jiggle pin at the top.
2. Position a new gasket with the printed side facing the thermostat case.
3. Install the thermostat cover.

#### Tightening torque:

7—10 N·m (70—100 cm·kg, 61—87 in·lb)

# 1C ASSEMBLY (INJECTION PUMP)

## INJECTION PUMP Torque Specifications



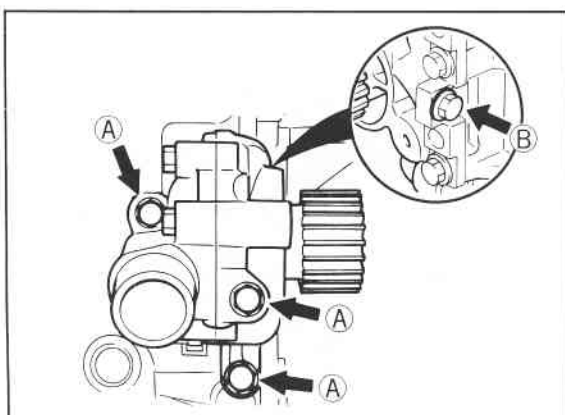
76G01C-179

### Water Pump

1. Remove the dirt or old gasket from the water pump mounting surface.
2. Install the water pump and new gasket so that the printed side of the gasket faces the water pump.

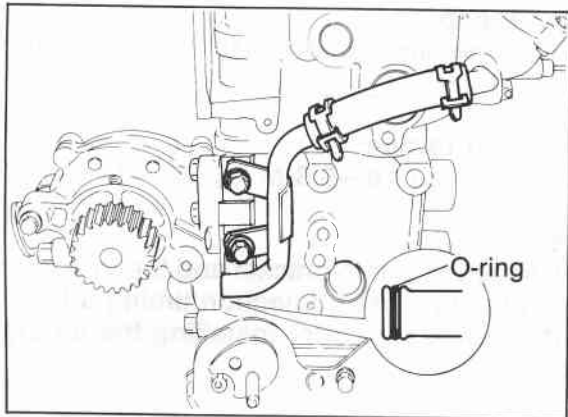
### Tightening torque:

- Bolt A:** 31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)
- Bolt B:** 8—11 N·m (80—110 cm·kg, 69—95 in·lb)



76G01C-180

## ASSEMBLY (INJECTION PUMP) 1C



76G01C-181

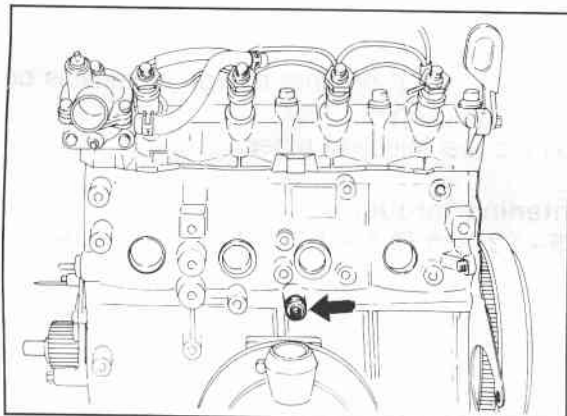
### Water Pipe

1. Apply a coat of vegetable oil to the O-ring.
2. Install the water pipe.

### Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

3. Connect the water hose.



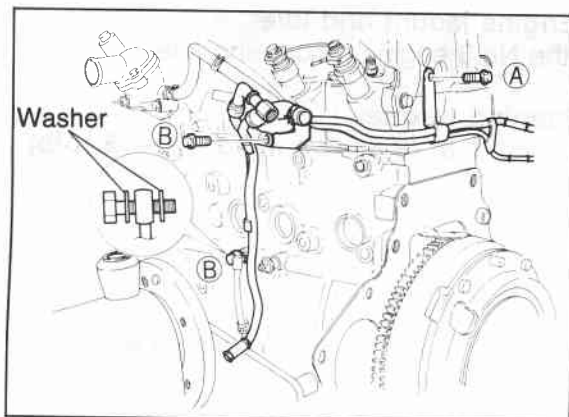
76G01C-182

### Oil Pressure Switch

Install the oil pressure switch.

### Tightening torque: 12—18 N·m

(1.2—1.8 m·kg, 104—156 in·lb)



76G01C-183

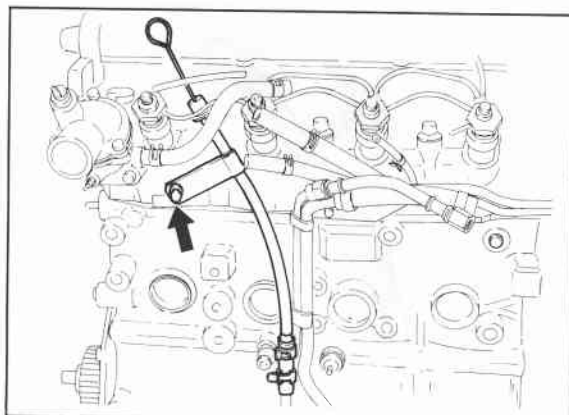
### Fuel Feed Pipe and Oil Pipe

1. Install the fuel feed pipe and tighten bolt (A).

### Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

2. Install the oil pipe and loosely tighten the bolts (B).



76G01C-184

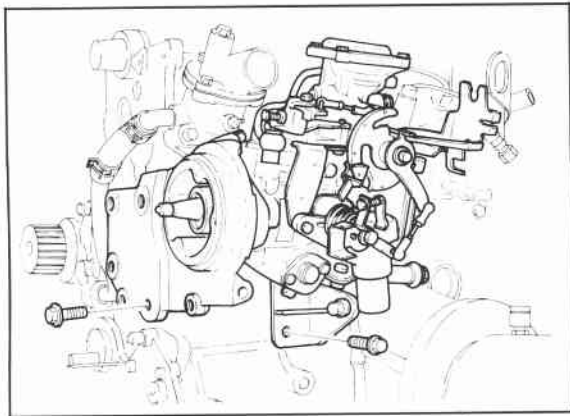
### Oil Level Gauge

Install the oil level gauge and stay.

### Tightening torque:

8—12 N·m (80—120 cm·kg, 69—104 in·lb)

# 1C ASSEMBLY (INJECTION PUMP)



76G01C-185

## Injection Pump

1. Install the injection pump with the injection pump bracket.

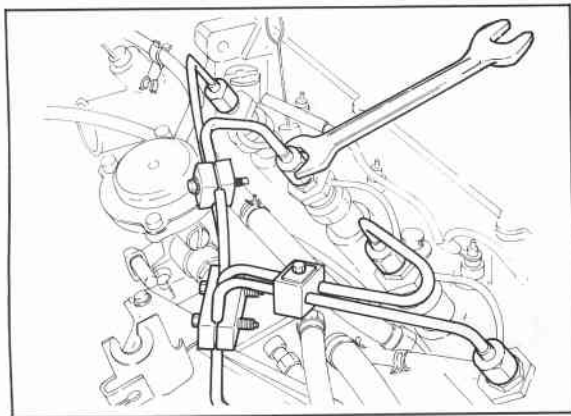
### Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

### Note

If the injection pump bracket and the injection pump are separated, injection timing adjustment is necessary after installing the timing belt.

2. Connect the CSD water hose and fuel hoses.



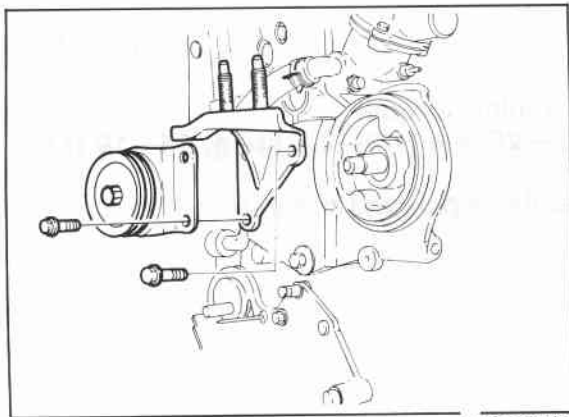
76G01C-186

## Injection Pipe

1. Check that no dirt or other foreign material is on the pipe coupling.
2. Install the fuel injection pipes.

### Tightening torque:

25—29 N·m (2.5—3.0 m·kg, 18—22 ft·lb)



76G01C-187

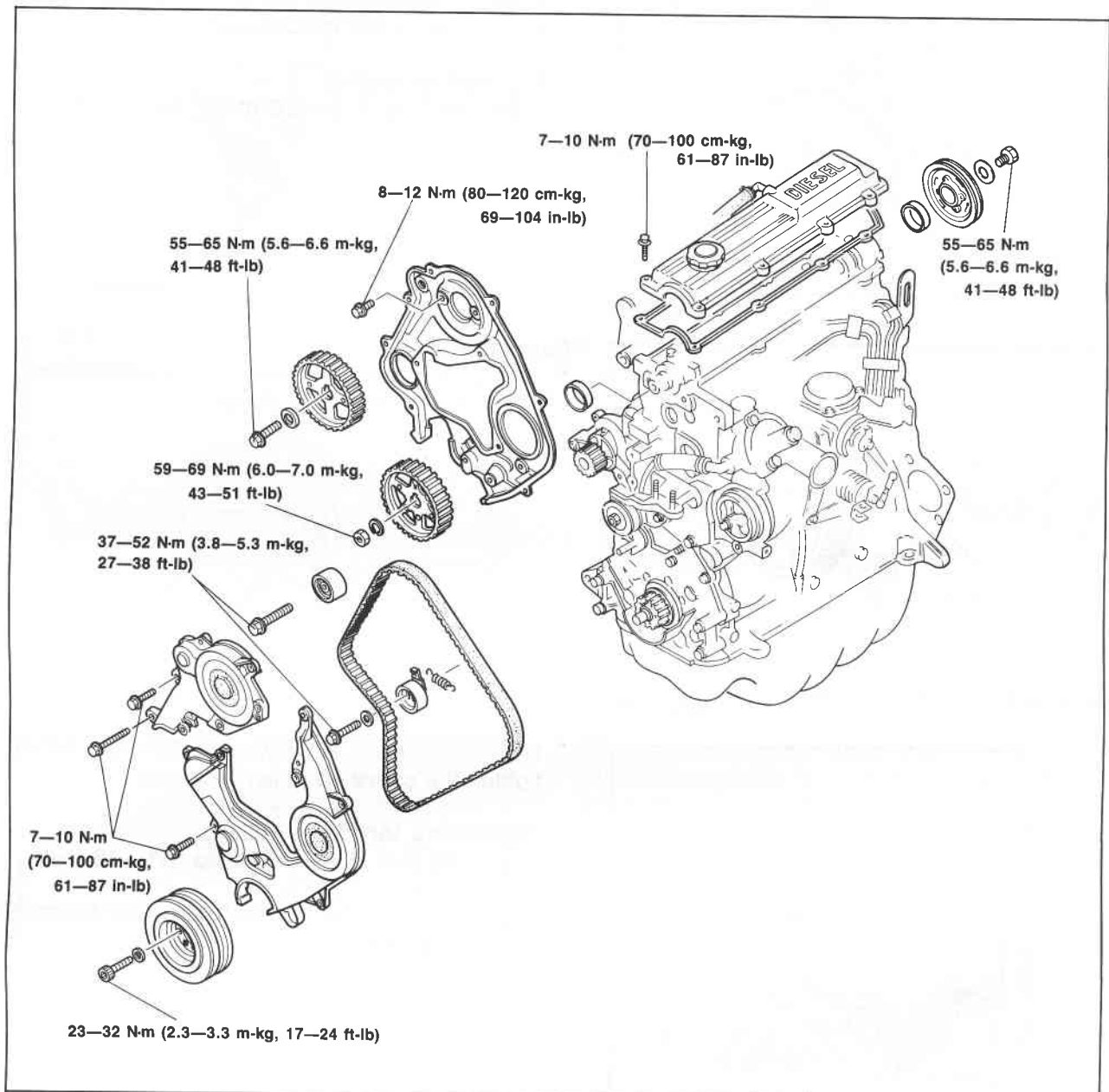
## No.3 Engine Mount and Idler

Install the No.3 engine mount and idler.

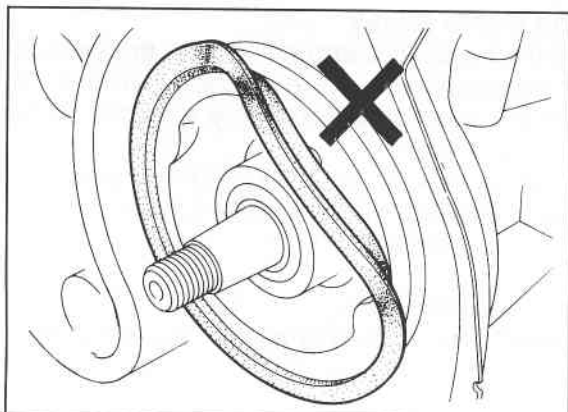
### Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

## TIMING BELT Torque Specifications



69G01B-160



76G01C-188

### Seal Plate

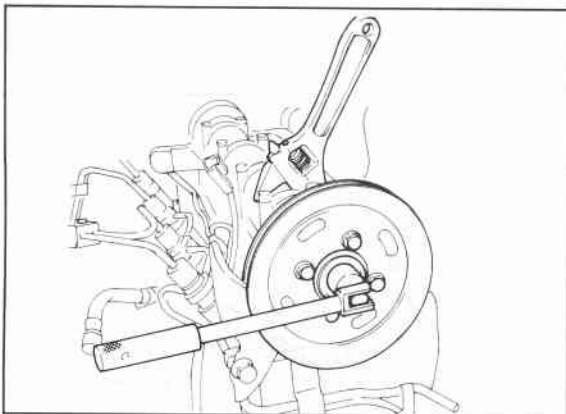
1. Install the seal plate.

### Tightening torque:

**8—12 N-m (0.8—1.2 m·kg, 69—104 in·lb)**

2. Check that the seal plate sealing rubbers are installed in position.

# 1C ASSEMBLY (TIMING BELT)



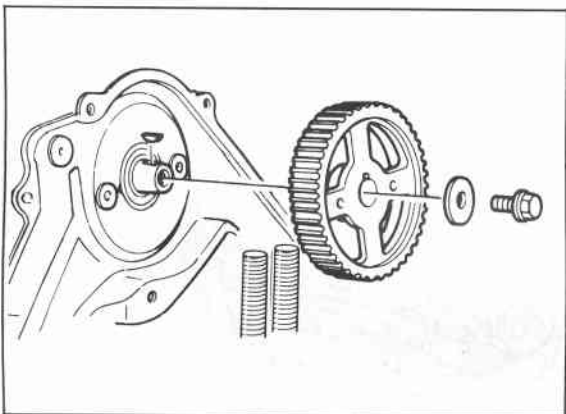
76G01C-189

## Rear Camshaft Pulley

1. Install the rear camshaft pulley.
2. Hold the camshaft with a wrench (29 mm, 1.14 in) and tighten to the specification.

### Tightening torque:

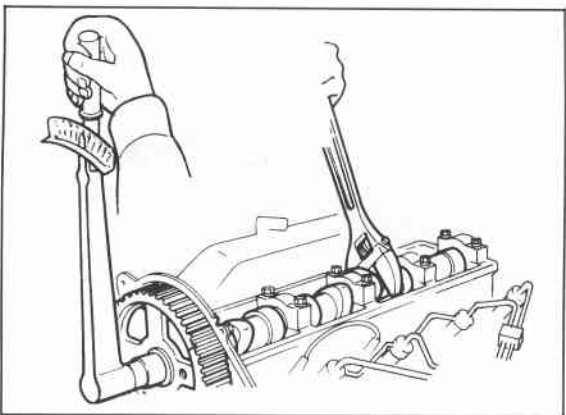
**55—65 N·m (5.6—6.6 m·kg, 41—48 ft·lb)**



4BG01B-200

## Camshaft Pulley

1. Connect the camshaft pulley onto the camshaft with the semicircular (woodruff) key.



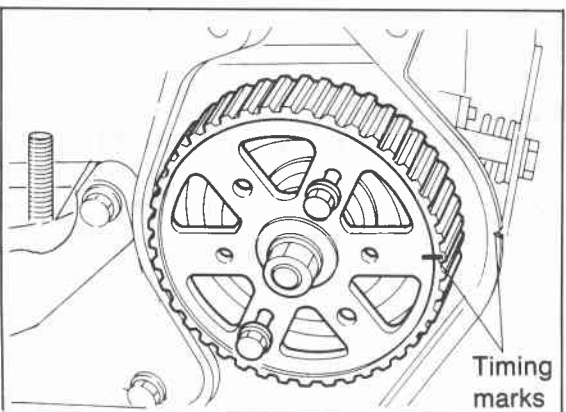
76G01C-190

2. Hold the camshaft with a wrench (29 mm, 1.14 in), tighten the camshaft pulley lock bolt.

### Tightening torque:

**55—65 N·m (5.6—6.6 m·kg, 41—48 ft·lb)**

3. Align the mark on the camshaft pulley with the mark on the seal plate.



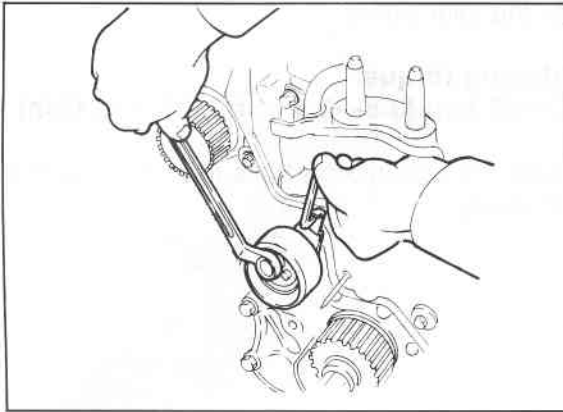
76G01C-254

## Injection Pump Pulley

1. Install the injection pump pulley with the semicircular (woodruff) key to the injection pump shaft.
2. Rotate the injection pump pulley until the timing marks are aligned.
3. Affix the injection pump pulley to the bracket using two bolts (35—40 mm, 1.4—1.6 in).
4. Tighten the lock nut.

### Tightening torque:

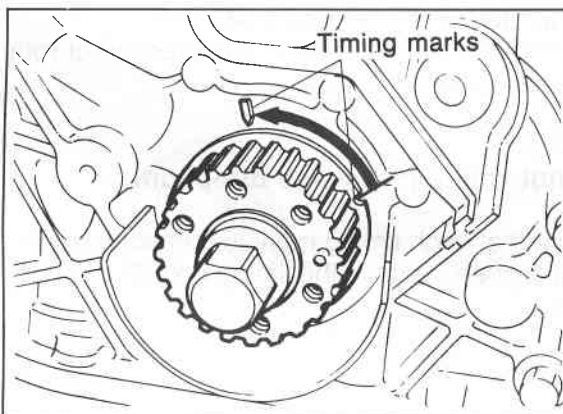
**59—69 N·m (6.0—7.0 m·kg, 43—51 ft·lb)**



63G01D-431

## Timing Belt Tensioner

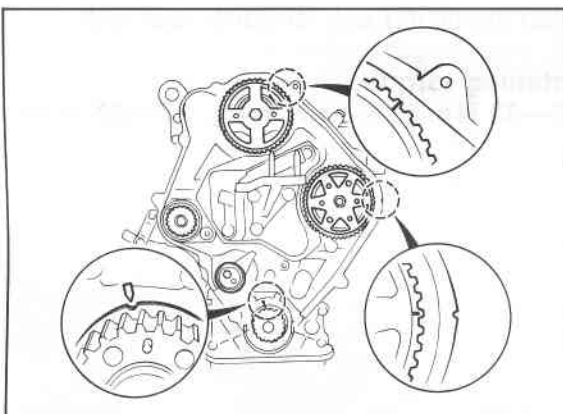
1. Install the tensioner spring onto the tensioner.
2. Install the tensioner assembly.
3. Temporarily secure it so the tensioner is shifted outward.



76G01C-191

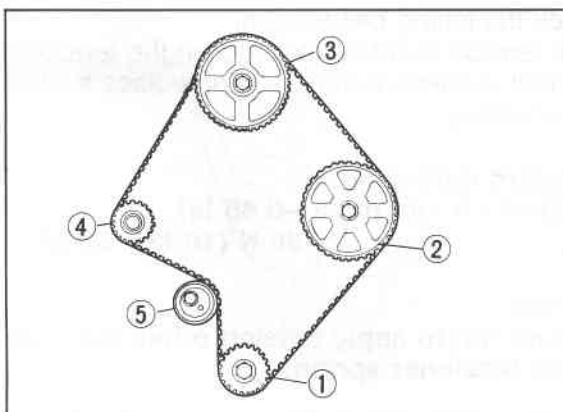
## Timing Belt

1. Return the crankshaft about 45° to the timing mark on the oil pump housing.



76G01C-192

2. Check that the timing marks of the camshaft pulley and the injection pump pulley align with the timing marks on the seal plate.



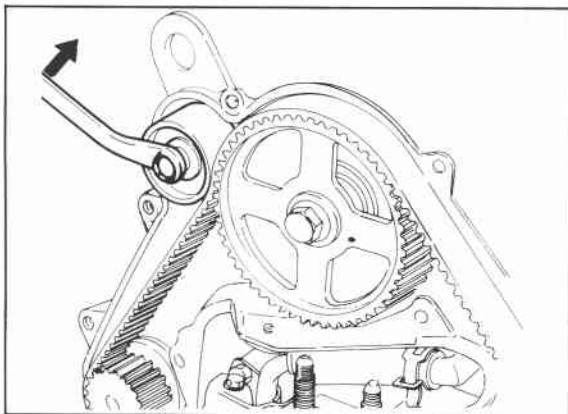
76G01C-193

3. Install the timing belt in the sequence shown in the figure.

## Caution

**The timing belt must be reinstalled in the same direction of rotation for continued durability.**

# 1C ASSEMBLY (TIMING BELT)



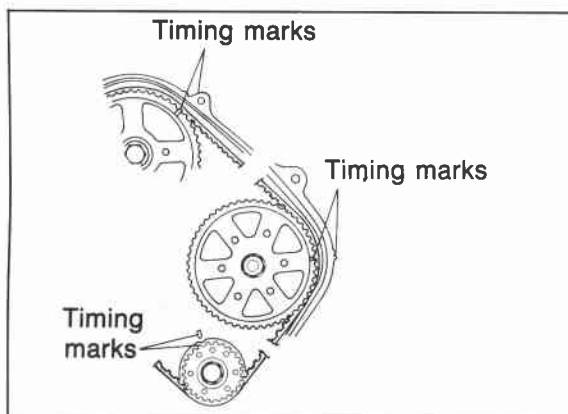
76G01C-194

4. Install the idler pulley.

**Tightening torque:**

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

5. Remove the two affixing bolts from the injection pump pulley.



76G01C-195

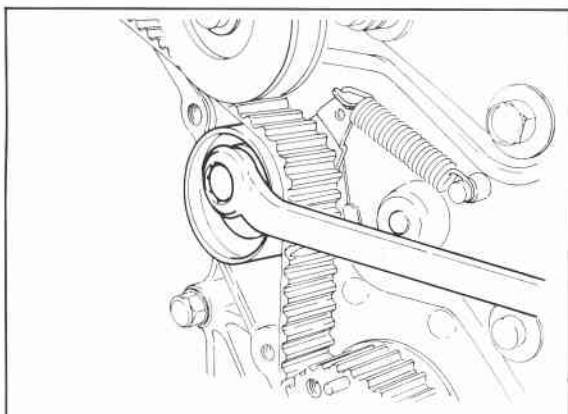
6. Loosen the tensioner lock bolt.

7. Turn the crankshaft twice in the direction of rotation (clockwise).

**Caution**

**Do not rotate in reverse direction.**

8. Check that each timing mark is correctly aligned. If not aligned, remove the timing belt. Repeat step 2—9.

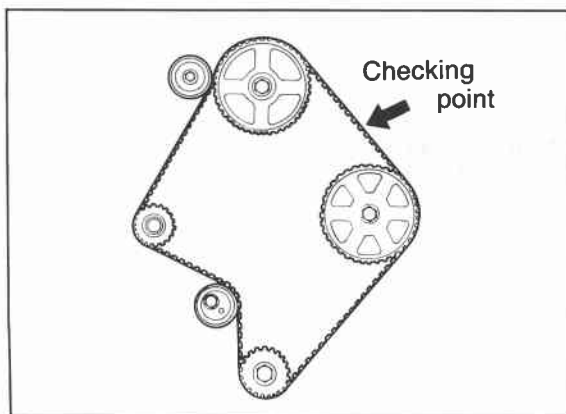


76G01C-196

9. Tighten the timing belt tensioner lock bolt.

**Tightening torque:**

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**



76G01C-197

10. Check the timing belt tension.

If the tension is not correct, loosen the tensioner lock bolt and repeat step 6—9, or replace the tensioner spring.

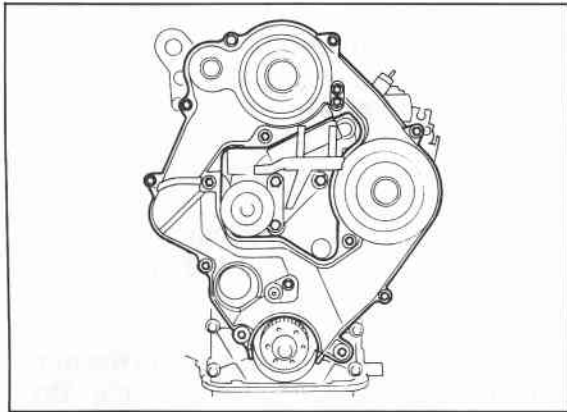
**Standard deflection:**

**9.0—11.5 mm (0.35—0.45 in)**

**/98 N (10 kg, 22 lb)**

**Caution**

**Be sure not to apply tension other than that of the tensioner spring.**



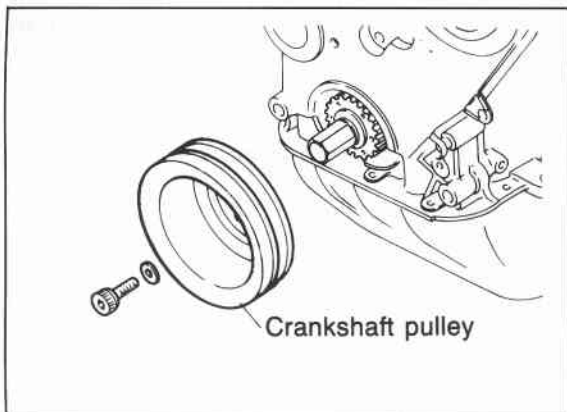
76G01C-198

## Timing Belt Cover

Install the left and right timing belt covers.

### Tightening torque:

**7—10 N·m (70—100 cm·kg, 61—87 in·lb)**



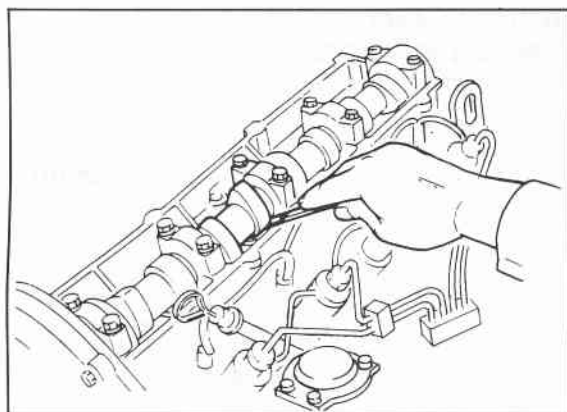
4BG01B-210

## Crankshaft Pulley

Install the crankshaft pulley.

### Tightening torque:

**23—32 N·m (2.3—3.3 m·kg, 17—24 ft·lb)**



76G01C-199

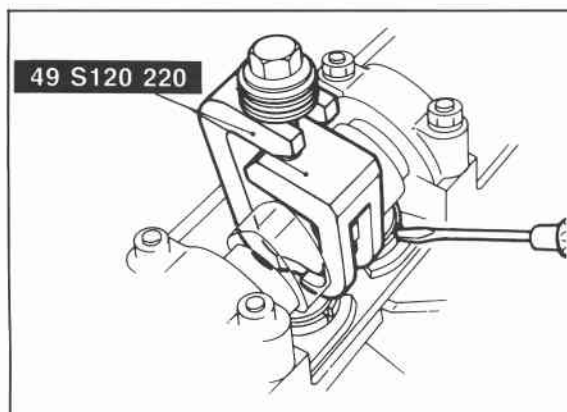
## Valve Clearance

1. Set the No.1 cylinder to compression TDC.
2. Measure the valve clearance at No.1, No.2 (intake), and No.1, No.3 (exhaust).

### Clearance (cold engine)

**IN : 0.20—0.30 mm (0.008—0.012 in)**

**EX: 0.30—0.40 mm (0.012—0.016 in)**

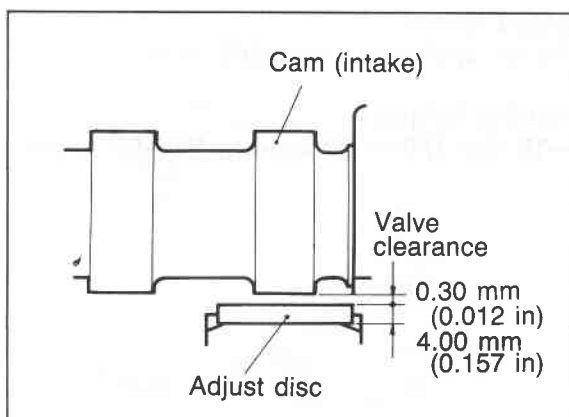


76G01C-200

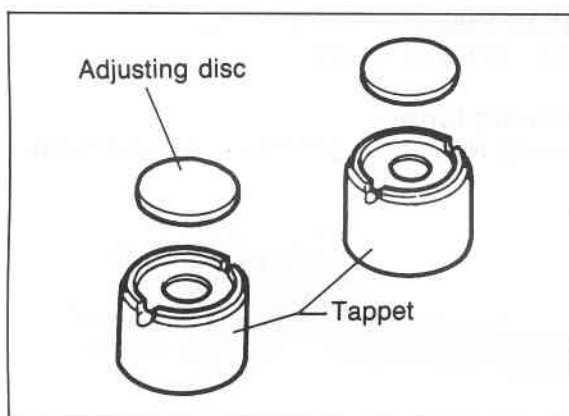
3. If the valve clearance is not within the specification, adjust the valve clearance.

- (1) Face the intake cam lobe straight upward.
- (2) Move the tappet so that its notch is at the manifold side.
- (3) Press the tappet down until the adjusting disc is accessible with the **SST**.
- (4) Take out the adjusting disc.

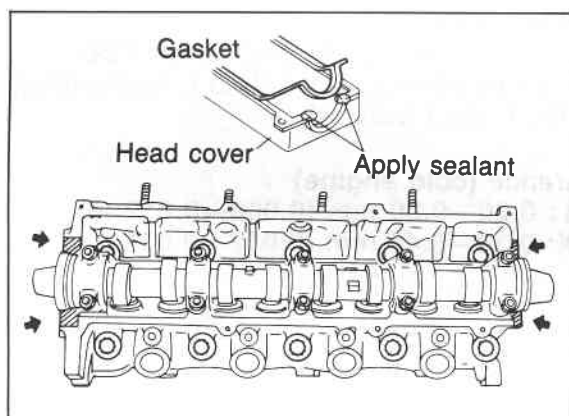
# 1C ASSEMBLY (TIMING BELT)



76G01C-201



76G01C-202



76G01C-203

- (5) Select an appropriate disc depending on the valve clearance measured. And install it.

## Example (intake valve):

Thickness of original adjusting disc + (measured clearance — standard clearance) = **thickness of new adjusting disc.**

$$4.00 + (0.30 - 0.25) = 4.05 \text{ mm}$$

$$0.157 + (0.012 - 0.010) = 0.159 \text{ in}$$

## Note

- a) The disc thickness is indicated by the number marked on the disc. For example, 3825 means 3.825 mm (0.1056 in).
- b) Adjusting discs are available in 25 different thicknesses within the 3.40—4.60 mm (0.134—0.181 in) range, at intervals of 0.05 mm (0.002 in).

- (6) Inspect the clearance again.

4. Set the No.4 cylinder to compression TDC.
5. Measure and adjust the valve clearance at No.3, No.4 (intake), and No.2, No.4 (exhaust) in the same way.

## Cylinder Head Cover

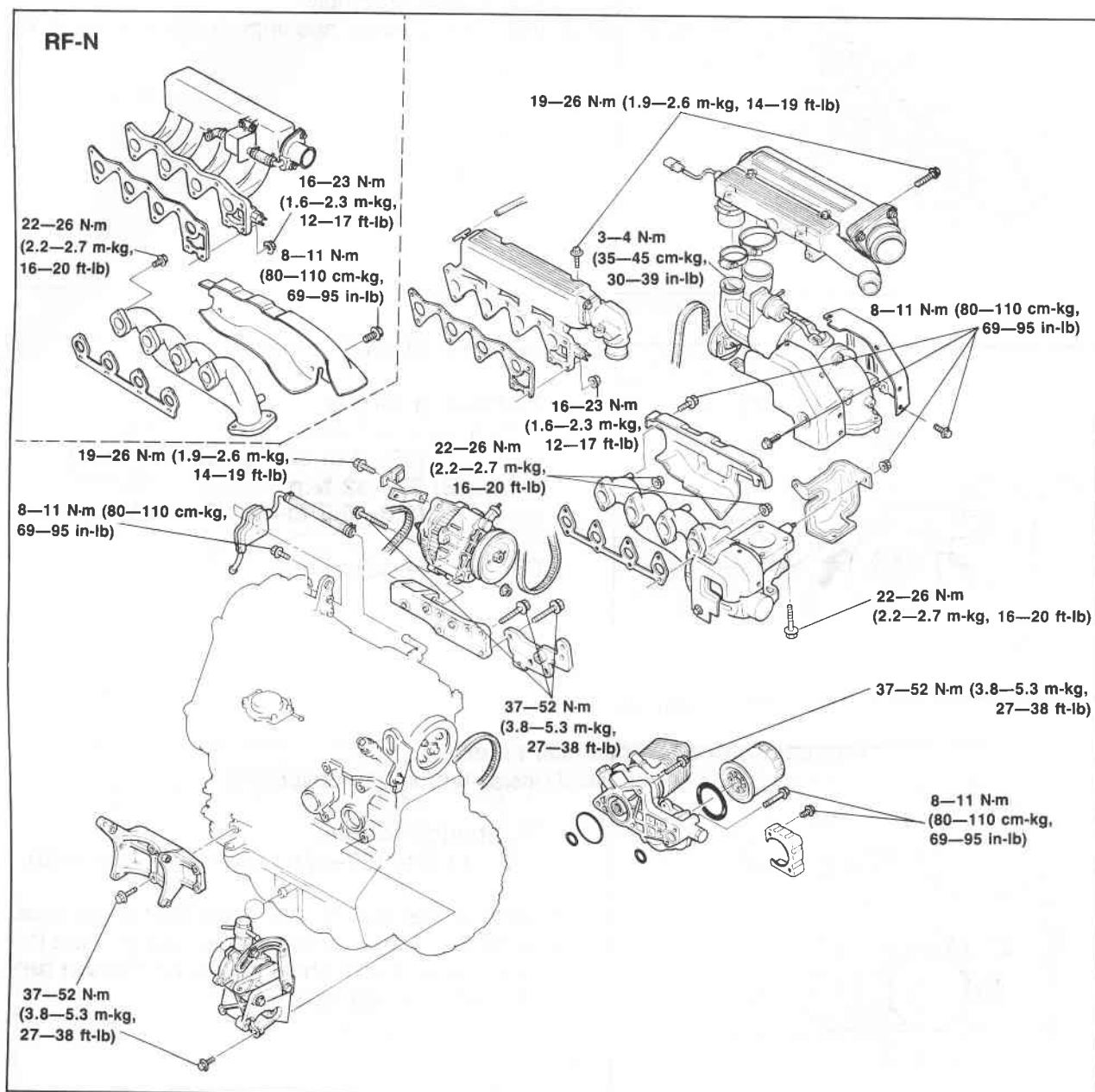
1. Apply sealant to the shaded areas.
2. Install the cylinder head cover.

## Tightening torque:

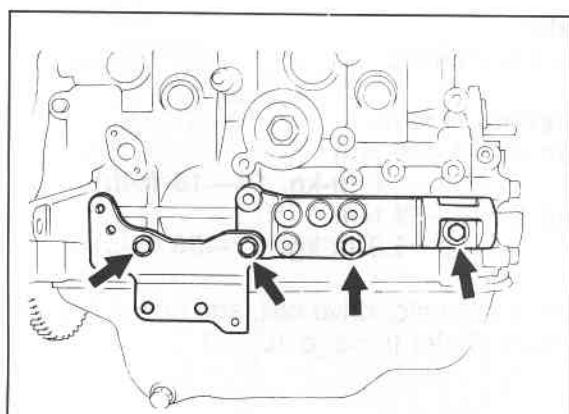
**7—10 N·m (70—100 cm·kg, 61—89 in·lb)**

3. Install the PVC hose.

## AUXILIARY PARTS Torque Specifications



86U01X-164

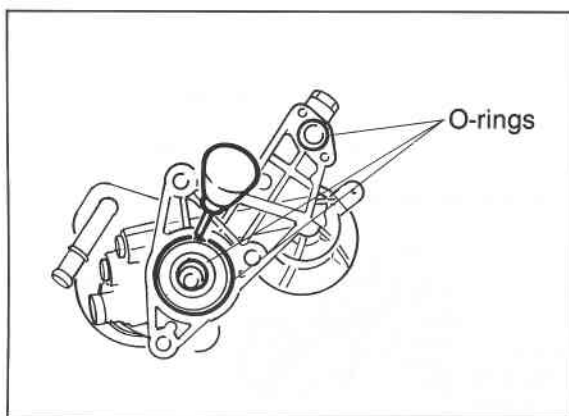


76G01C-205

**Alternator Bracket and Exhaust Pipe Bracket**  
Install the alternator bracket and exhaust pipe stay.

**Tightening torque:**  
37—52 N-m (3.8—5.3 m·kg, 27—38 ft·lb)

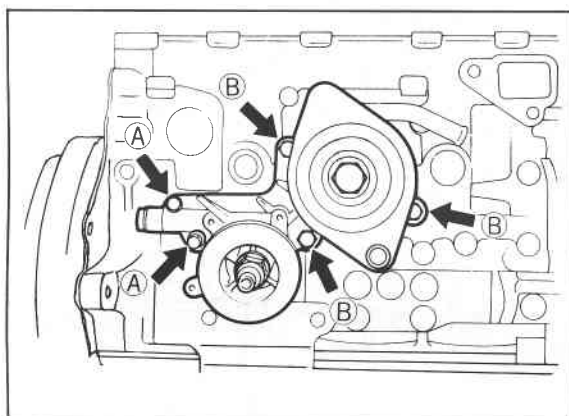
## 1C ASSEMBLY (AUXILIARY PARTS)



76G01C-205

### Oil Cooler Assembly

1. Clean the contact surfaces of the cylinder block and oil filter assembly.
2. Install new O-rings, and apply a coat of engine oil.



76G01C-206

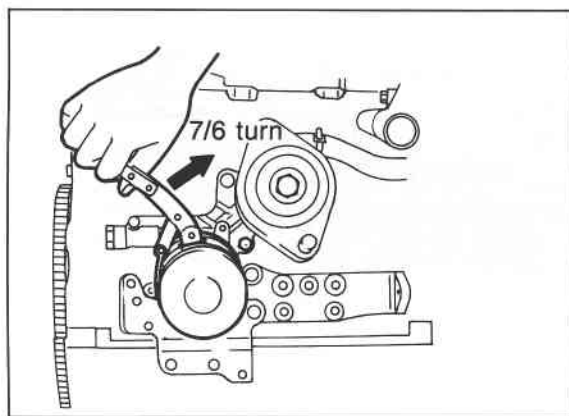
3. Install the oil cooler assembly.

### Tightening torque:

**Bolt A:** 8—11 N·m  
(80—110 cm·kg, 69—95 in·lb)

**Bolt B:** 37—52 N·m  
(3.8—5.3 m·kg, 27—38 ft·lb)

4. Connect the water hose.



76G01C-207

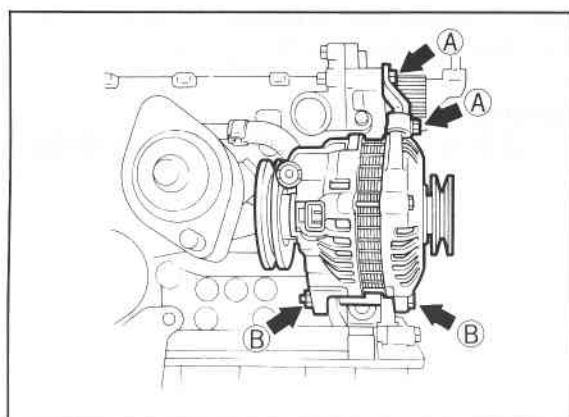
### Oil Filter

1. Install the oil filter cover.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

2. Apply a coat of engine oil to the filter rubber seal.
3. Install the oil filter until the rubber seal contacts the oil cooler by hand. Then tighten it a **7/6 turn further** with a band type wrench.



76G01C-208

### Alternator

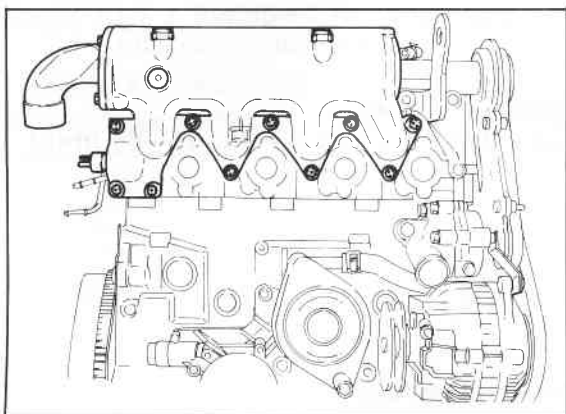
1. Install the alternator.

### Tightening torque:

**Bolt A:** 19—26 N·m  
(1.9—2.6 m·kg, 14—19 ft·lb)

**Bolt B:** 37—52 N·m  
(3.8—5.3 m·kg, 27—38 ft·lb)

2. Install the alternator drive belt, and adjust the belt deflection. (Refer to page 1C—7)



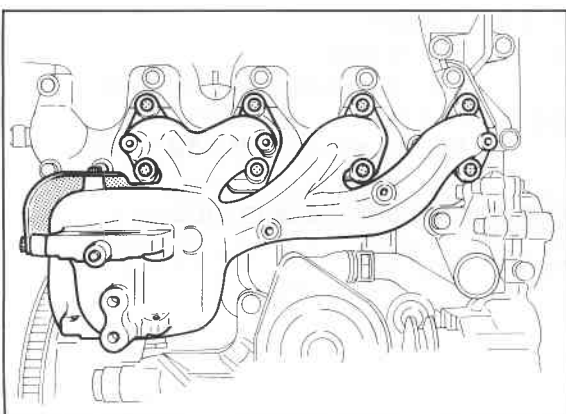
76G01C-209

### Intake Manifold

Install the intake manifold and gasket.

#### Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



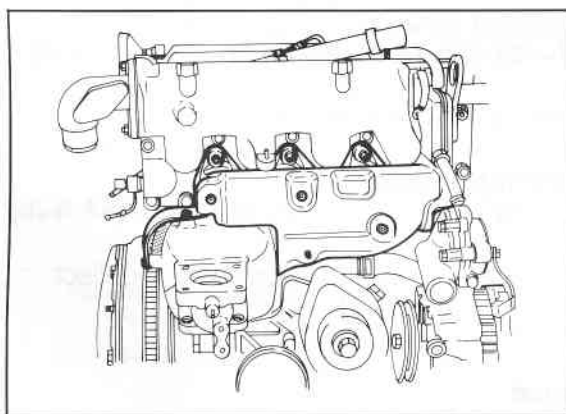
76G01C-210

### Exhaust Manifold

1. Place the exhaust manifold gasket in position.
2. Install the exhaust manifold.

#### Tightening torque:

22—26 N·m (2.2—2.7 m·kg, 16—20 ft·lb)



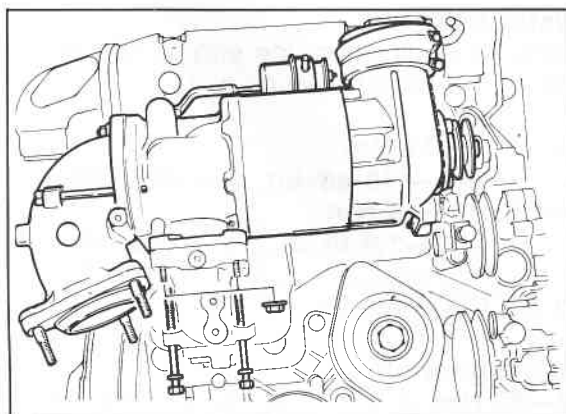
76G01C-211

### Exhaust Manifold Insulator

Install the exhaust manifold insulator.

#### Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



76G01C-212

### Compres Supercharger

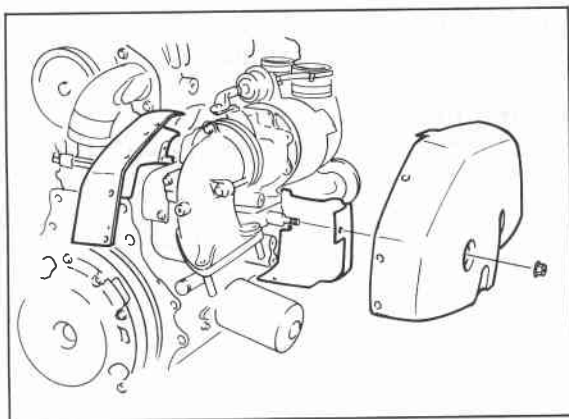
1. Install the Compres supercharger with new gasket.

#### Tightening torque:

22—26 N·m (2.2—2.7 m·kg, 16—20 ft·lb)

2. Install the Compres supercharger drive belt, and adjust the belt deflection. (Refer to page 1C—7)

# 1C ASSEMBLY (AUXILIARY PARTS)



76G01C-213

## Comprex Supercharger Insulator

Install the comprex supercharger insulator.

### Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

## Air Funnel Assembly

1. Install the air funnel assembly.

### Tightening torque:

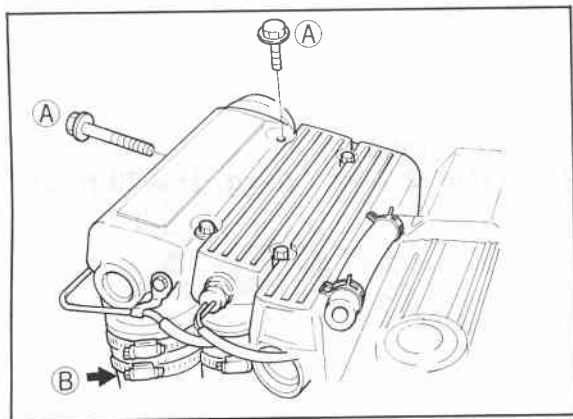
Bolt A: 19—26 N·m

(1.9—2.6 m·kg, 14—19 ft·lb)

Bolt B: 3—4 N·m

(35—45 cm·kg, 30—39 ft·lb)

2. Connect the actuator vacuum tube.



76G01C-214

## Vacuum Pump

1. Install the vacuum pump with bracket.

### Tightening torque:

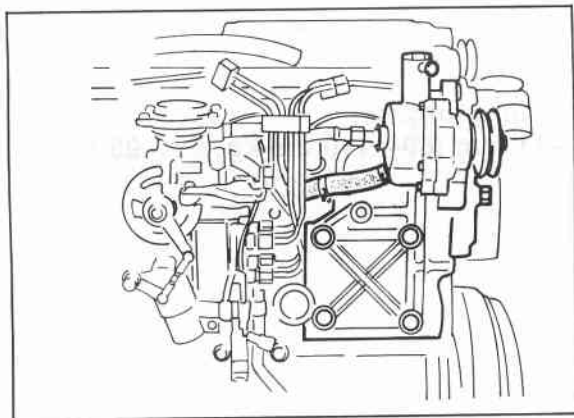
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

2. Connect the oil pipe and hose.

### Tightening torque:

12—18 N·m (1.2—1.8 m·kg, 104—156 ft·lb)

3. Install the drive belt, and adjust the belt deflection.  
(Refer to page 1C—7)



76G01C-215

## PCV Hose

Install the PCV hose.

## CSD Water Hose

1. Remove the engine from the engine hanger.  
2. Tighten the oil pipe mounting bolts.

Bolt A: 8—11 N·m

(80—110 cm·kg, 69—95 in·lb)

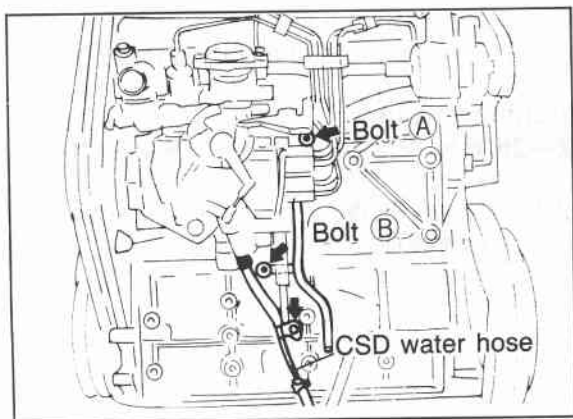
Bolt B: 12—18 N·m

(1.2—1.8 m·kg, 104—156 ft·lb)

3. Install the CSD water hose.

### Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

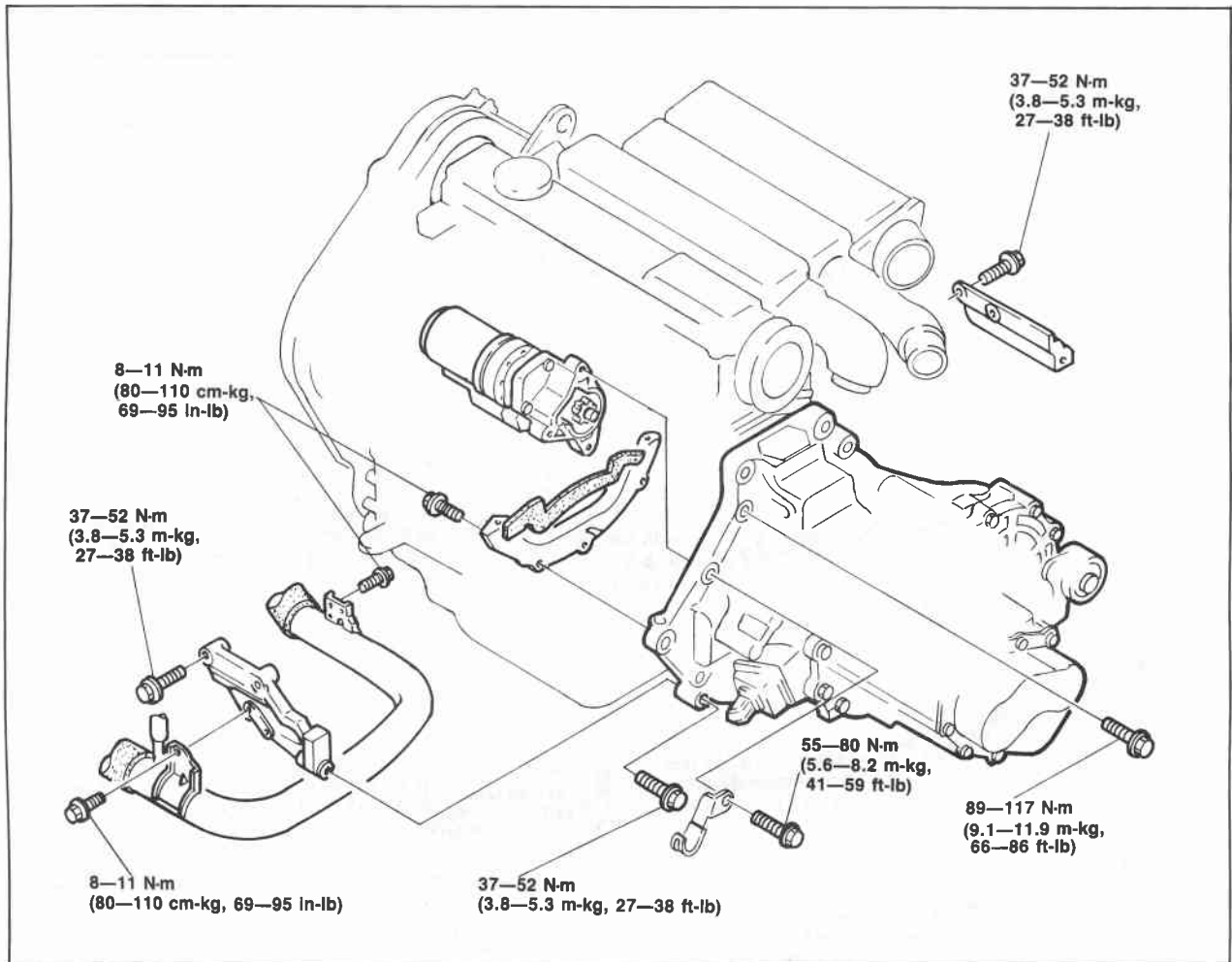


76G01C-216

## INSTALLATION

### TRANSAXLE ASSEMBLY

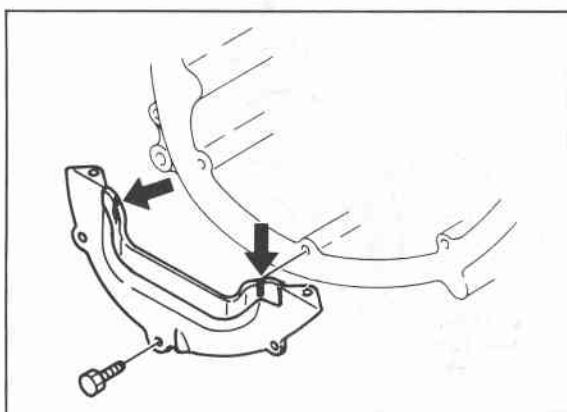
Assemble the transaxle to the engine in the sequence shown in the figure referring to the installation note.



76G01C-217

1. Transaxle
2. Clutch under cover
3. Gusset plate

4. Water pipe
5. Starter



86U01X-217

### Installation Note Clutch under cover

Before installation, fill the notches with silicon as shown in the figure.

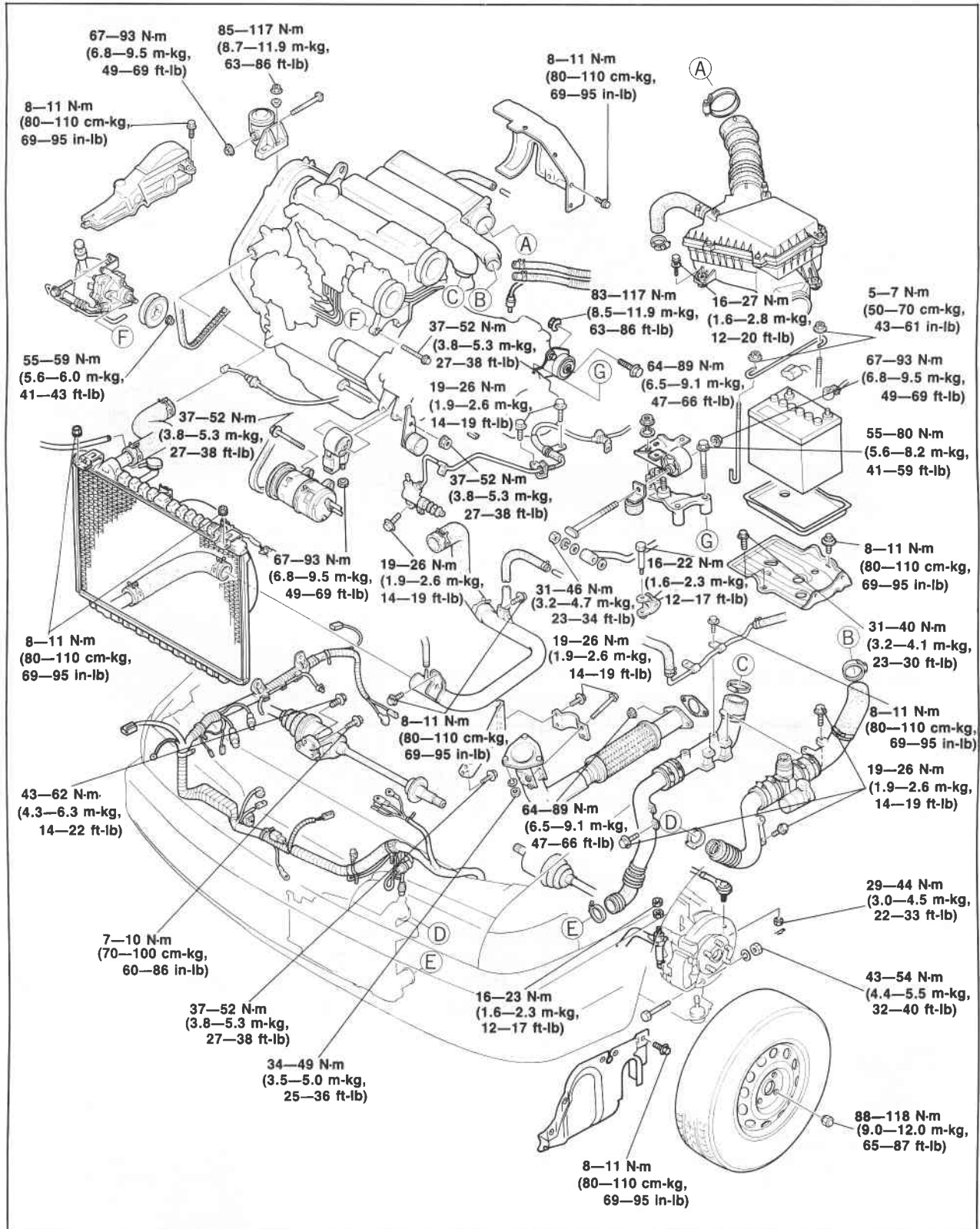
# 1C INSTALLATION

## ENGINE INSTALLATION

Install the engine and transaxle assembly.

**Warning: Be sure the vehicle is securely supported.**

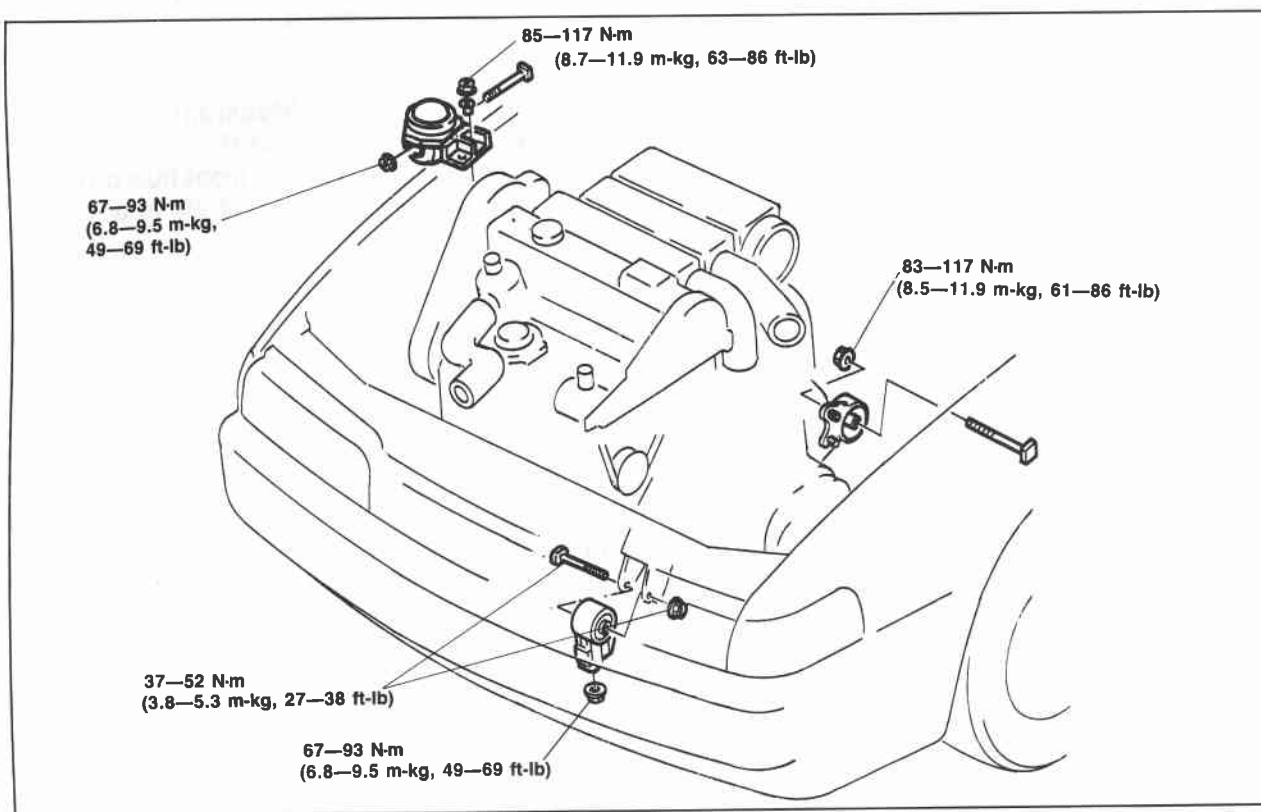
### Torque Specifications



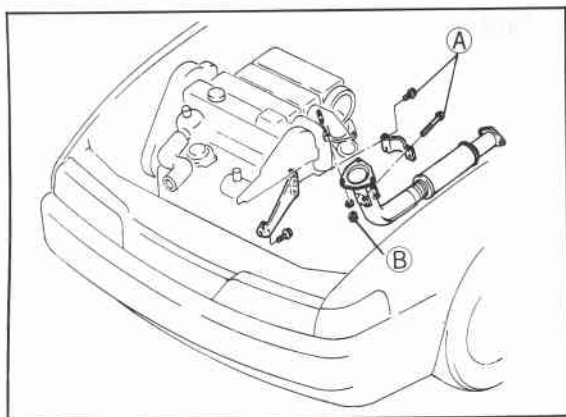
86U01X-180

## Engine Mount

Install the engine mount.



86U01X-181



76G01C-218

## Exhaust Pipe

1. Tighten exhaust pipe stay.

### Tightening torque:

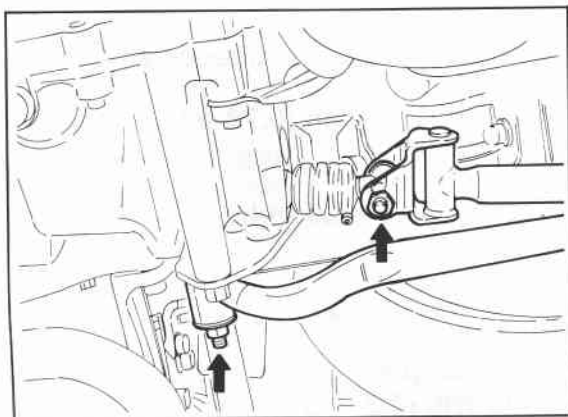
37—52 N-m (3.8—5.3 m-kp, 27—38 ft-lb)

2. Install the exhaust pipe.

### Tightening torque:

(A) : 19—26 N-m  
(1.9—2.6 m-kp, 14—19 ft-lb)

(B) : 34—49 N-m  
(3.5—5.0 m-kp, 25—36 ft-lb)



76G01C-219

## Extension Bar

Install the extension bar to the transaxle.

### Tightening torque:

31—46 N-m (3.2—4.7 m-kp, 23—34 ft-lb)

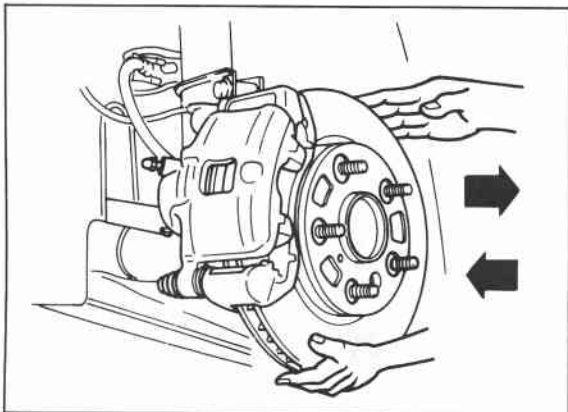
## Change Rod

Install the change rod to the transaxle.

### Tightening torque:

16—22 N-m (1.6—2.3 m-kp, 12—17 ft-lb)

# 1C INSTALLATION



76G01C-220

## Driveshaft

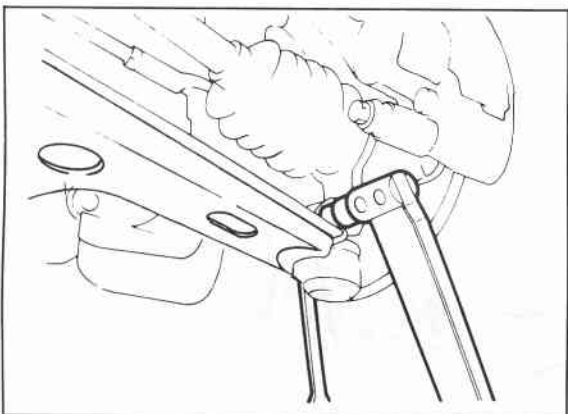
1. Apply grease to the end of the driveshaft.
2. Install the driveshaft and a new clip.

### Caution

- a) When installing the driveshaft, be careful not to damage the oil seal.
- b) After installation, pull the front hub outward to confirm that the driveshaft is securely held by the clip.

## Water Hose

Connect the water hose.



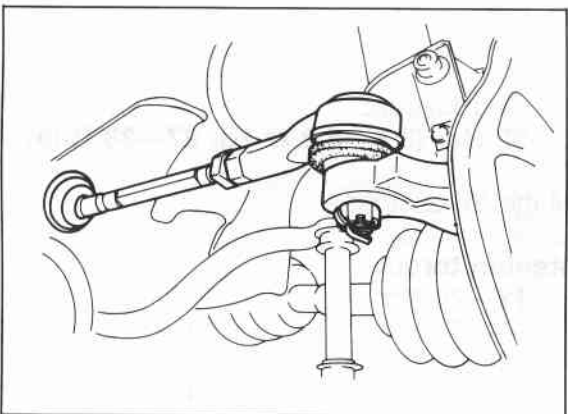
86U01X-185

## Lower Arm

Install the lower arm ball-joint to the knuckle; then tighten the lock nut.

### Tightening torque:

43—54 N·m (4.4—5.5 m·kg, 32—40 ft·lb)



86U01X-186

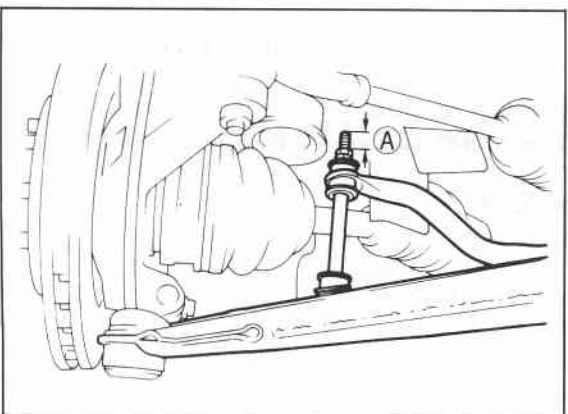
## Tie-Rod End

1. Install the tie-rod end to the knuckle.

### Tightening torque:

29—44 N·m (3.0—4.5 m·kg, 22—33 ft·lb)

2. Install the cotter pin.



76G01C-255

## Stabilizer Control Rod

Install and adjust the front stabilizer control rods.

**Dimension A:** 20.1 mm (0.79 in)

### Tightening torque:

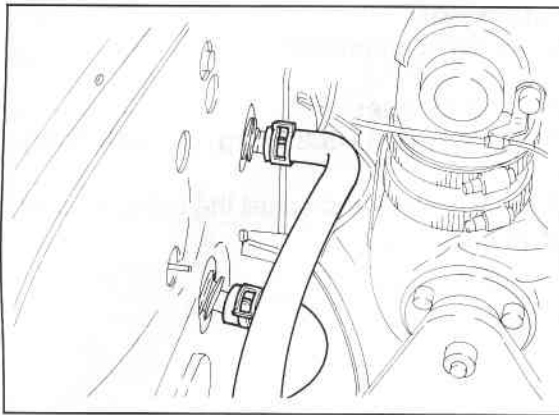
16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)

## Front Wheel

Install the front wheel.

### Tightening torque:

88—118 N·m (9.0—12.0 m·kg, 65—87 ft·lb)



86U01X-221

## Heater Hose

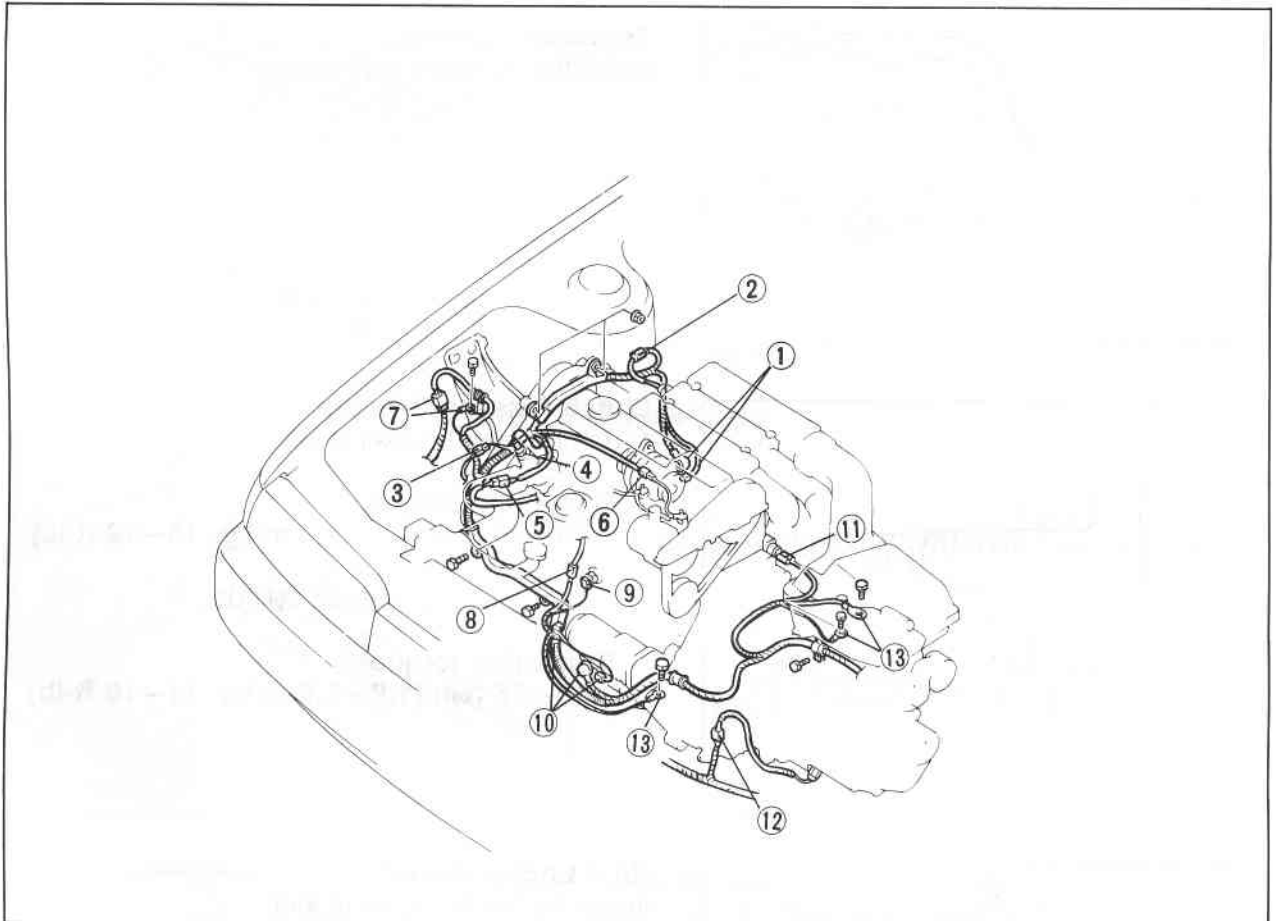
Connect the heater hoses.

### Note

Position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.

## Connector Location

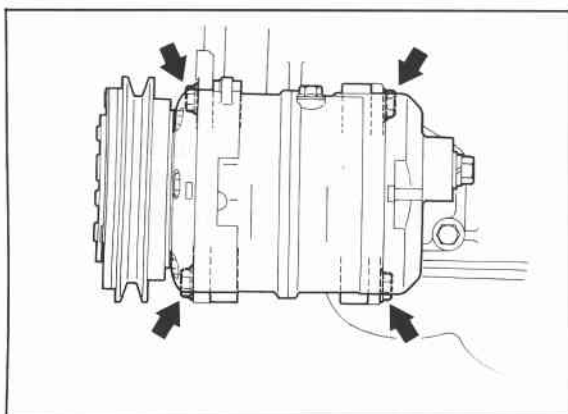
Install each harness as shown in the figure.



76G01C-222

- |                                         |                              |
|-----------------------------------------|------------------------------|
| 1. Alternator                           | 8. Fuel cut valve            |
| 2. Boost air temperature sensor (RF-CX) | 9. Oil pressure switch       |
| 3. Heat gauge unit                      | 10. Starter                  |
| 4. Water thermo switch                  | 11. Water temperature switch |
| 5. Pick up coil                         | 12. Transaxle harness        |
| 6. Glow cord                            | 13. Grounds                  |
| 7. Front harness connector and ground   |                              |

# 1C INSTALLATION



76G01C-223

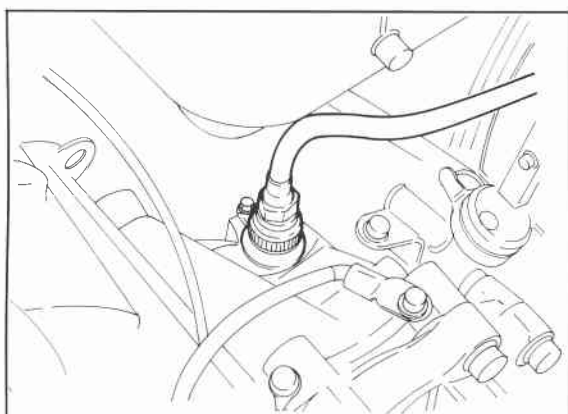
## A/C Compressor

1. Install the A/C compressor.

### Tightening torque:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

2. Install the drive belt and adjust the belt deflection.  
(Refer to page 1C—7)



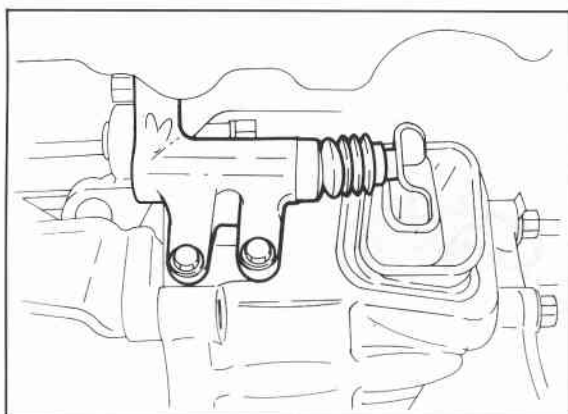
76G01C-224

## Speedometer Cable

Install the speedometer cable.

## Transaxle harness

Install the transaxle harness.



76G01C-225

## Clutch Release Cylinder

1. Set the pipe bracket in position.

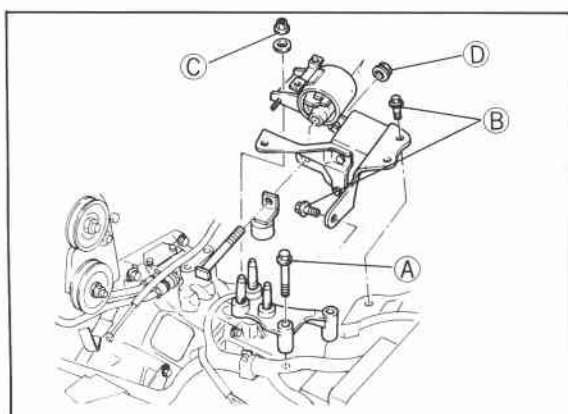
### Tightening torque:

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

2. Install the clutch release cylinder.

### Tightening torque

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**



76G01C-226

## No.4 Engine Mount

Install the No.4 engine mount.

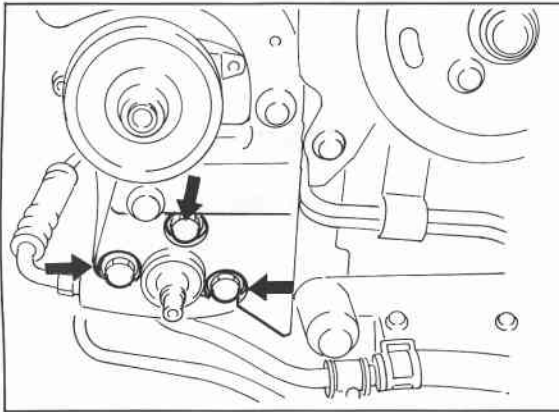
### Tightening torque:

**A : 55—80 N·m  
(5.6—8.2 m·kg, 41—59 ft·lb)**

**B : 36—54 N·m  
(3.7—5.5 m·kg, 27—40 ft·lb)**

**C : 64—89 N·m  
(6.5—9.1 m·kg, 47—66 ft·lb)**

**D : 67—93 N·m  
(6.8—9.5 m·kg, 49—69 ft·lb)**



76G01C-227

## P/S Oil Pump

1. Install the P/S oil pump.

### Tightening torque:

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

2. Install the P/S oil pump pulley. (Refer to section 10)

### Tightening torque:

**55—59 N·m (5.6—6.0 m·kg, 41—43 ft·lb)**

3. Set the pipe bracket in position.

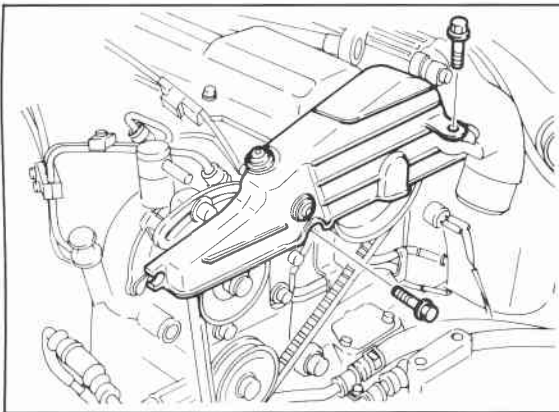
### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

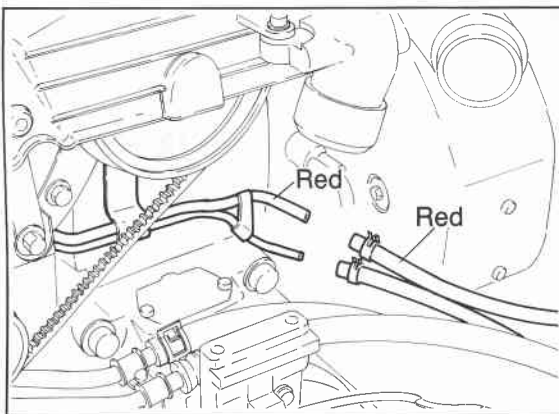
4. Install the drive belt and adjust the belt deflection. (Refer to page 1C—7)
5. Install the drive belt cover.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



76G01C-228



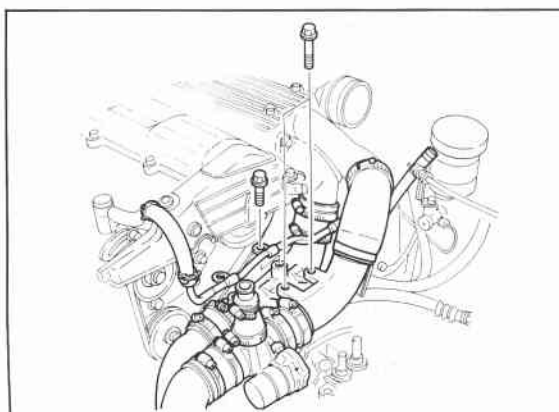
76G01C-229

## Fuel Hose

Install the fuel hose.

### Note

**Be careful of the red marks on the hose.**



76G01C-230

## Intercooler Pipe and Hose

1. Install the intercooler pipe and hose.

### Tightening torque:

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

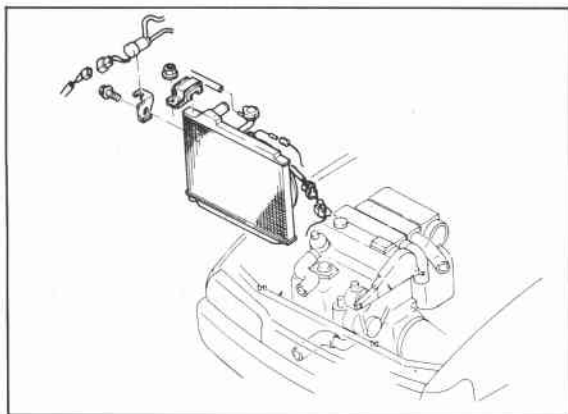
2. Install the brake vacuum pipe.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

3. Connect the brake vacuum hose securely and squeeze the clamp lightly with pliers to ensure a good fit.

# 1C INSTALLATION



76G01C-213

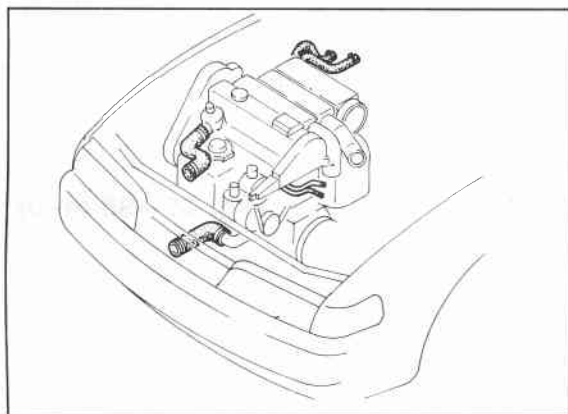
## Radiator

1. Install the radiator and cooling fan.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

2. Connect the radiator harness.



76G01C-232

3. Connect the upper and lower radiator hoses.

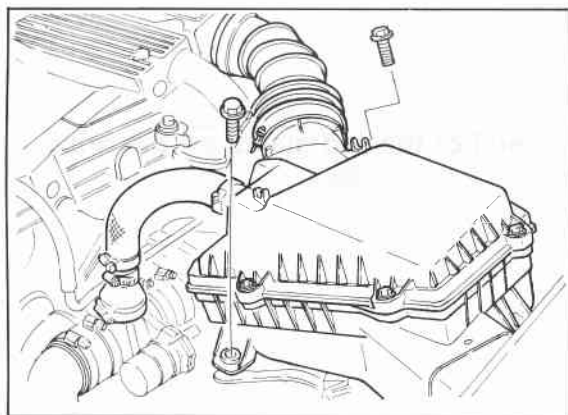
### Note

- a) Position the hose clamp in the original location on the hose.
- b) Squeeze the clamp lightly with large pliers to ensure a good fit.

4. Install the solenoid valve and ground.

### Tightening torque:

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



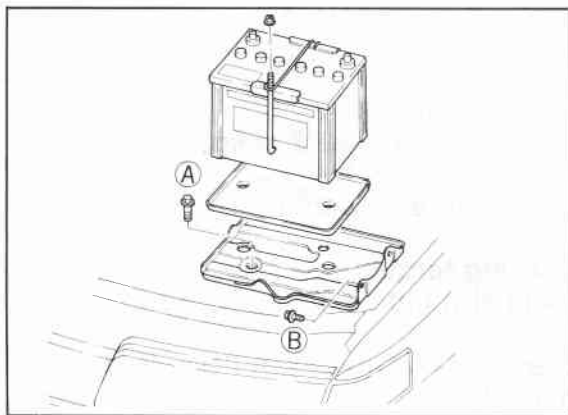
76G01C-233

## Air Cleaner Assembly

Install the air cleaner assembly.

### Tightening torque:

**16—27 N·m (1.6—2.8 m·kg, 12—20 ft·lb)**



76G01C-234

## Battery and Battery Carrier

1. Install the battery carrier.

### Tightening torque:

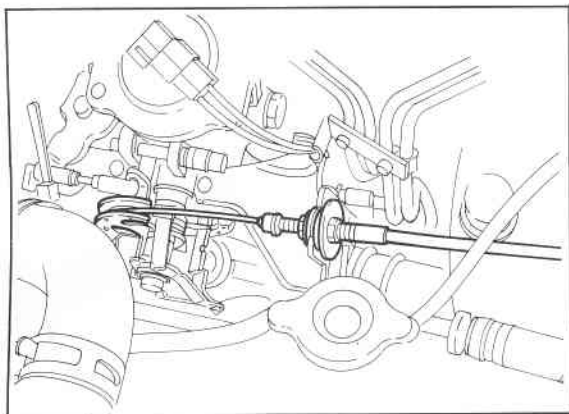
**Bolt A: 31—40 N·m  
(3.2—4.1 m·kg, 23—30 ft·lb)**

**Bolt B: 8—11 N·m  
(80—110 cm·kg, 69—95 in·lb)**

2. Install the battery tray and battery.

### Tightening torque:

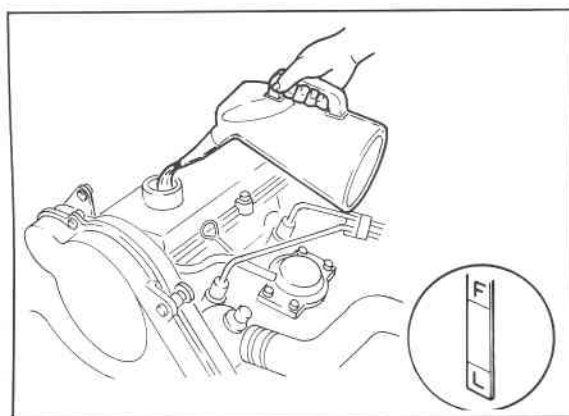
**5—7 N·m (50—70 cm·kg, 43—61 in·lb)**



76G01C-235

## Accelerator Cable

Install the accelerator cable.



76G01C-236

## Engine Oil

Add the specified amount and type of engine oil. (Refer to Section 2B)

## Coolant

Close the drain plug, fill the radiator and reservoir tank with the specified amount and type of coolant. (Refer to Section 3B)

## Check Engine Condition

1. Check for leaks.
2. Perform engine adjustments if necessary.
3. Perform a road test.
4. Recheck the oil and coolant levels.