

# ENGINE (SOHC)

<b>OUTLINE</b> .....	1A— 2
STRUCTURAL VIEW.....	1A— 2
SPECIFICATIONS.....	1A— 4
<b>TROUBLESHOOTING GUIDE</b> .....	1A— 4
<b>TUNE-UP PROCEDURE</b> .....	1A— 6
<b>ON-VEHICLE INSPECTION</b> .....	1A—13
COMPRESSION.....	1A—13
<b>ON-VEHICLE MAINTENANCE</b> .....	1A—14
TIMING BELT.....	1A—14
CYLINDER HEAD .....	1A—20
VALVE SEAL .....	1A—26
<b>REMOVAL</b> .....	1A—34
<b>DISASSEMBLY</b> .....	1A—36
AUXILIARY PARTS.....	1A—36
TIMING BELT.....	1A—38
CYLINDER HEAD .....	1A—40
CYLINDER BLOCK .....	1A—44
<b>INSPECTION AND REPAIR</b> .....	1A—48
<b>ASSEMBLY</b> .....	1A—62
CYLINDER BLOCK .....	1A—62
CYLINDER HEAD .....	1A—73
TIMING BELT.....	1A—82
AUXILIARY PARTS.....	1A—86
<b>INSTALLATION</b> .....	1A—91
TRANSAXLE ASSEMBLY .....	1A—91
ENGINE INSTALLATION .....	1A—92

# 1A OUTLINE

## OUTLINE

The new 626 is equipped with F-series gasoline engine and R-series diesel engine. (R-series diesel engine — explained in section 1C.) F-series engine has following variations.

### 1. SOHC model

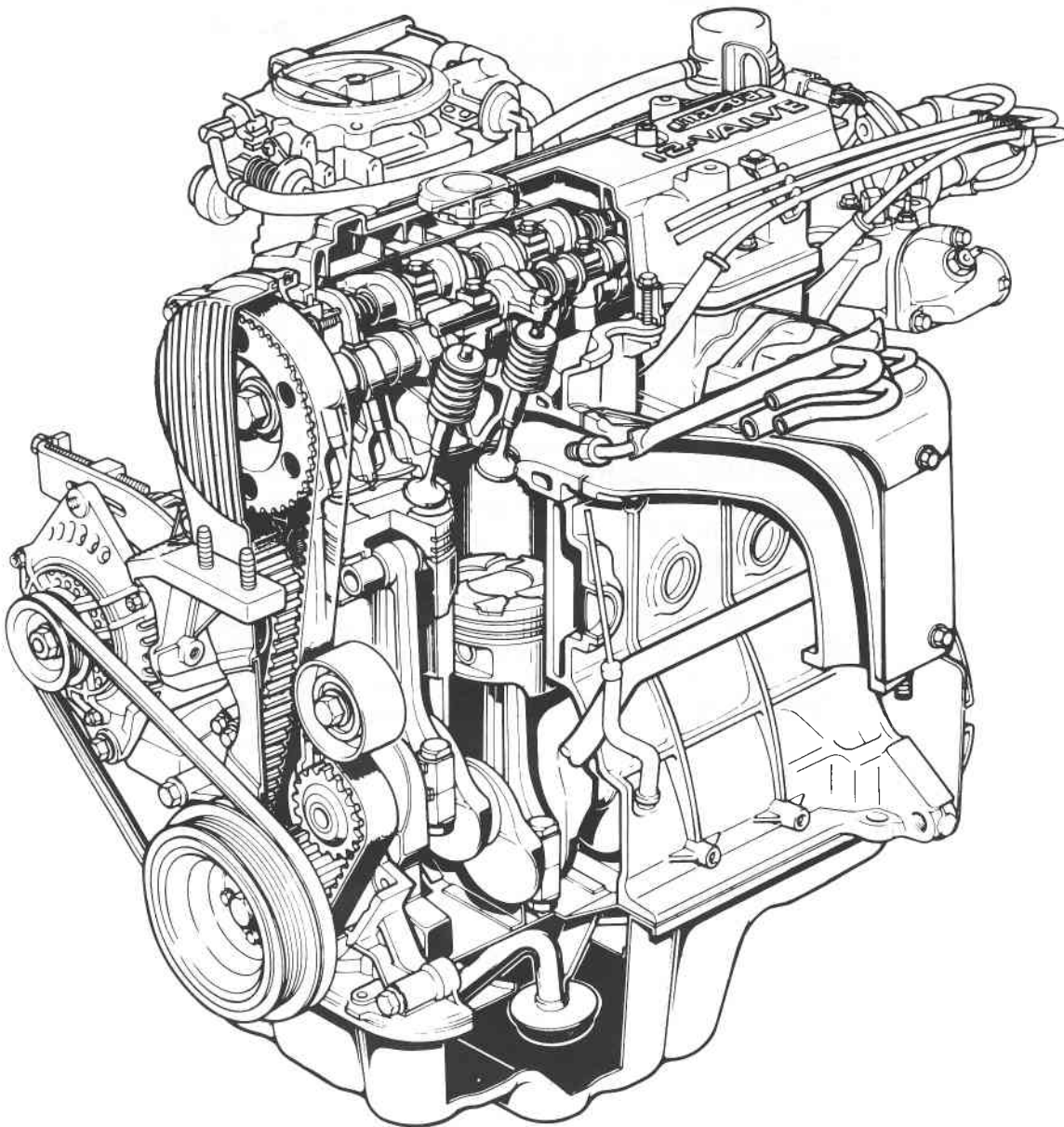
- (1) 12-valve model            2.0 l = FE engine
- (2) 8-valve model            1.6 l = F6 engine
- 1.8 l = F8 engine
- 2.0 l = FE engine

### 2. DOHC model (explained in section 1B)

- 2.0 l 16-valve = FE DOHC engine

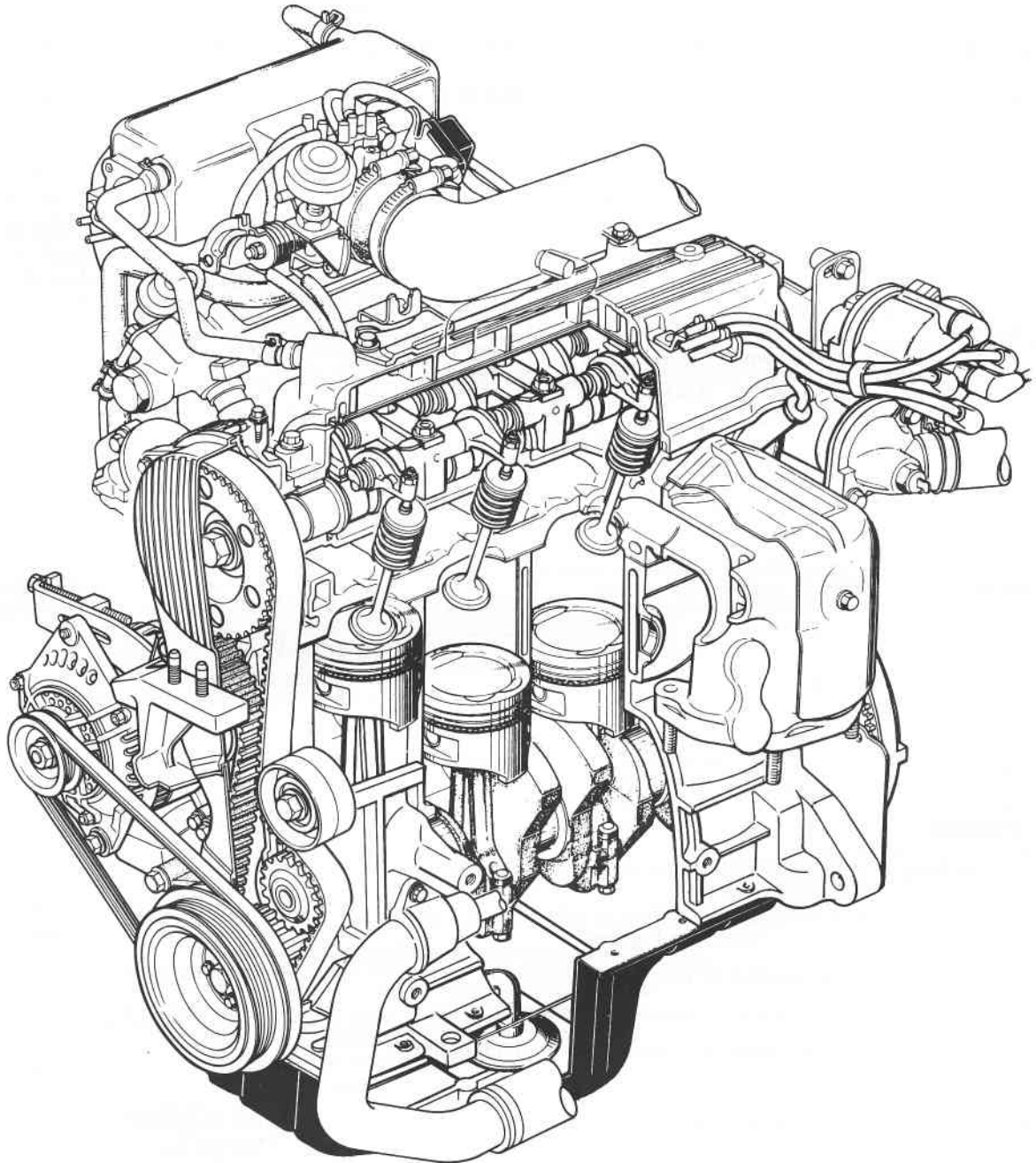
## STRUCTURAL VIEW

### 12-valve



76G01A-101

8-valve



# 1A TROUBLESHOOTING GUIDE

## SPECIFICATIONS

Item		Engine model	FE 12 -valve	FE 8-valve		F8		F6
				ECE	Except ECE	ECE	General	
Type		Gasoline, 4 cycle						
Cylinder arrangement and number		In line, 4 cylinders						
Combustion chamber		Pentroof	Multispherical					
Valve system		OHC, belt driven						
Displacement		cc (cu in)	1,998 (121.9)			1,789 (109.1)		1,587 (96.8)
Bore and stroke		mm (in)	86.0 x 86.0 (3.39 x 3.39)			86.0 x 77.0 (3.39 x 3.03)		81.0 x 77.0 (3.19 x 3.03)
Compression ratio			9.5 : 1	8.6 : 1			9.0 : 1	
Compression pressure kPa (kg/cm <sup>2</sup> , psi)—rpm		Standard	1,422 (14.5, 206)—280	1,275 (13.0, 185)—270			1,128 (11.5, 164)—270	
		Minimum	996 (10.2, 144)—280	893 (9.1, 129)—270			790 (8.1, 114)—270	
Valve timing		IN	Open BTDC	14°	16°	20°	20°	17°
			Close ABDC	56°	54°	65°	65°	56°
		EX	Open BBDC	69°	54°	65°	65°	64°
			Close ATDC	13°	16°	20°	20°	15°
Valve clearance		mm (in)	IN	0; Maintenance-free	0.30 (0.012)			
		EX		0; Maintenance-free	0.30 (0.012)			
Idle speed		rpm	MTX	800 $\pm$ 50 ... carb., 850 $\pm$ 50 ... FI				
			ATX	900 $\pm$ 50 ... carb., 850 $\pm$ 50 ... FI				950 $\pm$ 50 carb. 850 $\pm$ 50..FI
Ignition timing		BTDC	6° $\pm$ 1°					
Firing order		1—3—4—2						

76G01A-003

## TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
<b>Difficult starting</b>	<b>Malfunction of engine-related components</b> Burned valve Worn piston, piston ring, or cylinder Failed cylinder head gasket	Replace Replace or repair Replace	1A—49 1A—57 1A—20
	<b>Malfunction of fuel system</b>	Refer to Section 4	
	<b>Malfunction of electrical system</b>	Refer to Section 5	
<b>Poor idling</b>	<b>Malfunction of engine-related components</b> Malfunction of HLA Improper valve clearance Poor valve to valve seat contact Failed cylinder head gasket	Replace Adjust Repair or replace Replace	1A—75 1A—10 1A—51 1A—20
	<b>Malfunction of fuel system</b>	Refer to Section 4	
<b>Excessive oil consumption</b>	<b>Oil working up</b> Worn piston ring groove or sticking piston ring Worn piston or cylinder	Replace Replace or repair	1A—57 1A—57
	<b>Oil working down</b> Worn valve seal Worn valve stem or guide	Replace Replace	1A—26 1A—49
	<b>Oil leakage</b>	Refer to Section 2A	

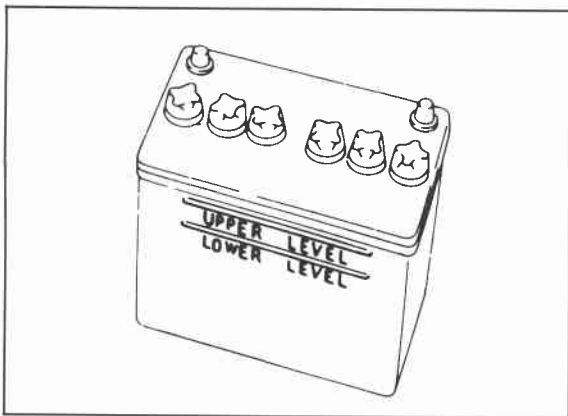
76G01A-004

Problem	Possible Cause	Remedy	Page
<b>Insufficient power</b>	<b>Insufficient compression</b> Malfunction of HLA Improper valve clearance Compression leakage from valve seat Seized valve stem Weak or broken valve spring Failed cylinder head gasket Cracked or distorted cylinder head Sticking, damaged, or worn piston ring Cracked or worn piston	Replace Adjust Repair Replace Replace Replace Replace Replace Replace	1A—75 1A—10 1A—51 1A—49 1A—53 1A—20 1A—48 1A—57 1A—57
	<b>Malfunction of fuel system</b>	Refer to Section 4	
	<b>Others</b> Slipping clutch Dragging brakes Wrong size tires	Refer to Section 6 Refer to Section 11 Refer to Section 12	
<b>Abnormal combustion</b>	<b>Malfunction of engine-related components</b> Malfunction of HLA Improper valve clearance Sticking or burned valve Weak or broken valve spring Carbon accumulation in combustion chamber	Replace Adjust Replace Replace Eliminate carbon	1A—75 1A—10 1A—49 1A—53 —
	<b>Malfunction of fuel system</b>	Refer to Section 4	
<b>Engine noise</b>	<b>Crankshaft or bearing related parts</b> Excessive main bearing oil clearance Main bearing seized or heat-damaged Excessive crankshaft end play Excessive connecting rod bearing oil clearance Connecting rod bearing seized or heat-damaged	Replace or repair Replace Replace or repair Replace or repair Replace	1A—65 1A—65 1A—66 1A—67 1A—67
	<b>Piston related parts</b> Worn cylinder Worn piston or piston pin Seized piston Damaged piston ring Bent connecting rod	Replace or repair Replace Replace Replace Replace	1A—55 1A—57 1A—57 1A—57 1A—59
	<b>Valves or timing related parts</b> Malfunction of HLA* Improper valve clearance Broken valve spring Excessive valve guide clearance Malfunction of timing belt tensioner	Replace Adjust Replace Replace Replace	1A—75 1A—10 1A—53 1A—49 1A—61
	<b>Malfunction of cooling system</b>	Refer to Section 3A	
	<b>Malfunction of fuel system</b>	Refer to Section 4	
	<b>Others</b> Malfunction of water pump bearing Improper drive belt tension Malfunction of alternator bearing Exhaust gas leakage	Replace Adjust Replace Repair	— 1A— 7 — 1A—48

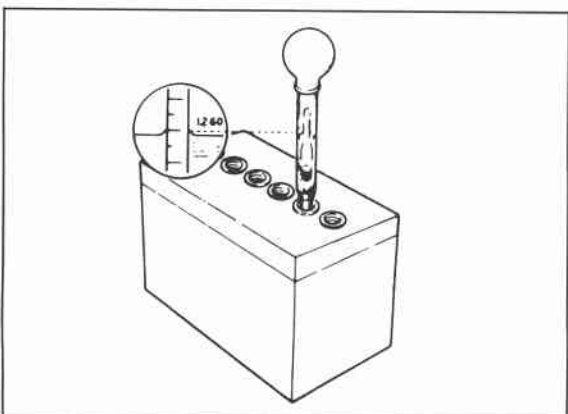
\* Tappet noise may occur if the engine is not operated for an extended period of time. The noise should stop after the engine has reached normal operating temperature.

76G01A-005

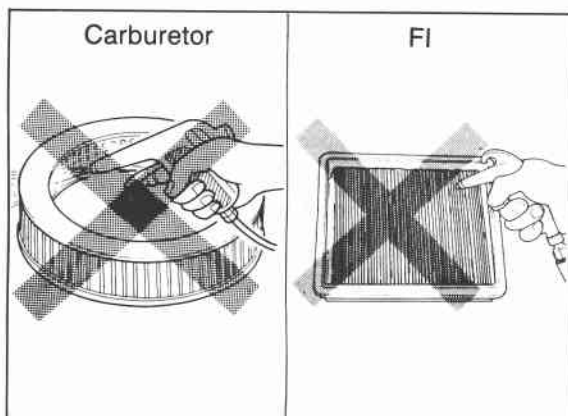
# 1A TUNE-UP PROCEDURE



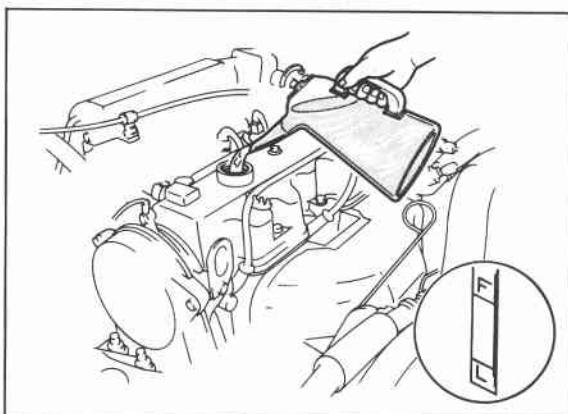
76G01A-102



76G01A-103



76G01A-104



4BG01A-010

## TUNE-UP PROCEDURE

Tune 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 that the electrolyte level is between the UPPER and LOWER marks.  
Add distilled water if necessary.
3. Check the specific gravity by using a hydrometer.  
If the specific gravity reading is 1.200 or less, recharge the battery. (Refer to Section 5.)

### Air Cleaner Element

Visually check the air cleaner element for excessive dirt, damage, or oil. Replace if necessary.

### Caution

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

### Engine Oil

Check the engine oil level and condition with the oil level gauge.  
Add oil, or change it, if necessary.



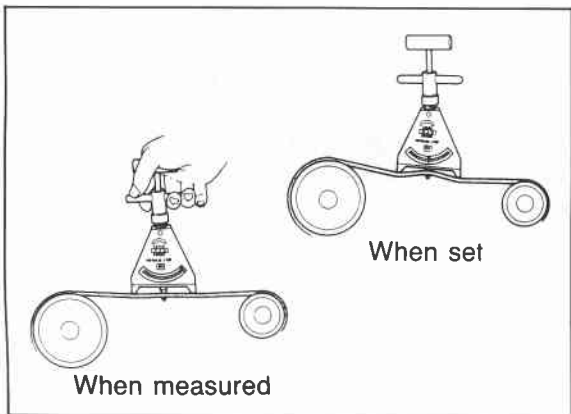
86U01X-008

### Coolant Level (Cold engine)

1. Check that the coolant level is near the radiator inlet port.
2. Check that the level in the coolant reservoir is between the FULL and LOW marks. Add coolant if necessary.

### Warning

- a) Never remove the radiator cap while the engine is hot.
- b) Wrap a thick cloth around the cap and carefully remove it.



76G01A-006

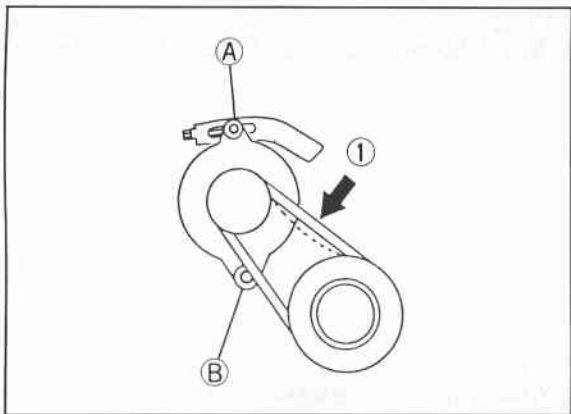
### Drive Belt

1. Check the drive belt for wear, cracks, or fraying. Replace if necessary.
2. Check the drive belt tension by using the tension gauge.

### Standard belt tension

N (kg, lb)

Belt	New	Used
Alternator	589-785 (60-80, 132-176)	491-687 (50-70, 110-154)
P/S	687-883 (70-90, 154-198)	589-785 (60-80, 132-176)
A/C	687-883 (70-90, 154-198)	589-785 (60-80, 132-176)



76G01A-007

3. Check the drive belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys.

- (1) Alternator belt deflection

**New : 6-8 mm (0.24-0.31 in)**

**Used: 7-9 mm (0.27-0.35 in)**

If necessary, loosen the alternator mounting bolts and adjust the belt deflection by turning the adjusting bolt.

### Tightening torque

**A: 31-46 N·m (3.2-4.7 m·kg, 23-34 ft·lb)**

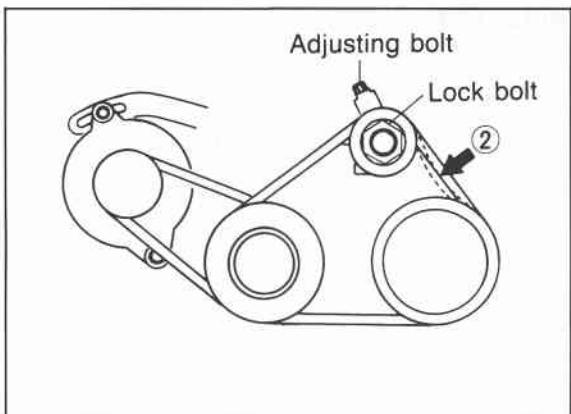
**B: 37-52 N·m (3.8-5.3 m·kg, 27-38 ft·lb)**

- (2) P/S belt deflection

**New : 8-10 mm (0.31-0.39 in)**

**Used: 9-11 mm (0.35-0.43 in)**

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

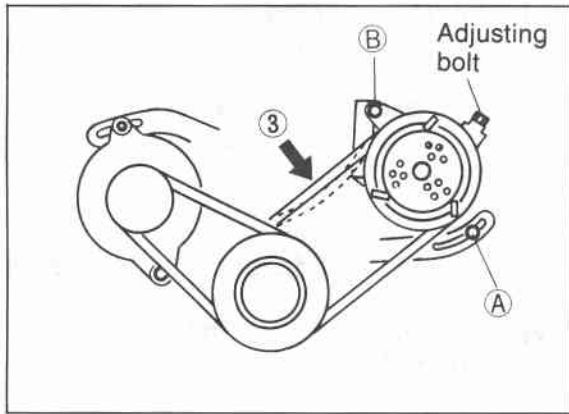


76G01A-008

### Tightening torque of lock bolt:

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

# 1A TUNE-UP PROCEDURE



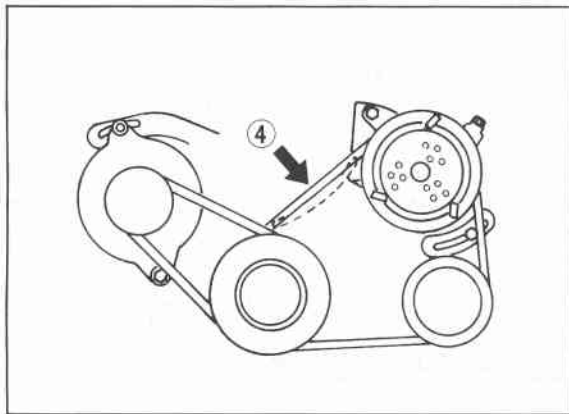
76G01A-009

- (3) A/C belt deflection  
**New : 7—9 mm (0.27—0.35 in)**  
**Used: 8—10 mm (0.31—0.39 in)**

If necessary, loosen the A/C mounting bolts and adjust the belt deflection by turning the adjusting bolt.

### Tightening torque

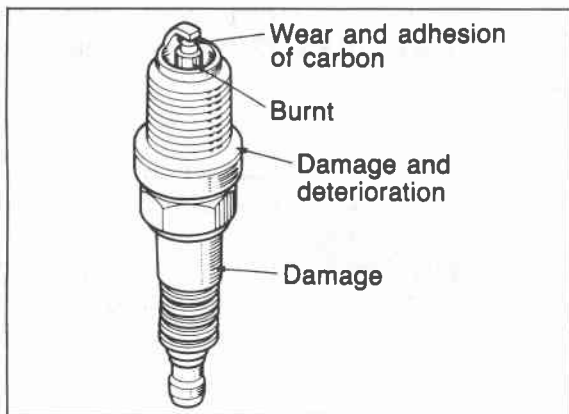
- (A) : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**  
**(B) : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**



76G01A-010

- (4) P/S and A/C belt deflection  
**New : 7—9 mm (0.27—0.35 in)**  
**Used: 8—10 mm (0.31—0.39 in)**

If necessary, adjust the belt deflection using the same procedure as used for the A/C belt deflection.



76G01A-011

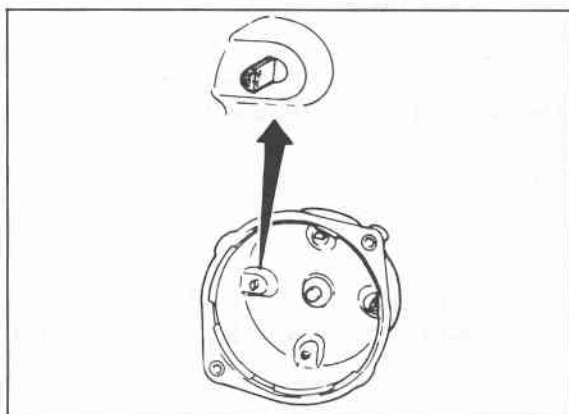
### Spark Plug

Check the following points. Clean or replace if necessary.

1. Damaged insulation
2. Worn electrodes
3. Carbon deposits
4. Damaged gasket
5. Burnt spark insulator
6. Plug gap

### Plug gap:

- 0.75—0.85 mm (0.030—0.033 in) ... 8-valve**  
**0.70—0.80 mm (0.028—0.031 in) ... 12-valve**

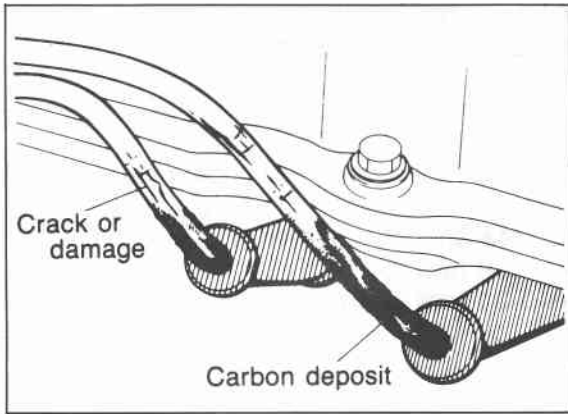


86U01X-013

### Distributor Cap

Check the following points. Replace if necessary.

1. Cracks or carbon deposits
2. Burnt or corroded terminals
3. Worn distributor center contact

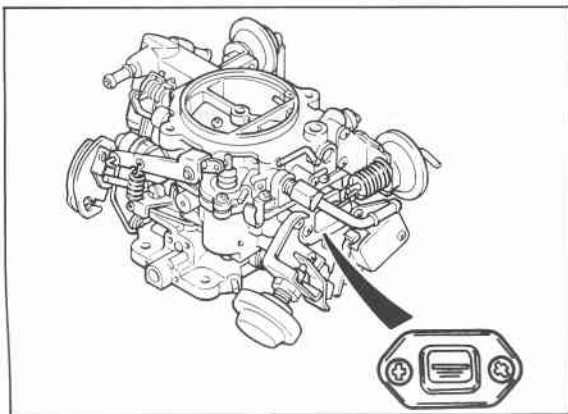


86U01X-014

## High-Tension Lead

Check the following points. Clean or replace if necessary.

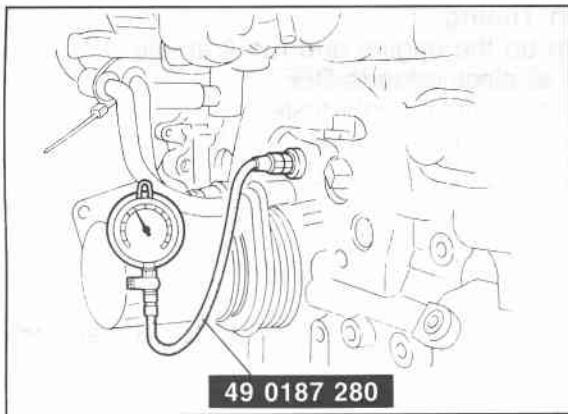
1. Damaged lead
2. Carbon deposits



76G01A-012

## Carburetor Float Level (Carburetor)

1. Run the engine at idle.
2. Check that the fuel level is at the center of the float level indicator window.  
If necessary, adjust the fuel float level. (Refer to Section 4A.)



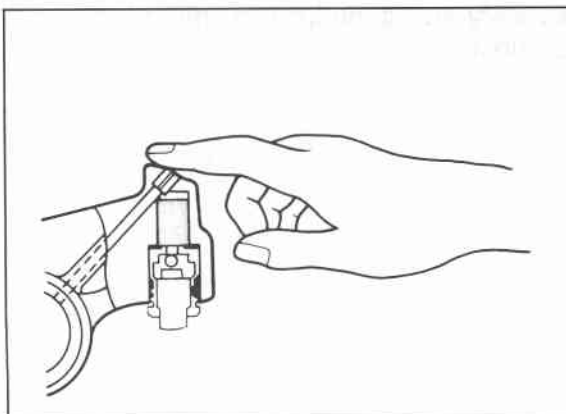
76G01A-013

## Hydraulic Lash Adjuster (12 valve)

### Note

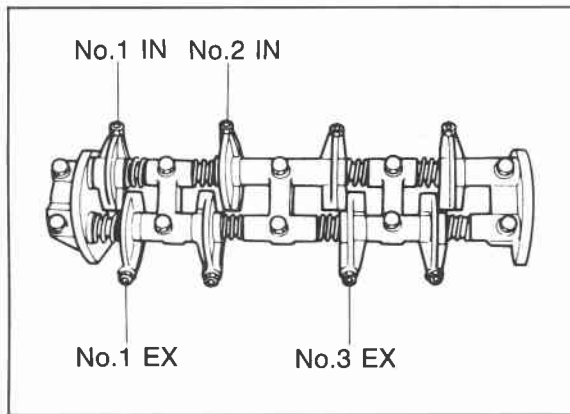
**Tappet noise may occur if the engine is not operated for an extended period of time. The noise should stop after the engine has reached normal operating temperature.**

1. Check for tappet noise. If noise exists, check the following points.
  - (1) Engine oil condition and level
  - (2) Engine oil pressure (Refer to Section 2A)
2. If the noise does not stop, check for movement of each HLA by pushing down each rocker arm by hand while at TDC of compression stroke.
3. If the rocker arm moves down, replace the HLA. (Refer to page 1A—75.)

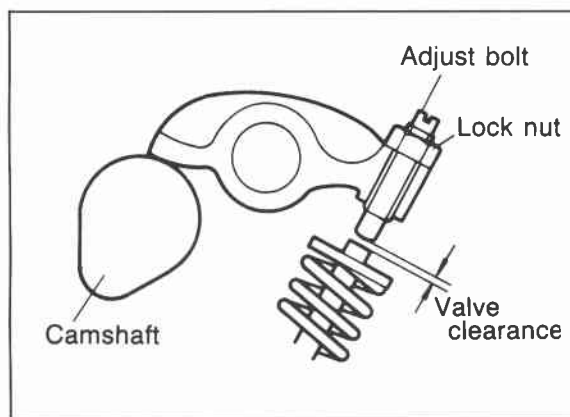


76G01A-014

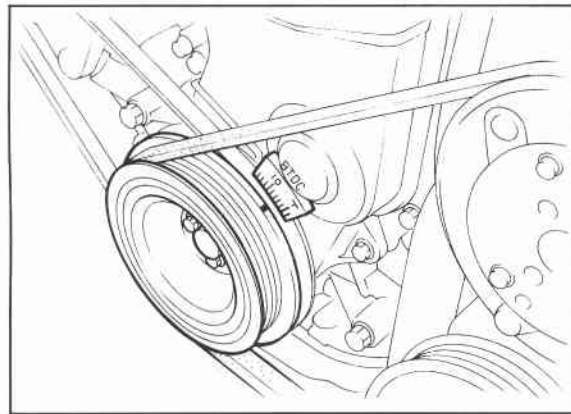
# 1A TUNE-UP PROCEDURE



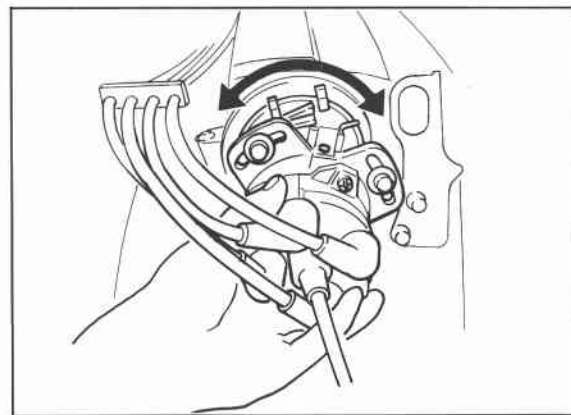
76G01A-015



76G01A-016



76G01A-017



69G01B-518

## Valve Clearance (8-valve)

1. Warm up the engine to the normal operating temperature.
2. With the piston of the No.1 cylinder at TDC of compression stroke. Adjust the valve clearance as shown in the figure.

## Valve clearance (valve side)

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

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

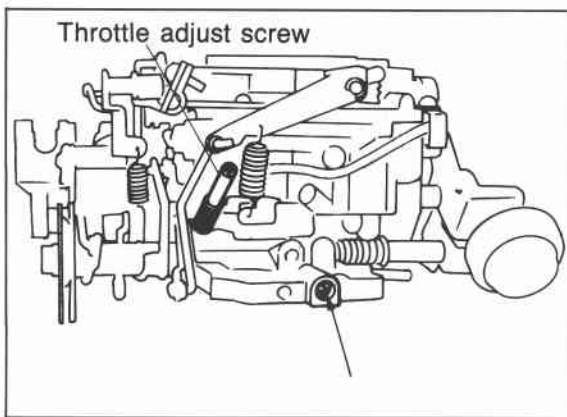
3. Turn the crankshaft one full turn so that the piston of the No.4 cylinder is at TDC of compression stroke. Adjust the clearances of the remaining valves.

## Ignition Timing

1. Warm up the engine and run it at idle.
2. Turn all electric loads OFF.
3. Connect a timing light tester.
4. Disconnect the vacuum hose from the vacuum control, and plug the hose.
5. Check that the ignition timing mark (yellow) on the crankshaft pulley and the timing mark on the timing belt cover are aligned.

**Ignition timing:  $6^\circ \pm 1^\circ$  BTDC (at idle speed)**

6. If necessary adjust the ignition timing by turning the distributor.



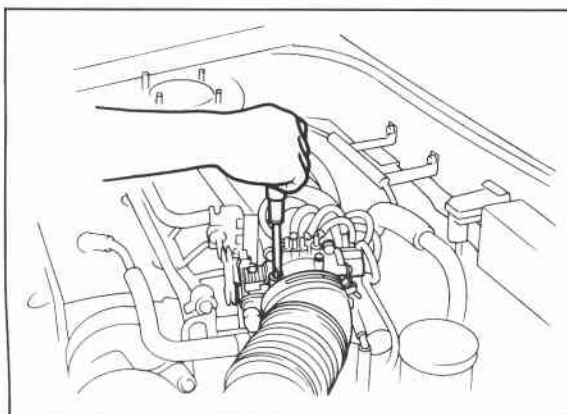
76G01A-105

### Idle Speed (Carburetor)

1. Connect a tachometer to the engine.
2. Turn all electric loads OFF.
3. Confirm that the choke valve has fully returned at idling speed.
4. Check the idle speed. If necessary, turn the throttle adjust screw and adjust the idle speed.

#### Idle speed

MTX: 800  $\pm_{-0}^{+50}$  rpm (in neutral)  
 ATX: 950  $\pm_{-0}^{+50}$  rpm (in "N" range)..... F6  
 900  $\pm_{-0}^{+50}$  rpm (in "N" range).. FE, F8



76G01A-018

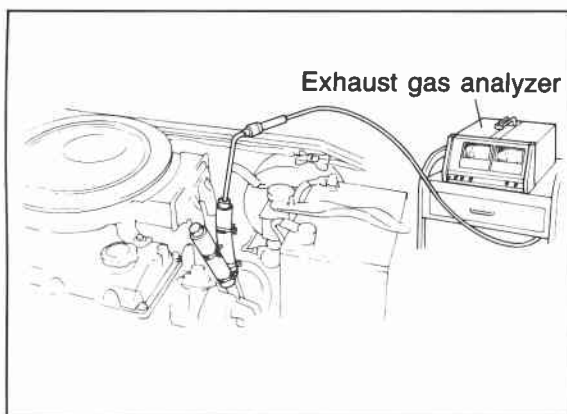
### Idle Speed (FI)

1. Connect the tachometer to the engine.
2. Check the idle speed.

#### Idle speed

MTX: 850  $\pm_{-50}^{+50}$  rpm (in neutral)  
 ATX: 850  $\pm_{-50}^{+50}$  rpm (in "N" range)

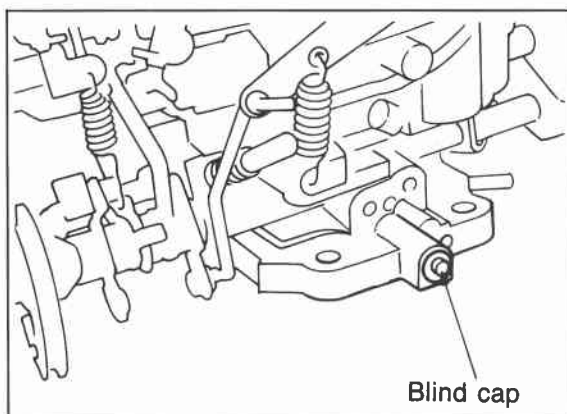
3. If necessary, remove the blind cap from the throttle body and adjust by turning the air adjust screw.
4. Install the blind cap.



76G01A-106

### Idle Mixture (Carburetor)

1. Disconnect the secondary air hoses from the reed valves and then plug the hoses (if equipped).
2. Connect an exhaust gas analyzer to the vehicle as shown in the figure and measure the CO concentration.



76G01A-019

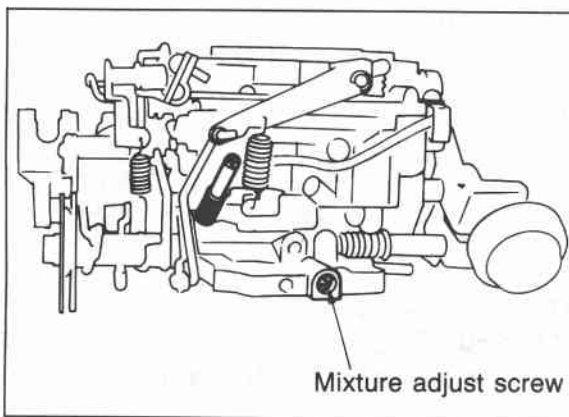
3. Remove the blind cap from the mixture adjust screw.

#### Note

**The blind cap will be broken when it is removed, do not attempt to reinstall it.**

# 1A TUNE-UP PROCEDURE

---

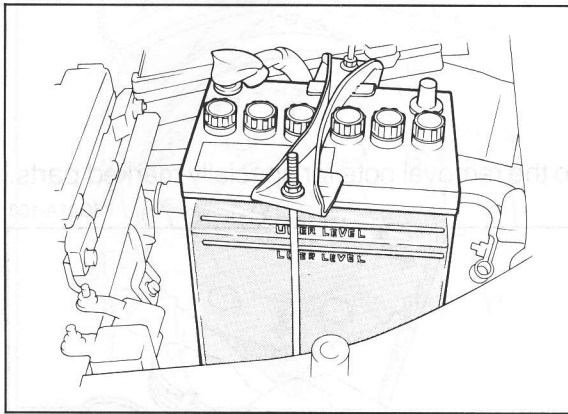


76G01A-020

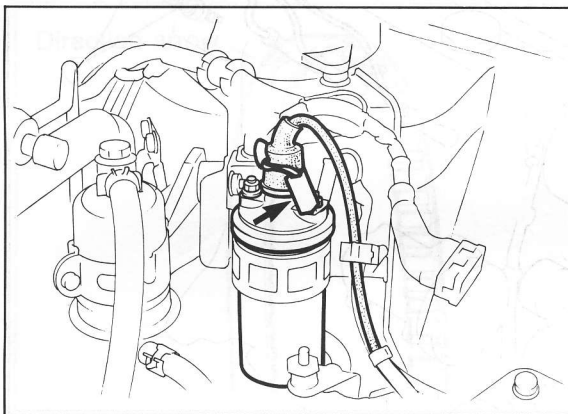
4. Turn the mixture adjust screw and adjust the CO concentration to the specified level.

**CO concentration:  $2.0 \pm 0.5\%$**

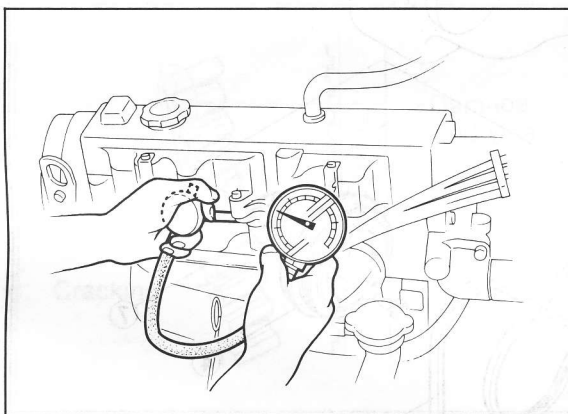
5. If the idle speed fails to meet the specification, adjust the idle speed again, then adjust the CO concentration.
6. Fit a new blind cap onto the mixture adjusting screw.
7. Connect the secondary air hoses (if equipped).



76G01A-107



86U01X-020



76G01A-023

## ON-VEHICLE INSPECTION

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

1. Ignition system (Refer to Section 5)
2. Compression
3. Fuel system (Refer to Section 4)

### COMPRESSION

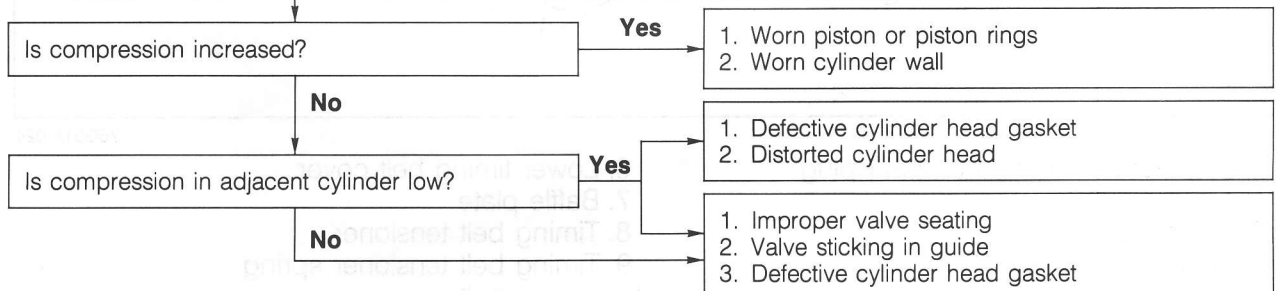
1. Check that the battery is fully charged. Recharge if necessary.
2. Warm up the engine to the normal operating temperature.
3. Turn it off for about 10 minutes to allow the exhaust manifold to cool.
4. Remove all spark plugs.
5. Disconnect the primary wire connector from the ignition coil.
6. Connect a compression gauge to No. 1 spark plug hole.
7. Fully depress the accelerator pedal and crank the engine.
8. Note the maximum gauge reading.
9. Check each cylinder.

### Compression pressure kPa (kg/cm<sup>2</sup>, psi)-rpm

	Standard	Minimum
F6	1,128 (11.5, 164)—270	790 (8.1, 114)—270
F8·FE	1,275 (13.0, 185)—270	893 (9.1, 129)—270
FE 12-valve	1,422 (14.5, 206)—280	996 (10.2, 144)—280

### Possible Cause

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



86U01X-022

# 1A ON-VEHICLE MAINTENANCE (TIMING BELT)

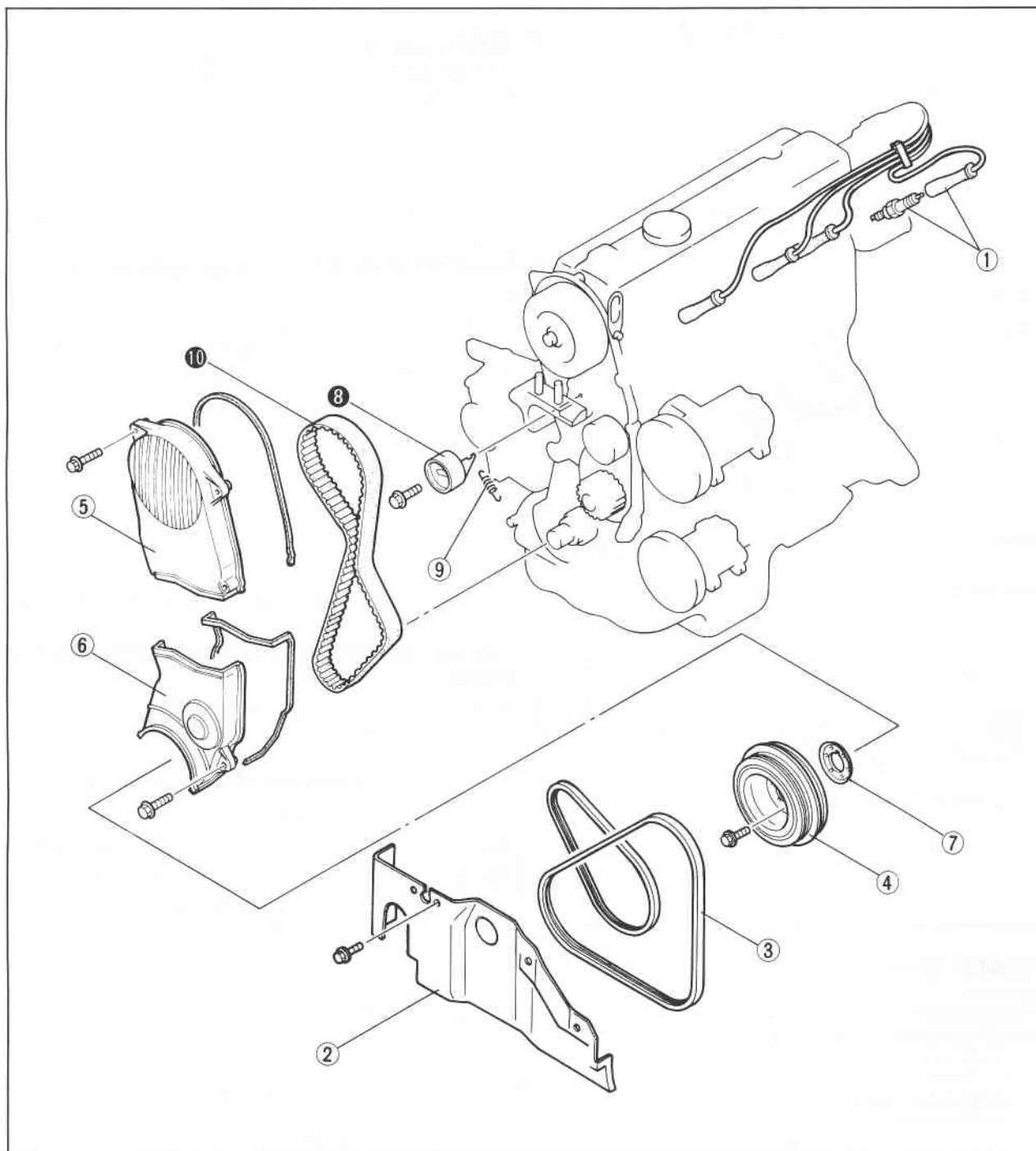
## ON-VEHICLE MAINTENANCE

### TIMING BELT

#### Removal

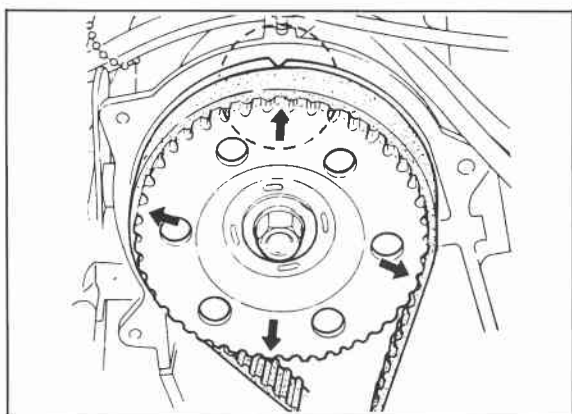
1. Disconnect the negative battery cable.
2. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.

76G01A-108

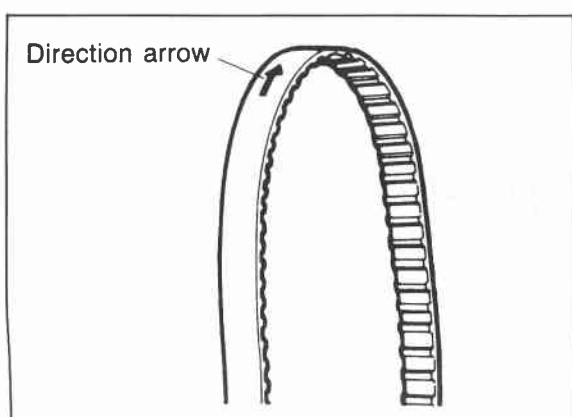


76G01A-024

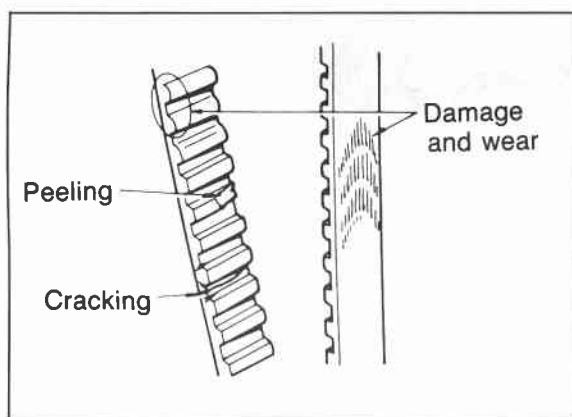
- |                                     |                                 |
|-------------------------------------|---------------------------------|
| 1. High-tension lead and spark plug | 6. Lower timing belt cover      |
| 2. Engine side cover                | 7. Baffle plate                 |
| 3. Drive belt                       | 8. Timing belt tensioner        |
| 4. Crankshaft pulley                | 9. Timing belt tensioner spring |
| 5. Upper timing belt cover          | 10. Timing belt                 |



76G01A-025



86U01X-024



76G01A-026

## Removal note

### Timing belt tensioner

1. Turn the crankshaft to align the mating mark of the camshaft pulley with the front housing timing mark.

### Note

For FE engine, align "2" mark.

For F8, F6 engine, align "3" mark.

2. Remove the tensioner.

## Timing belt

Mark the timing belt rotation for proper reinstallation if it is reused.

### Caution

Be careful not to allow oil, grease, or water on the belt.

## Inspection

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

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

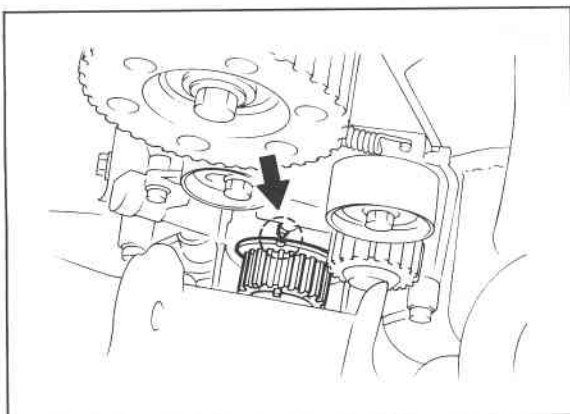
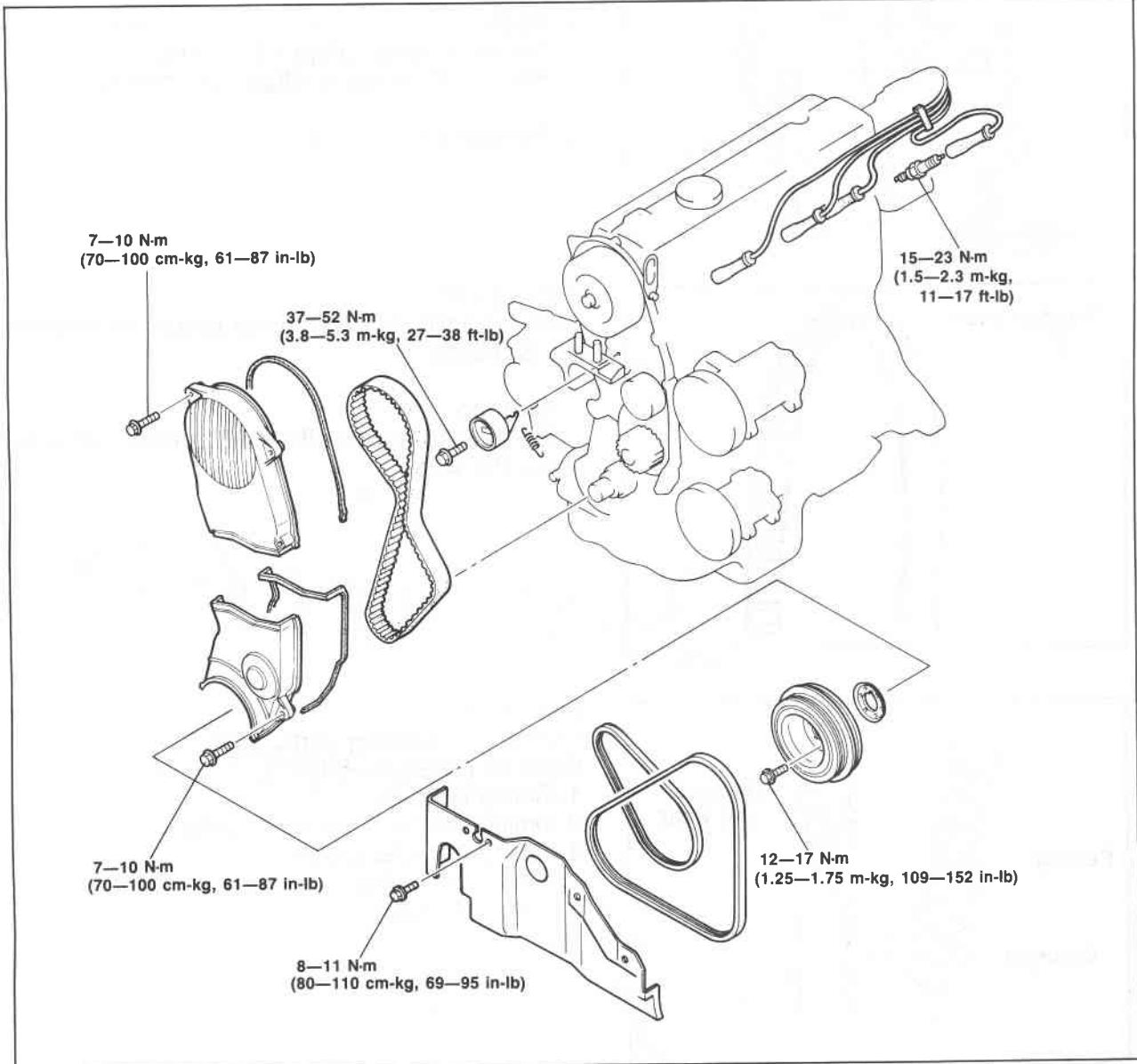
# 1A ON-VEHICLE MAINTENANCE (TIMING BELT)

## Installation

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

## Torque Specifications

76G01A-109

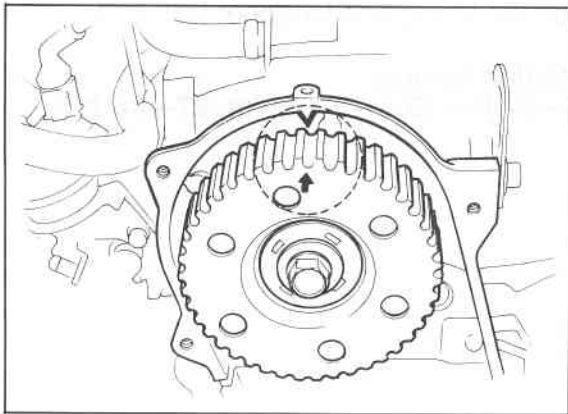


86U01X-220

## Installation note

### Timing belt

1. Check that the mark on the timing belt pulley is aligned with the mating mark.



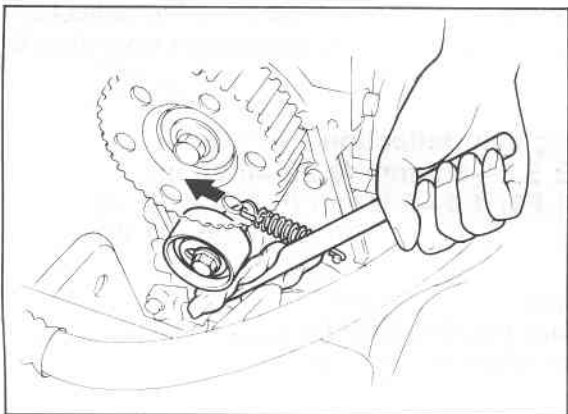
76G01A-027

2. Check that the mating mark of the camshaft pulley is aligned with the timing mark. If it is not aligned, turn the camshaft to align.

**Note**

**For FE engine, align "2" mark.**

**For F8, F6 engine, align "3" mark.**

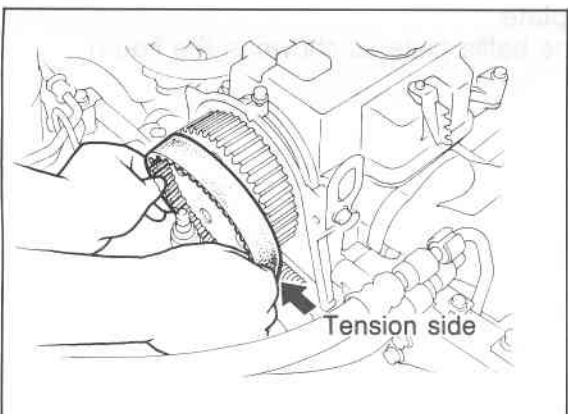


76G01B-024

3. Install the timing belt tensioner and spring. Temporarily secure it with the spring fully extended.

**Caution**

**Do not damage the pulleys when securing the tensioner pulley.**



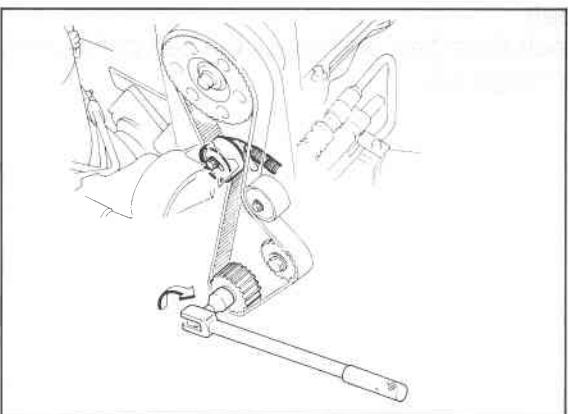
76G01A-028

4. Install the timing belt. (Keep the tension side of belt as tight as possible).

**Caution**

**a) If the timing belt is being reused, it must be reinstalled to rotate in the original direction.**

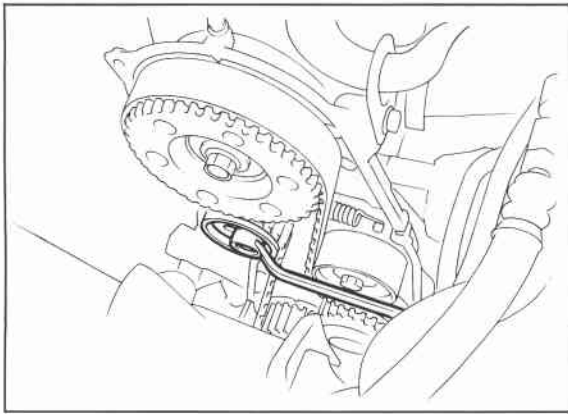
**b) Check that there is no oil, grease, or dirt on the timing belt.**



69G01B-027

5. Loosen the tensioner lock bolt.
6. Turn the crankshaft twice in the direction of rotation, and align the mating marks.
7. Check that the timing marks are correctly aligned. If not aligned, remove the timing belt tensioner and timing belt, and repeat steps 1—6.

# 1A ON-VEHICLE MAINTENANCE (TIMING BELT)

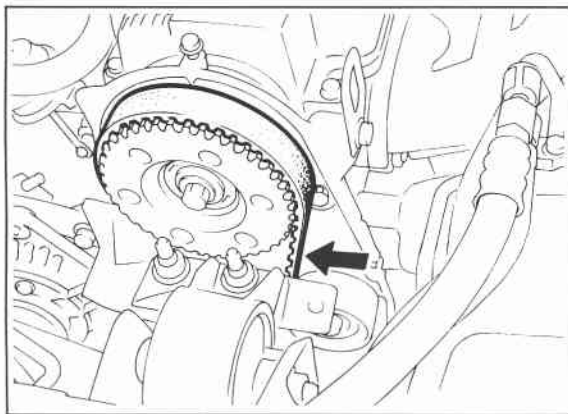


69G01B-028

8. Tighten the timing belt tensioner lock bolt.

**Tightening torque:**

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



76G01A-029

9. Check the timing belt deflection. If the deflection is not correct, repeat the adjustment from step 5 above.

**Timing belt deflection**

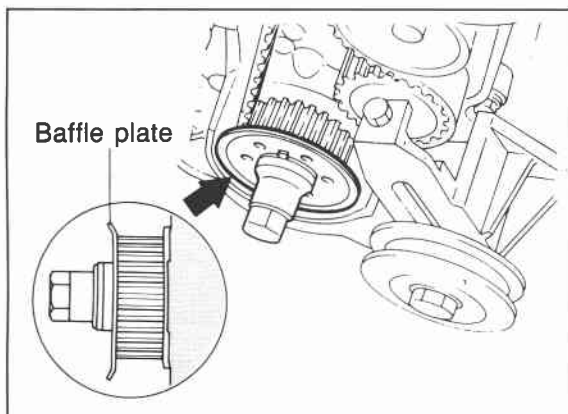
**FE: 5.5—6.5 mm (0.22—0.26 in)**

**F8, F6: 4.0—5.0 mm (0.16—0.20 in)**

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

**Caution**

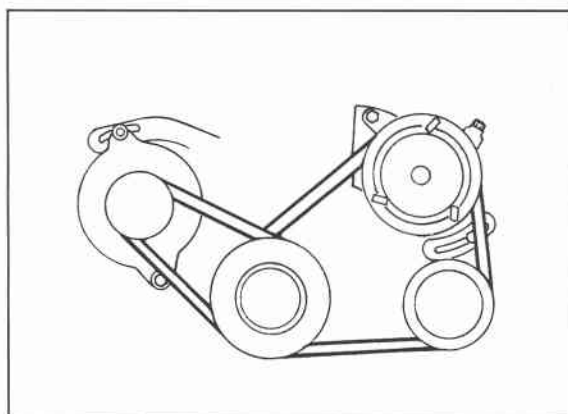
**Be sure not to apply tension other than that of the tensioner spring.**



69G01B-030

**Baffle plate**

Install the baffle plate as shown in the figure.

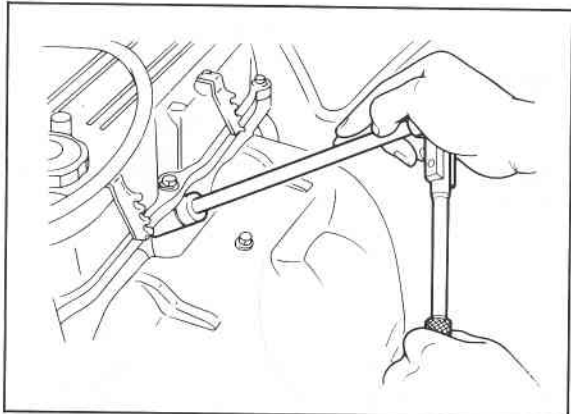


76G01A-030

**Drive belt**

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

## ON-VEHICLE MAINTENANCE (TIMING BELT) **1A**



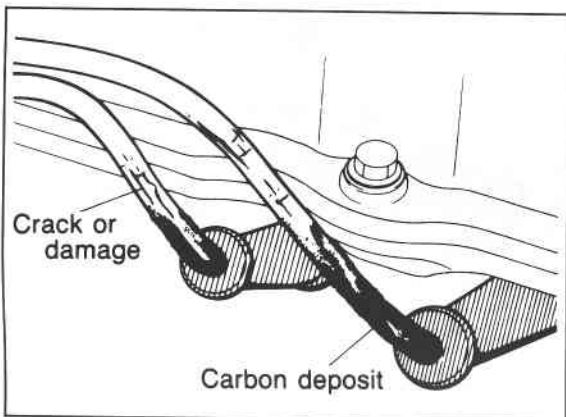
79G01C-021

### **Spark plug**

1. Apply anti-seize compound or molybdenum-based lubricant to the spark plug threads.
2. Install the spark plugs.

### **Tightening torque:**

**15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)**



86U01X-029

### **Steps After Installation**

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

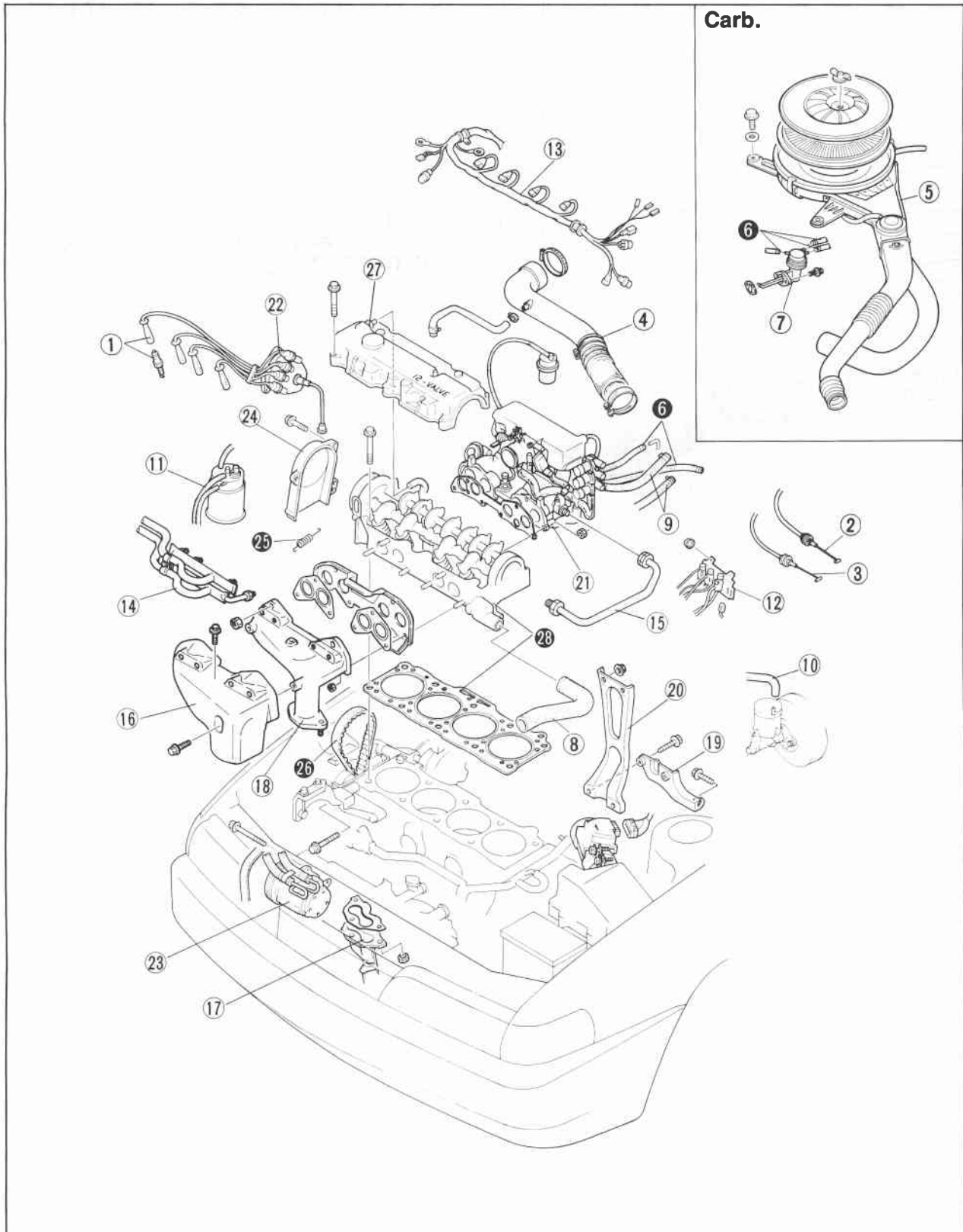
# 1A ON-VEHICLE MAINTENANCE (CYLINDER HEAD)

## CYLINDER HEAD

### Removal

**Warning: Release the fuel pressure. (Refer to Section 4.)**

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.

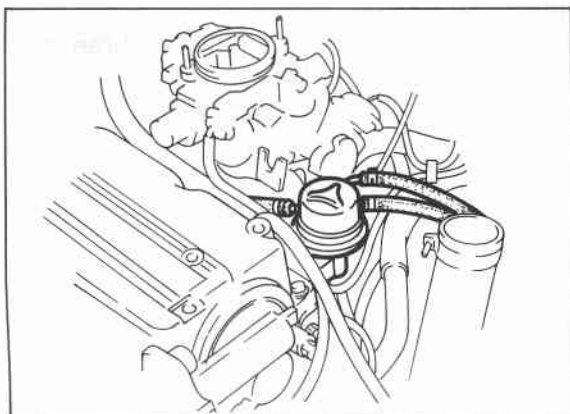


76G01A-110

1. High-tension lead and spark plug
2. Accelerator cable
3. Throttle cable (ATX)
4. Air intake pipe (FI)
5. Air cleaner assembly (carb.)
6. Fuel hose
7. Fuel pump (carb.)
8. Upper radiator hose
9. Heater hose
10. Brake vacuum hose
11. Canister hose (FI, Middle East)
12. Three-way solenoid assembly
13. Engine harness connector and ground
14. Secondary air pipe assembly (except General)

15. EGR pipe (FI, Unleaded carb.)
16. Exhaust manifold insulator
17. Exhaust pipe
18. Exhaust manifold
19. Gusset plate (FI)
20. Intake manifold bracket (FI)
21. Intake manifold assembly
22. Distributor
23. A/C compressor and bracket
24. Upper timing belt cover
25. Timing belt tensioner spring
26. Timing belt
27. Cylinder head cover
28. Cylinder head and gasket

76G01A-031



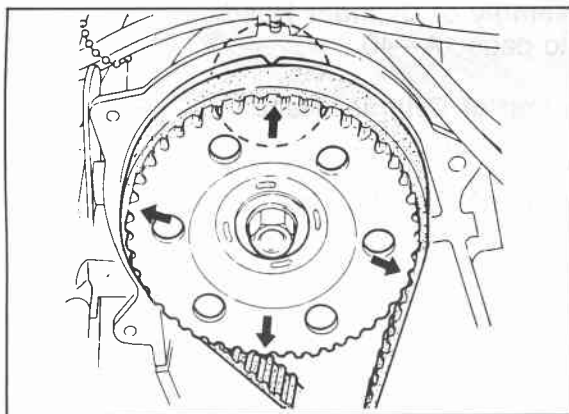
86U01X-032

## Removal note Fuel hose

### Warning

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

Plug the disconnected hoses to avoid fuel leakage.



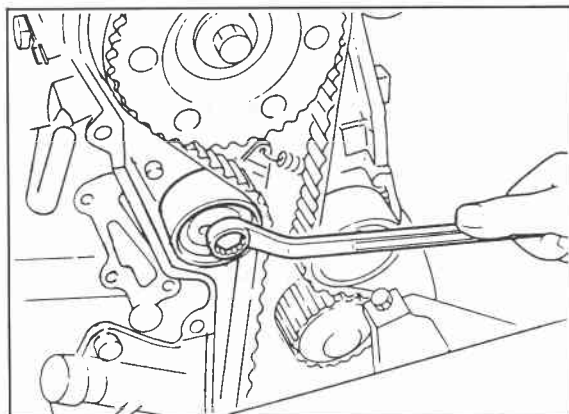
76G01A-032

## Timing belt

1. Before removing the timing belt, turn the crankshaft to align the mating mark of the camshaft pulley with the front housing timing mark.

### Note

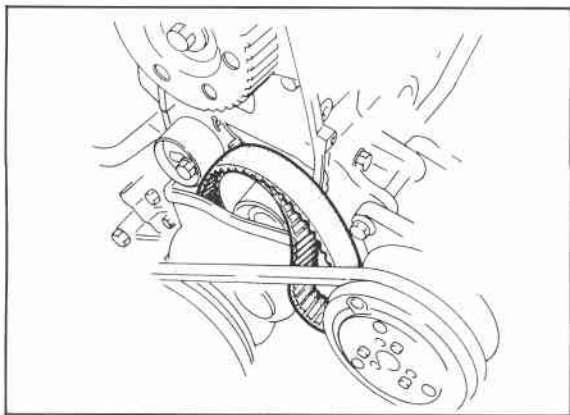
- For FE engine, align "2" mark.**  
**For F8, F6 engine, align "3" mark.**



69G01B-036

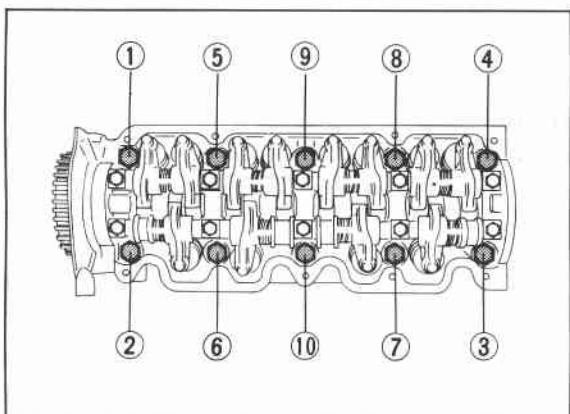
2. Loosen the timing belt tensioner lock bolt.
3. Shift the tensioner outward as far as possible, then temporarily tighten it.

# 1A ON-VEHICLE MAINTENANCE (CYLINDER HEAD)



69G01B-037

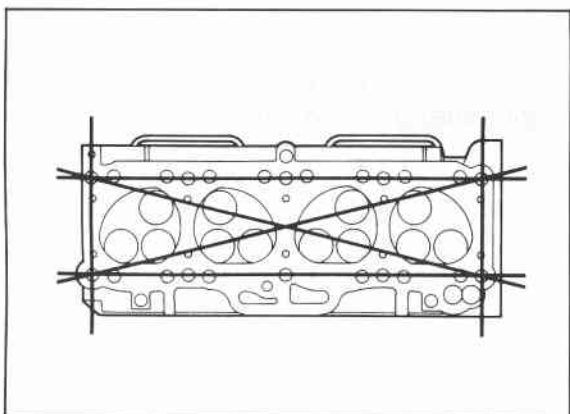
4. Remove the timing belt and secure it out of the way to prevent damage during removal and installation of the cylinder head.



76G01A-111

## Cylinder head bolt

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



76G01A-033

## Disassembly of Cylinder Head

Refer to page 1A—40.

## Inspection of Cylinder Head

Refer to page 1A—48.

## Assembly of Cylinder Head

Refer to page 1A—73.

# ON-VEHICLE MAINTENANCE (CYLINDER HEAD) 1A

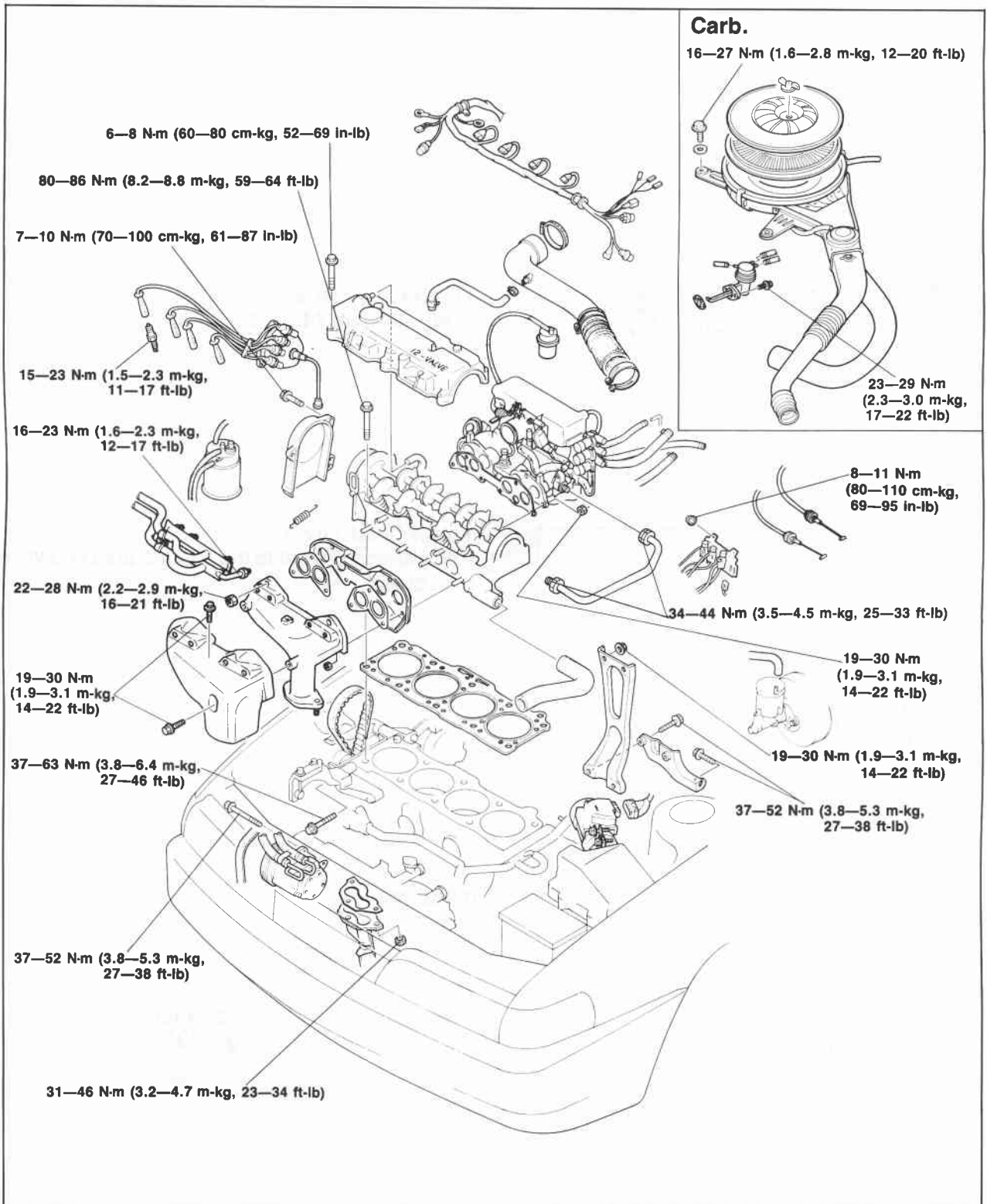
## Installation

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

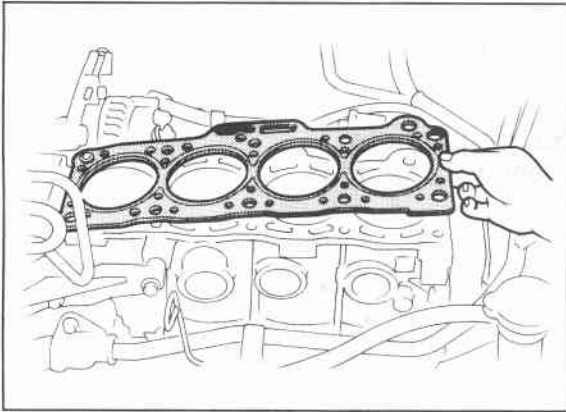
### Note

- 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



# 1A ON-VEHICLE MAINTENANCE (CYLINDER HEAD)

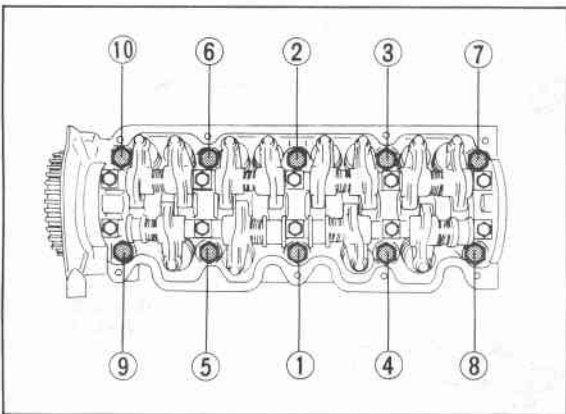


86U01X-035

## Installation note

### Cylinder head

1. Thoroughly remove all dirt and oil from the top of the cylinder block with a rag.
2. Place a new cylinder head gasket in position.

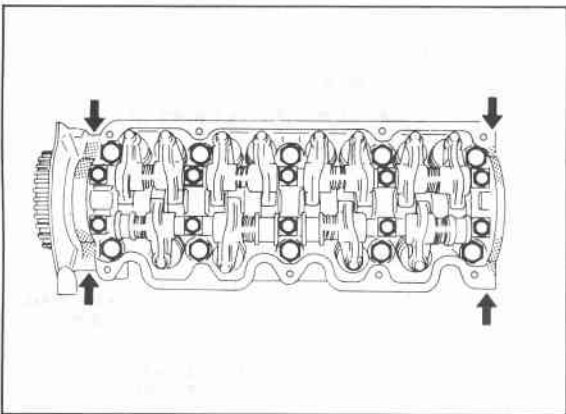


86U01X-036

3. Set the cylinder head in place.
4. Apply engine oil to the bolt threads and seat faces.
5. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

### Tightening torque:

**80—86 N·m (8.2—8.8 m·kg, 59—64 ft·lb)**



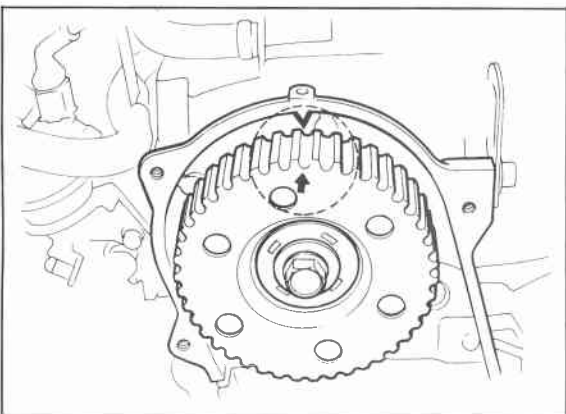
86U01X-037

### Cylinder head cover

1. Apply silicon sealant to the shaded area shown in the figure.
2. Install the cylinder head cover.

### Tightening torque:

**6—8 N·m (60—80 cm·kg, 52—69 in·lb)**



76G01A-034

### Timing belt

1. Align the mating mark of the camshaft pulley with the front housing timing mark.

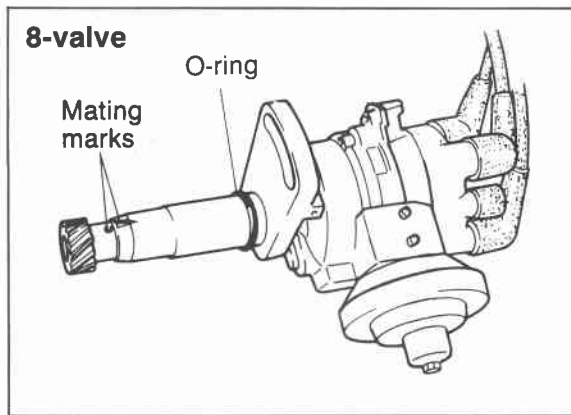
### Note

**For FE engine, align "2" mark.**

**For F8, F6 engine, align "3" mark.**

2. Install the timing belt. (Refer to TIMING BELT of ON-VEHICLE MAINTENANCE.)

# ON-VEHICLE MAINTENANCE (CYLINDER HEAD) 1A



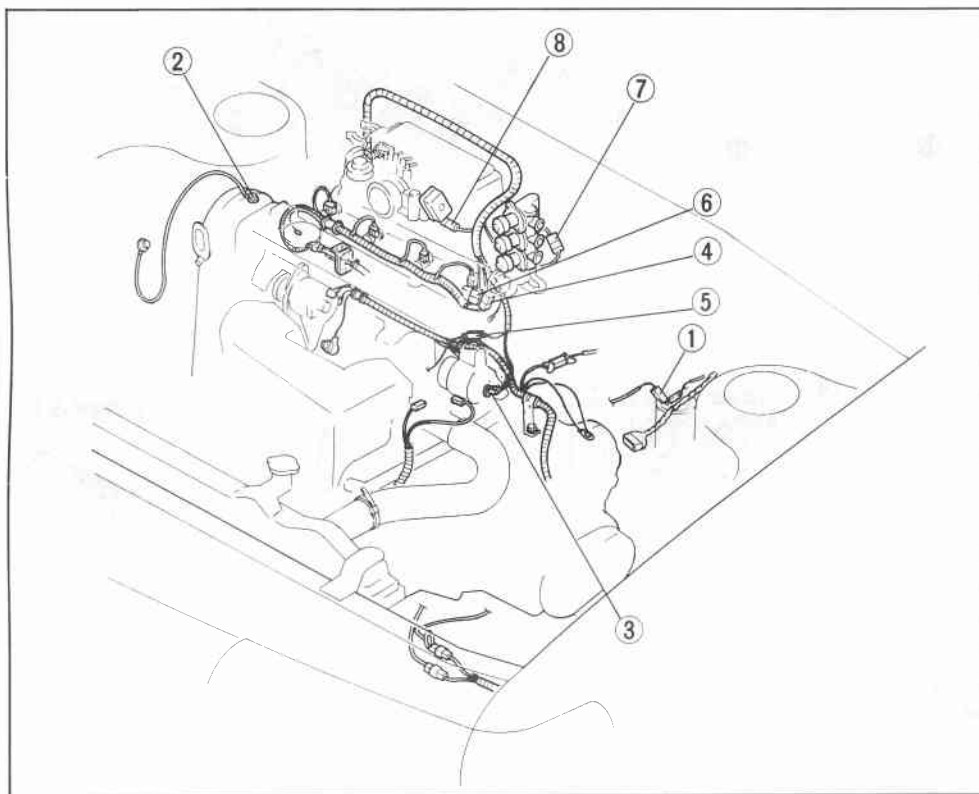
76G01A-035

## Distributor

1. Apply engine oil to the O-ring, and position it on the distributor.
2. Apply engine oil to the blade or gear.
3. Align the mating marks as shown in the figure ...8-valve.
4. Install the distributor with the marks facing straight up.
5. Loosely tighten the distributor mounting bolt.

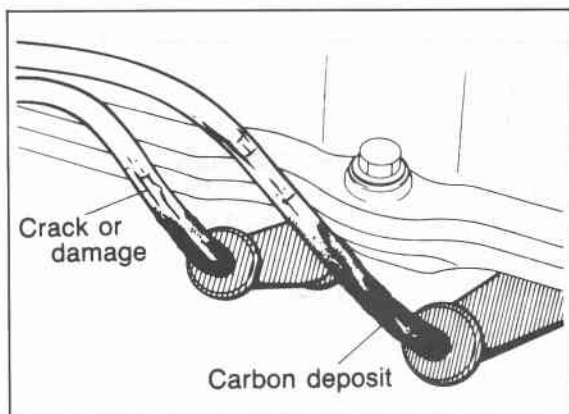
## Engine harness connector

Install the engine harness connectors.



76G01A-113

1. IG coil
2. Engine ground
3. Water temperature sensor
4. Water thermo switch
5. Oxygen sensor (FI)
6. Injection harness (FI)
7. F/I solenoid valve (FI)
8. Throttle sensor (FI)



86U01X-041

## 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.)

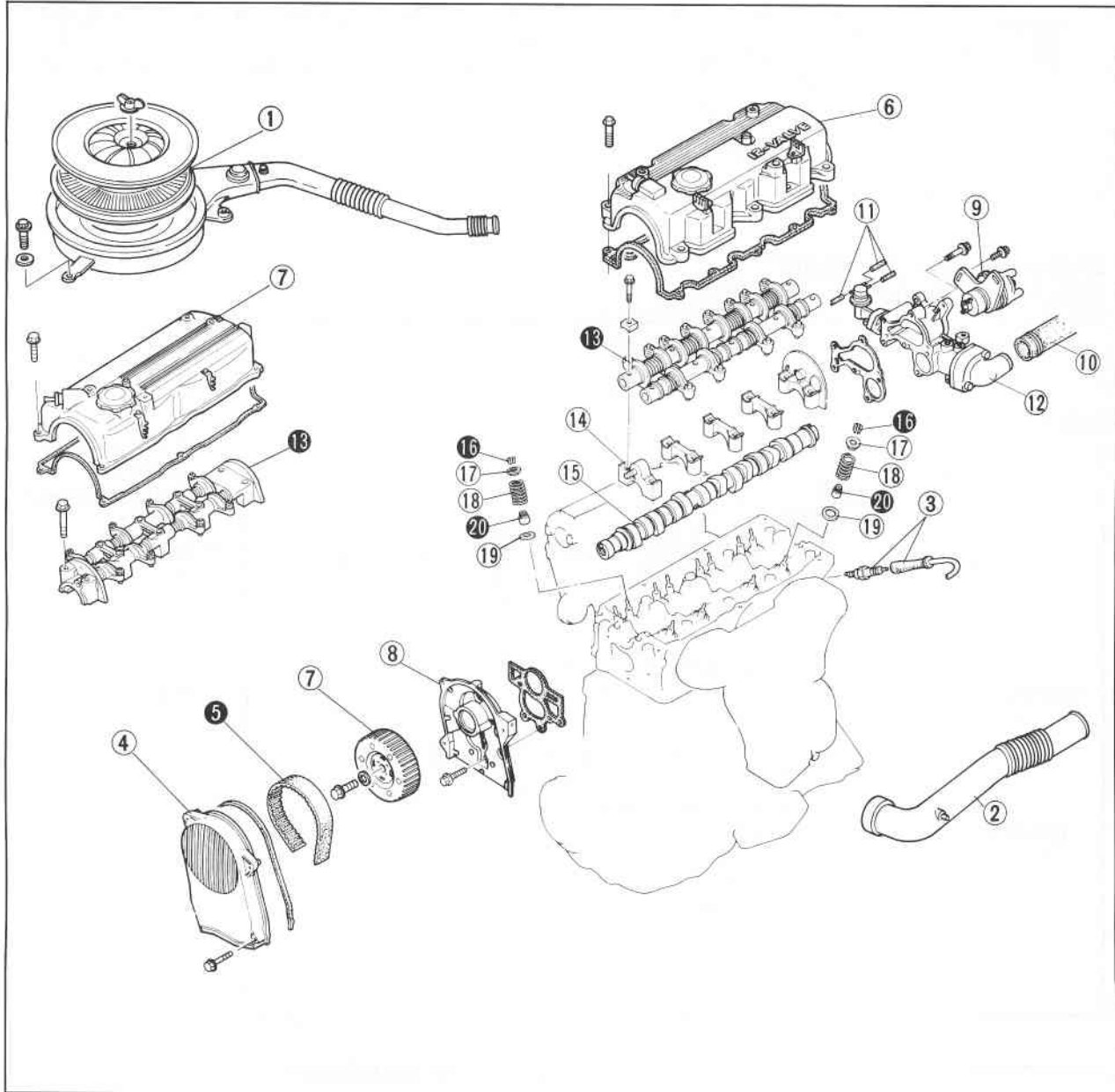
# 1A ON-VEHICLE MAINTENANCE (VALVE SEAL)

## VALVE SEAL

### Removal

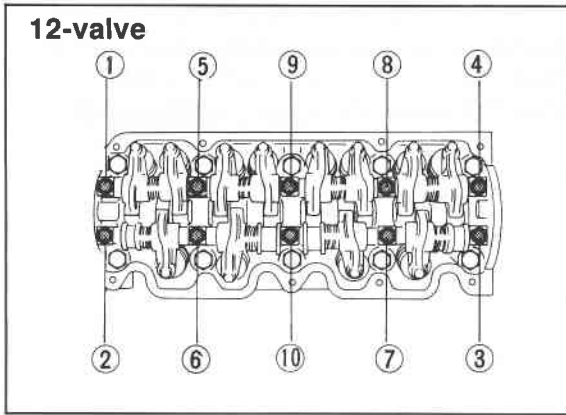
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.

76G01A-114

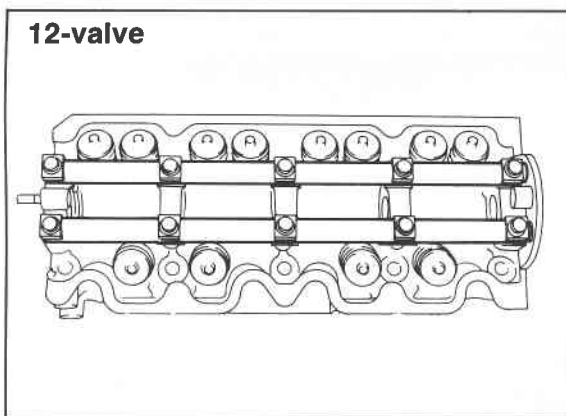
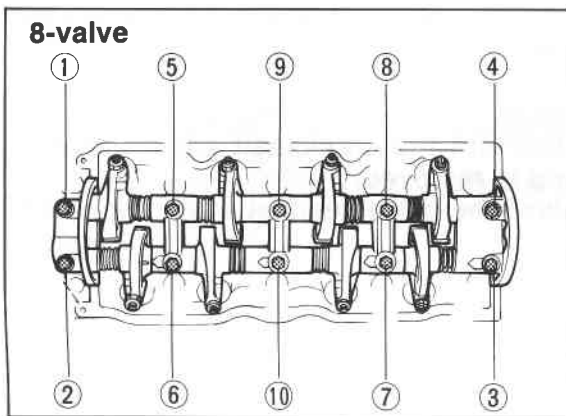


76G01A-036

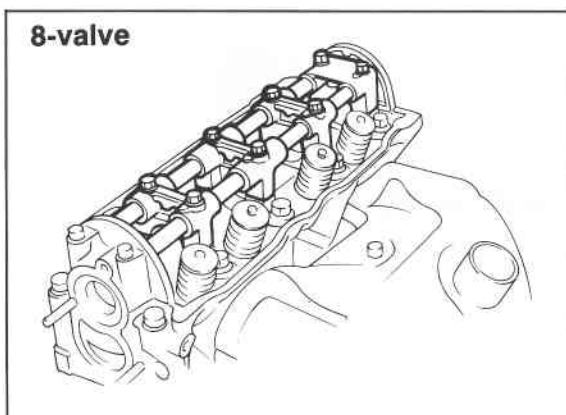
- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| 1. Air cleaner assembly (carb.)     | 11. Fuel hose (carb.)             |
| 2. Air intake pipe (FI)             | 12. Rear housing                  |
| 3. High-tension lead and spark plug | 13. Rocker arm and shaft assembly |
| 4. Upper timing belt cover          | 14. Camshaft cap (12-valve)       |
| 5. Timing belt                      | 15. Camshaft                      |
| 6. Cylinder head cover              | 16. Valve keeper                  |
| 7. Camshaft pulley                  | 17. Upper valve spring seat       |
| 8. Front housing                    | 18. Valve spring                  |
| 9. Distributor                      | 19. Lower valve spring seat       |
| 10. Upper radiator hose             | 20. Valve seal                    |



76G01A-037



86U01X-045



**Removal note**

**Timing belt**

Remove the timing belt. (Refer to page 1A—14.)

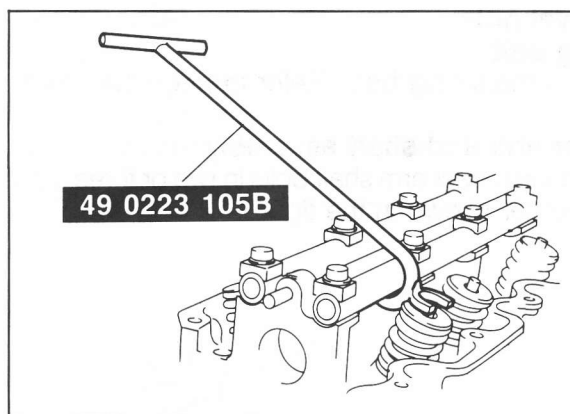
**Rocker arm and shaft assembly**

Loosen the rocker arm shaft bolts in two or three steps in the order shown in the figure.

**Valve seal**

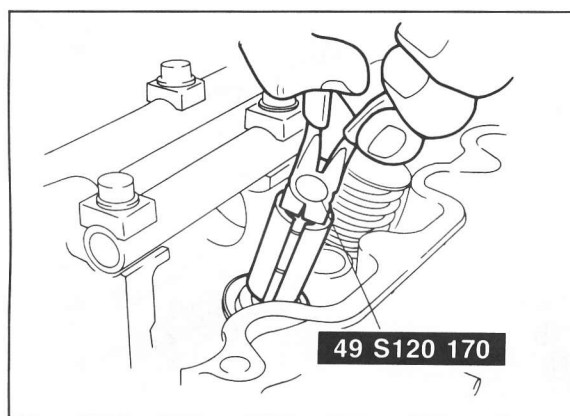
1. Remove the rocker arms and springs from the rocker arm shaft.
2. Install the camshaft caps and rocker arm shafts onto the cylinder head.
3. Plug the oil drain hole with a rag to prevent the possibility of the valve keepers from falling into the oil pan.

# 1A ON-VEHICLE MAINTENANCE (VALVE SEAL)



86U01X-046

4. Turn the crankshaft to position the piston of the valve seal to be replaced at top dead center.
5. Remove the valve keepers with the **SST**.
6. Remove the valve spring and spring seats.



86U01X-047

7. Remove the valve seal from the valve guide with the **SST**.

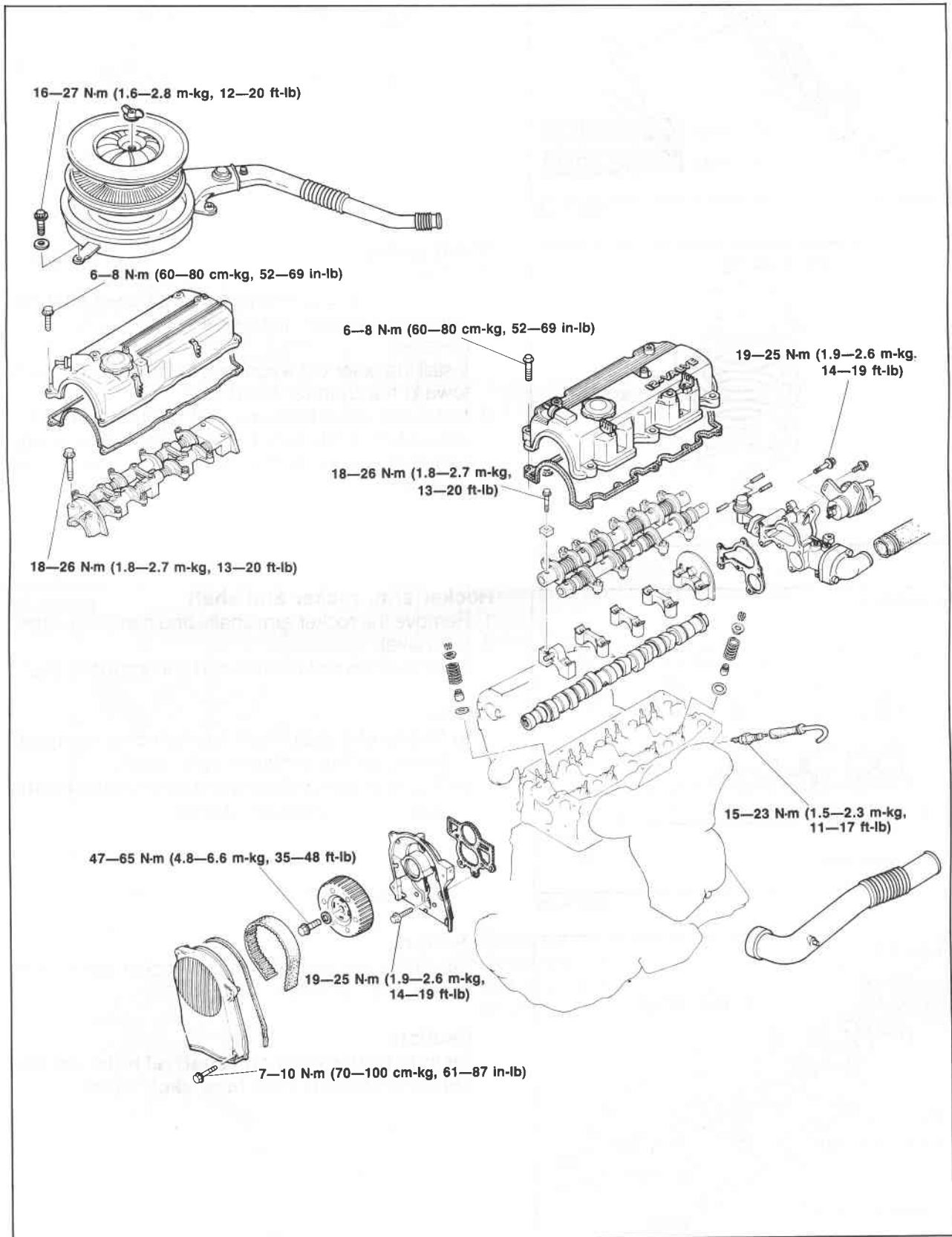
### Caution

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

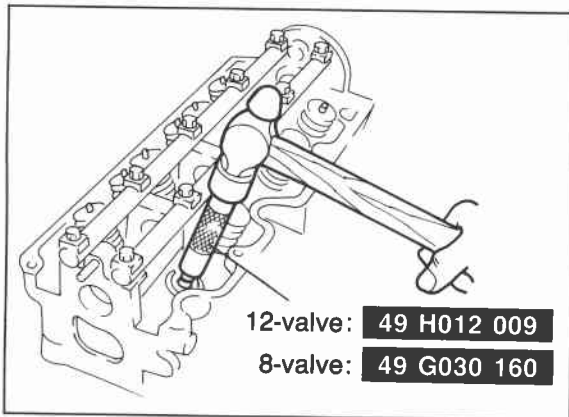
## Installation

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

## Torque Specifications



# 1A ON-VEHICLE MAINTENANCE (VALVE SEAL)

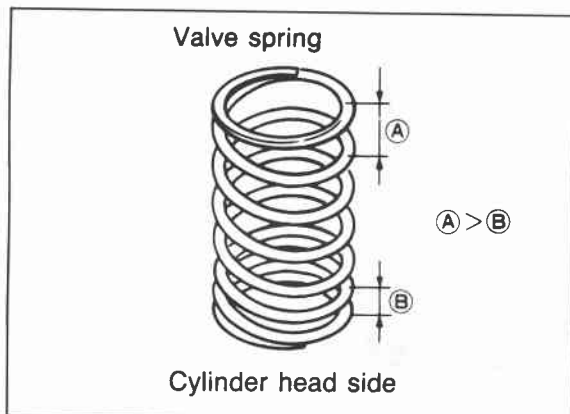


86U01X-049

## Installation note

### Valve seal

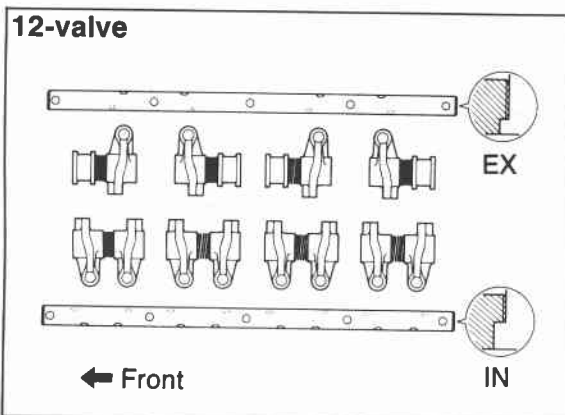
1. Apply engine oil to the inside of the new valve seal.
2. Push it on gently with the **SST**.



76G01A-038

## Valve spring

1. (12-valve)  
Install the valve spring with the narrower pitch toward the cylinder head side.  
(8-valve)  
Install the outer valve spring with the narrower pitch toward the cylinder head side.
2. Install the valve keepers, and 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.



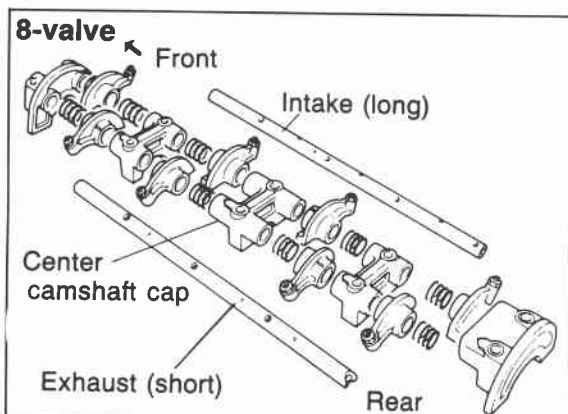
76G01A-039

## Rocker arm, rocker arm shaft

1. Remove the rocker arm shafts and camshaft caps.
2. (12-valve)  
Assemble the rocker arms and springs to the shaft.

### Note

- a) The intake side shaft has twice as many oil holes as the exhaust side shaft.
- b) The stepped ends are the rear sides of both intake and exhaust shafts.



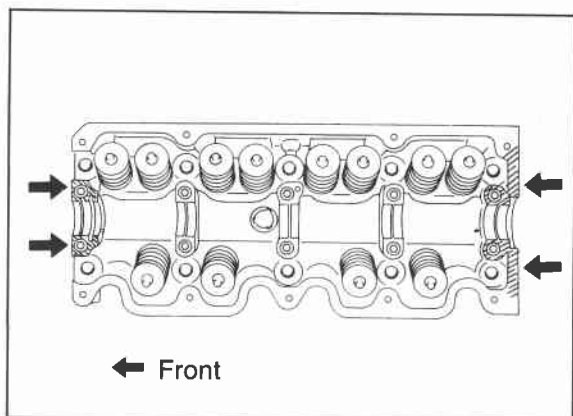
76G01A-040

(8-valve)

Assemble the camshaft caps, rocker arms, and springs, to the shafts.

### Caution

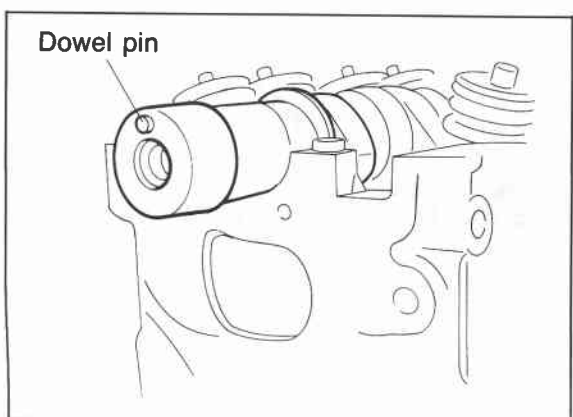
**Be sure both rocker arm shaft oil holes (in the center camshaft cap) face each other.**



76G01A-041

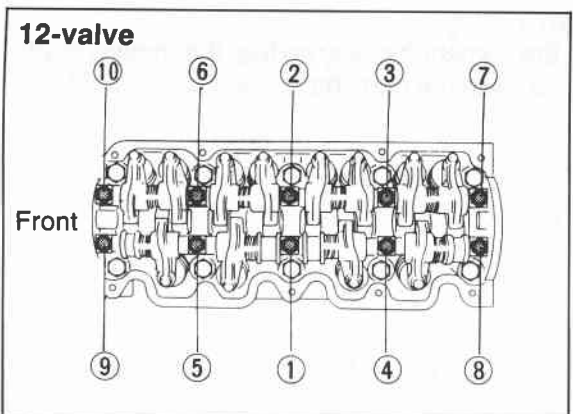
### Camshaft

1. Apply sealant to the shaded areas as shown in the figure.



76G01A-042

2. Apply engine oil to the camshaft journals.
3. Install the camshaft with its dowel pin upward.



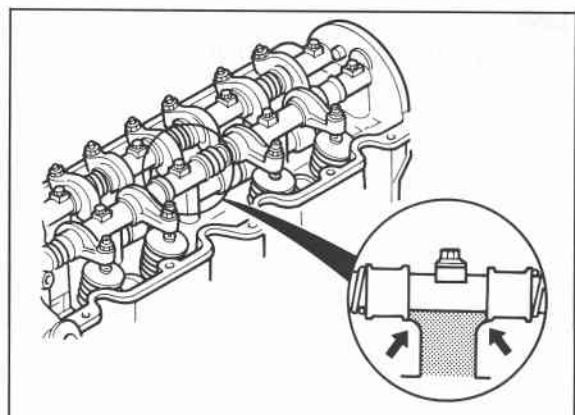
76G01A-043

### Rocker arm and shaft assembly (12-valve)

1. Install the camshaft caps.
2. Install the rocker arm and shaft assemblies on the cylinder head, and tighten them in three steps in the order shown in the figure.

#### Tightening torque:

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

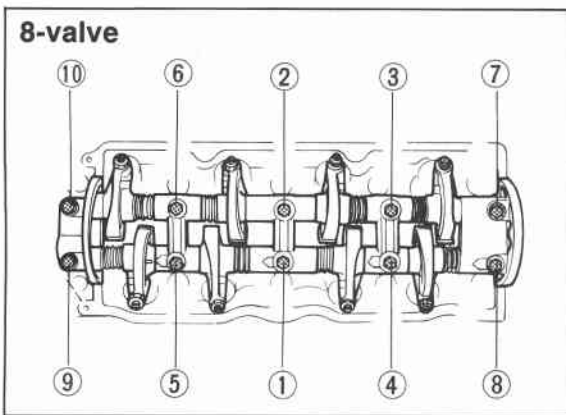


86U01X-052

### Caution

**Be careful that the rocker arms or spacers do not get caught between the shaft and camshaft cap.**

# 1A ON-VEHICLE MAINTENANCE (VALVE SEAL)



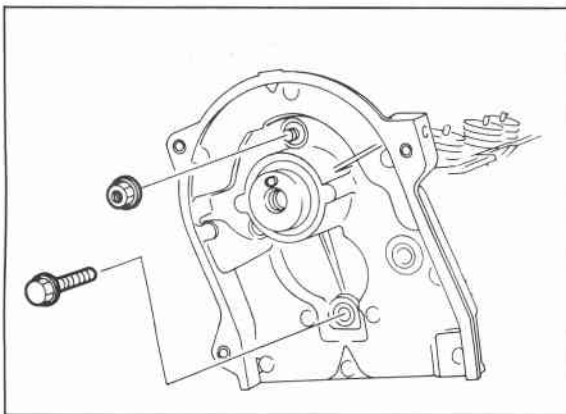
76G01A-044

(8-valve)

Install the rocker arm and shaft assemblies on the cylinder head and tighten them in three steps in the order shown in the figure.

**Tightening torque:**

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



86U01X-212

**Front housing**

1. Replace the oil seal in the front housing.
2. Apply engine oil to the oil seal lip.
3. Install the front housing along with a new gasket.

**Tightening torque:**

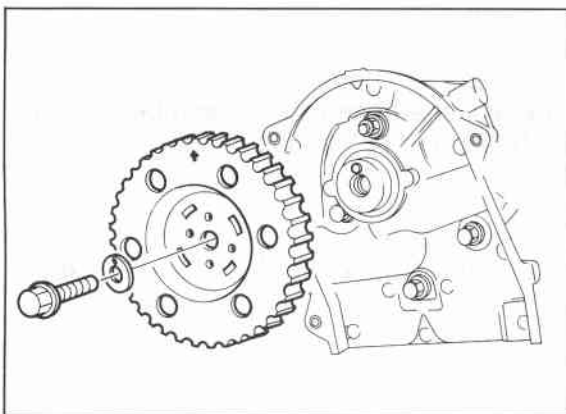
**19–25 N·m (1.9–2.6 m·kg, 14–19 ft·lb)**

**Rear housing**

Install the rear housing along with a new gasket.

**Tightening torque:**

**19–25 N·m (1.9–2.6 m·kg, 14–19 ft·lb)**



76G01A-045

**Camshaft pulley**

1. Install the camshaft pulley so that the mating mark is aligned with the camshaft dowel pin straight up.

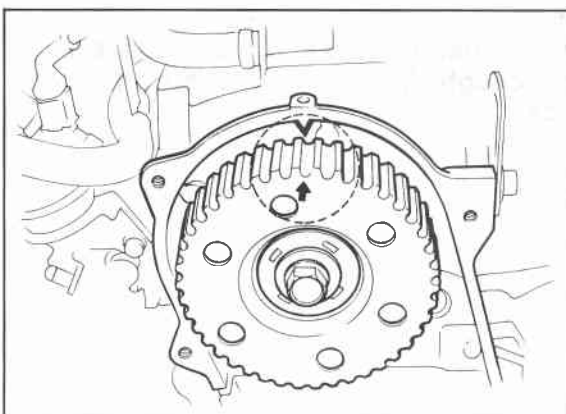
**Note**

**For FE engine, align “2” mark.  
For F8, F6 engine, align “3” mark.**

2. Tighten the lock bolt.

**Tightening torque:**

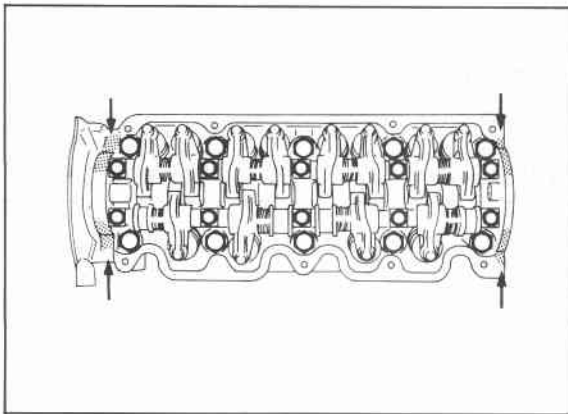
**47–65 N·m (4.8–6.6 m·kg, 35–48 ft·lb)**



86U01X-053

**Timing belt**

Install the timing belt. (Refer to TIMING BELT of ON-VEHICLE MAINTENANCE.)



76G01A-116

## Valve clearance (8-valve)

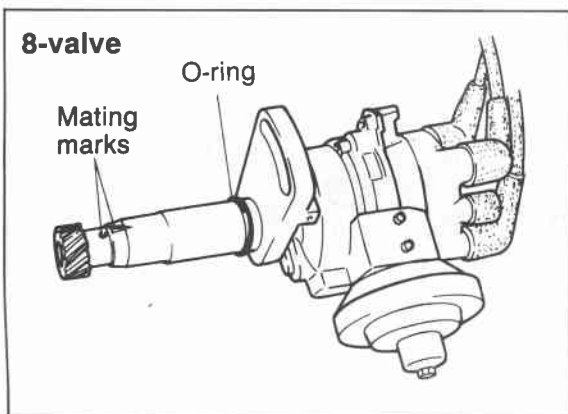
Adjust the valve clearance. (Refer to page 1A—10.)

## Cylinder head cover

1. Apply silicon sealant to the shaded areas shown in the figure.
2. Install the cylinder head cover.

## Tightening torque:

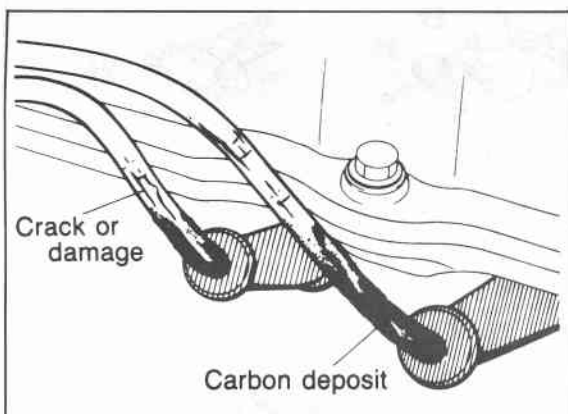
**6—8 N·m (60—80 cm·kg, 52—69 in·lb)**



76G01A-035

## Distributor

1. Apply engine oil to the O-ring, and position it on the distributor.
2. Apply engine oil to the blade or gear.
3. Align the mating marks as shown in the figure ...8-valve.
4. Install the distributor with the marks facing straight up.
5. Loosely tighten the distributor mounting bolt.



86U01X-055

## Steps After Installation

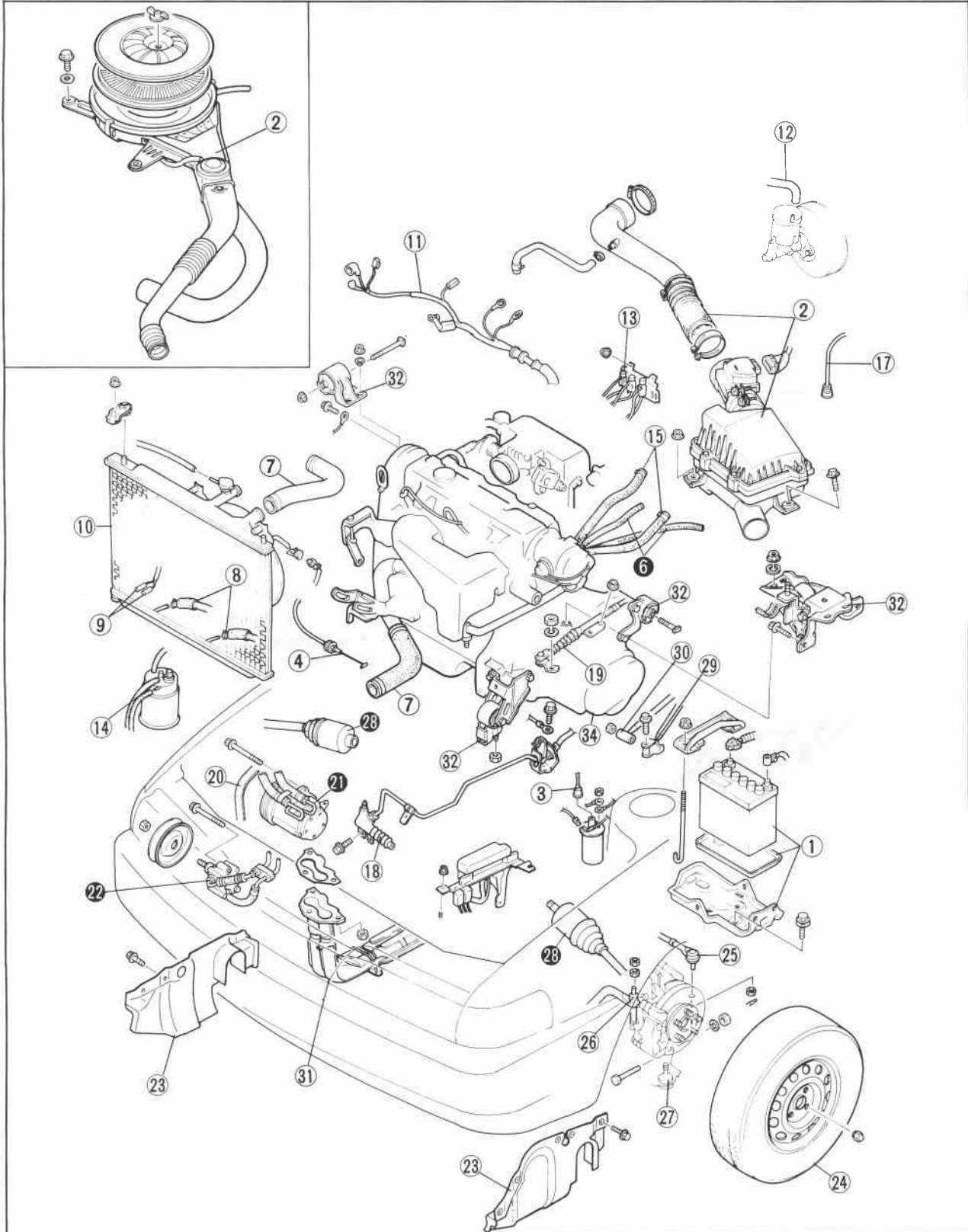
1. Fill the radiator with the specified amount and type of coolant.
2. Perform the necessary engine adjustments. (Refer to TUNE-UP PROCEDURE.)

# 1A REMOVAL

## REMOVAL

**Warning: Release the fuel pressure. (Refer to Section 4.)**

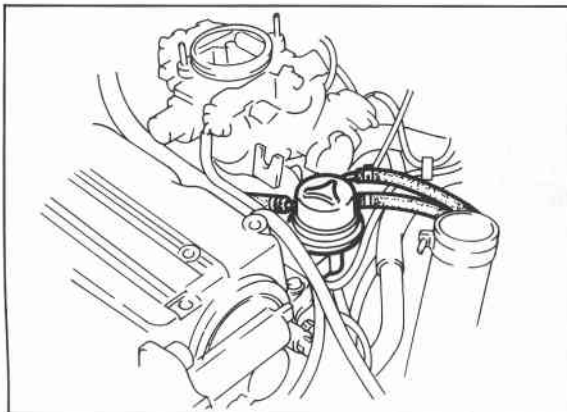
1. Disconnect the negative battery cable.
2. Drain the engine oil and coolant.
3. Remove in the sequence shown in the figure referring to the removal note for specially marked parts.



76G01A-117

- |                                |                                     |                            |
|--------------------------------|-------------------------------------|----------------------------|
| 1. Battery and battery carrier | 13. Three-way solenoid assembly     | 22. P/S oil pump           |
| 2. Air cleaner assembly        | 14. Canister hose (FI, Middle East) | 23. Engine side cover      |
| 3. High-tension lead           | 15. Heater hose                     | 24. Front wheel            |
| 4. Accelerator cable           | 16. Transaxle harness               | 25. Tie-rod end            |
| 5. Throttle cable (ATX)        | 17. Speedometer cable               | 26. Stabilizer control rod |
| 6. Fuel hose                   | 18. Clutch release cylinder (MTX)   | 27. Lower arm bushing      |
| 7. Radiator hose               | 19. Control cable (ATX)             | 28. Driveshaft             |
| 8. ATF hose (ATX)              | 20. Drive belt                      | 29. Change rod (MTX)       |
| 9. Radiator harness            | 21. A/C compressor and bracket      | 30. Extension bar (MTX)    |
| 10. Radiator and cooling fan   |                                     | 31. Exhaust pipe           |
| 11. Engine harness             |                                     | 32. Engine mount           |
| 12. Brake vacuum hose          |                                     | 33. Engine and transaxle   |
|                                |                                     | 34. Transaxle              |

76G01A-046



76G01A-118

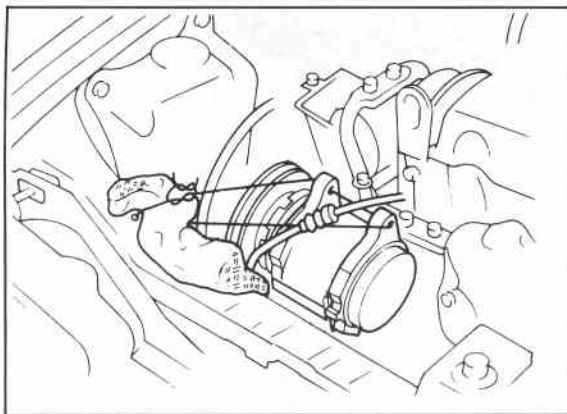
### Removal Note Fuel hose

#### Warning

a) Cover the hose with a rag because fuel will spray out when disconnecting.

b) Keep sparks and open flame away from the fuel area.

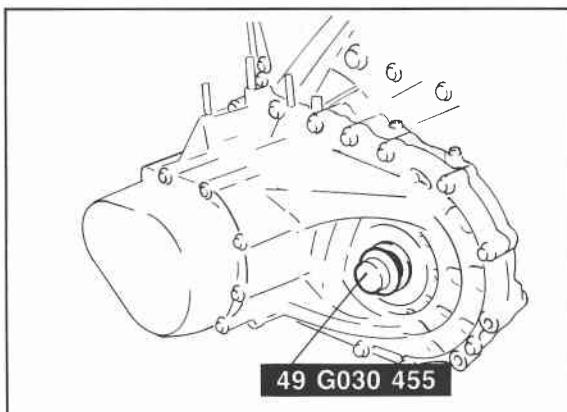
Plug the disconnected hoses to avoid fuel leakage.



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.



86U01X-060

### Driveshaft

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

# 1A DISASSEMBLY (AUXILIARY PARTS)

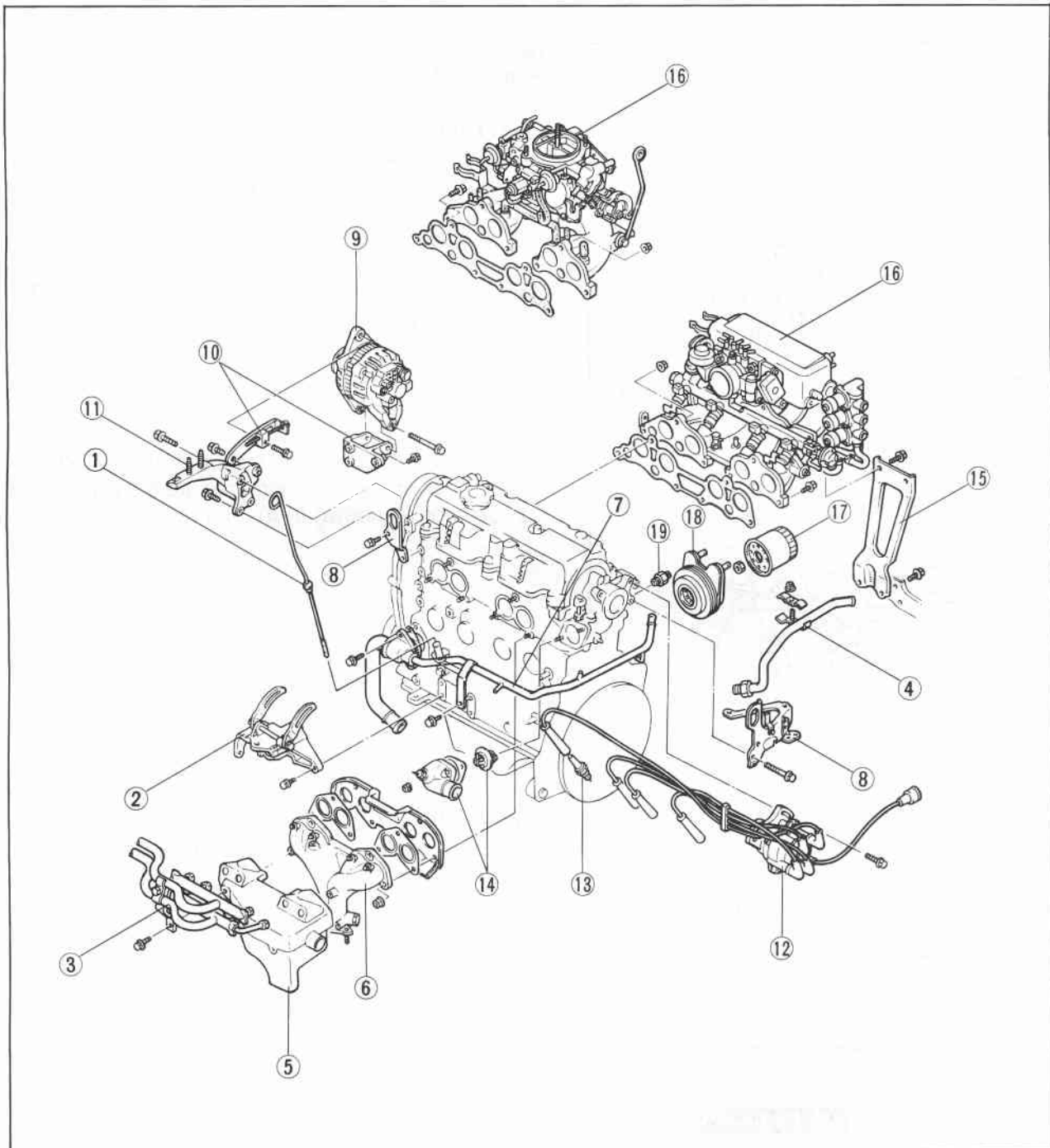
## DISASSEMBLY

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

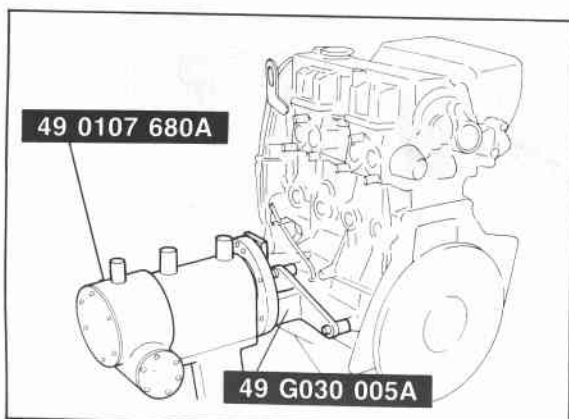


76G01A-119

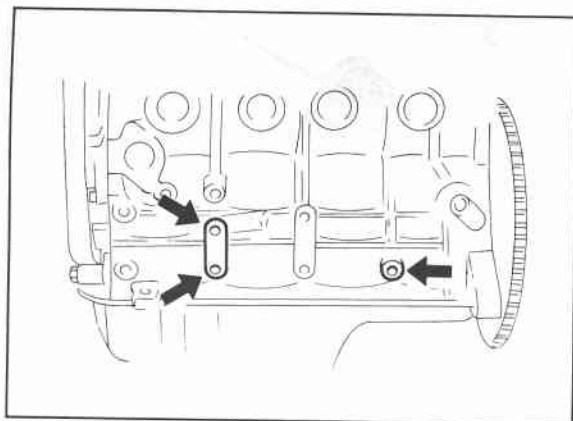
## DISASSEMBLY (AUXILIARY PARTS) 1A

1. Oil level gauge
2. P/S oil pump bracket
3. Secondary air pipe assembly (except General)
4. EGR pipe (FI, Unleaded carb.)
5. Exhaust manifold insulator
6. Exhaust manifold assembly
7. Coolant inlet pipe and bypass pipe
8. Engine hanger
9. Alternator
10. Alternator strap and bracket
11. Engine mount bracket
12. Distributor and high-tension lead
13. Spark plug
14. Thermostat and thermostat cover
15. Intake manifold bracket (FI)
16. Intake manifold assembly
17. Oil filter
18. Oil cooler (8-valve...only ECE, 12-valve)
19. Oil pressure switch

76G01A-047



76G01A-120

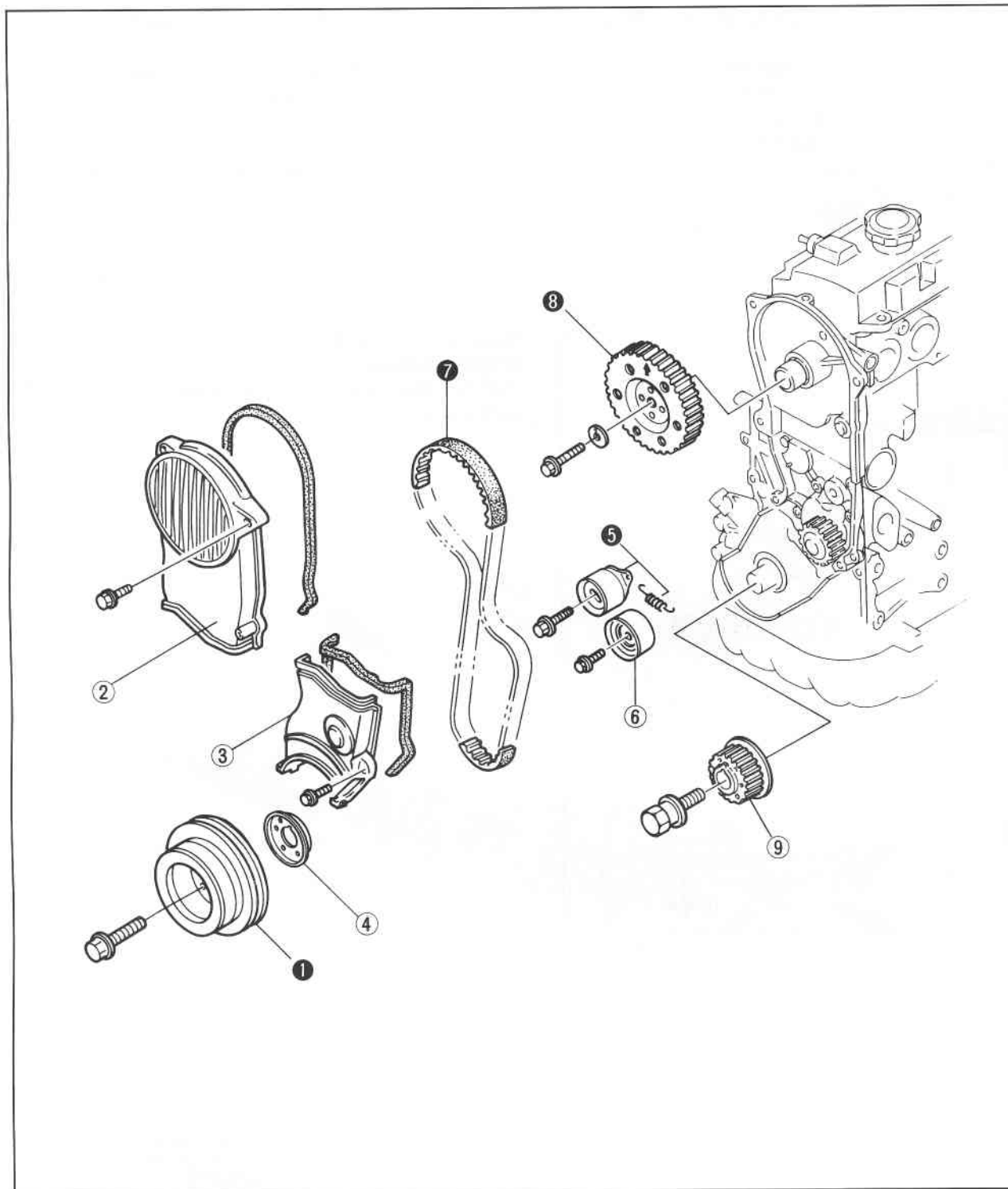


### Disassembly Note Engine hanger

Remove the exhaust manifold; then connect the **SST** to the engine.

# 1A DISASSEMBLY (TIMING BELT)

## TIMING BELT

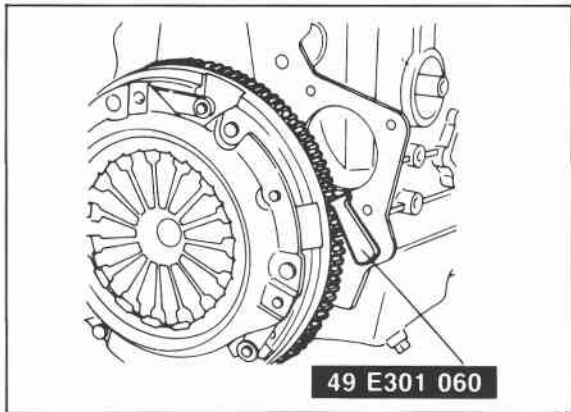


69G01B-072

1. Crankshaft pulley
2. Upper timing belt cover
3. Lower timing belt cover
4. Baffle plate
5. Timing belt tensioner and spring

6. Timing belt idler pulley
7. Timing belt
8. Camshaft pulley
9. Timing belt pulley

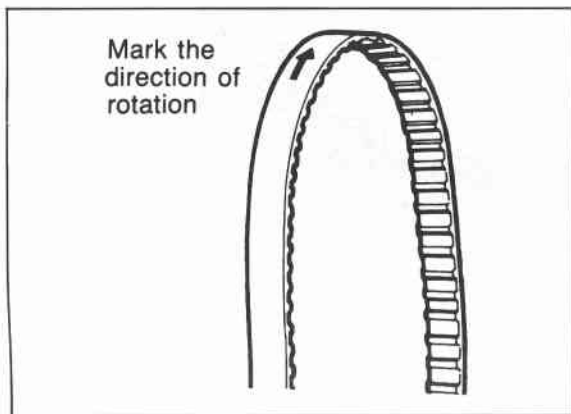
# DISASSEMBLY (TIMING BELT) 1A



76G01A-121

## Disassembly Note Crankshaft pulley

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



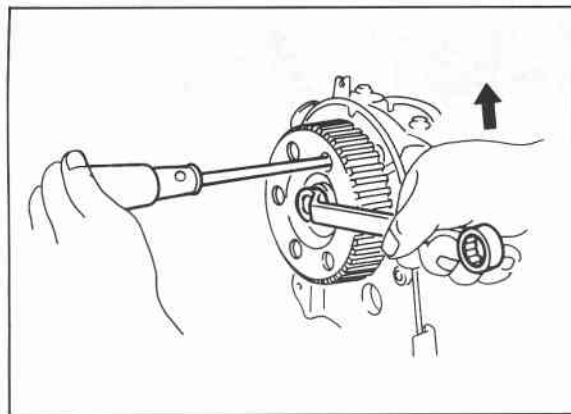
76G01A-122

## Timing belt

1. Loosen the tensioner lock bolt, and remove the tensioner spring.
2. Mark the timing belt rotation for proper reinstallation if it is reused.
3. Remove the timing belt.

## Caution

**Be careful not to allow oil or grease on the belt.**



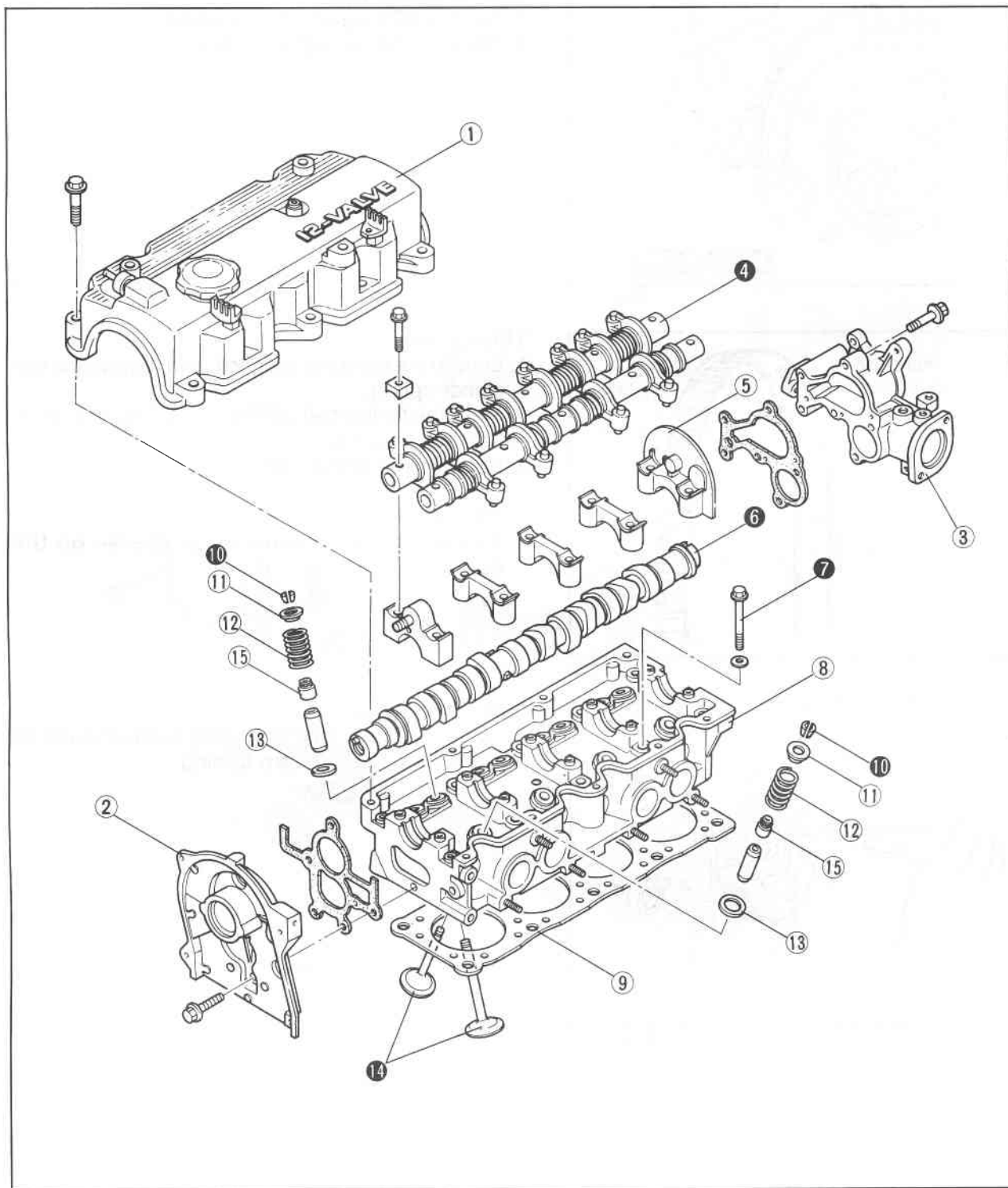
76G01A-123

## Camshaft pulley

Remove the pulley lock bolt using a screw driver to prevent the camshaft from turning.

# 1A DISASSEMBLY (CYLINDER HEAD)

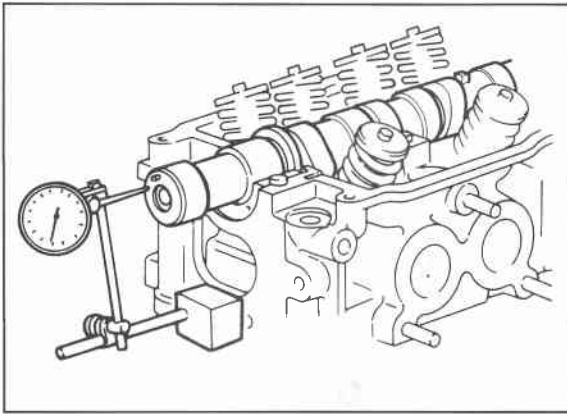
## CYLINDER HEAD (12-valve)



76G01A-048

- |                                  |                         |
|----------------------------------|-------------------------|
| 1. Cylinder head cover           | 8. Cylinder head        |
| 2. Front housing                 | 9. Cylinder head gasket |
| 3. Rear housing                  | 10. Valve keeper seat   |
| 4. Rocker arm and shaft assembly | 11. Upper spring seat   |
| 5. Camshaft cap                  | 12. Valve spring        |
| 6. Camshaft                      | 13. Lower spring seat   |
| 7. Cylinder head bolt            | 14. Valve               |
|                                  | 15. Valve seal          |

# DISASSEMBLY (CYLINDER HEAD) 1A



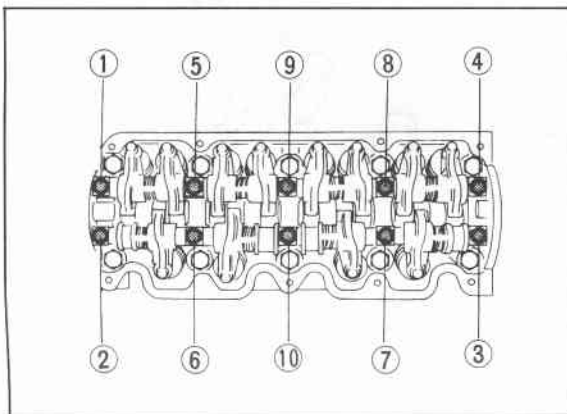
76G01A-049

## Disassembly Note

### Camshaft

Before removing the rocker arm and shaft assembly, clean the bearings and journals, and measure the following points.

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



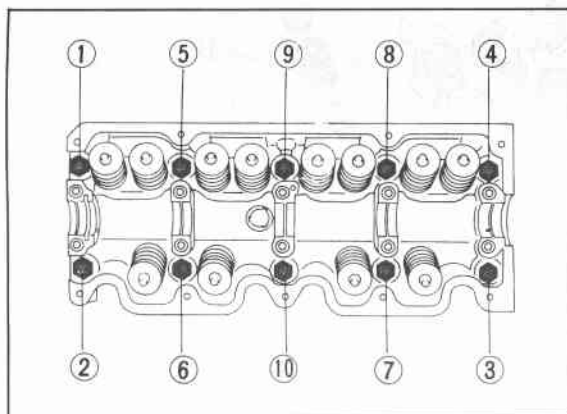
86U01X-067

## Rocker arm and shaft assembly

1. Loosen the bolts in two or three steps in the order shown in the figure.
2. Remove the rocker arm and shaft assembly together with the bolts.

### Caution

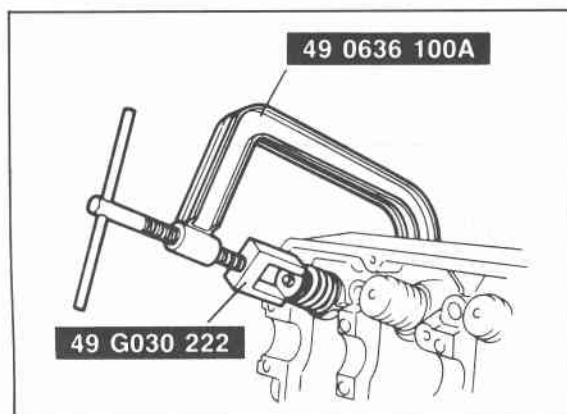
- a) Do not mix up the various parts of the rocker arm and shaft assembly.
- b) Do not remove the HLA unless necessary.



86U01X-068

## Cylinder head bolt

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



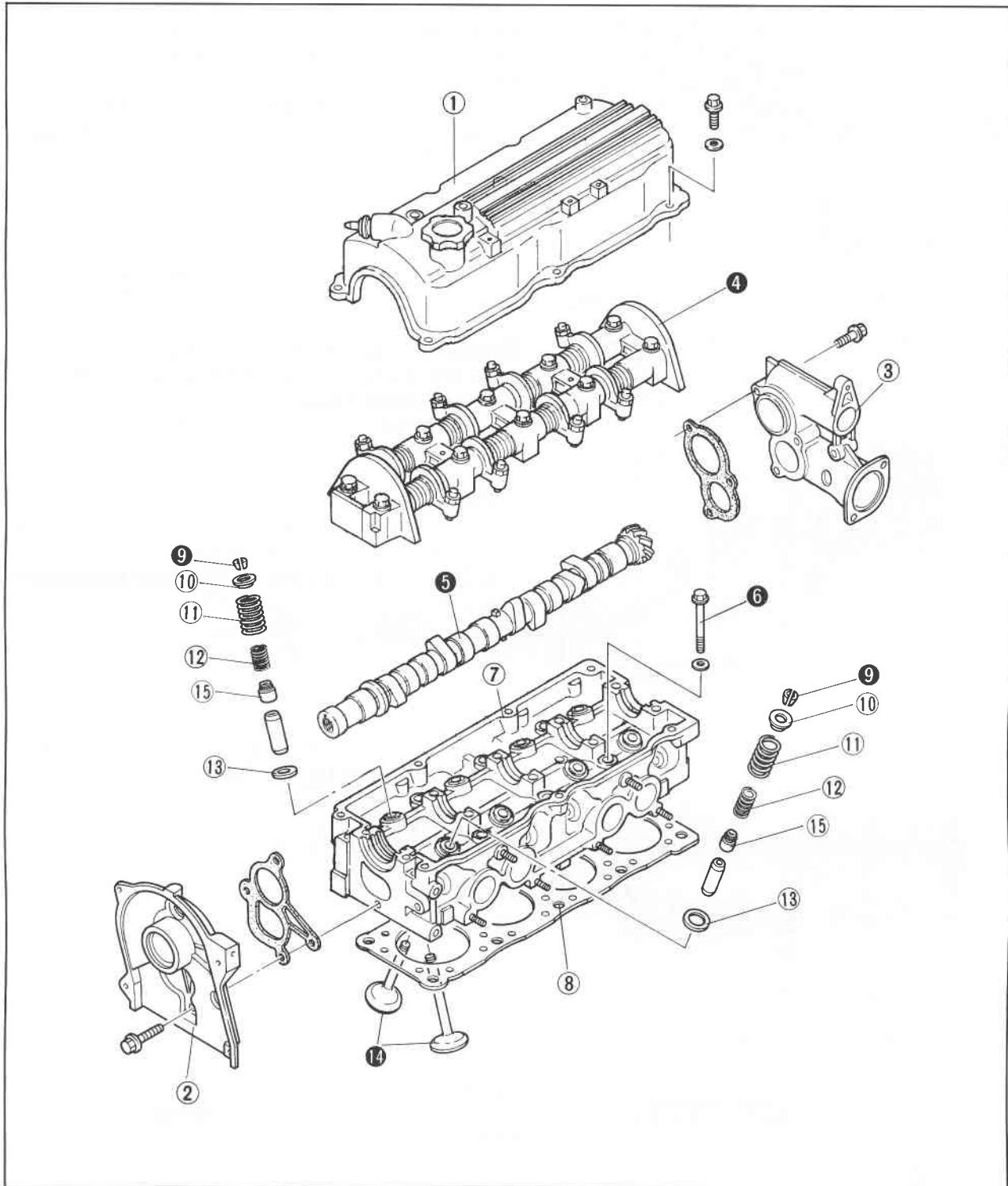
86U01X-069

## Valve

Remove the valves from the cylinder head with the SST.

# 1A DISASSEMBLY (CYLINDER HEAD)

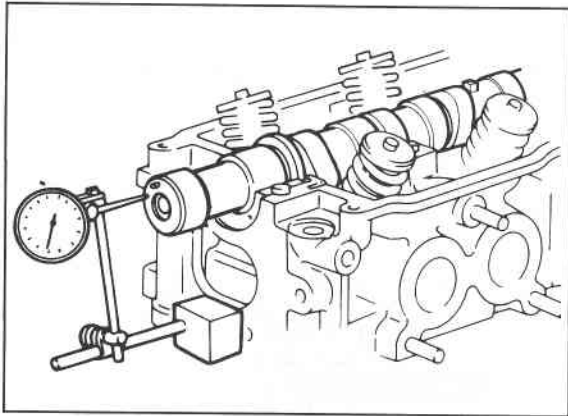
## CYLINDER HEAD (8-valve)



76G01A-050

- |                                  |                        |
|----------------------------------|------------------------|
| 1. Cylinder head cover           | 9. Valve keeper        |
| 2. Front housing                 | 10. Upper spring seat  |
| 3. Rear housing                  | 11. Outer valve spring |
| 4. Rocker arm and shaft assembly | 12. Inner valve spring |
| 5. Camshaft                      | 13. Lower spring seat  |
| 6. Cylinder head bolt            | 14. Valve              |
| 7. Cylinder head                 | 15. Valve seal         |
| 8. Cylinder head gasket          |                        |

# DISASSEMBLY (CYLINDER HEAD) 1A

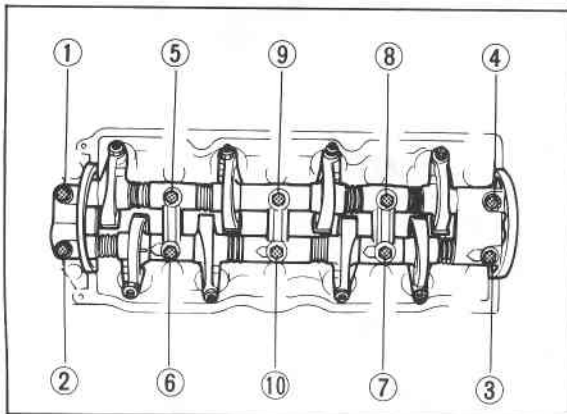


76G01A-049

## Disassembly Note Camshaft

Before removing the rocker arm and shaft assembly, clean the bearings and journals, and measure the following points.

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



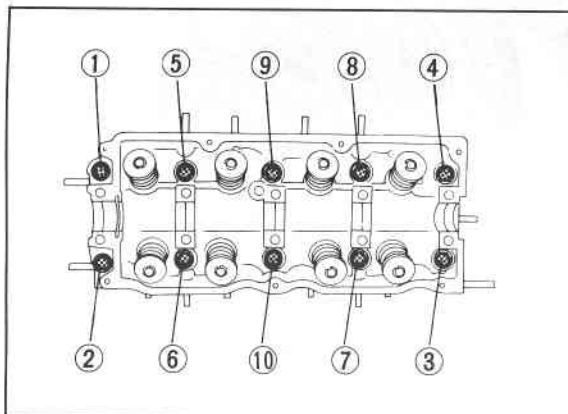
76G01A-057

## Rocker arm and shaft assembly

1. Loosen the bolts in two or three steps in the order shown in the figure.
2. Remove the rocker arm and shaft assembly together with the bolts.

### Caution

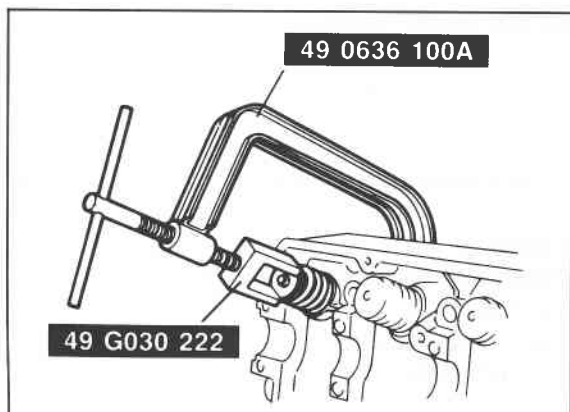
**Do not mix up the various parts of the rocker arm and shaft assembly.**



86U01X-068

## Cylinder head bolt

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



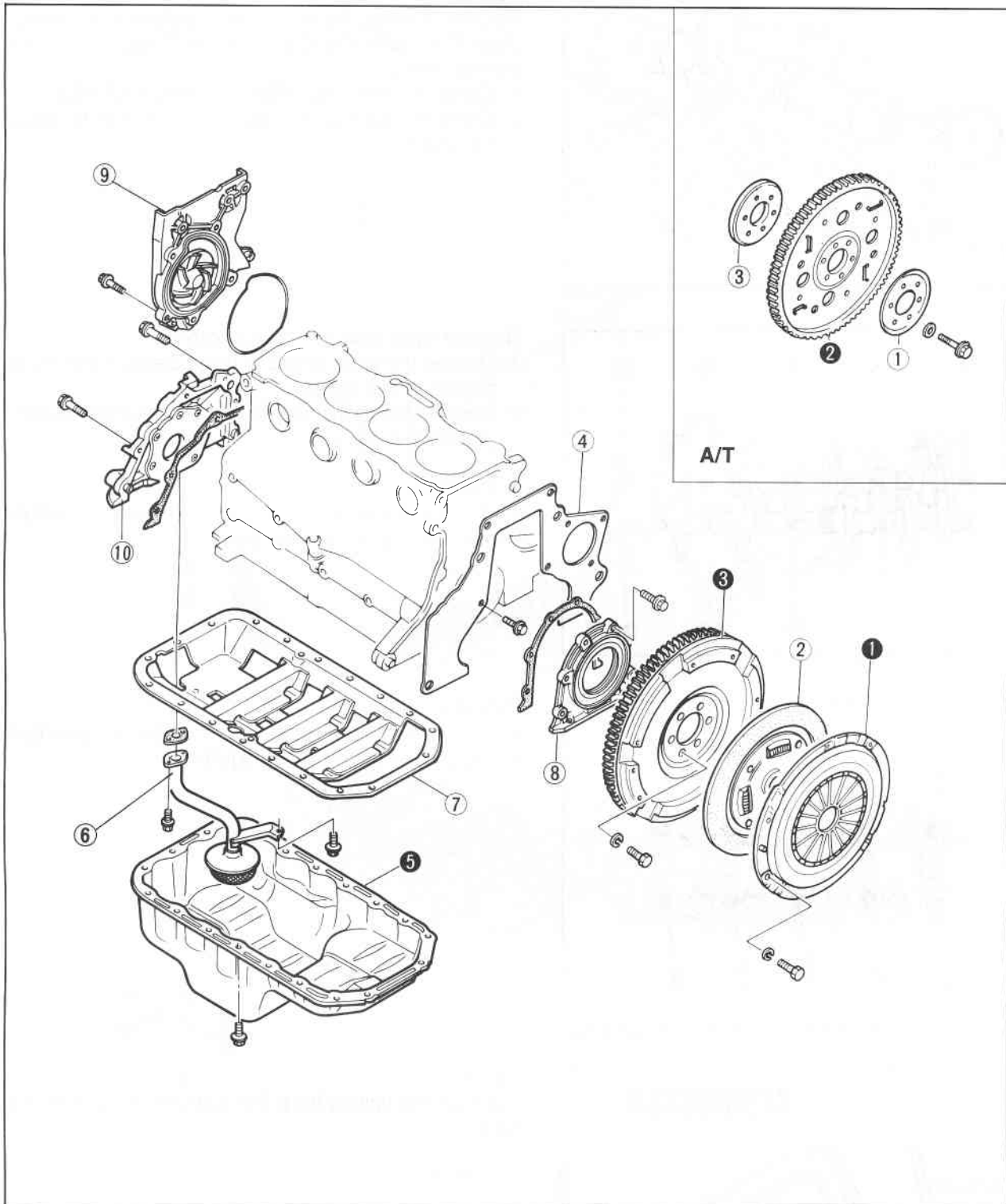
86U01X-069

## Valve

Remove the valves from the cylinder head with the SST.

# 1A DISASSEMBLY (CYLINDER BLOCK)

## CYLINDER BLOCK—I

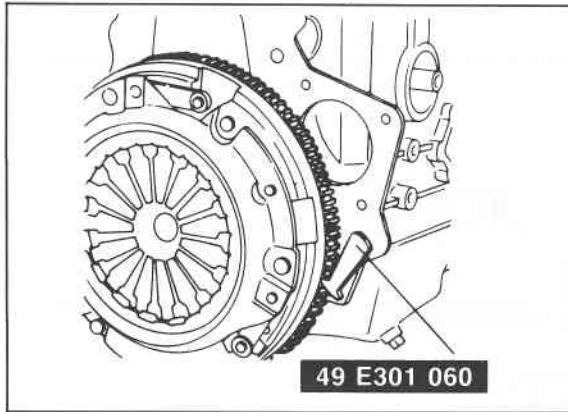


76G01A-051

1. Clutch cover (MTX), Backing plate (ATX)
2. Clutch disc (MTX), Drive plate (ATX)
3. Flywheel (MTX), Adaptor (ATX)
4. End plate
5. Oil pan

6. Oil strainer
7. Stiffener (FE 8-valve...only ECE, 12-valve)
8. Rear cover
9. Water pump assembly
10. Oil pump assembly

## DISASSEMBLY (CYLINDER BLOCK) 1A

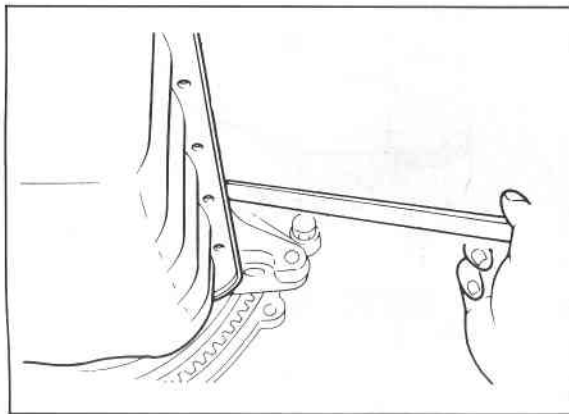


76G01A-125

### Disassembly Note

#### Clutch cover, flywheel (MTX) or drive plate (ATX)

Remove the clutch cover and flywheel (MTX), or drive plate (ATX) with the **SST**.



### Oil pan

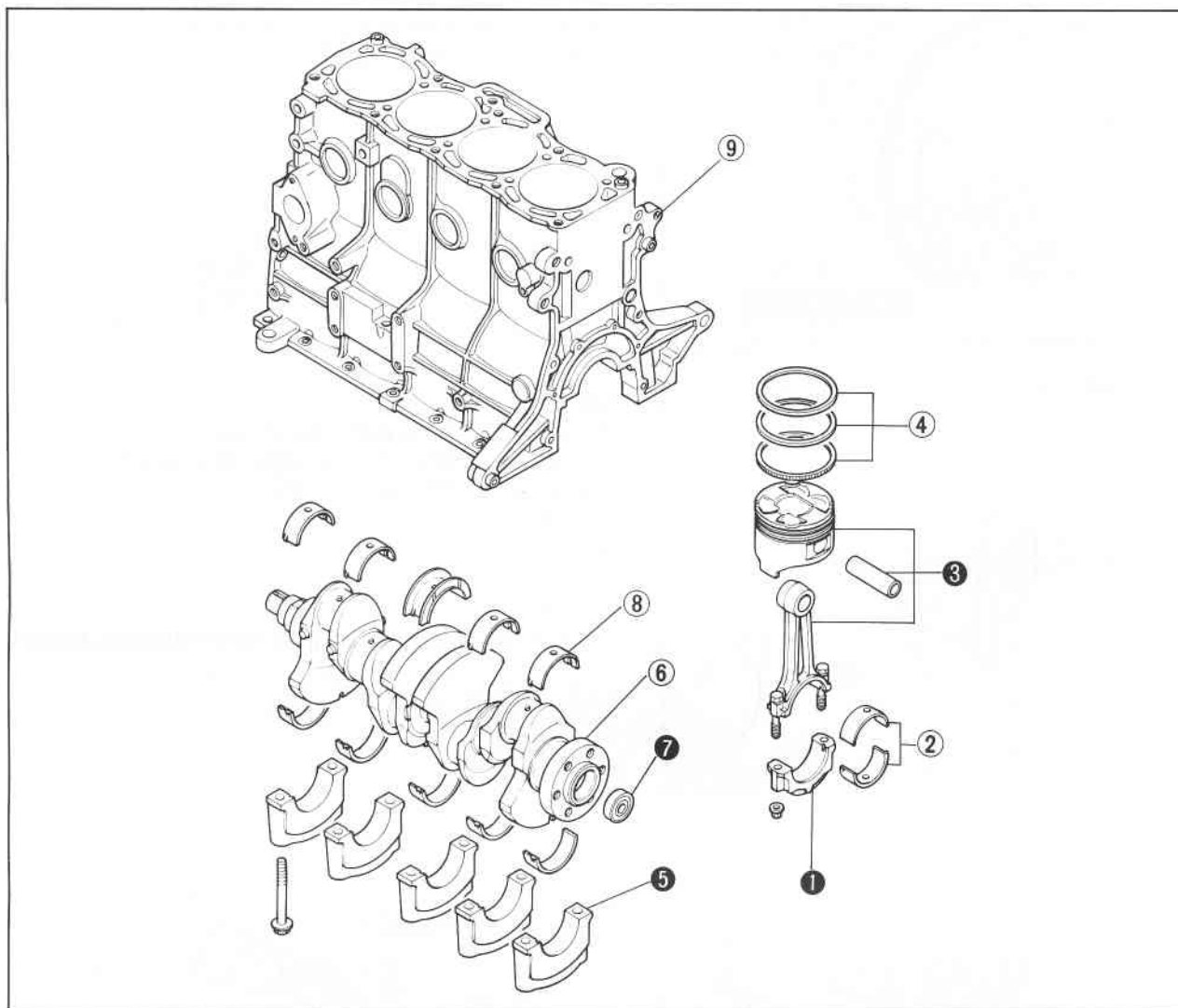
1. Remove the oil pan mounting bolts.
2. Insert a scraper or a suitable tool between the oil pan and the stiffener or the cylinder block to separate them.
3. Remove the oil pan.

### Caution

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

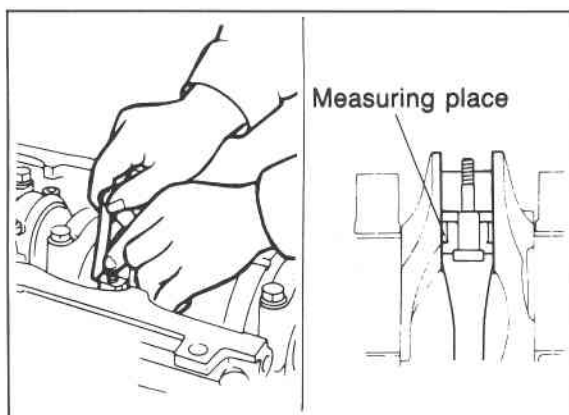
# 1A DISASSEMBLY (CYLINDER BLOCK)

## CYLINDER BLOCK—II



86U01X-073

- |                              |                        |
|------------------------------|------------------------|
| 1. Connecting rod cap        | 6. Crankshaft          |
| 2. Connecting rod bearing    | 7. Pilot bearing (MTX) |
| 3. Connecting rod and piston | 8. Main bearing        |
| 4. Piston ring               | 9. Cylinder block      |
| 5. Main bearing cap          |                        |



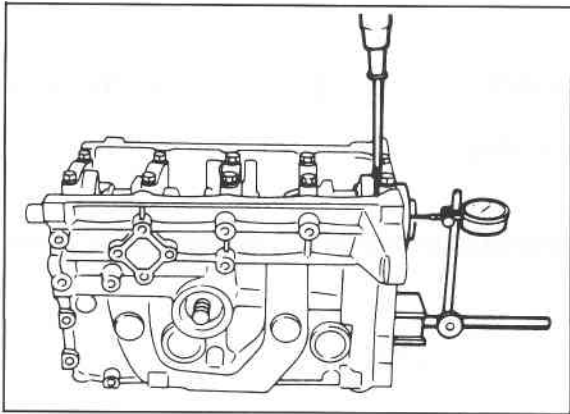
76G01A-053

### Disassembly Note Connecting rod and cap

Before removing the connecting rod, clean the bearing, connecting rod, and crankpin, and measure the following points.

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

# DISASSEMBLY (CYLINDER BLOCK) 1A

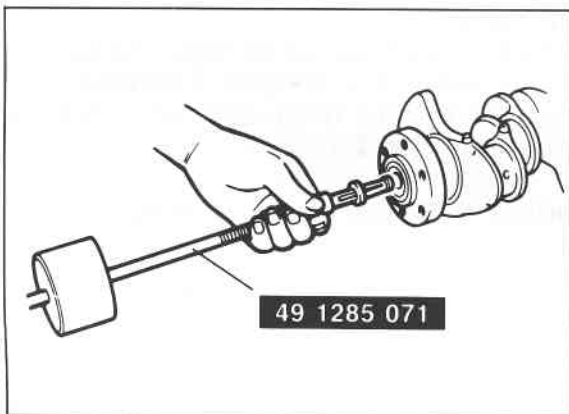


76G01A-054

## Main bearing cap

Before removing the main bearing caps, clean the bearings, main journals, and caps, and measure the following points.

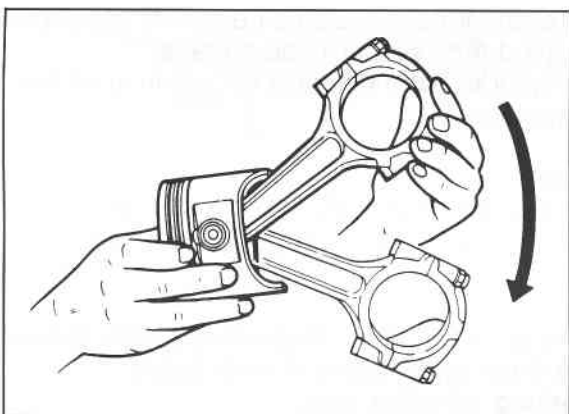
1. Crankshaft end play. (Refer to page 1A—66.)
2. Main journal oil clearance. (Refer to page 1A—65.)



86U01X-076

## Pilot bearing (MTX)

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

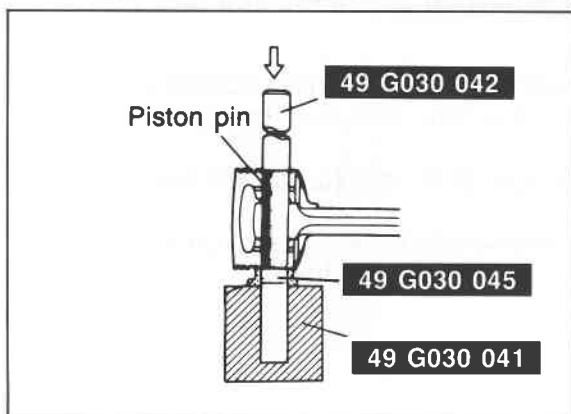


79G01C-050

## 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.



79G01C-051

2. Remove the piston pin with the **SST**.

While removing the piston pin, check the pressure. If it is lower than **5kN (500kg, 1,100 lb)**, replace the piston pin or connecting rod.

# 1A INSPECTION AND REPAIR

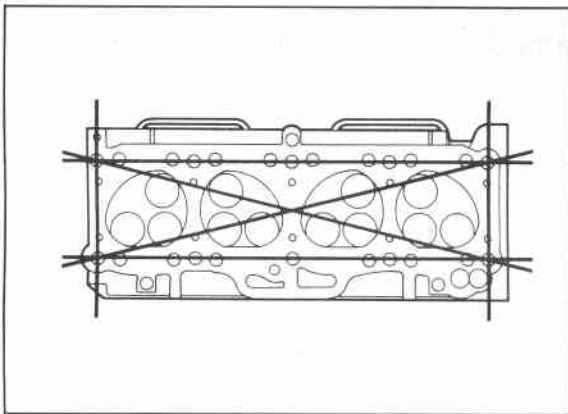
## INSPECTION AND REPAIR

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

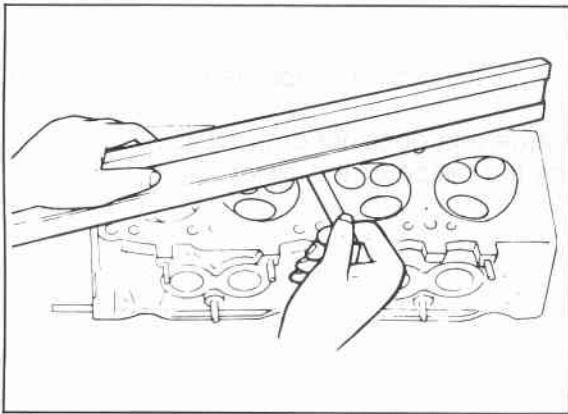


79G01C-106

### 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 six directions shown in the figure.

**Distortion: 0.15 mm (0.006 in) max.**



76G01A-126

3. If the cylinder head distortion exceeds specification, grind the cylinder head surface.  
If the cylinder head height is not within specification, replace it.

### Height:

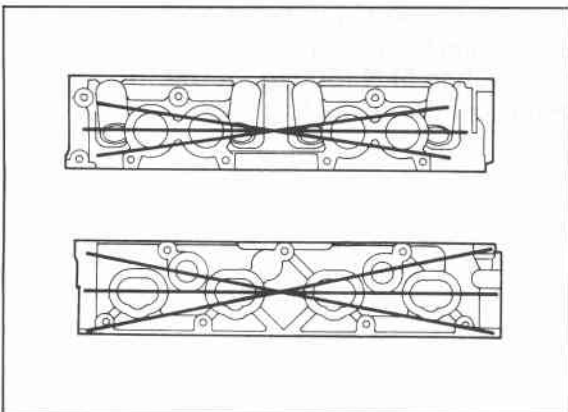
**91.95—92.05 mm (3.620—3.624 in)**

**Grinding limit: 0.20 mm (0.008 in) max.**

### Note

Before grinding the cylinder head, first check the following. Replace if necessary.

- Sinking of valve seat
- Damage of manifold contact surface
- Camshaft oil clearance and end play

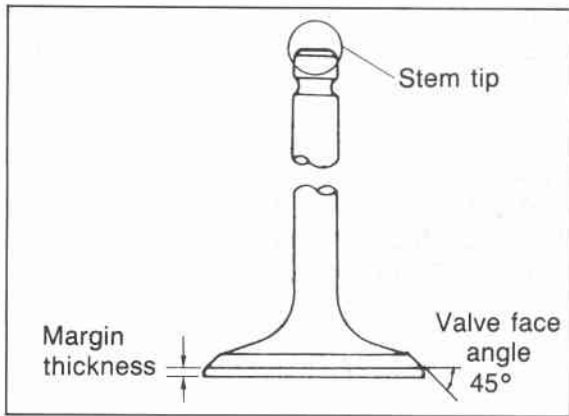


79G01C-053

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

**Distortion: 0.15 mm (0.006 in) max.**

5. If distortion exceeds specification grind the surface or replace the cylinder head.



86U01X-078

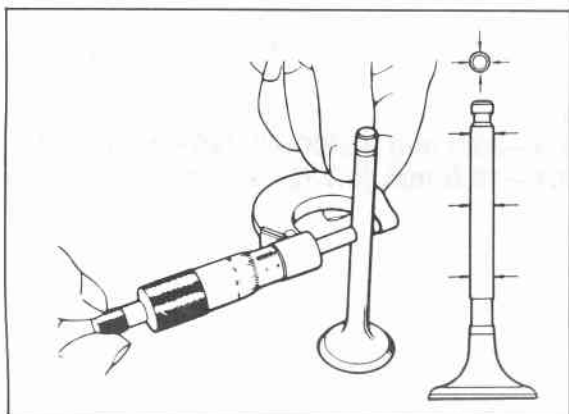
## Valve and Valve Guide

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

**IN: 0.5 mm (0.020 in) min.**

**EX: 1.0 mm (0.039 in) min.**



76G01A-055

3. Measure the valve length.

## Length

mm (in)

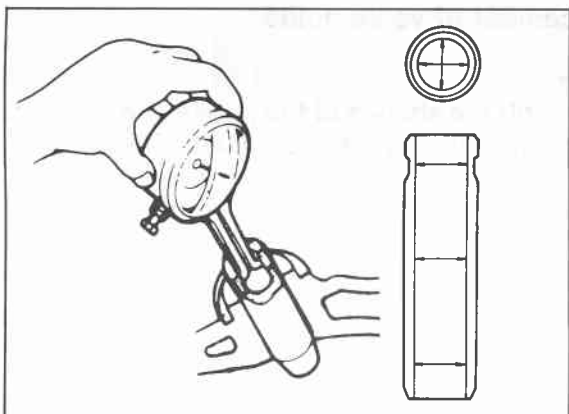
	12-valve	8-valve
IN	115.81 (4.5594)	111.89 (4.4051)
EX	116.21 (4.5752)	111.69 (4.3972)

4. Measure the valve stem diameter.

## Diameter

mm (in)

	12-valve	8-valve
IN	6.970—6.985 (0.2744—0.2750)	8.030—8.045 (0.3161—0.3167)
EX	6.965—6.980 (0.2742—0.2748)	8.025—8.040 (0.3159—0.3165)



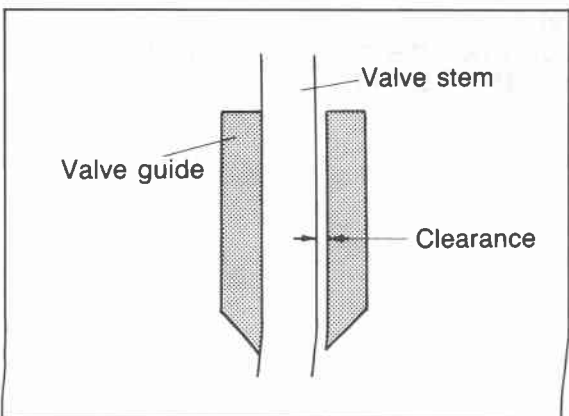
76G01A-056

5. Measure the valve guide inner diameter.

## Inner diameter

mm (in)

	12-valve	8-valve
IN	7.01—7.03 (0.2760—0.2768)	8.07—8.09 (0.3177—0.3185)
EX	7.01—7.03 (0.2760—0.2768)	8.07—8.09 (0.3177—0.3185)



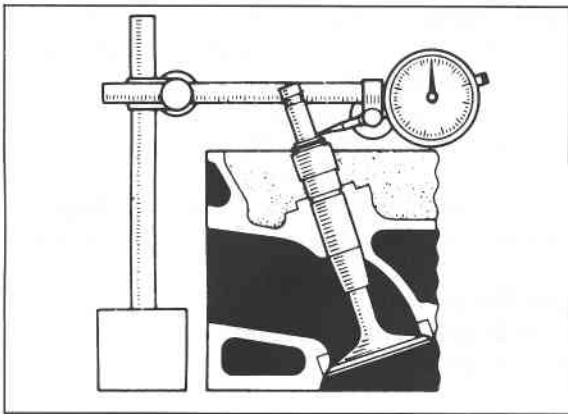
86U01X-081

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.

# 1A INSPECTION AND REPAIR



86U01X-082

(2) Method No. 2

Measure the valve stem play at a point close to the valve guide with the valve lifted slightly off the valve seat.

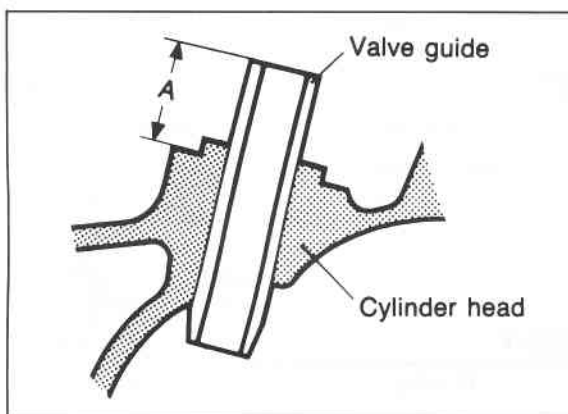
### Clearance

**IN : 0.025—0.060 mm (0.0010—0.0024 in)**

**EX : 0.030—0.065 mm (0.0012—0.0026 in)**

**Maximum: 0.20 mm (0.0079 in)**

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



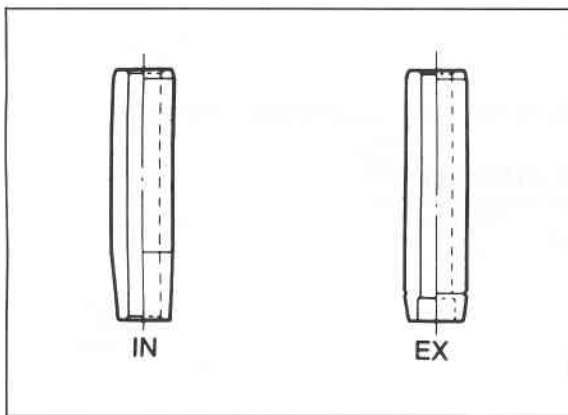
76G01A-057

8. Check that the valve guide projection height (dimension A in the figure). Replace if necessary.

### Height:

**19.8—20.3 mm (0.780—0.799 in)...12-valve**

**19.1—19.6 mm (0.752—0.772 in)...8-valve**

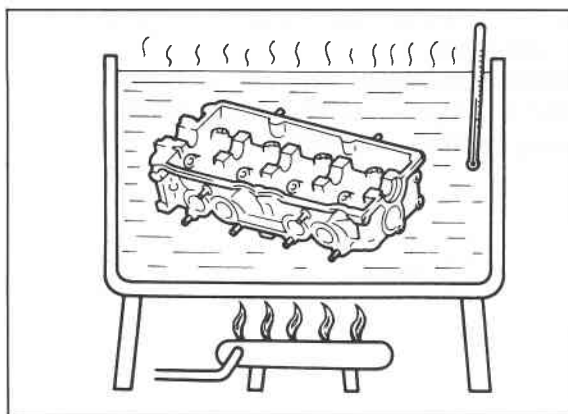


86U01X-214

## Replacement of valve guide

### Note

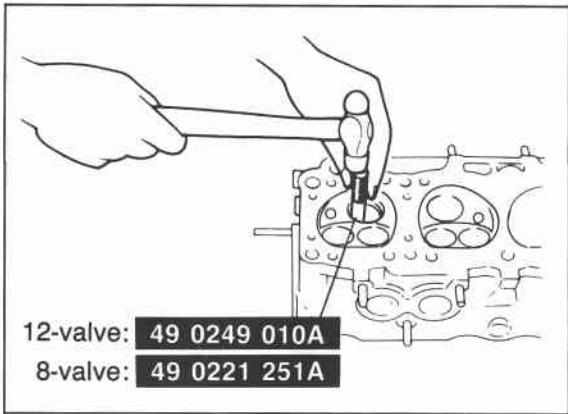
Although the shapes of the intake and exhaust valve guides are different, use the exhaust valve guide on both sides as a replacement.



76G01A-127

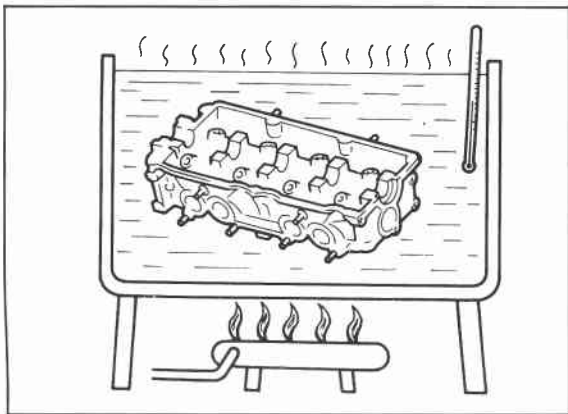
### Removal

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



76G01A-058

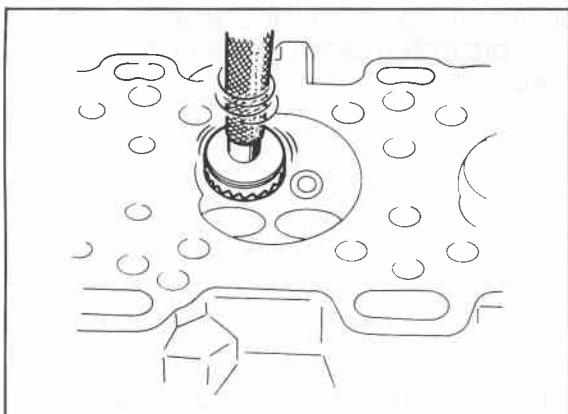
2. Remove the valve guide from the side opposite the combustion chamber with the **SST**.
3. Remove the valve guide clip (8-valve).



76G01A-059

### Installation

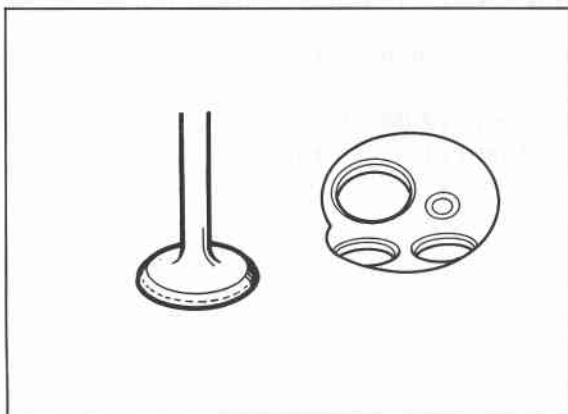
1. Fit the clip onto the valve guide (8 valve).
2. Gradually heat the cylinder head in water to **approx. 90°C (194°F)**.
3. Tap the valve guide in from the side opposite the combustion chamber with the **SST** until the projection height is as specified.



86U01X-087

### Valve Seat

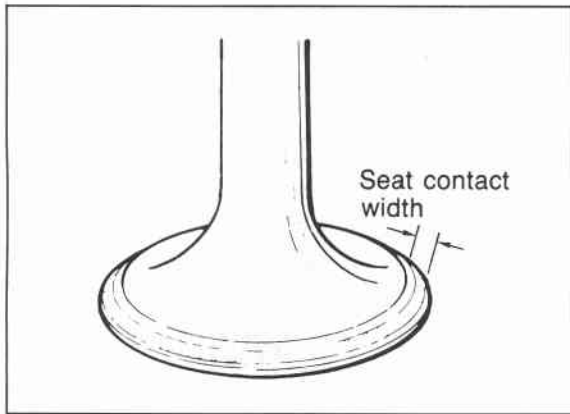
1. Inspect the contact surface of the valve seat and valve face for the following.
  - (1) Roughness
  - (2) Damage
2. If necessary, resurface the valve seat with a **45°** valve seat cutter and/or resurface the valve face.



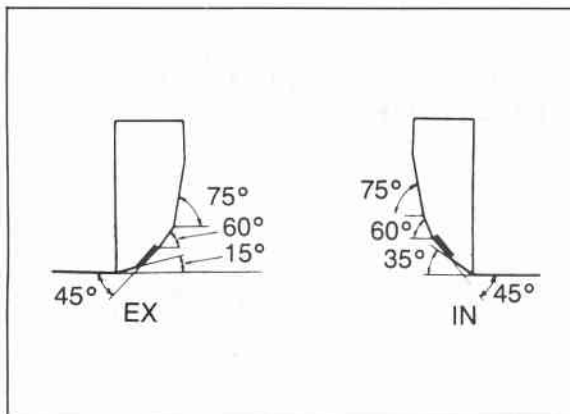
69G01A-101

3. Apply a thin coat of prussian blue to the valve face.
4. Check the valve seating by rotating 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.

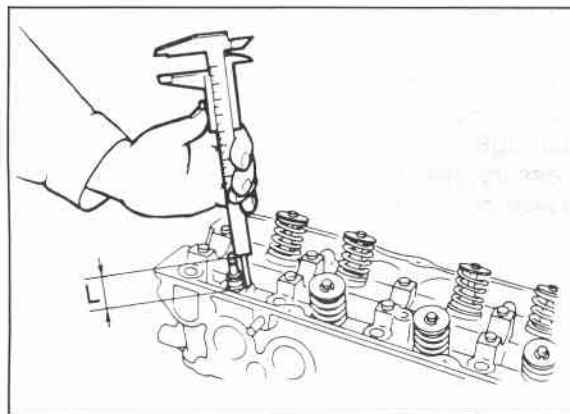
# 1A INSPECTION AND REPAIR



76G01A-128



86U01X-088



76G01A-060

5. Check the seat contact width.

**Width: 1.2—1.6 mm (0.047—0.063 in)**

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 with a **60°** cutter and a **45°** cutter.
- (2) If the seating position is too low, correct the valve seat with a **35° (IN)** or **15° (EX)** cutter and a **45°** cutter.

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

8. Check the sinking of the valve seat.

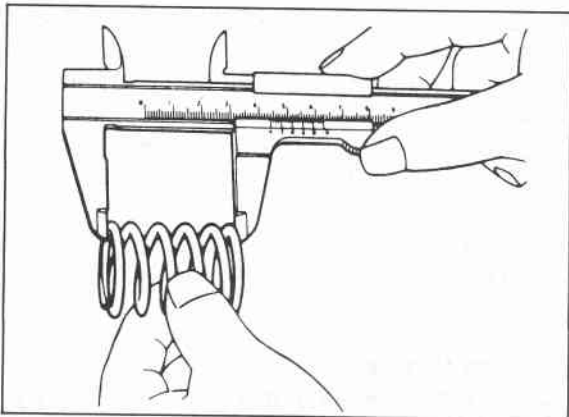
Measure protruding length (dimension L) of each valve stem.

**Dimension L: 50.2 mm (1.976 in)....12-valve**  
**46.5 mm (1.831 in).... 8-valve**

- (1) If L is as below, it can be used as it is.  
**50.2—51.0 mm (1.976—2.008 in)..12-valve**  
**46.5—48.0 mm (1.831—1.890 in).. 8-valve**

- (2) If L is as below, insert a spacer between the spring seat and cylinder head to adjust.  
**51.0—51.7 mm (2.008—2.035 in)..12-valve**  
**48.0—48.7 mm (1.890—1.917 in).. 8-valve**

- (3) If L is more than as below, replace the cylinder head.  
**51.7 mm (2.035 in) or more.....12-valve**  
**48.7 mm (1.917 in) or more..... 8-valve**



76G01A-062

## Valve Spring

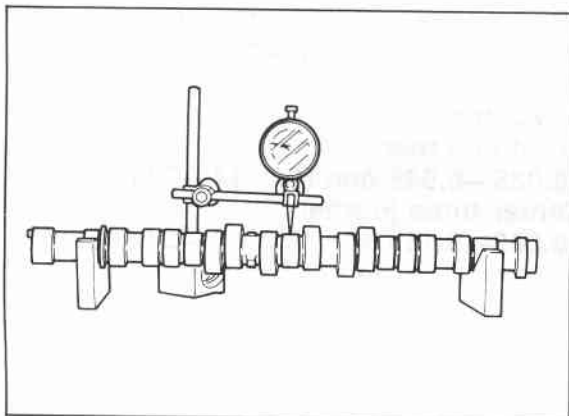
1. Inspect each valve spring for cracks or damage.
2. Check the free length and angle. Replace if necessary.

### Free length

mm (in)

			Standard	Minimum
12-valve	IN		49.5 (1.949)	49.0 (1.929)
	EX		50.4 (1.984)	48.7 (1.917)
8-valve	FE.Middle East General	Outer	51.2 (2.016)	50.6 (1.992)
		Inner	45.7 (1.799)	43.7 (1.720)
	Others	Outer	52.0 (2.047)	51.5 (2.028)
		Inner	44.0 (1.732)	43.3 (1.705)

**Angle: 1.8 mm (0.071 in) max.**

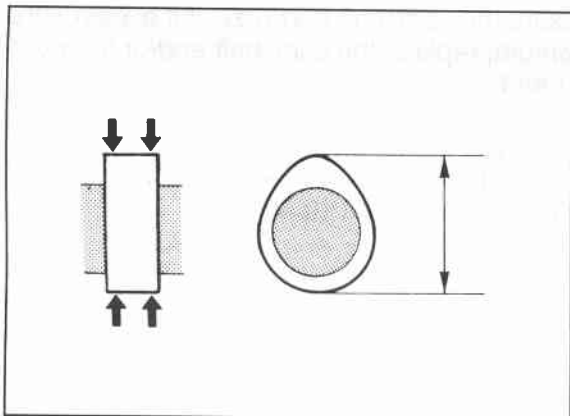


86U01X-092

## Camshaft

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

**Runout: 0.03 mm (0.0012 in) max.**



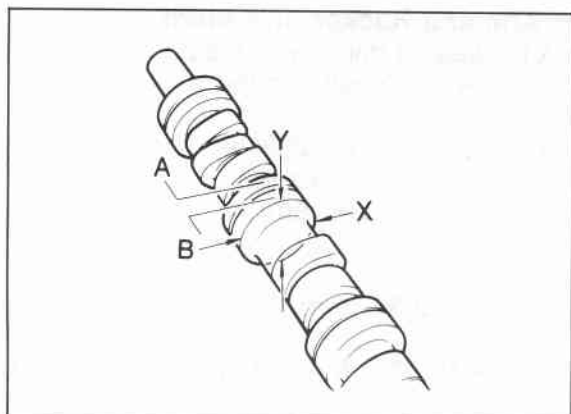
76G01A-063

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
12-valve	IN		41.340 (1.6276)	41.14 (1.620)
	EX		41.847 (1.6476)	41.65 (1.640)
8-valve	IN		38.157 (1.5022)	37.96 (1.494)
	EX		38.160 (1.5024)	37.96 (1.494)



76G01A-129

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

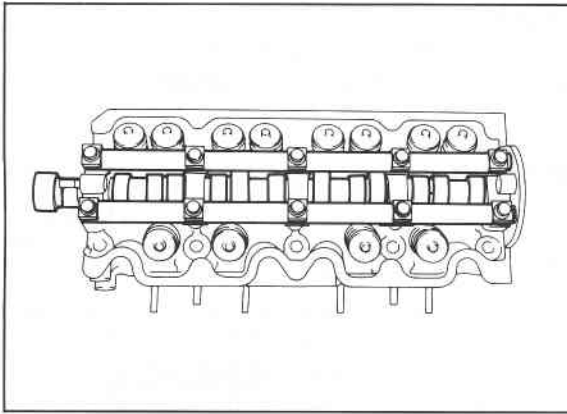
### Diameter

mm (in)

	12-valve	8-valve
No. 1,5	31.940—31.965 (1.2575—1.2585)	31.940—32.035 (1.2575—1.2612)
No. 2,3,4	31.910—31.935 (1.2563—1.2573)	31.910—32.065 (1.2563—1.2624)

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

# 1A INSPECTION AND REPAIR



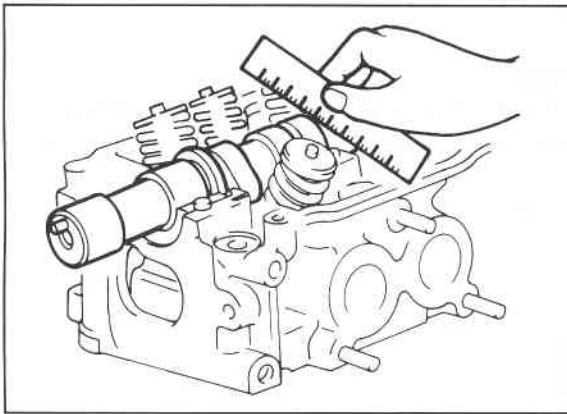
86U01X-095

5. Measure the oil clearance of the camshaft and camshaft caps.

- (1) Remove any oil, or dirt from the journals and bearing surface.
- (2) Set the camshaft onto the cylinder head.
- (3) Position plasti-gauge on top of the journals in the axial direction.
- (4) Place the camshaft caps and rocker arm shafts in position, and tighten them to the specified torque.

### Tightening torque:

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



86U01X-096

(5) Remove the camshaft caps and measure the oil clearance at each cap.

### Oil clearance

#### Front and rear:

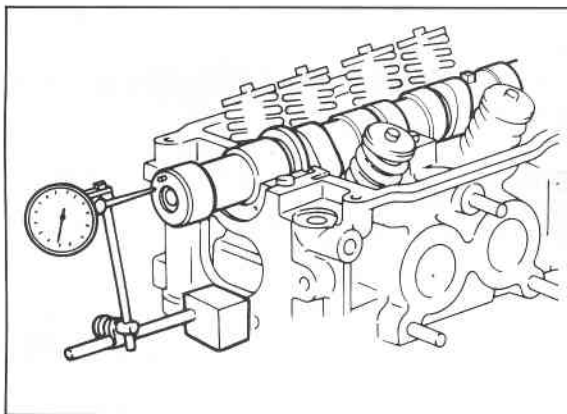
**0.035—0.085 mm (0.0014—0.0033 in)**

#### Center three journals:

**0.065—0.115 mm (0.0026—0.0045 in)**

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

(6) If the oil clearance exceeds the maximum, replace the cylinder head.



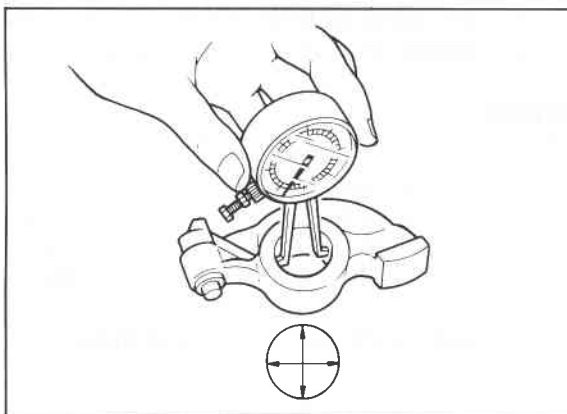
86U01X-097

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

### End play:

**0.08—0.16 mm (0.003—0.006 in)**

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



76G01A-064

### Rocker Arm and Rocker Arm Shaft

1. Check for wear or damage to the contact surface of the rocker arm shaft and the rocker arm. Replace if necessary.
2. Check the oil clearance between the rocker arm and shaft. Replace if necessary.
  - (1) Measure the rocker arm inner diameter.

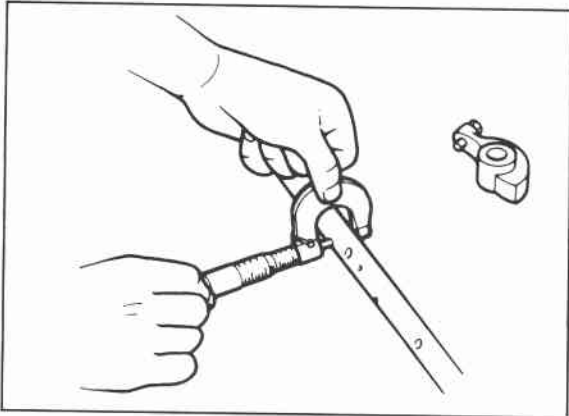
### Diameter:

**19.000—19.033 mm (0.7480—0.7493 in)**

... 12-valve

**16.000—16.027 mm (0.6299—0.6310 in)**

... 8-valve



76G01A-065

(2) Measure the rocker arm shaft diameter.

**Diameter:**

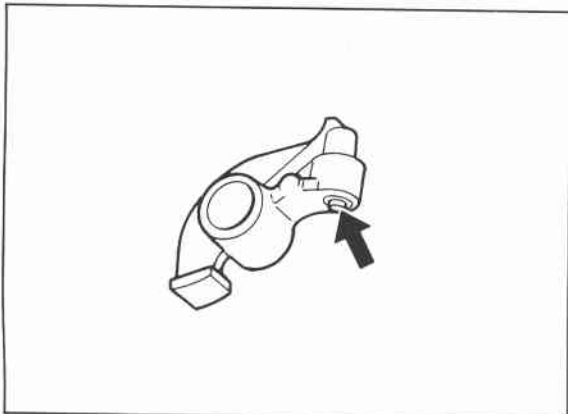
- 18.959—18.980 mm (0.7464—0.7472 in)**  
... 12 valve
- 15.966—15.984 mm (0.6286—0.6293 in)**  
... 8 valve

(3) Subtract the shaft diameter from the rocker arm diameter.

**Oil clearance**

mm (in)

	Standard	Maximum
12-valve	0.020—0.074 (0.0008—0.0029)	0.10 (0.0039)
8-valve	0.016—0.061 (0.0006—0.0024)	0.10 (0.0039)



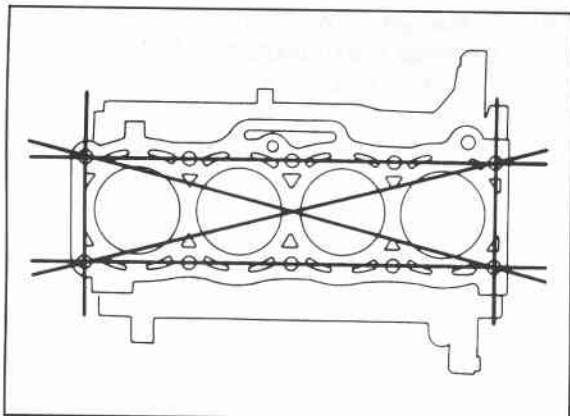
76G01A-066

**Hydraulic Lash Adjuster (12-valve)**

Check the HLA face for wear or damage. Replace if necessary.

**Caution**

**Do not remove the HLA unless necessary to prevent damaging the O-ring.**



86U01X-100

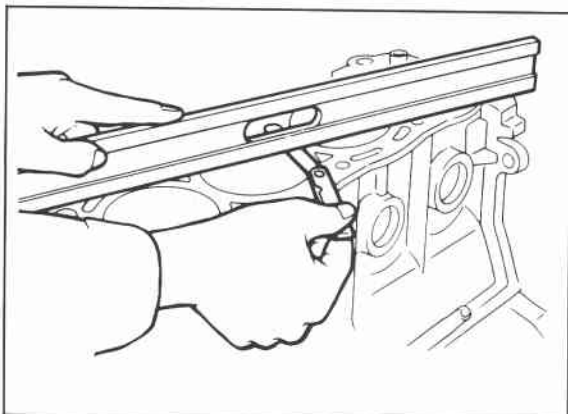
**Cylinder Block**

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: 0.15 mm (0.006 in) max.**

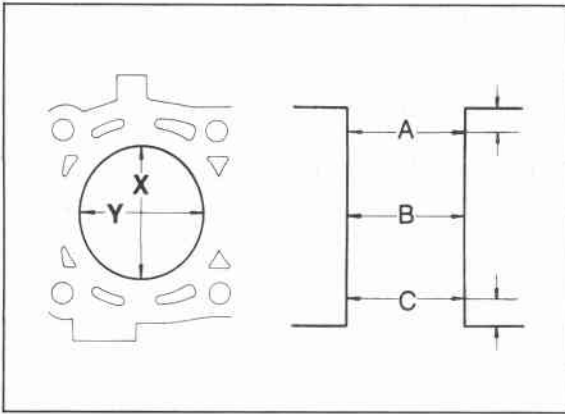
3. If the distortion exceeds the maximum, repair by grinding, or replace the cylinder block.

**Grinding limit: 0.20 mm (0.008 in) max.**



86U01X-101

# 1A INSPECTION AND REPAIR

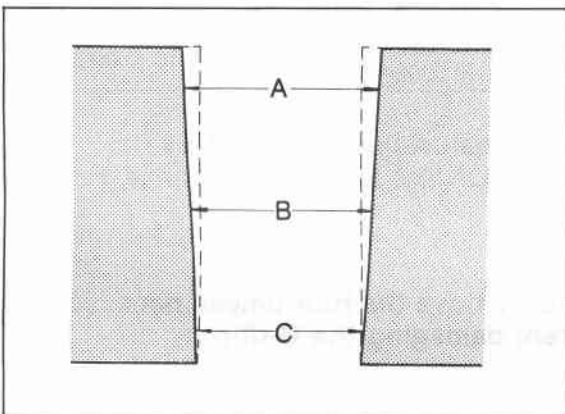


76G01A-067

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

## Cylinder bore mm (in)

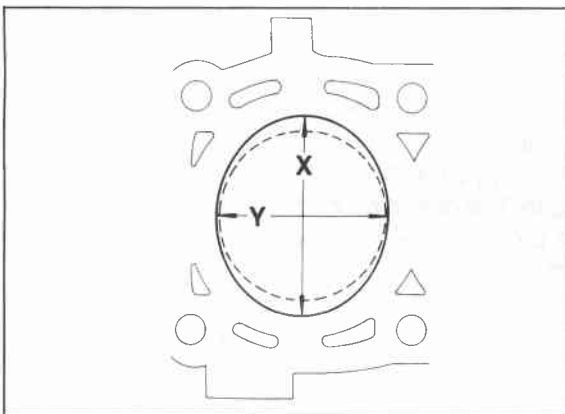
	Size	Bore
FE F8	Standard	86.000—86.019 (3.3858—3.3866)
	0.25 (0.010) oversize	86.250—86.269 (3.3957—3.3964)
	0.50 (0.020) oversize	86.500—86.519 (3.4055—3.4062)
F6	Standard	81.000—81.019 (3.1890—3.1897)
	0.25 (0.010) oversize	81.250—81.269 (3.1988—3.1996)
	0.50 (0.020) oversize	81.500—81.519 (3.2087—3.2094)
	0.75 (0.030) oversize	81.750—81.769 (3.2185—3.2192)
	1.00 (0.039) oversize	82.000—82.019 (3.2283—3.2291)



79G01C-071

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

**Taper: 0.019 mm (0.0007 in) max.**



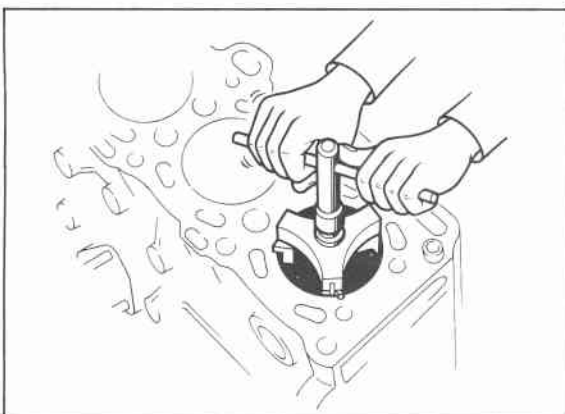
79G01C-072

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

**Out-of-round: 0.019 mm (0.0007 in) max.**

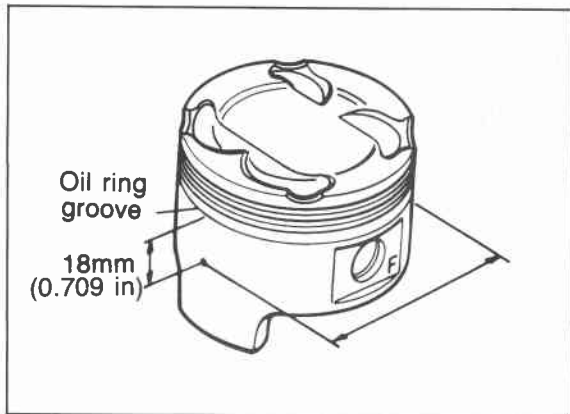
### Caution

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.



76G01A-068

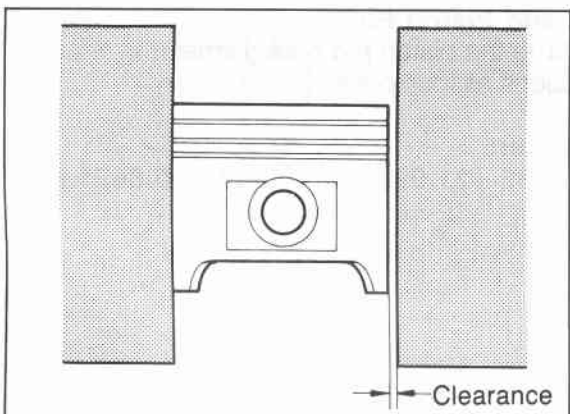
## Piston

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 ( $90^\circ$ ) to the piston pin, **18 mm (0.709 in) below** the oil ring land lower edge.

## Piston diameter

mm (in)

	Size	Diameter
FE F8	Standard	85.944—85.964 (3.3836—3.3844)
	0.25 (0.010) oversize	86.194—86.214 (3.3935—3.3942)
	0.50 (0.020) oversize	86.444—86.464 (3.4033—3.4041)
F6	Standard	80.944—80.964 (3.1868—3.1876)
	0.25 (0.010) oversize	81.194—81.214 (3.1966—3.1974)
	0.50 (0.020) oversize	81.444—81.464 (3.2065—3.2072)
	0.75 (0.030) oversize	81.694—81.714 (3.2163—3.2171)
	1.00 (0.039) oversize	81.944—81.964 (3.2261—3.2269)



76G01A-130

3. Check the piston to cylinder clearance.

### Clearance:

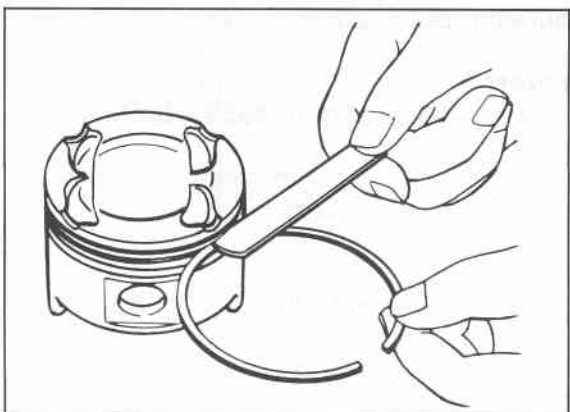
**0.036—0.075 mm (0.0014—0.0030 in)**

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

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

### Caution

**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.

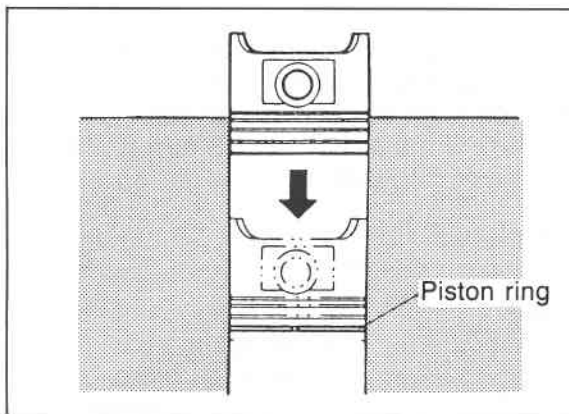
### Clearance (Top and Second):

**0.03—0.07 mm (0.001—0.003 in)**

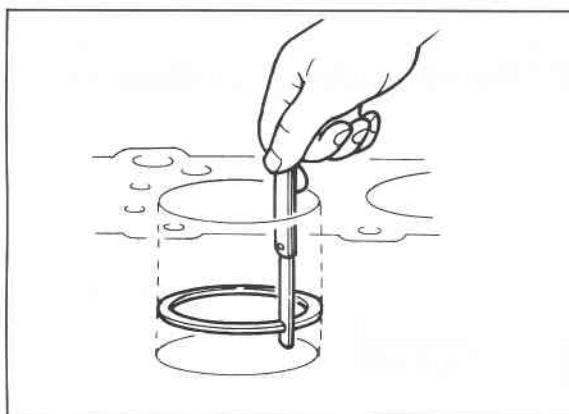
**Maximum: 0.15 mm (0.006 in)**

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

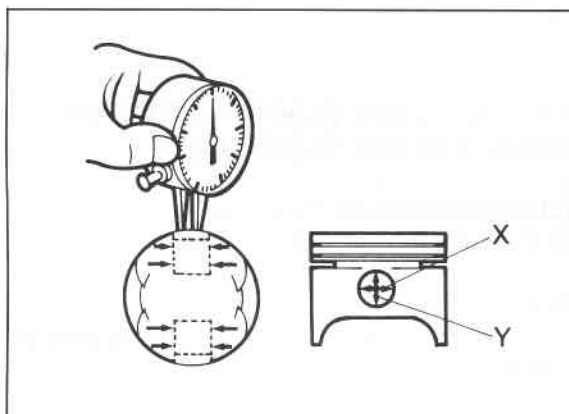
# 1A INSPECTION AND REPAIR



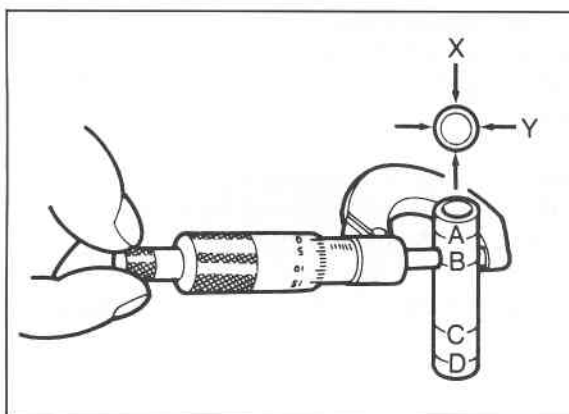
86U01X-104



76G01A-069



86U01X-106



86U01X-107

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.

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

### End gap

**Top : 0.20—0.35 mm (0.008—0.014 in)**

**Second: 0.15—0.30 mm (0.006—0.012 in)**

**Oil rail : 0.20—0.70 mm (0.008—0.028 in)**

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

### Piston and Piston Pin

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

### Diameter:

**21.988—21.998 mm (0.8657—0.8661 in)**

2. Measure the piston pin diameter.

### Diameter:

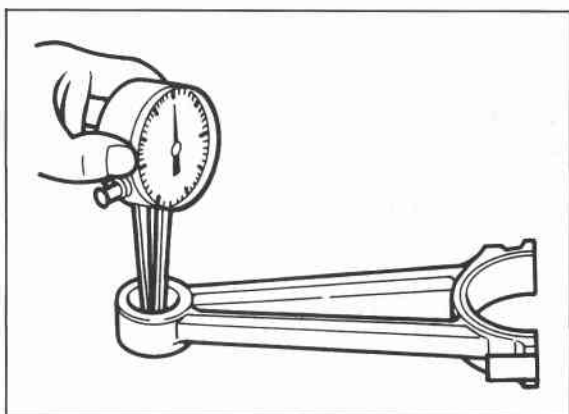
**21.974—21.980 mm (0.8651—0.8654 in)**

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

### Clearance:

**0.008—0.024 mm (0.0003—0.0009 in)**

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



76G01A-070

## Connecting Rod

1. Measure the connecting rod small end bore.

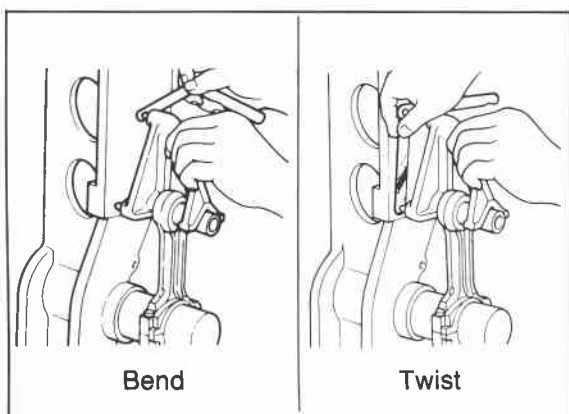
### Diameter:

**21.943—21.961 mm (0.8640—0.8646 in)**

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

### Interference:

**0.013—0.037 mm (0.0005—0.0015 in)**

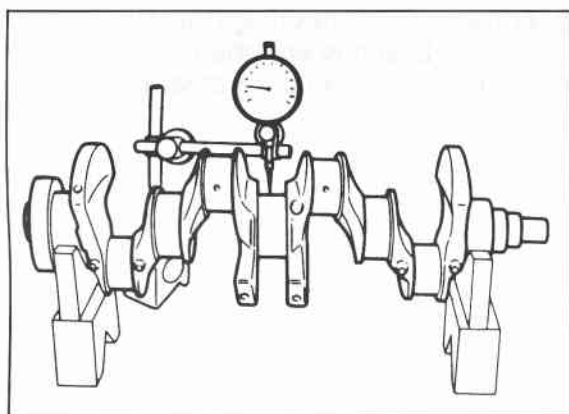


76G01A-071

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

**Bend: 0.06 mm (0.0024 in) max.**

**Twist: 0.06 mm (0.0024 in) max.**

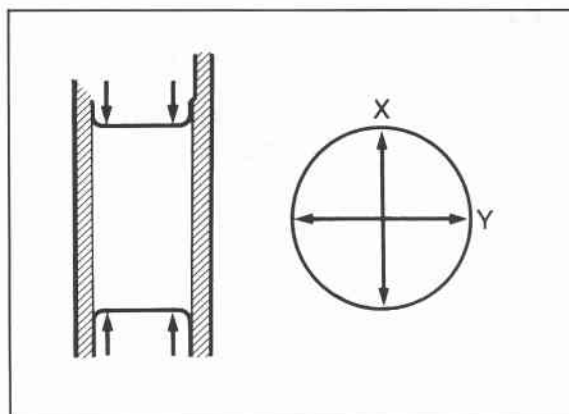


86U01X-109

## 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: 0.03 mm (0.0012 in) max.**



76G01A-131

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)**

**Out-of-round: 0.05 mm (0.0020 in) max.**

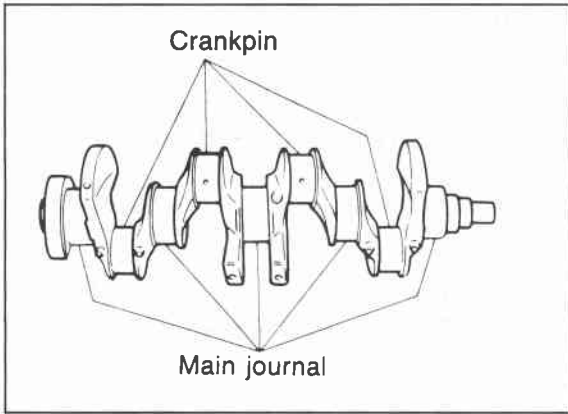
### Crankpin journal

#### Diameter:

**50.940—50.955 mm (2.0055—2.0061 in)**

**Out-of-round: 0.05 mm (0.0020 in) max.**

# 1A INSPECTION AND REPAIR



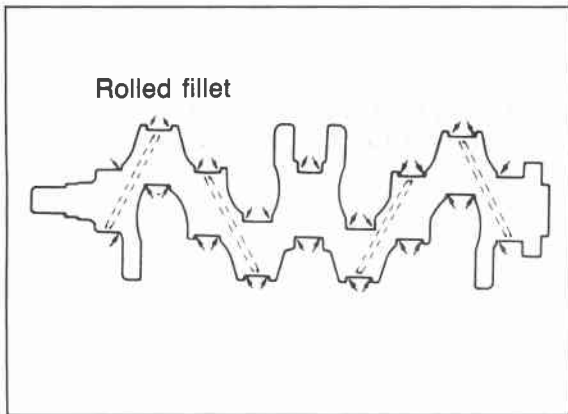
76G01A-132

- 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 in)**

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

Bearing size		Journal diameter
0.25 (0.010) undersize	No.1,2,4,5	59.693—59.711 (2.3501—2.3508)
	No.3	59.687—59.705 (2.3499—2.3506)
0.50 (0.020) undersize	No.1,2,4,5	59.443—59.461 (2.3403—2.3410)
	No.3	59.437—59.455 (2.3400—2.3407)
0.75 (0.030) undersize	No.1,2,4,5	59.193—59.211 (2.3304—2.3311)
	No.3	59.187—59.205 (2.3302—2.3309)



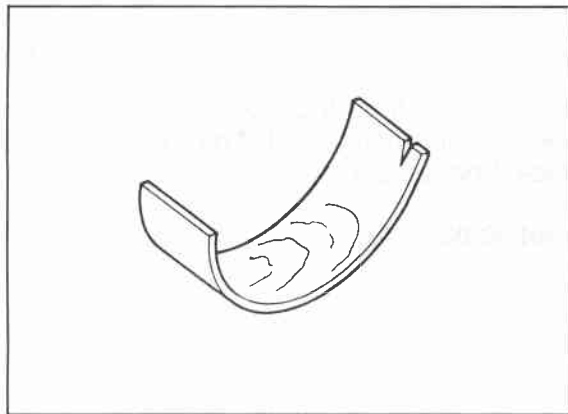
76G01A-133

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

Bearing size		Journal diameter
0.25 (0.010) undersize		50.690—50.705 (1.9957—1.9963)
0.50 (0.020) undersize		50.440—50.455 (1.9858—1.9864)
0.75 (0.030) undersize		50.190—50.205 (1.9760—1.9766)

### Caution

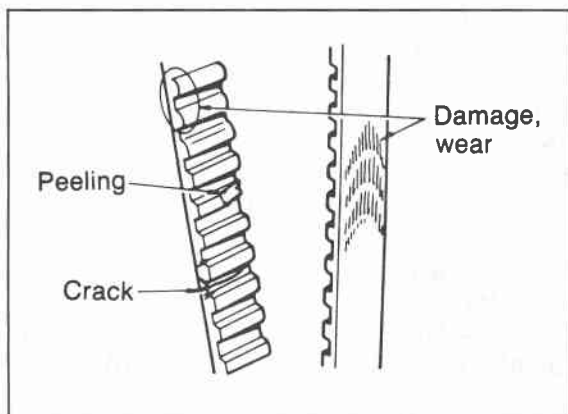
**Do not grind the rolled fillet area.**



79G01C-077

### Main Bearing and Connecting Rod Bearing

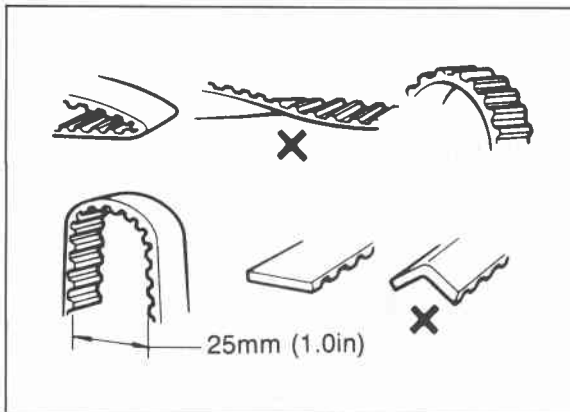
Check the main bearings and the connecting rod bearings for peeling, scoring, or other damage.



86U01X-113

### Timing Belt

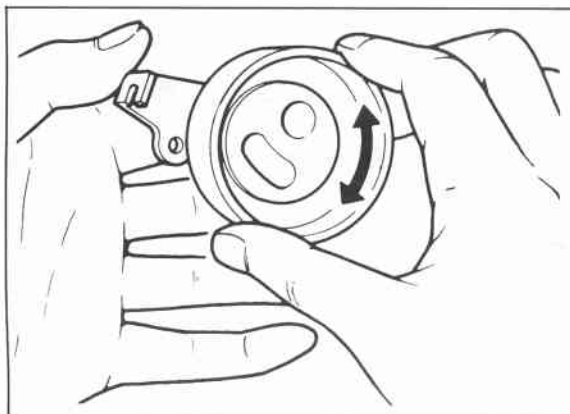
- Replace the timing belt if there is any oil or grease on it.
- Check the timing belt for damage, wear, peeling, cracks, or hardening. Replace if necessary.



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.



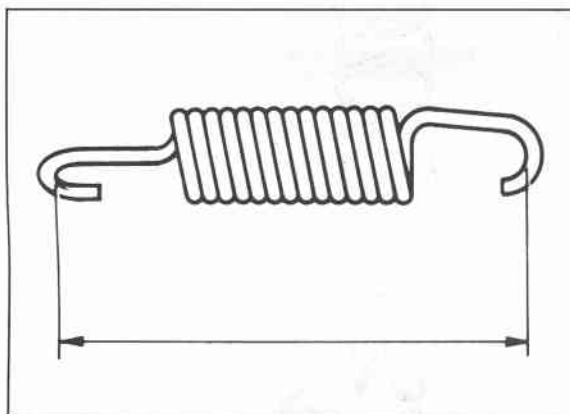
86U01X-115

**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.

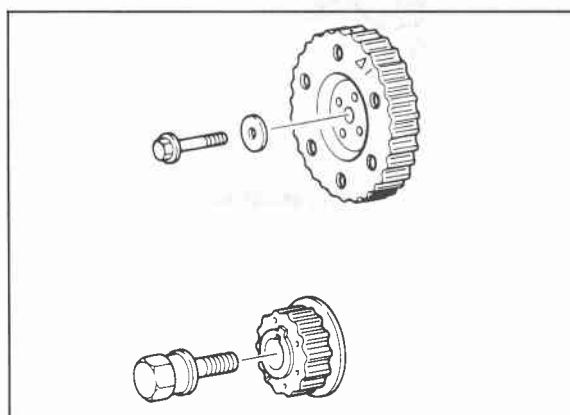


76G01A-134

**Timing Belt Tensioner Spring**

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

- Free length: 56.9 mm (2.240 in).....FE
- 64.1 mm (2.524 in).....F8, F6



86U01X-117

**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 (lower and upper)**

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

# 1A ASSEMBLY (CYLINDER BLOCK)

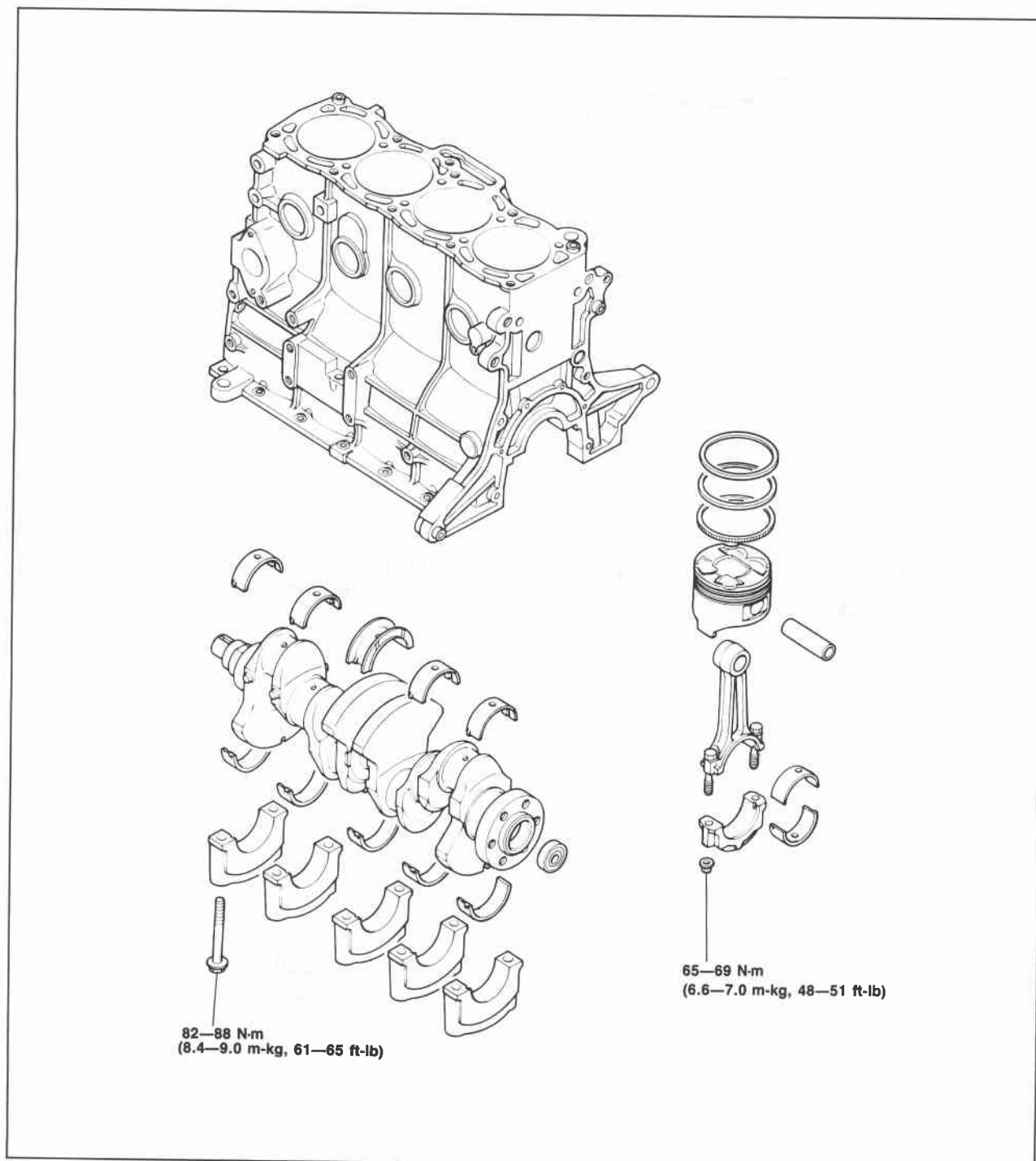
## ASSEMBLY

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.

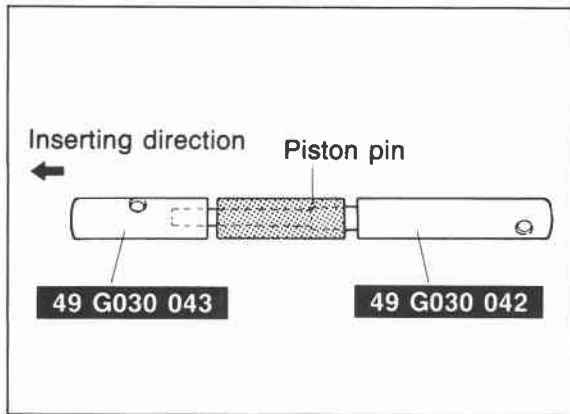
### Caution

Do not reuse gaskets or oil seals.

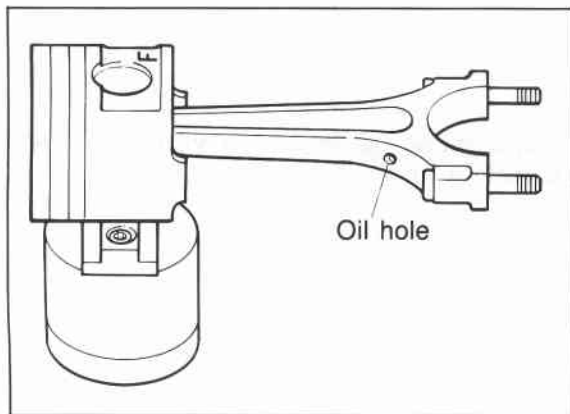
## CYLINDER BLOCK—I Torque Specifications



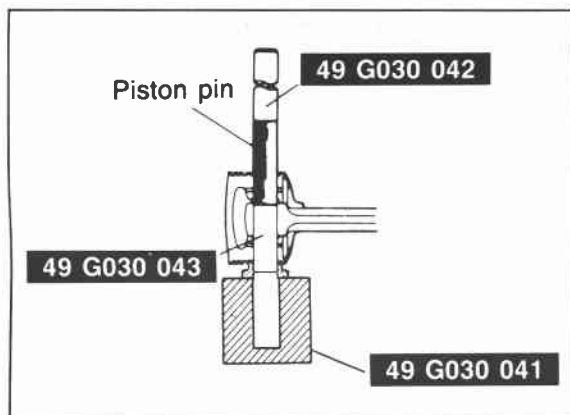
69G01A-139



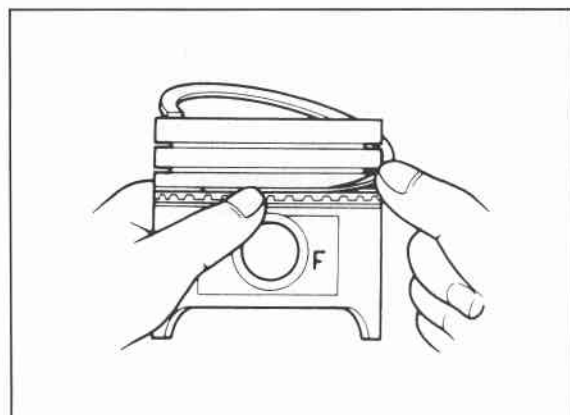
86U01X-118



76G01A-135



76G01A-072



69G01A-144

## Connecting Rod

1. Assemble the **SST** to the piston pin.
  2. Apply engine oil to the piston pin.
  3. Set the piston on the **SST** with the **F** mark facing upward.
  4. Set the connecting rod in piston with the oil hole in the large end opposite the **F** mark.
  5. Press the piston pin into the piston and connecting rod until the **SST** contacts the block.
  6. While inserting the piston pin, check the pressure force. If it is less than specified, replace the piston pin or the connecting rod.
- Press force:**  
**5—15 kN (500—1,500 kg, 1,100—3,300 lb)**
7. Check the oscillation torque of the connecting rod. (Refer to page 1A—47.)

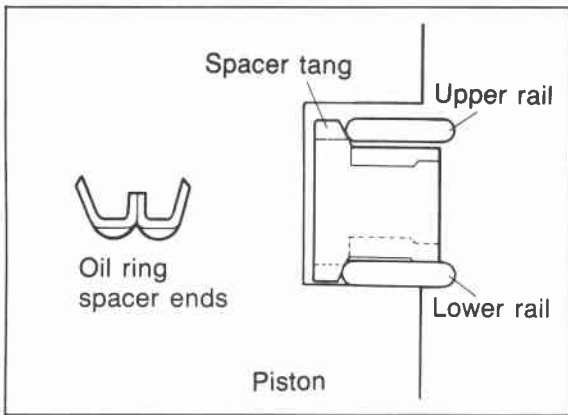
## Piston Ring

1. Install the three-piece oil rings on the pistons.
  - (1) Apply engine oil to the oil ring spacer and rails.
  - (2) Install the oil ring spacer so that the opening faces upward.
  - (3) Install the upper rail and lower rail.

### Note

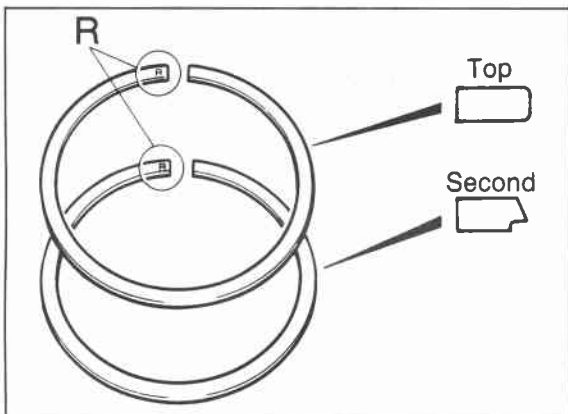
- a) The upper rail and lower rail are the same.
- b) Each rail can be installed with either face upward.

# 1A ASSEMBLY (CYLINDER BLOCK)



69G01A-145

2. Check that both rails are expanded by the spacer tangs as shown in the figure by checking that both rails turn smoothly in both directions.



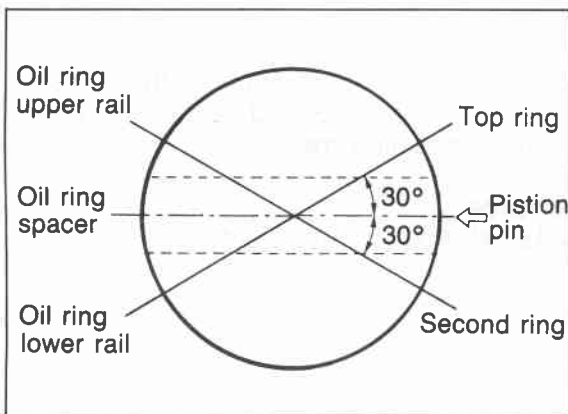
86U01X-121

3. Install the second ring to the piston first, then install the top ring. Use a piston ring expander.

### Caution

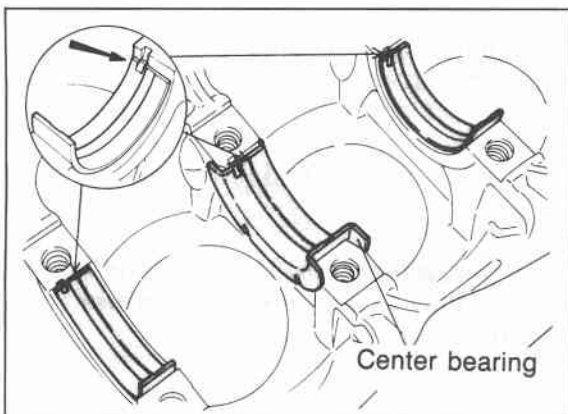
The rings must be installed with the "R" marks facing upward.

4. Apply a liberal amount of clean engine oil to the second and top piston rings.



69G01A-147

5. Position the opening of each ring as shown in the figure.



86U01X-215

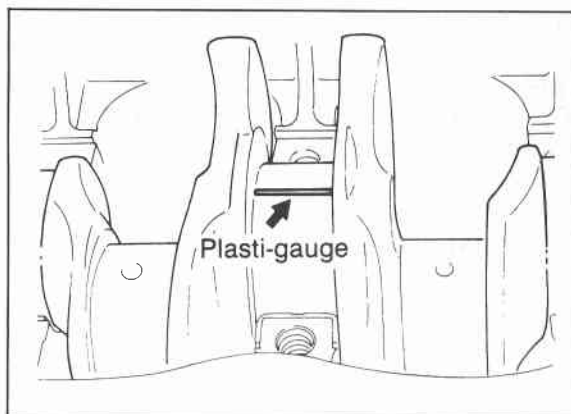
### Crankshaft

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

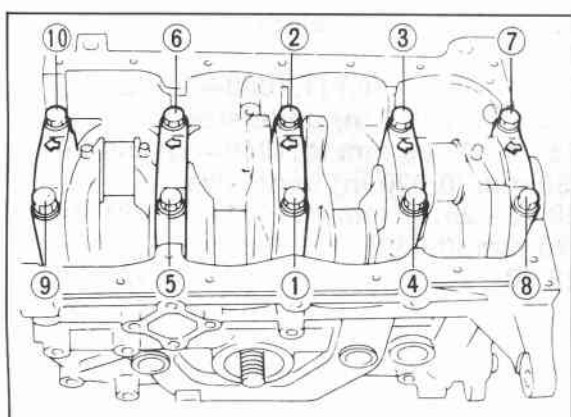
### Note

The bearing with thrust shoulders is the center bearing in the cylinder block.

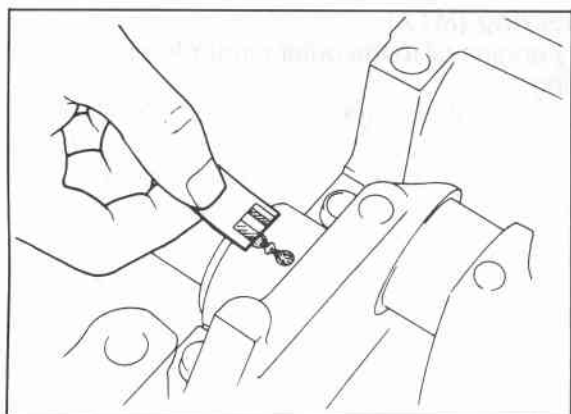
## ASSEMBLY (CYLINDER BLOCK) 1A



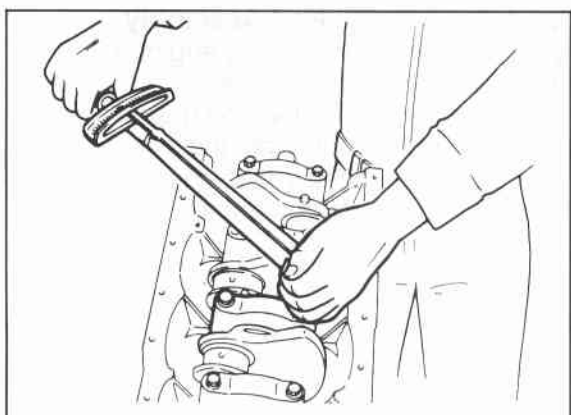
86U01X-122



86U01X-123



76G01A-073



86U01X-125

### Oil clearance inspection

- (1) Remove any foreign material and oil from the journals and bearings.
- (2) Install the upper main bearings in the cylinder block.
- (3) Set the crankshaft into the cylinder block.
- (4) Position the plasti-gauge on top of the journals in the axial direction.

- (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 1A—59.)

### Oil clearance

**No. 1, 2, 4, 5:**

**0.025—0.043 mm (0.0010—0.0017 in)**

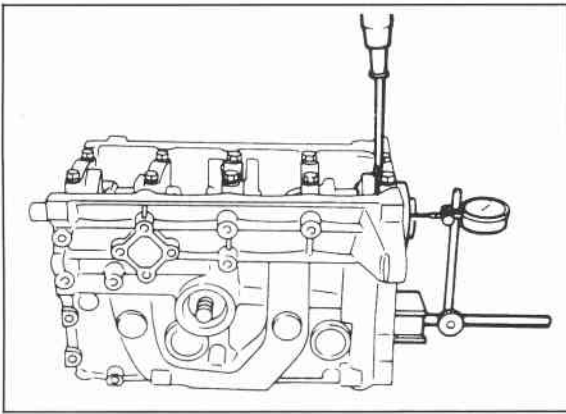
**No. 3:**

**0.031—0.049 mm (0.0012—0.0019 in)**

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

2. Apply a liberal amount of engine oil to the main bearings and main journals.
3. Install the crankshaft and the main bearing caps according to the cap number and ← mark.

# 1A ASSEMBLY (CYLINDER BLOCK)



76G01A-074

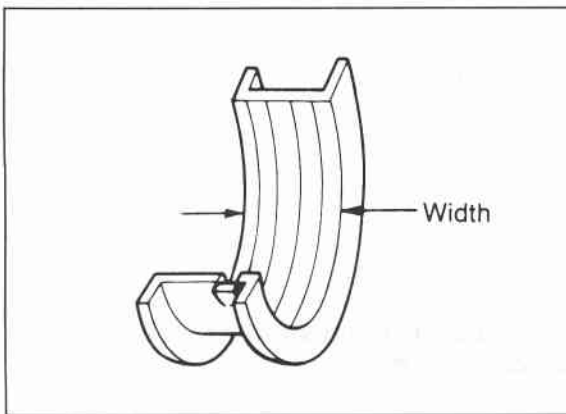
4. Inspect the crankshaft end play.

### End play:

**0.08—0.18 mm (0.0031—0.0071 in)**

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

5. If the end play exceeds specification, grind the crankshaft and use undersize center main bearing.



86U01X-216

### Center main bearing width

#### Standard:

**27.94—27.99 mm (1.1000—1.1020 in)**

**0.25 mm (0.010 in) undersize:**

**28.04—28.09 mm (1.1040—1.1059 in)**

**0.50 mm (0.020 in) undersize:**

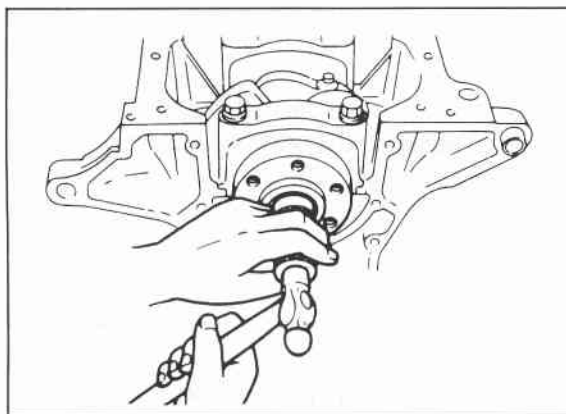
**28.12—28.17 mm (1.1071—1.1091 in)**

**0.75 mm (0.030 in) undersize:**

**28.20—28.25 mm (1.1102—1.1122 in)**

### Note

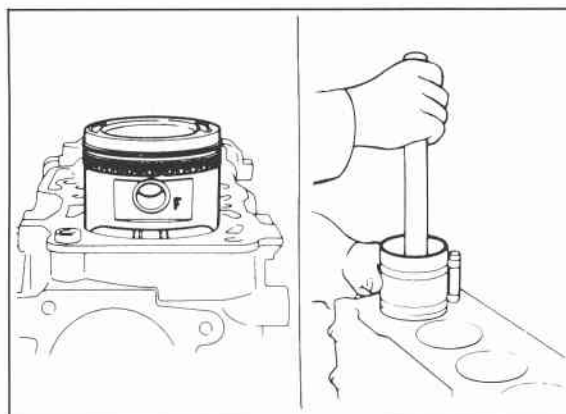
**Wider thrust width is available only in undersize center main bearing.**



86U01X-127

### Pilot Bearing (MTX)

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.

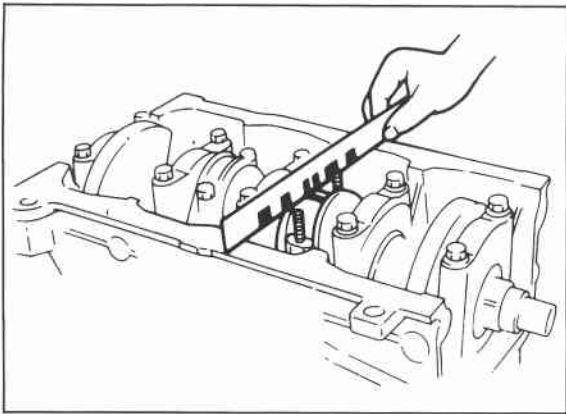


76G01A-136

### 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).

## ASSEMBLY (CYLINDER BLOCK) 1A



69G01B-137

### Connecting Rod Cap

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

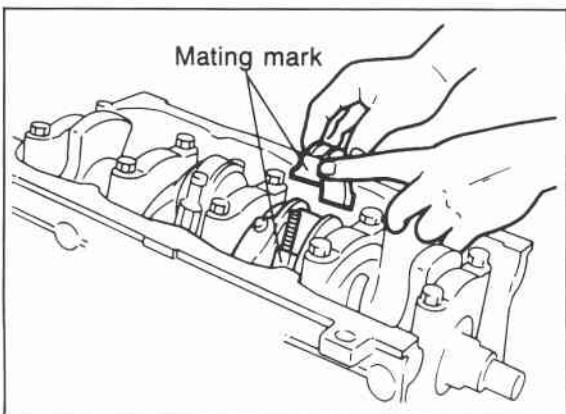
#### Connecting rod cap tightening torque:

65—69 N·m (6.6—7.0 m·kg, 48—51 ft·lb)

#### Oil clearance:

0.027—0.067 mm (0.0011—0.0026 in)

Maximum: 0.10 mm (0.0039 in)

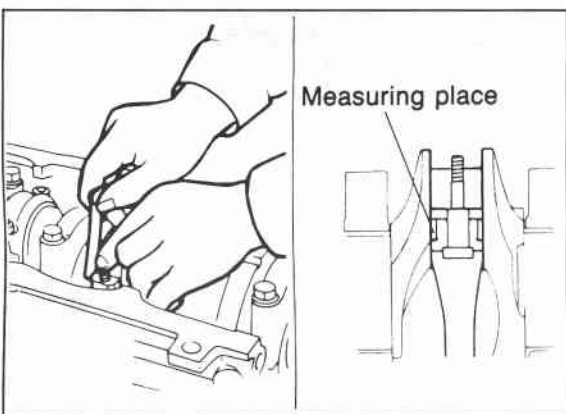


76G01A-075

### 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 specification, grind the crankshaft and use undersize bearings. (Refer to page 1A—59.)



69G01B-139

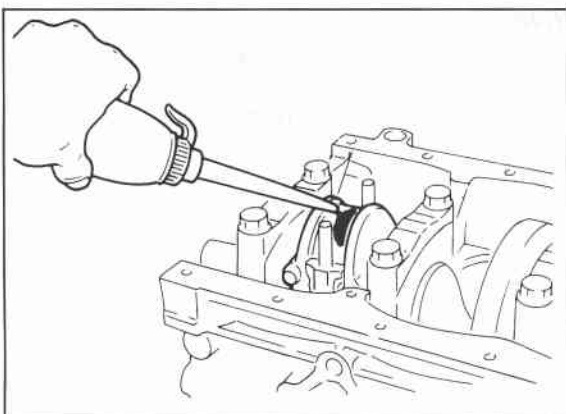
3. Check the side clearance of each connecting rod without the cap installed.

#### Side clearance:

0.110—0.262 mm (0.004—0.0103 in)

Maximum: 0.30 mm (0.012 in)

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



86U01X-130

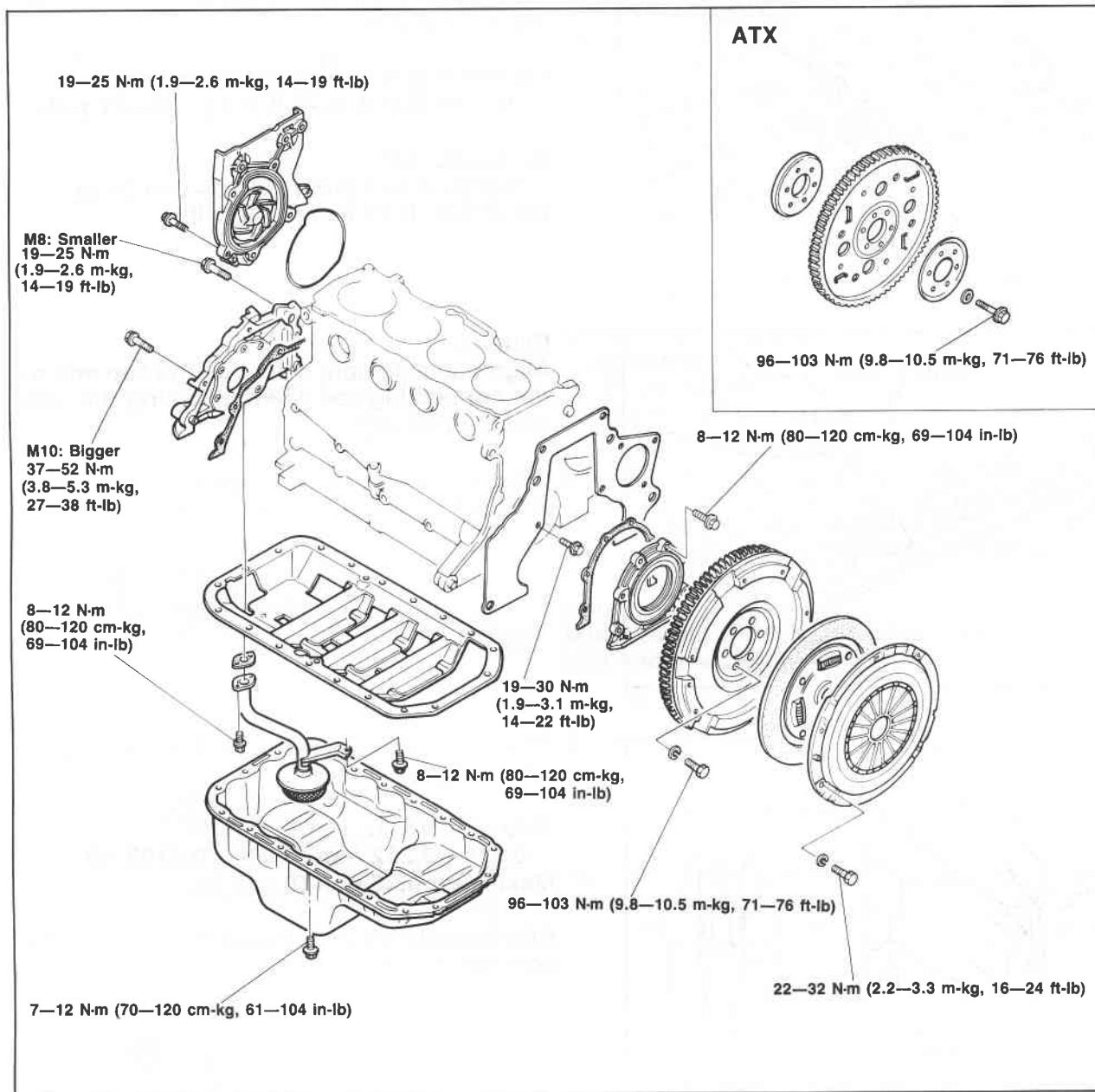
4. Apply a liberal amount of engine oil to the crankpin journal and connecting rod bearing.
5. Install the connecting rod cap with the alignment marks aligned.

#### Tightening torque:

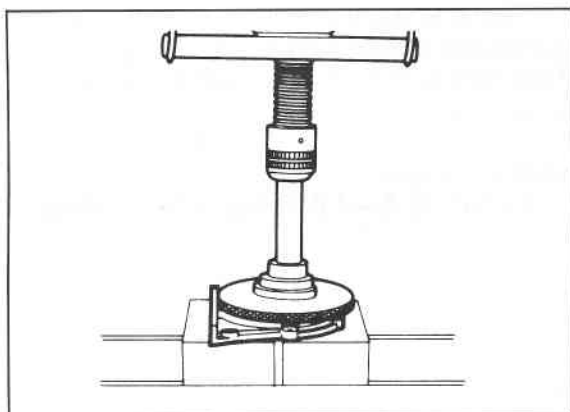
65—69 N·m (6.6—7.0 m·kg, 48—51 ft·lb)

# 1A ASSEMBLY (CYLINDER BLOCK)

## CYLINDER BLOCK—II Torque Specifications



69G01A-166

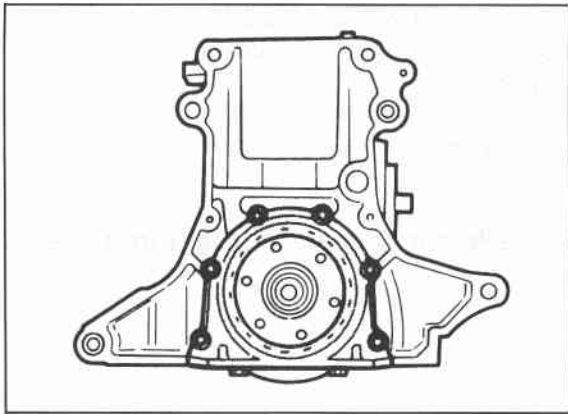


4BG01A-158

### 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) 1A

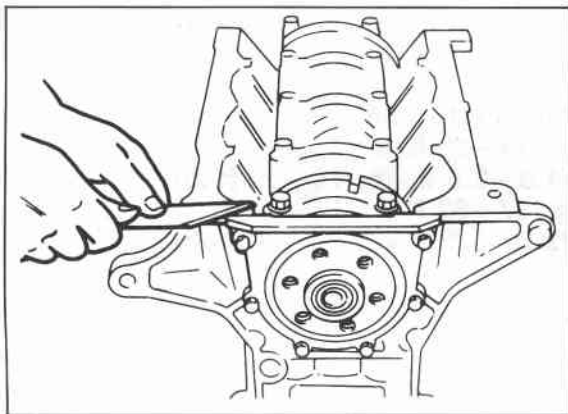


86U01X-131

3. Install the rear cover and a new gasket.

**Tightening torque:**

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

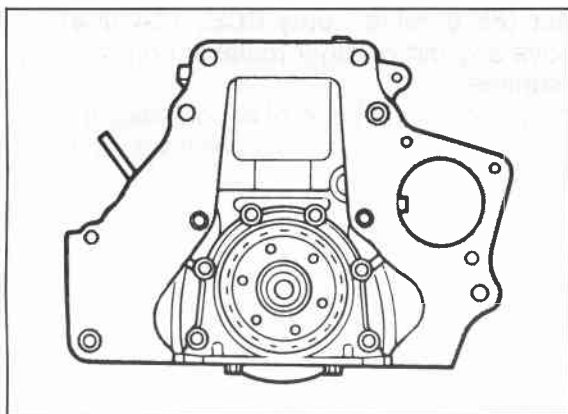


86U01X-132

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.**



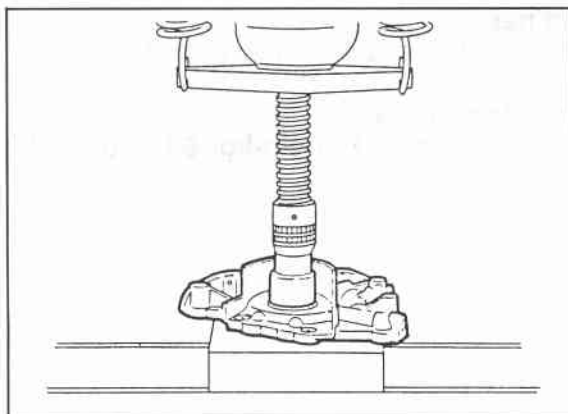
4BG01A-160

**End Plate**

Install the end plate.

**Tightening torque:**

**19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)**

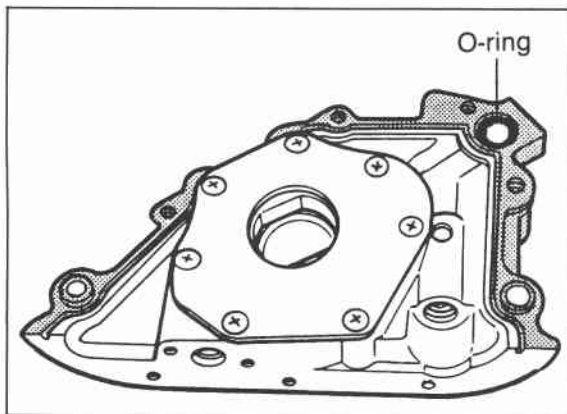


79G01C-085

**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.

# 1A ASSEMBLY (CYLINDER BLOCK)

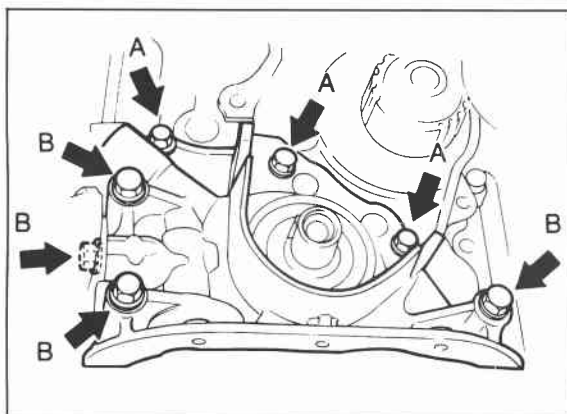


86U01X-133

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.**



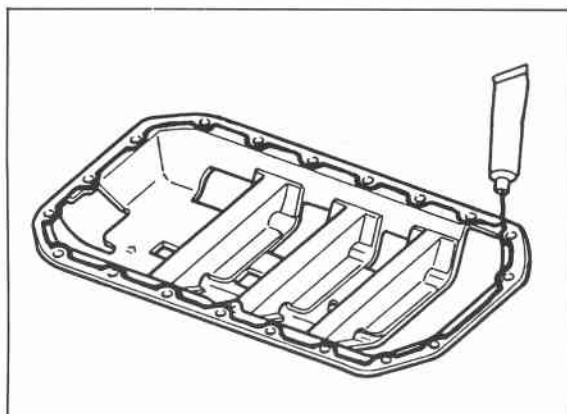
76G01A-137

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

### Tightening torque

- A: 19—25 N·m**  
**(1.9—2.6 m·kg, 14—19 ft·lb)**
- B: 37—52 N·m**  
**(3.8—5.3 m·kg, 27—38 ft·lb)**

8. Remove any sealant which has been squeezed out.



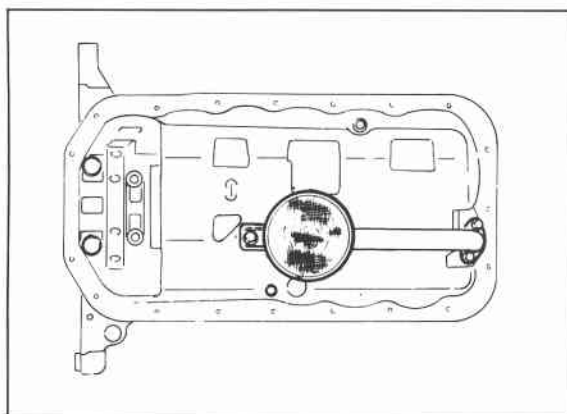
76G01A-076

### Stiffener (FE 8-valve...only ECE, 12-valve)

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

### Tightening torque:

**7—12 N·m (70—120 cm·kg, 61—104 in·lb)**



86U01X-136

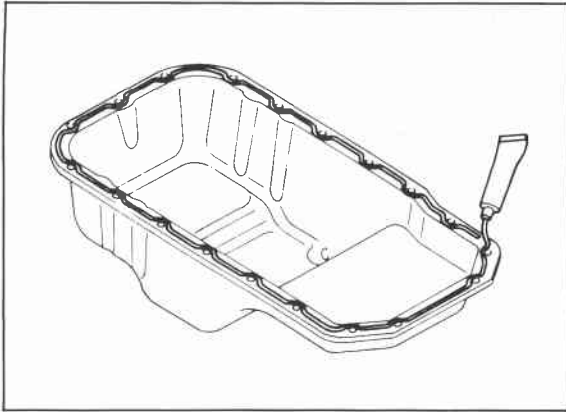
### Oil Strainer

Install the oil strainer and a new gasket.

### Tightening torque:

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

# ASSEMBLY (CYLINDER BLOCK) 1A



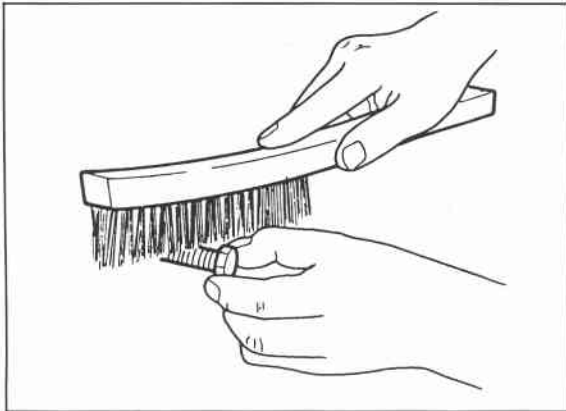
86U01X-137

## Oil Pan

1. Apply a continuous bead of silicon sealant to the oil pan along the inside of the bolt holes, and overlap the ends.
2. Install the oil pan.

## Tightening torque:

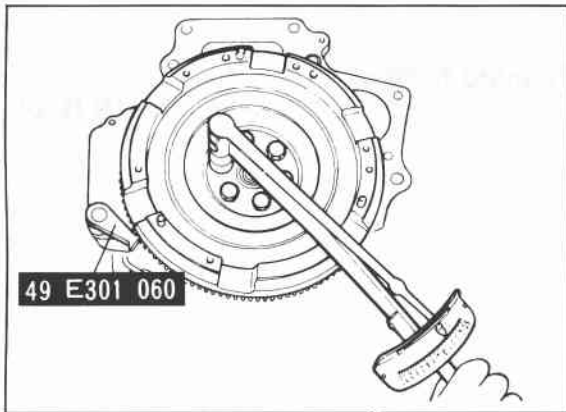
7—12 N·m (70—120 cm·kg, 61—104 in·lb)



76G01A-138

## Flywheel (MTX), Drive Plate (ATX)

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.



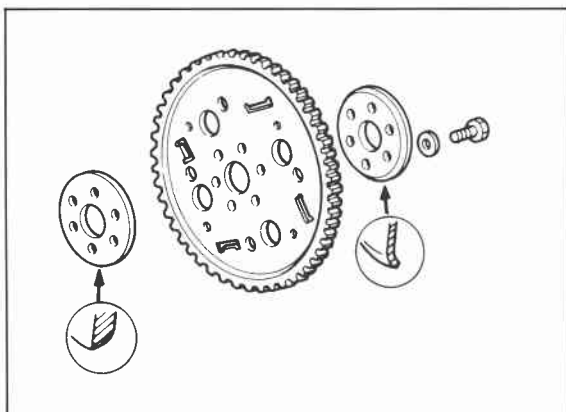
86U01X-139

(MTX)

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

## Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



76G01A-139

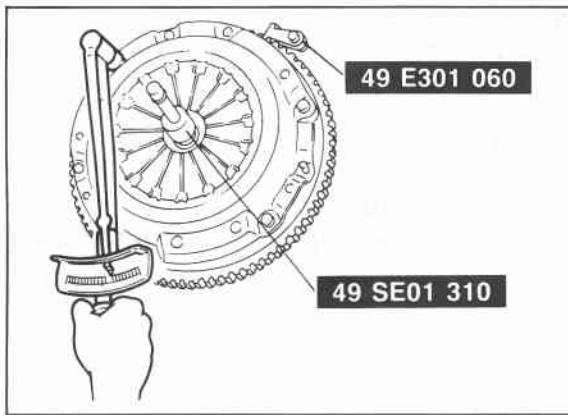
(ATX)

3. Install, and tighten the drive plate adaptor, drive plate, and backing plate with the **SST**.

## Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)

# 1A ASSEMBLY (CYLINDER BLOCK)



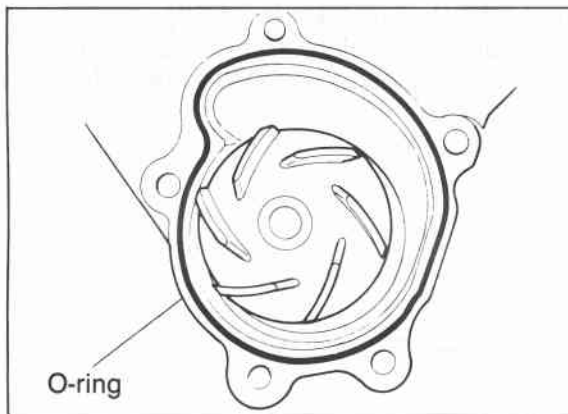
86U01X-141

## Clutch Disc and Clutch Cover (MTX)

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

### Tightening torque:

**22—32 N·m (2.2—3.3 m·kg, 16—24 ft·lb)**



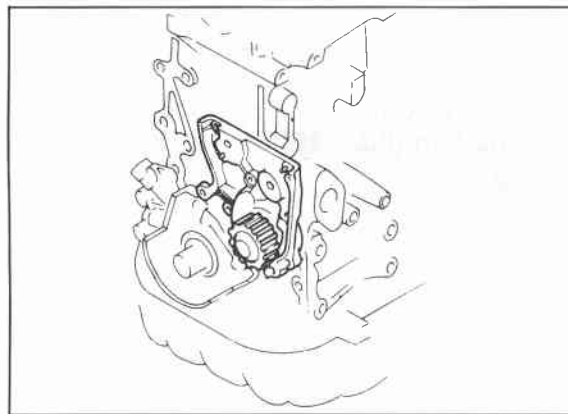
86U01X-142

## Water Pump

1. Remove all dirt, grease, and other material from the water pump mounting surface.
2. Place a new O-ring in position.

### Caution

**Do not reuse the original O-ring.**

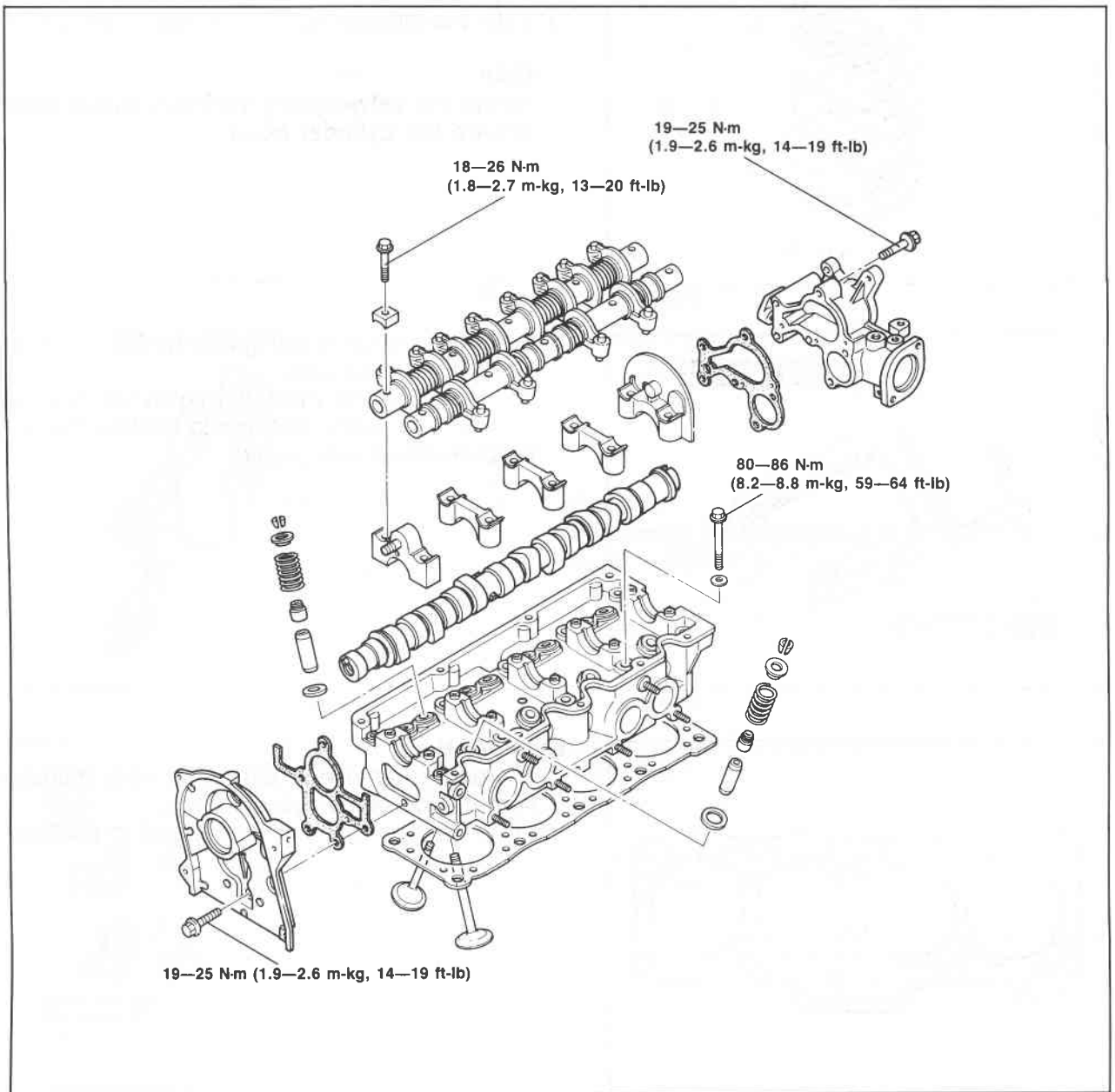


7BU01B-103

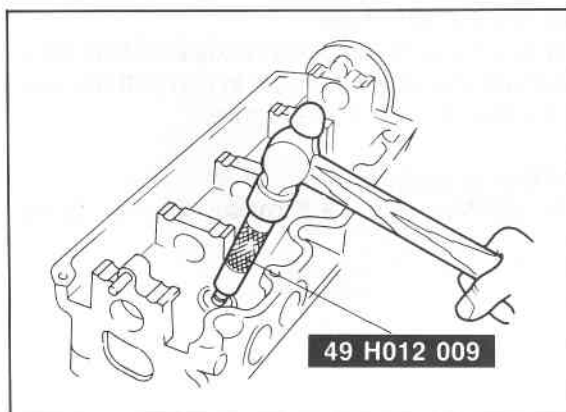
### Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

## CYLINDER HEAD (12-valve) Torque Specifications



76G01A-077

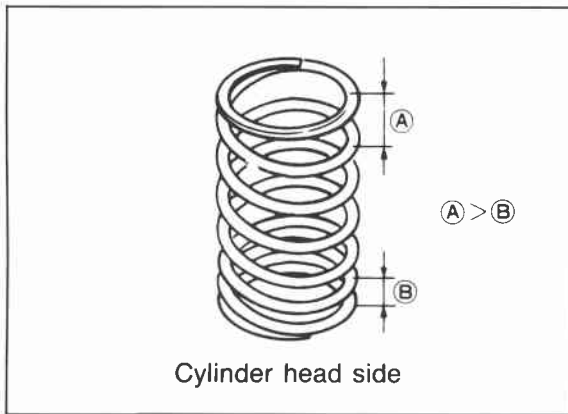


86U01X-143

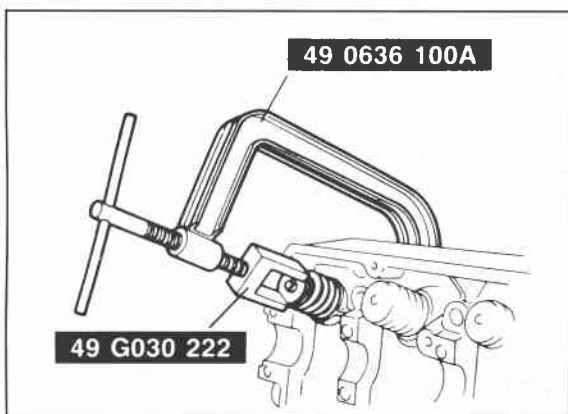
### Valve Seal

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

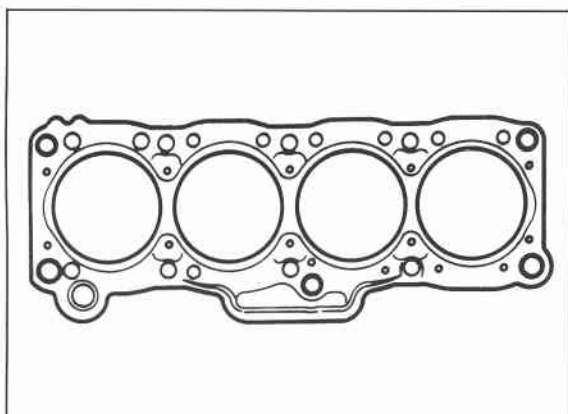
# 1A ASSEMBLY (CYLINDER HEAD)



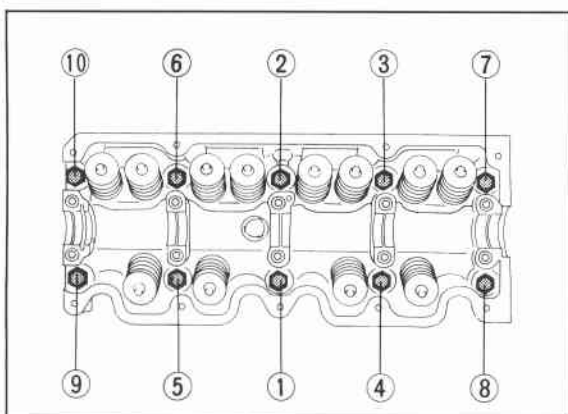
86U01X-144



86U01X-145



86U01X-146



86U01X-147

## Valve and Valve Spring

1. Install the lower spring seat.
2. Install the valve.
3. Install the valve springs and the upper spring seat.

### Note

**Install the valve spring with the closer pitch toward the cylinder head.**

4. Compress the valve spring with the **SST**; then install the valve keepers.
5. 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.

## Cylinder Head

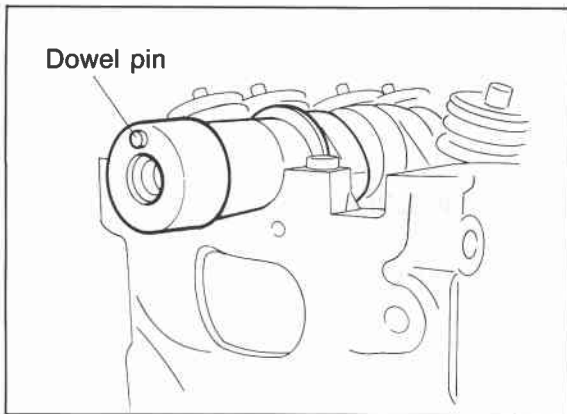
1. Thoroughly remove all dirt, oil, or other material from the top of the cylinder block.
2. Place the new cylinder head gasket in position.

3. Install the cylinder head.
4. Apply engine oil to the bolt threads and seat faces.
5. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

### Tightening torque:

**80—86 N·m (8.2—8.8 m·kg, 59—64 ft·lb)**

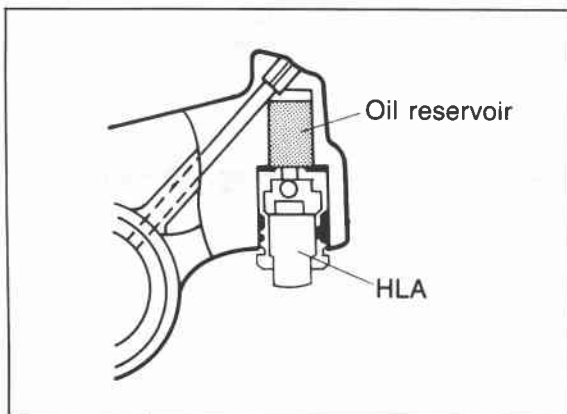
# ASSEMBLY (CYLINDER HEAD) 1A



86U01X-148

## Camshaft

1. Apply a liberal amount of engine oil to the journals and bearings.
2. Place the camshaft in position with the dowel pin facing straight up.



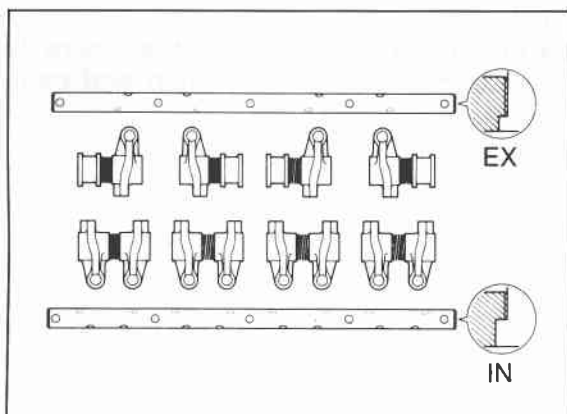
86U01X-149

## Hydraulic Lash Adjuster (HLA)

1. Pour engine oil into the oil reservoir in the rocker arm.
2. Apply engine oil to the new HLA.
3. Carefully install the HLA into the rocker arm.

## Caution

**Be careful not to damage the O-ring when installing the HLA.**



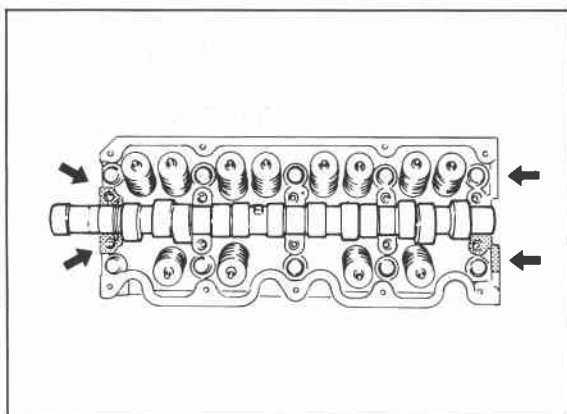
86U01X-150

## Camshaft Cap, Rocker Arm and Shaft Assembly

1. Assemble the rocker arm and shaft assembly as shown in the figure.

## Note

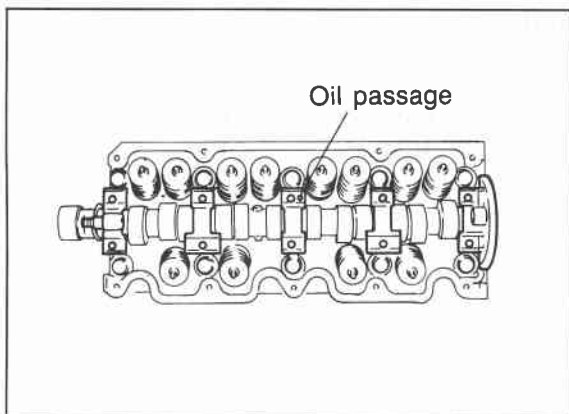
- a) The intake side shaft has twice as many oil holes as the exhaust side shaft.
- b) The stepped ends are the rear of the shafts.



76G01A-140

2. Apply silicone sealant to the shaded areas shown in the figure.

# 1A ASSEMBLY (CYLINDER HEAD)

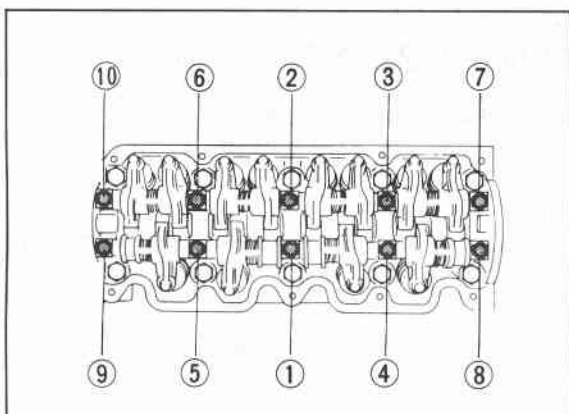


86U01X-152

3. Apply liberal amount of clean engine oil to the cam lobes and journals.
4. Position the camshaft caps according to the ← mark.

### Note

The No. 3 camshaft cap has an oil passage from the cylinder head, be certain it is installed correctly.

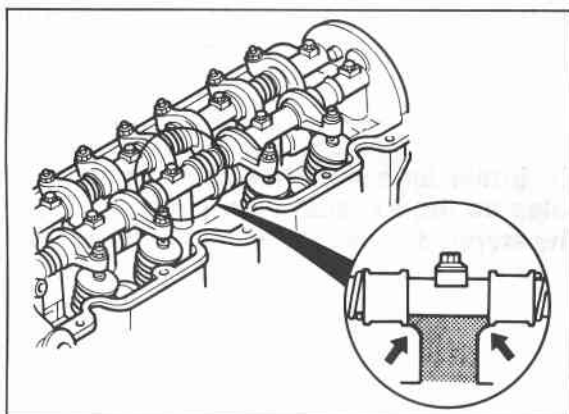


86U01X-153

5. Install the rocker arm and shaft assemblies. Tighten the bolts in two or three steps in the order shown in the figure.

### Tightening torque:

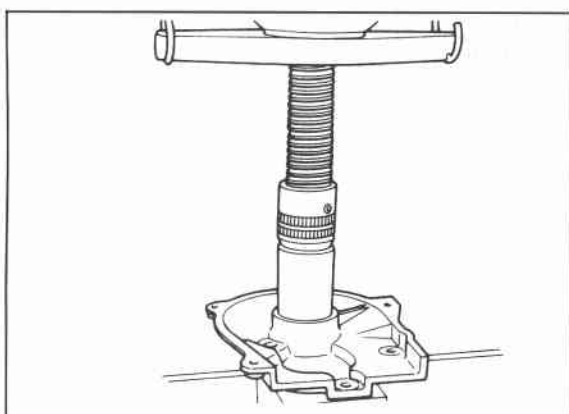
18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)



86U01X-154

### Caution

Be careful that the rocker arms or spacers do not get caught between the shaft and camshaft cap.

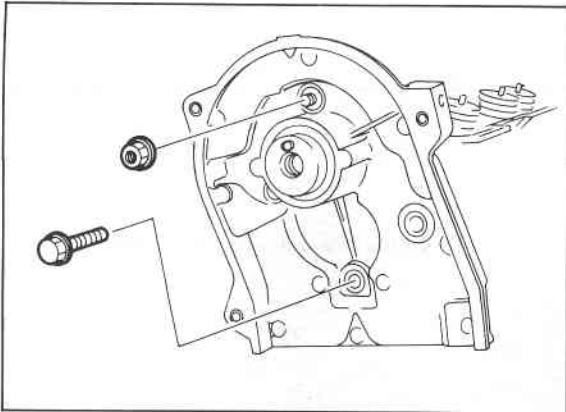


86U01X-155

### Front Housing

1. Apply engine oil to the front housing and a new oil seal.
2. Press the oil seal into the front housing.

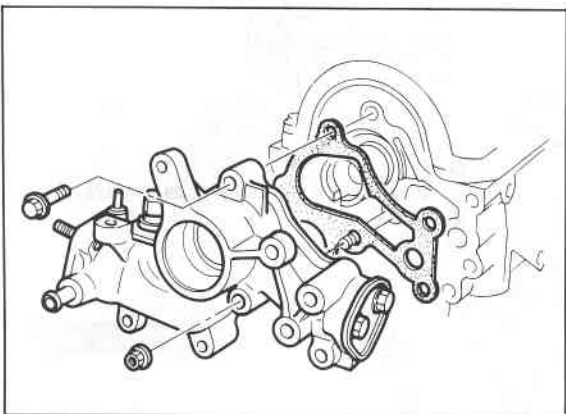
## ASSEMBLY (CYLINDER HEAD) 1A



86U01X-156

3. Apply engine oil to the oil seal lip.
4. Install the front housing and a new gasket.

**Tightening torque:**  
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



86U01X-157

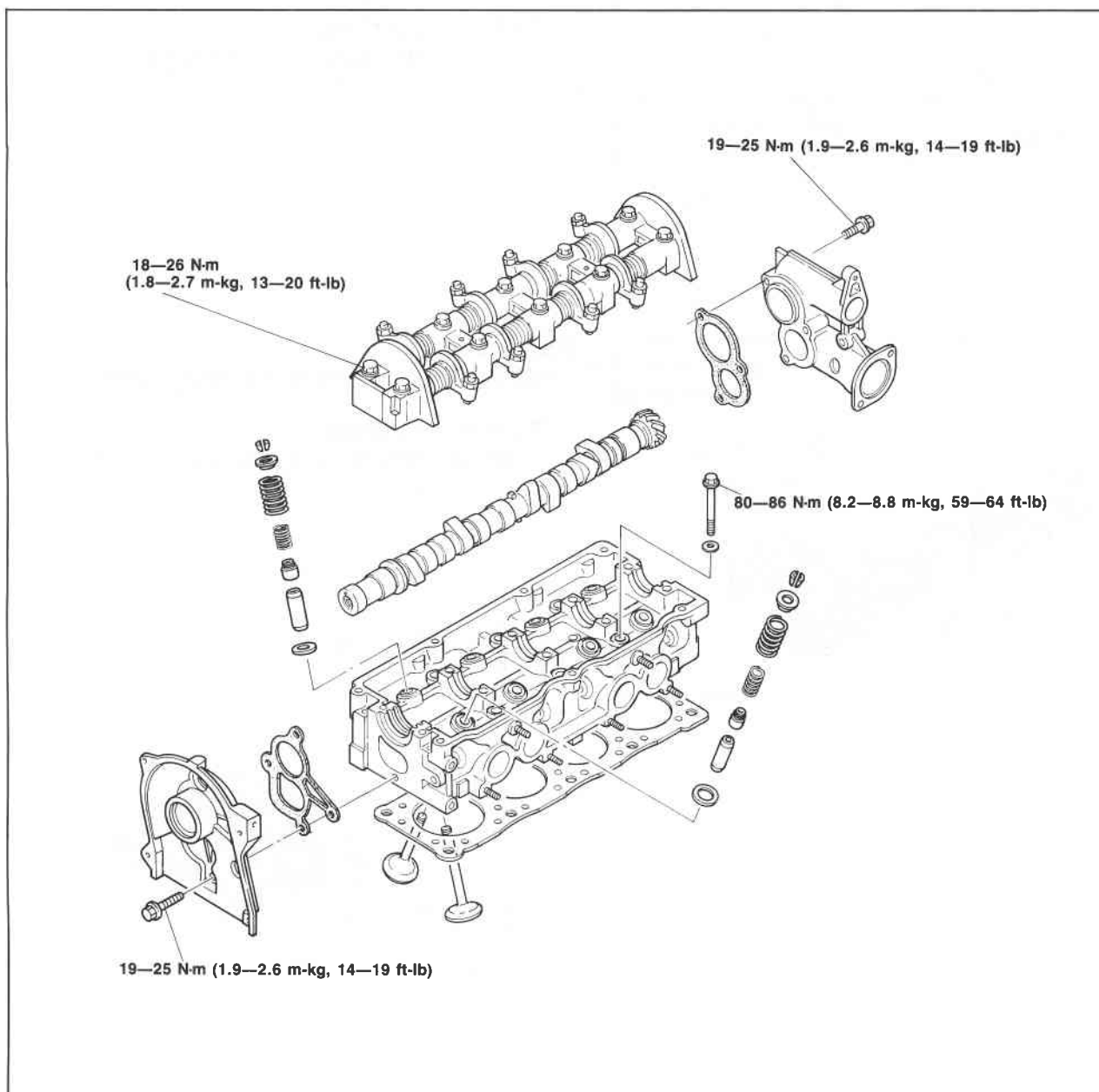
### Rear Housing

Install the rear housing and a new gasket.

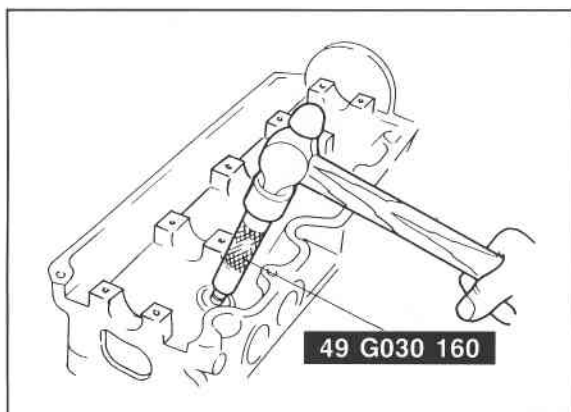
**Tightening torque:**  
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

# 1A ASSEMBLY (CYLINDER HEAD)

## CYLINDER HEAD (8-valve) Torque Specifications



76G01A-078

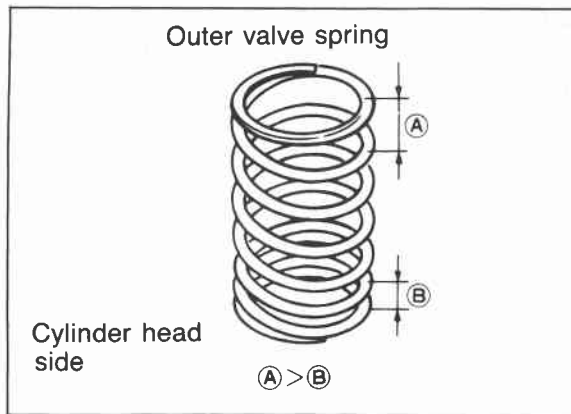


86U01X-143

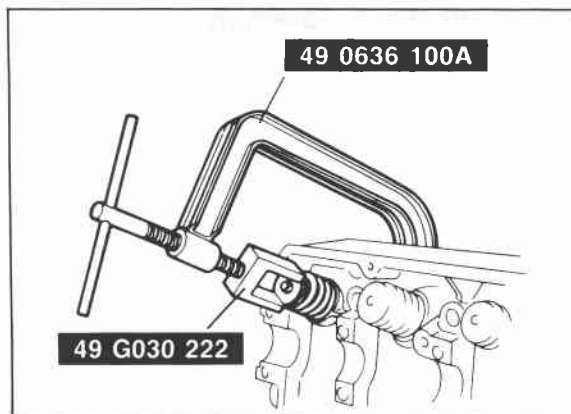
### Valve Seal

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

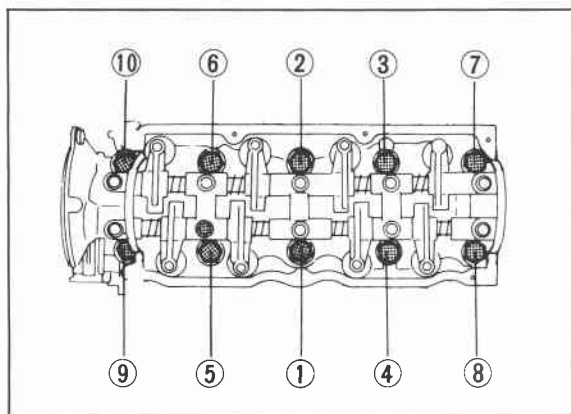
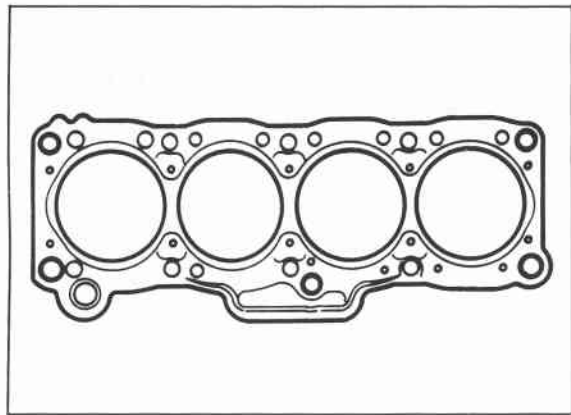
# ASSEMBLY (CYLINDER HEAD) 1A



76G01A-079



86U01X-145



## Valve and Valve Spring

1. Install the lower spring seat.
2. Install the valve.
3. Install the valve springs and the upper spring seat.

### Note

**Install the outer valve spring with the closer pitch toward the cylinder head.**

4. Compress the valve spring with the **SST**; then install the valve keepers.
5. 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.

## Cylinder Head

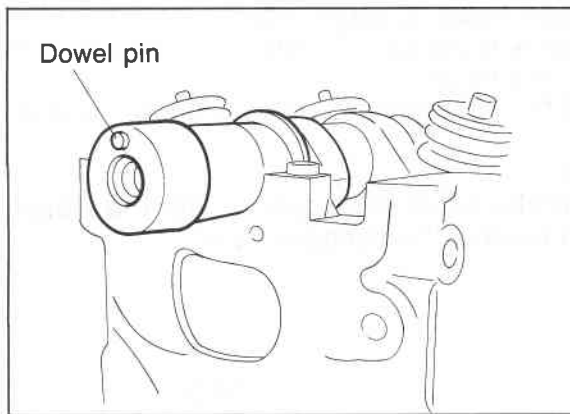
1. Thoroughly remove all dirt, oil, or other material from the top of the cylinder block.
2. Place the new cylinder head gasket in position.

3. Install the cylinder head.
4. Apply engine oil to the bolt threads and seat faces.
5. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

### Tightening torque:

**80—86 N·m (8.2—8.8 m·kg, 59—64 ft·lb)**

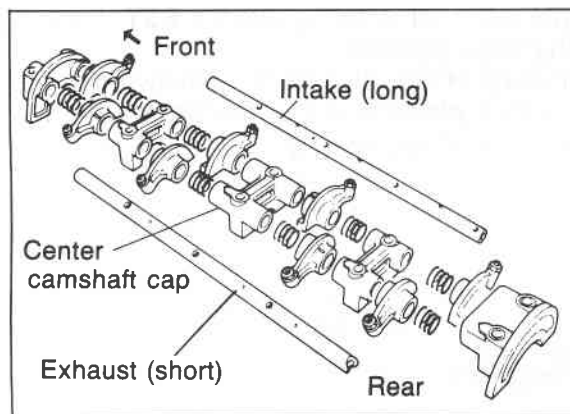
# 1A ASSEMBLY (CYLINDER HEAD)



86U01X-148

## Camshaft

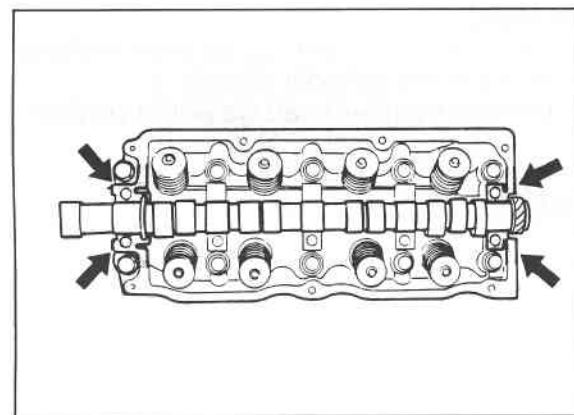
1. Apply a liberal amount of engine oil to the journals and bearings.
2. Place the camshaft in position with the dowel pin facing straight up.



76G01A-080

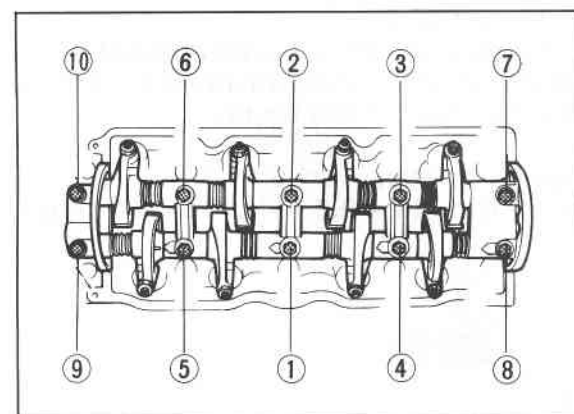
## Rocker Arm and Shaft Assembly

1. Assemble the rocker arm and shaft assembly as shown in the figure.



76G01A-081

2. Apply silicon sealant to the shaded areas shown in the figure.
3. Apply liberal amount of clean engine oil to the cam lobes and journals.



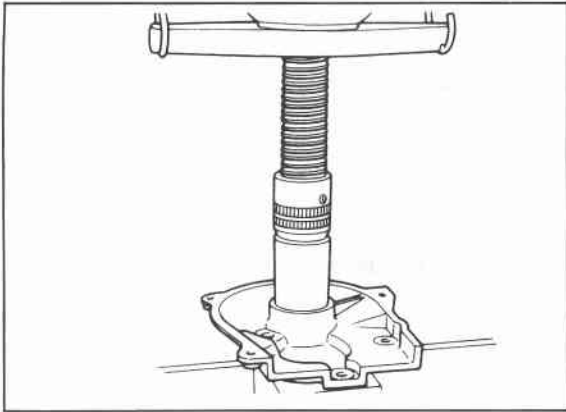
76G01A-082

5. Install the rocker arm and shaft assembly. Tighten the bolts in two or three steps in the order shown in the figure.

## Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)

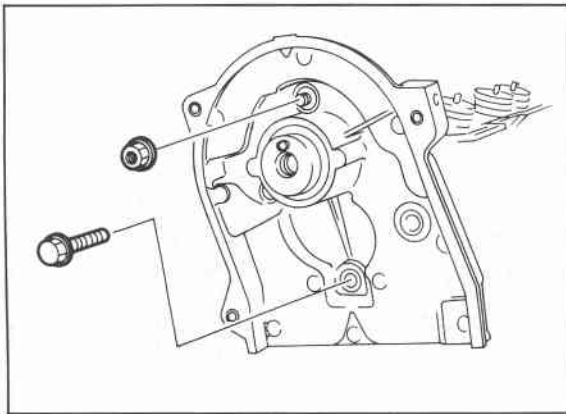
# ASSEMBLY (CYLINDER HEAD) 1A



86U01X-155

## Front Housing

1. Apply engine oil to the front housing and a new oil seal.
2. Press the oil seal into the front housing.

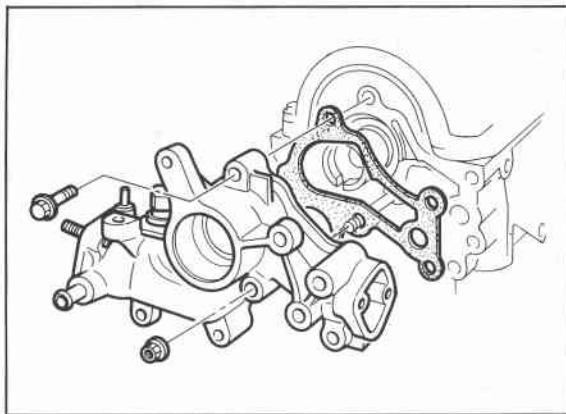


86U01X-156

3. Apply engine oil to the oil seal lip.
4. Install the front housing and a new gasket.

## Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**



86U01X-157

## Rear Housing

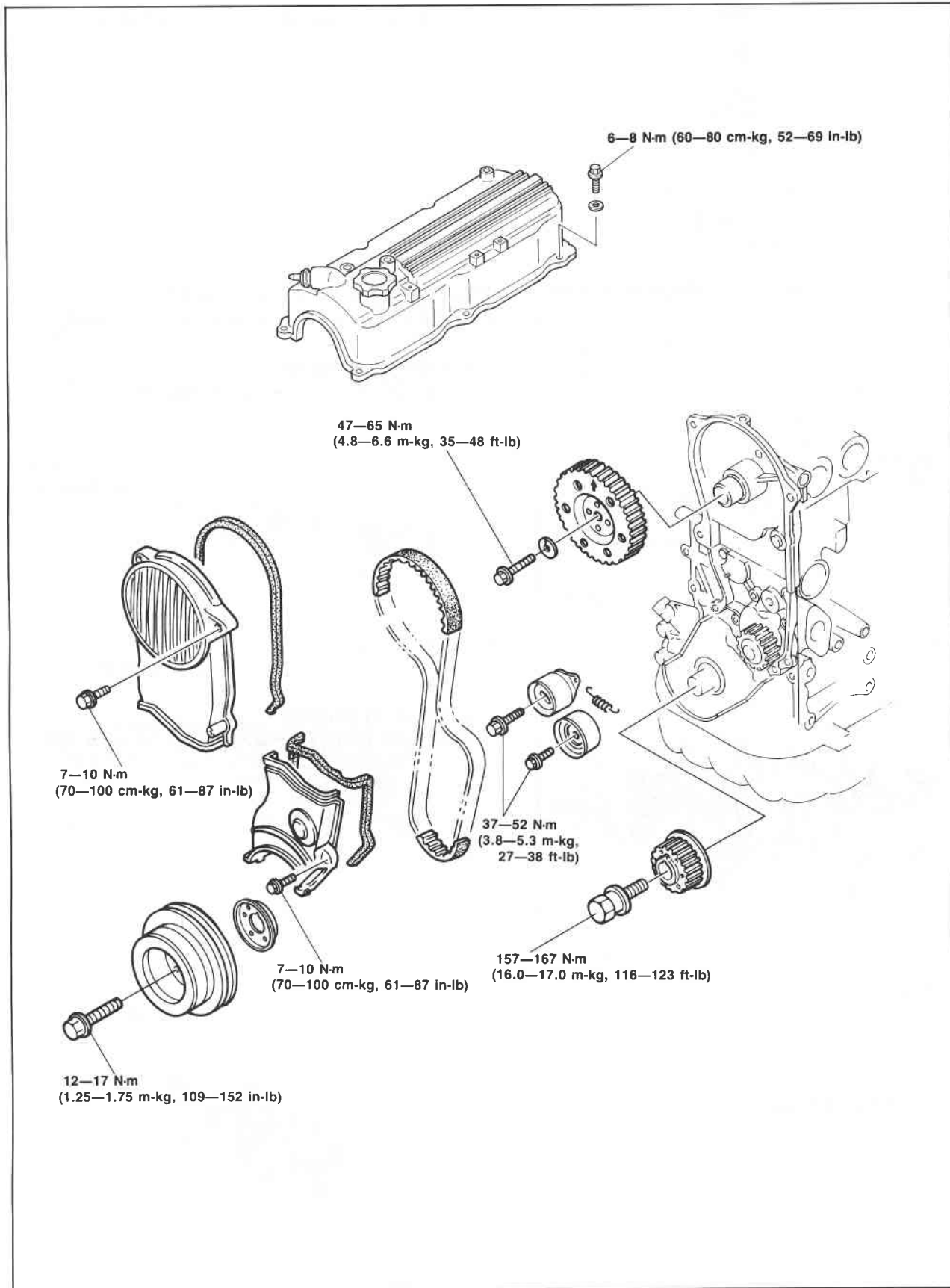
Install the rear housing and a new gasket.

## Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

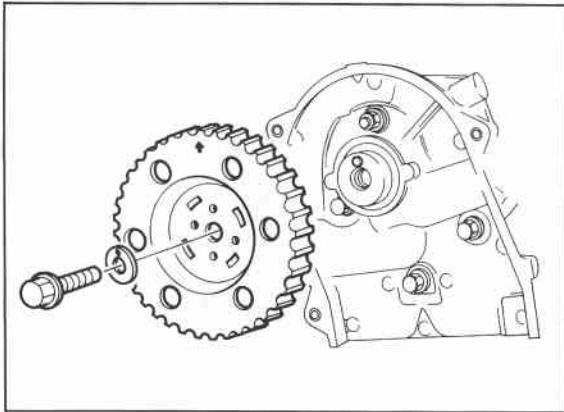
# 1A ASSEMBLY (TIMING BELT)

## TIMING BELT Torque Specifications



69G01B-160

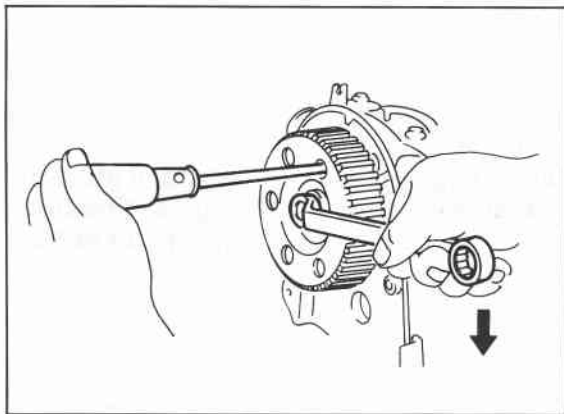
# ASSEMBLY (TIMING BELT) 1A



76G01A-083

## Camshaft Pulley

1. Install the camshaft pulley on the camshaft with the dowel pin fit into the hole at the **2** mark (FE) or **3** mark (F8, F6).

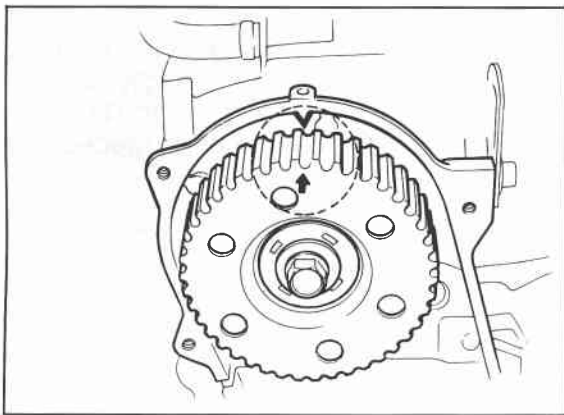


76G01A-141

2. Tighten the camshaft pulley lock bolt.

## Tightening torque:

**47—65 N·m (4.8—6.6 m·kg, 35—48 ft·lb)**



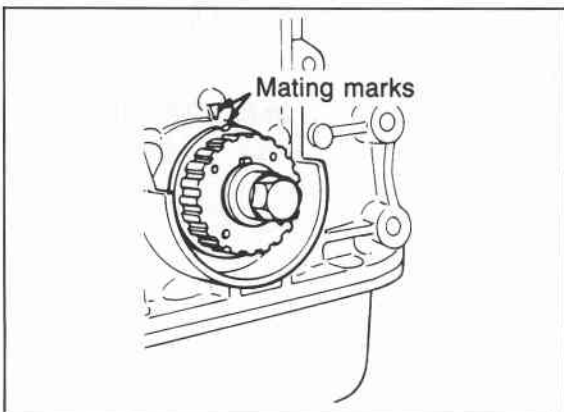
76G01A-084

3. Align the mating mark on the pulley with the alignment mark on the front housing.

## Note

**For FE engine, align "2" mark.**

**For F8, F6 engine, align "3" mark.**



86U01X-160

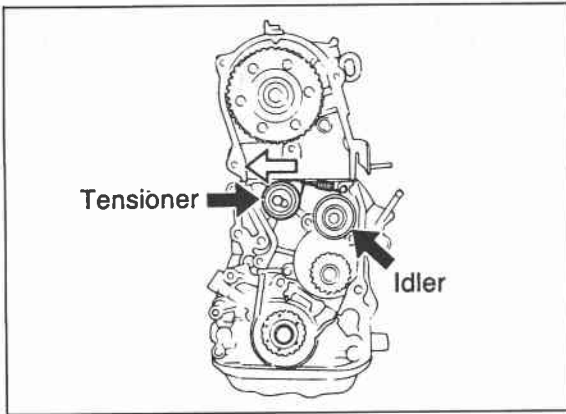
## Timing Belt Pulley

1. Reverse the direction of the **SST** (ring gear brake).
2. Install the crankshaft key.
3. Install the timing belt pulley on the crankshaft.

**Tightening torque: 157—167 N·m  
(16.0—17.0 m·kg, 116—123 ft·lb)**

4. Release the ring gear brake.
5. Align the timing belt pulley and the pump body alignment marks.

# 1A ASSEMBLY (TIMING BELT)



69G01B-165

## Timing Belt Idler Pulley

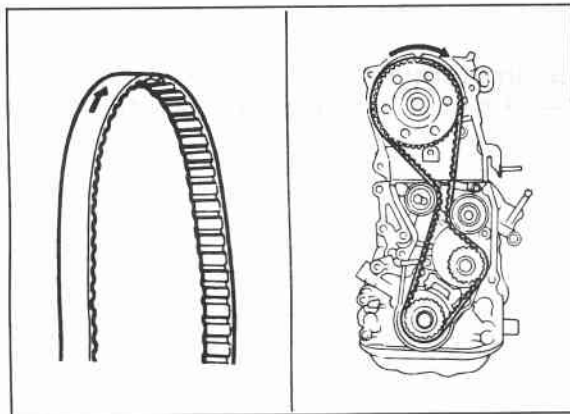
Install the timing belt idler pulley.

### Tightening torque:

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

## Timing Belt Tensioner

1. Install the timing belt tensioner and tensioner spring.
2. Tentatively secure the tensioner with the spring fully extended.



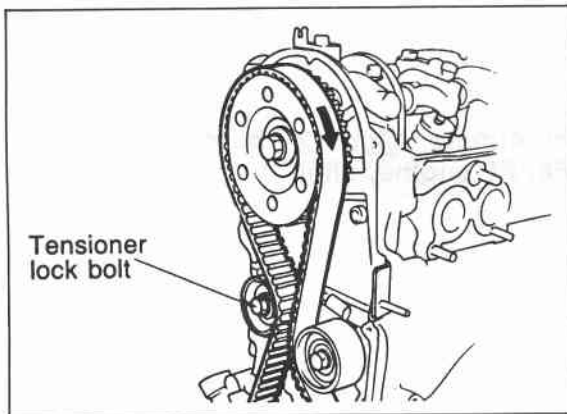
76G01A-085

## Timing Belt

1. Install the timing belt. (keep the tension side of belt as tight as possible.)

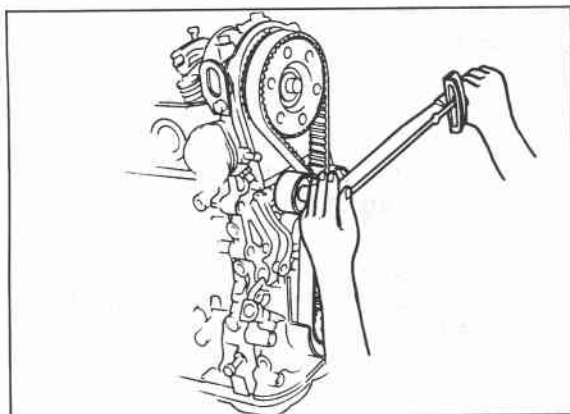
### Caution

- a) If the timing belt is being reused, it must be reinstalled to rotate in the original direction.
- b) Check that there is no oil, grease, or dirt on the timing belt.



79G01C-097

2. Loosen the tensioner lock bolt.
3. Turn the crankshaft twice in the direction of rotation.
4. Check that the mating marks are correctly aligned. If not aligned, remove the timing belt and tensioner, and repeat the above-mentioned procedure.



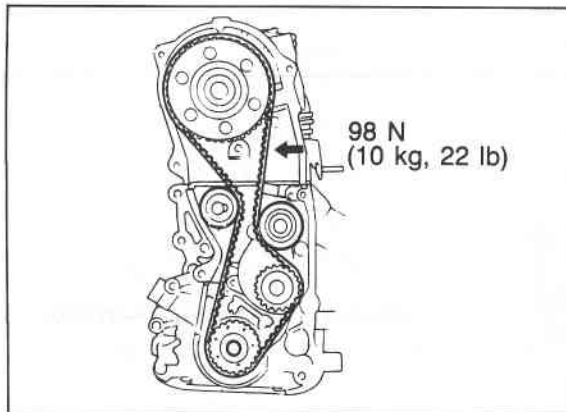
4BG01A-186

5. Tighten the timing belt tensioner lock bolt.

### Tightening torque:

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

## ASSEMBLY (TIMING BELT) 1A



76G01A-086

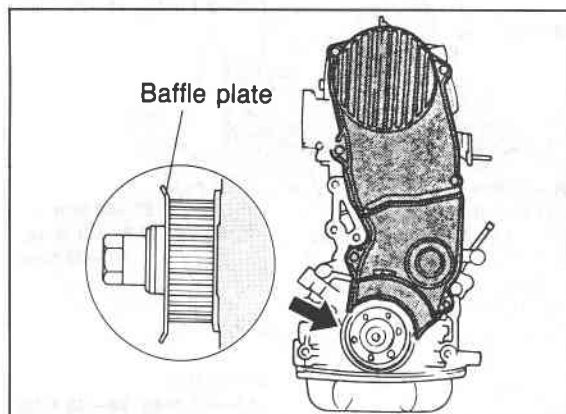
6. Check the timing belt deflection. If the deflection is not correct, loosen the tensioner lock bolt and repeat steps 3—5 above. Replace the tensioner spring if necessary.

### Belt deflection:

**FE: 5.5—6.5 mm (0.22—0.26 in)**

**F8, F6: 4.0—5.0 mm (0.16—0.20 in)**

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



86U01X-163

### Baffle Plate

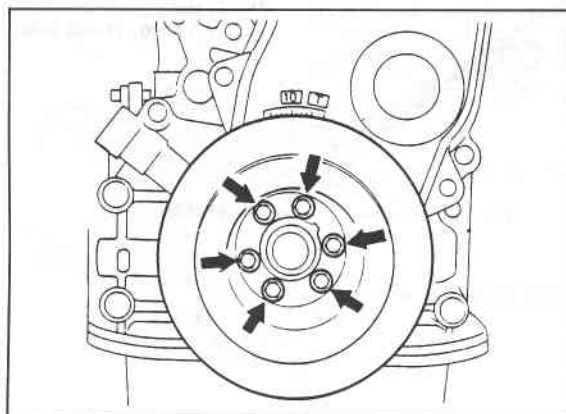
Position the baffle plate on the timing belt pulley.

### Timing Belt Cover

Install the lower timing belt cover, upper timing belt cover, and new gaskets.

### Tightening torque:

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



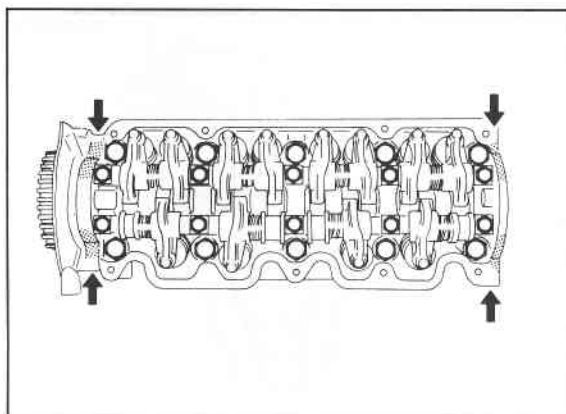
69G01B-170

### Crankshaft Pulley

Install the crankshaft pulley.

**Tightening torque: 12—17 N·m**

**(1.25—1.75 m·kg, 109—152 in·lb)**



76G01A-142

### Valve Clearance (8-valve)

Adjust the valve clearance. (Refer to page 1A—10.)

### Cylinder Head Cover

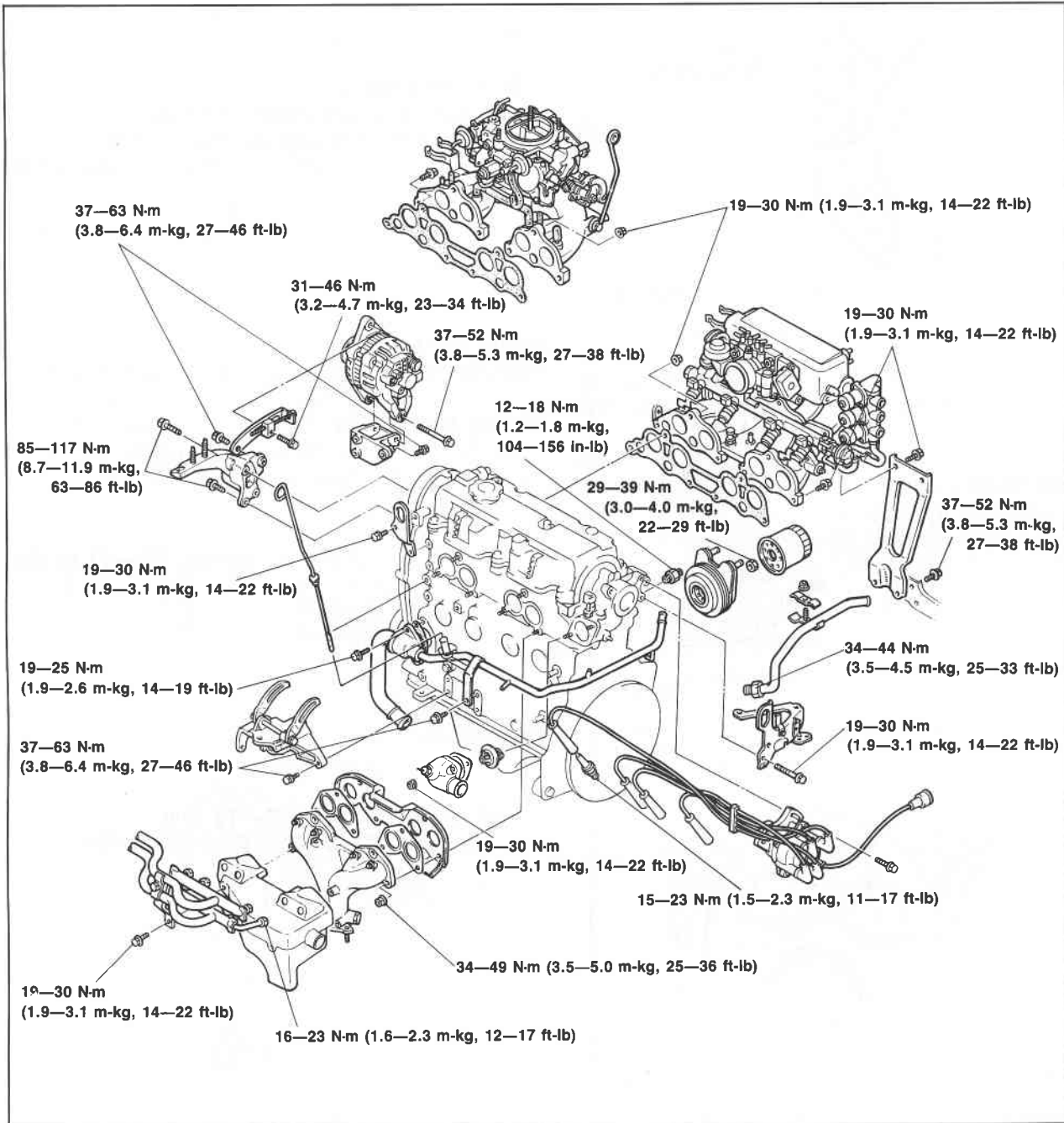
1. Apply silicon sealant to the shaded areas shown in the figure.
2. Install the cylinder head cover.

### Tightening torque:

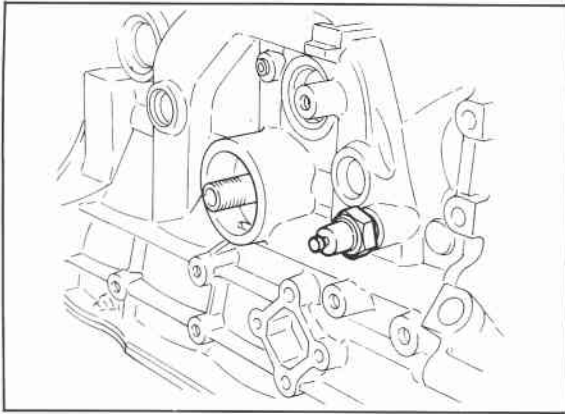
**6—8 N·m (60—80 cm·kg, 52—69 in·lb)**

# 1A ASSEMBLY (AUXILIARY PARTS)

## AUXILIARY PARTS Torque Specifications



## ASSEMBLY (AUXILIARY PARTS) 1A

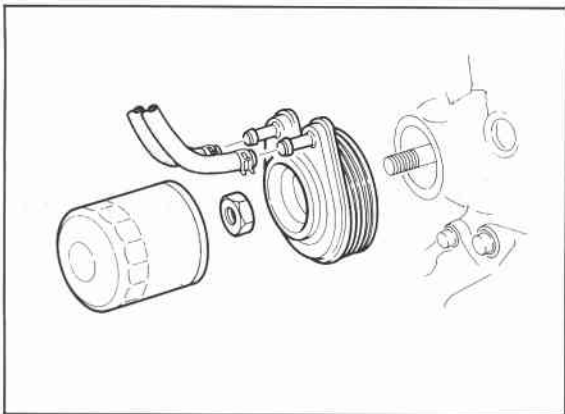


76G01A-087

### Oil Pressure Switch

Install the oil pressure switch.

**Tightening torque: 12—18 N·m  
(1.2—1.8 m·kg, 104—156 in·lb)**



76G01A-088

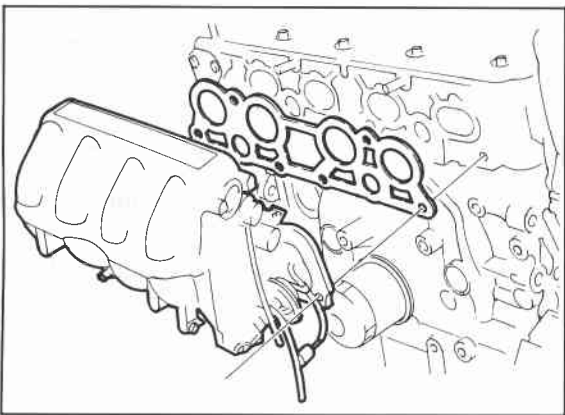
### Oil Cooler (8-valve...only ECE, 12-valve)

Install the oil cooler.

**Tightening torque:  
29—39 N·m (3.0—4.0 m·kg, 22—29 ft·lb)**

### Oil Filter

1. Apply engine oil to the rubber gasket of the new filter.
2. Install the oil filter, and tighten it by hand only. Do not use a wrench.

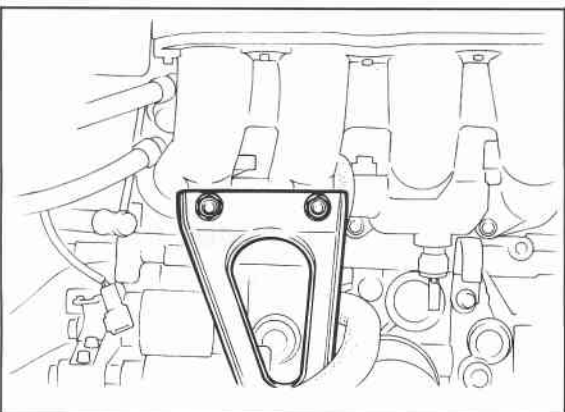


86U01X-167

### Intake Manifold Assembly

1. Place the new gasket in position.
2. Install the intake manifold assembly.
3. Tighten the nuts in two or three steps.

**Tightening torque:  
19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)**



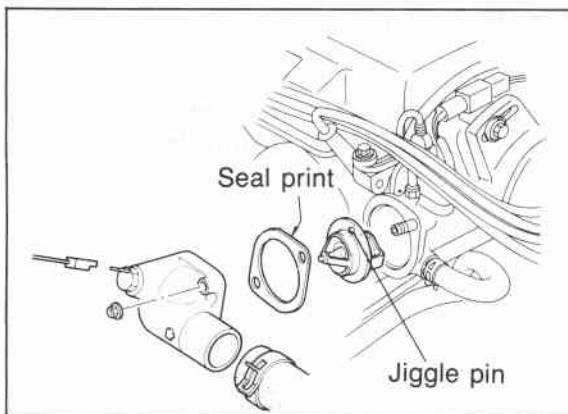
76G01A-089

### Intake Manifold Bracket (FI)

Install the intake manifold bracket.

**Tightening torque:  
19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)**

# 1A ASSEMBLY (AUXILIARY PARTS)



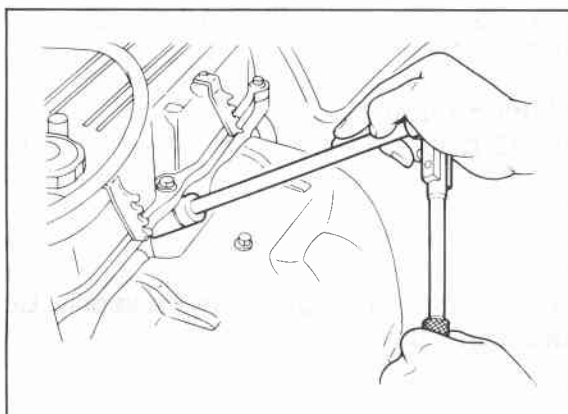
86U01X-169

## Thermostat and Thermostat Cover

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

### Tightening torque:

19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)



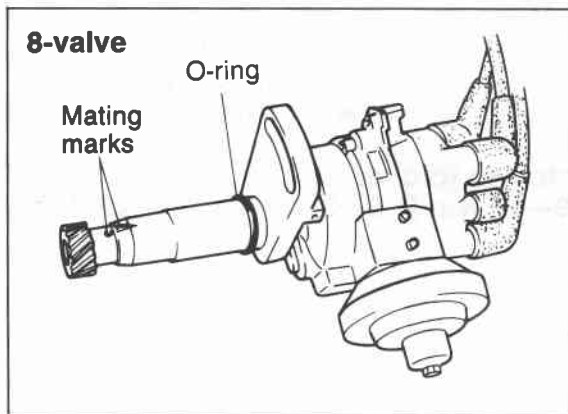
86U01X-219

## Spark Plug

1. Apply anti-seize compound or molybdenum-based lubricant to the spark plug threads.
2. Install the spark plugs.

### Tightening torque:

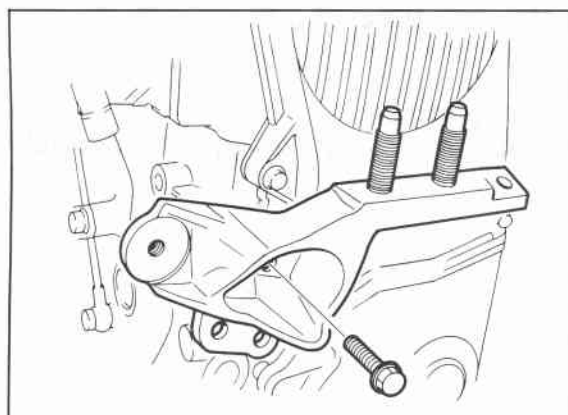
15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)



76G01A-035

## Distributor

1. Apply engine oil to the O-ring, and position it on the distributor.
2. Apply engine oil to the blade or gear.
3. Align the mating marks as shown in the figure ...8-valve.
4. Install the distributor with the marks facing straight up.
5. Loosely tighten the distributor mounting bolt.



86U01X-170

## High-Tension Lead

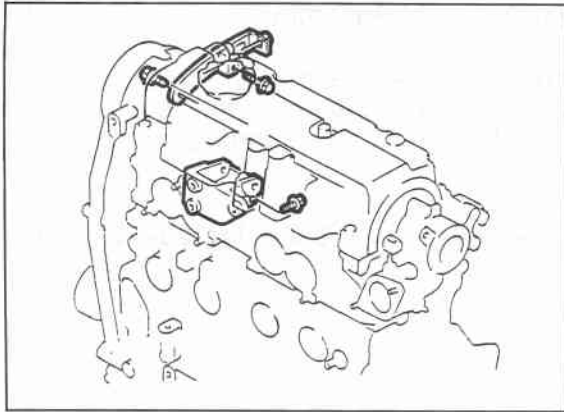
Install the high-tension leads.

## Engine Mount Bracket

Install the engine mount.

### Tightening torque:

85—117 N·m (8.7—11.9 m·kg, 63—86 ft·lb)



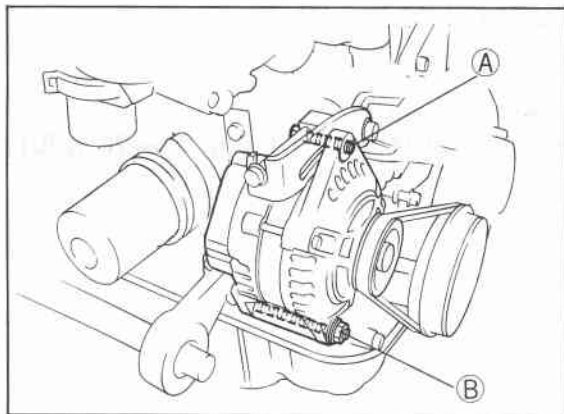
86U01X-171

## Alternator

1. Install the alternator strap and bracket.

### Tightening torque:

**37—63 N·m (3.8—6.4 m·kg, 27—46 ft·lb)**



76G01A-090

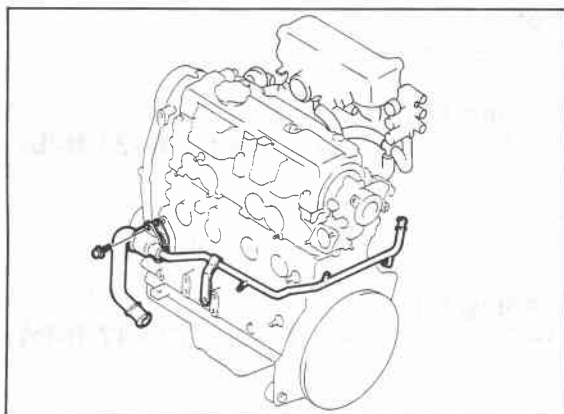
2. Install the alternator.

### Tightening torque

**A : 31—46 N·m  
(3.2—4.7 m·kg, 23—34 ft·lb)**

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

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



76G01A-091

## Coolant Inlet Pipe and Bypass Pipe

1. Install the coolant inlet pipe.

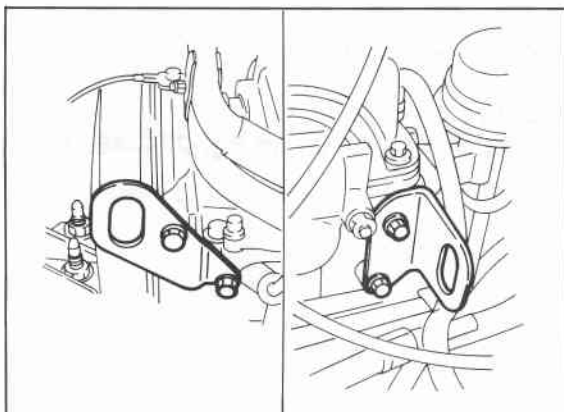
### Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

2. Apply vegetable oil to the O-ring.
3. Install the coolant bypass pipe.

### Tightening torque:

**37—63 N·m (3.8—6.4 m·kg, 27—46 ft·lb)**



76G01A-092

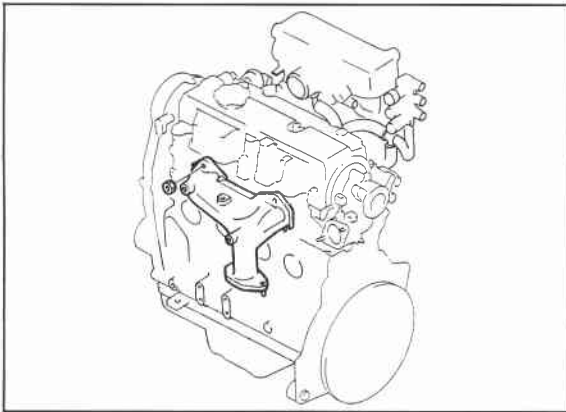
## Engine Hanger

- Install the front and rear engine hangers.

### Tightening torque:

**19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)**

# 1A ASSEMBLY (AUXILIARY PARTS)



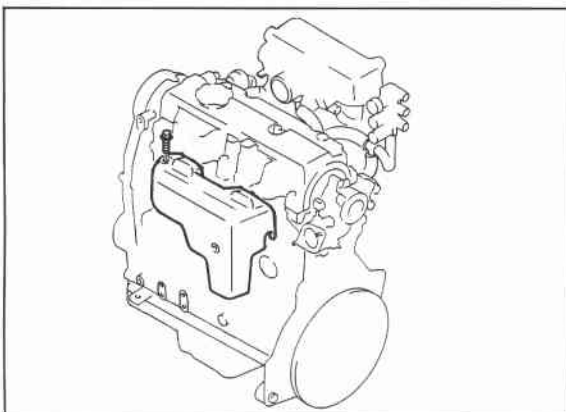
76G01A-093

## Exhaust Manifold Assembly

1. Place the new gaskets in position with the ridge facing the cylinder head.
2. Install the exhaust manifold assembly.
3. Tighten the nuts in two or three steps.

### Tightening torque:

**34—49 N·m (3.5—5.0 m·kg, 25—36 ft·lb)**



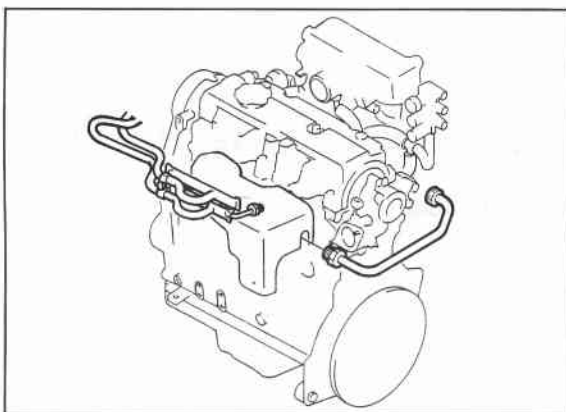
76G01A-094

## Exhaust Manifold Insulator

Install the exhaust manifold insulator.

### Tightening torque:

**19—30 N·m (1.9—3.1 m·kg, 14—22 ft·lb)**



76G01A-095

## EGR Pipe

Install the EGR pipe.

### Tightening torque:

**34—44 N·m (3.5—4.5 m·kg, 25—33 ft·lb)**

## Secondary Air Pipe Assembly

Install the secondary air pipe assembly.

### Tightening torque:

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



86U01X-178

## P/S Oil Pump Bracket

Install the P/S oil pump bracket.

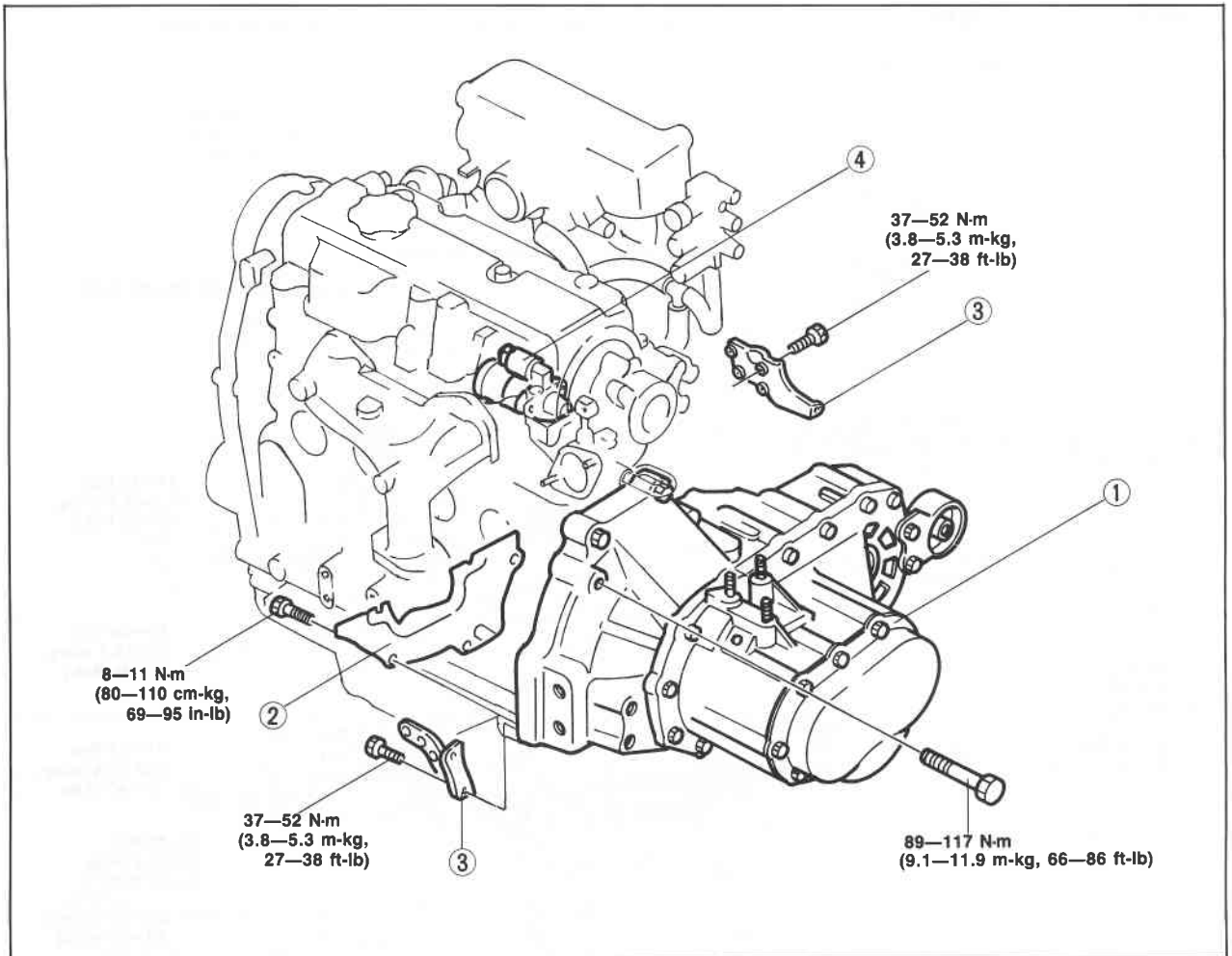
### Tightening torque:

**37—63 N·m (3.8—6.4 m·kg, 27—46 ft·lb)**

## INSTALLATION

### TRANSAXLE ASSEMBLY

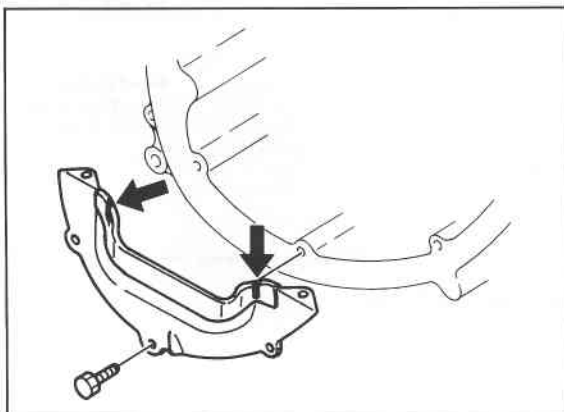
Assemble the transaxle to the engine in the sequence shown in the figure referring to the installation note.



76G01A-143

1. Transaxle
2. Clutch under cover

3. Gusset plate
4. Starter



76G01A-144

#### Installation Note Clutch under cover

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

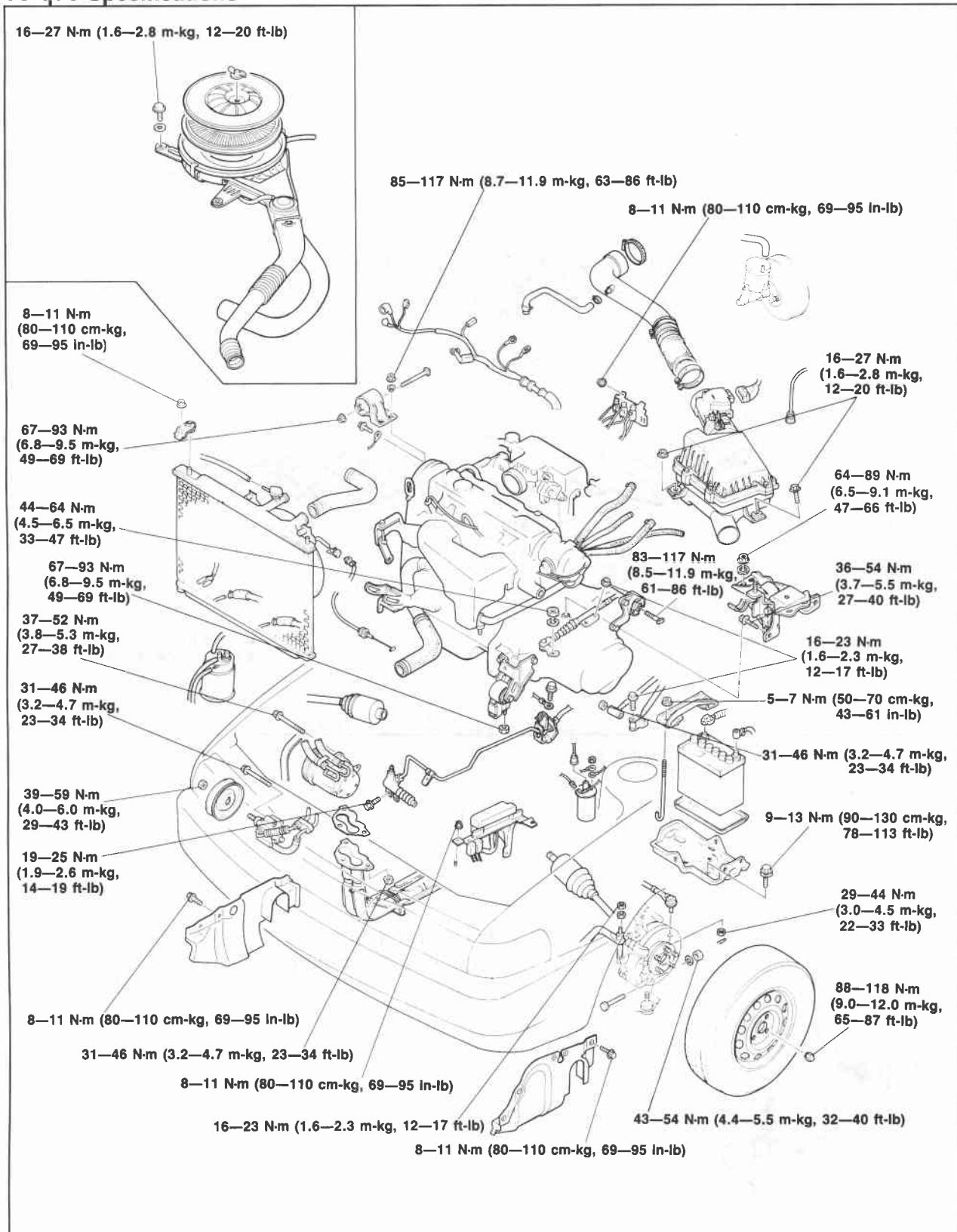
# 1A INSTALLATION

## ENGINE INSTALLATION

Install the engine and transaxle assembly.

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

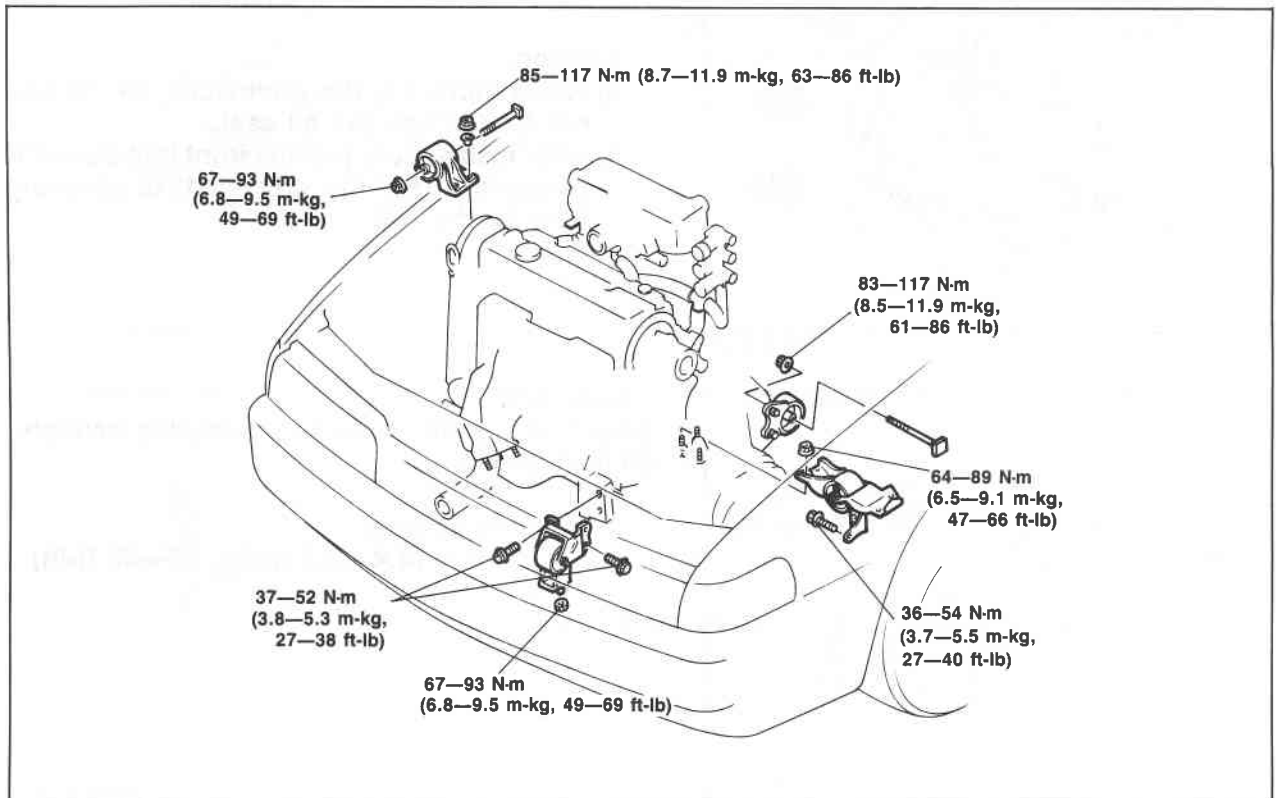
### Torque Specifications



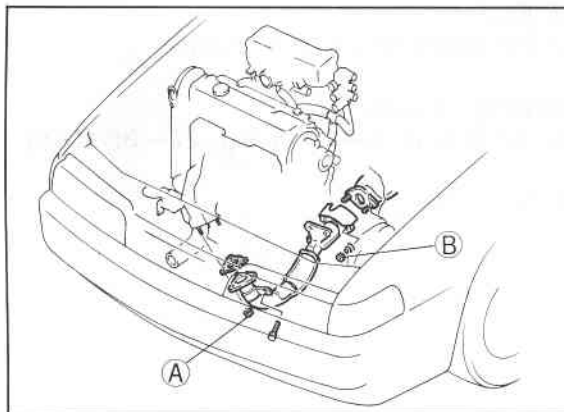
86U01X-180

## Engine Mount

Install the engine mount.



86U01X-181



86U01X-182

## Exhaust Pipe

1. Install the exhaust pipe.

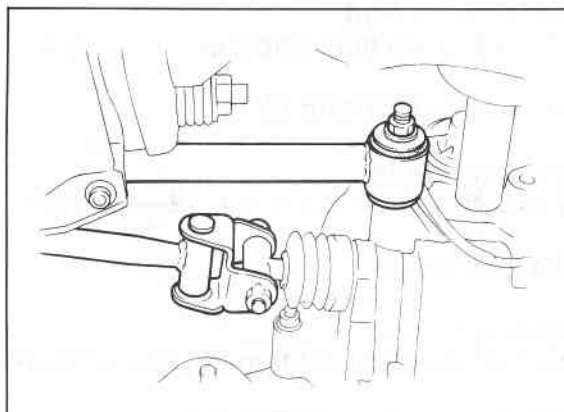
### Tightening torque

- Ⓐ : 31—46 N-m  
(3.2—4.7 m-kG, 23—34 ft-lb)
- Ⓑ : 64—89 N-m  
(6.5—9.1 m-kG, 47—66 ft-lb)

2. Tighten the bracket bolt.

### Tightening torque:

- 19—25 N-m (1.9—2.6 m-kG, 14—19 ft-lb)



76G01A-145

## Extension Bar (MTX)

Install the extension bar to the transaxle.

### Tightening torque:

- 31—46 N-m (3.2—4.7 m-kG, 23—34 ft-lb)

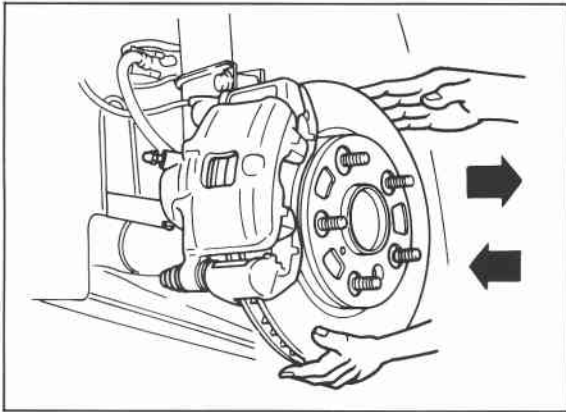
## Change Rod (MTX)

Install the change rod to the transaxle.

### Tightening torque:

- 16—23 N-m (1.6—2.3 m-kG, 12—17 ft-lb)

# 1A INSTALLATION



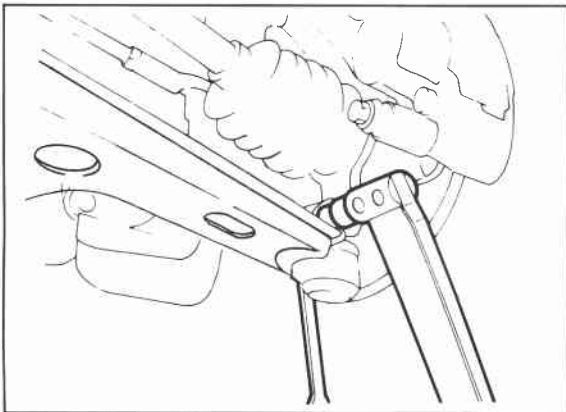
86U01X-184

## 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.



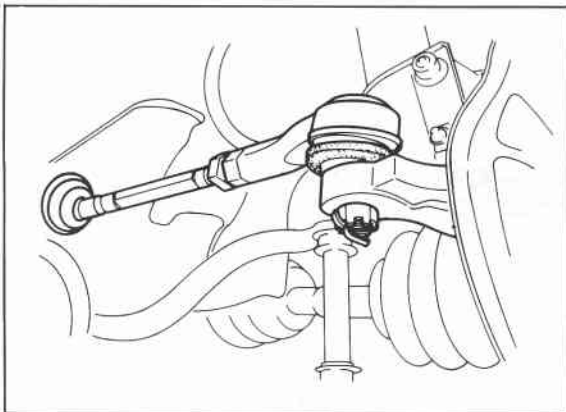
86U01X-185

## 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

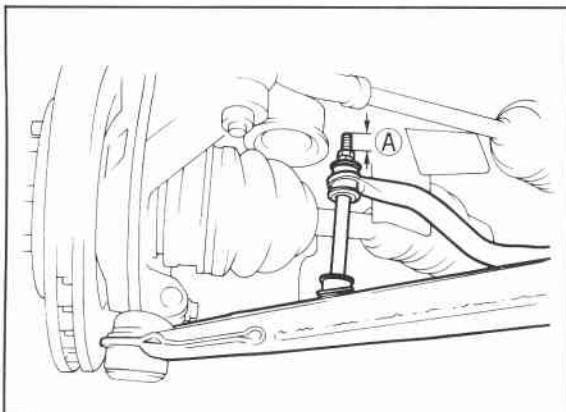
## Tie-Rod End

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.



86U01X-187

## Stabilizer Control Rod

Install and adjust the front stabilizer control rods.

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

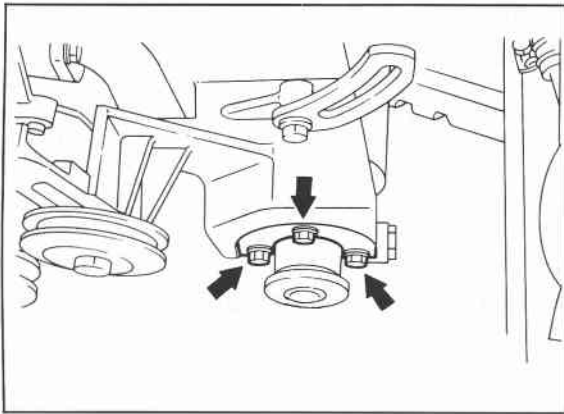
### Tightening torque:

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

Install the front wheel.

### Tightening torque:

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



86U01X-188

## P/S Oil Pump

1. Install the P/S oil pump.

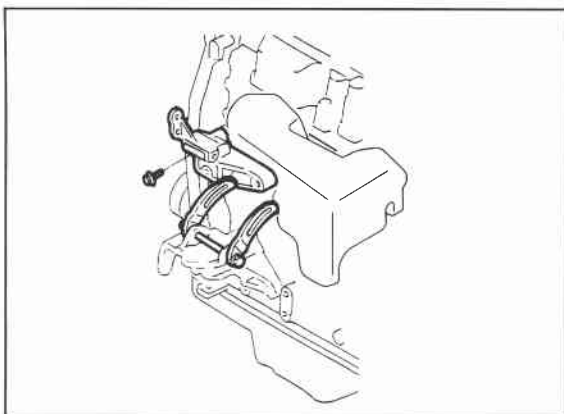
### Tightening torque:

**31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)**

2. Tighten the pulley lock nut.

### Tightening torque:

**39—59 N·m (4.0—6.0 m·kg, 29—43 ft·lb)**



86U01X-189

## A/C Compressor

1. Install the A/C compressor strap to the P/S oil pump bracket.

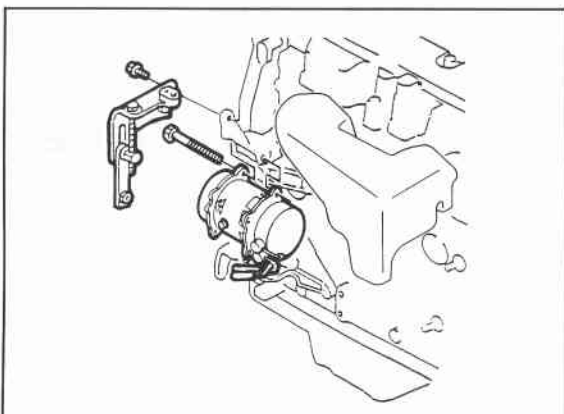
### Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

2. Install the A/C compressor bracket.

### Tightening torque:

**37—63 N·m (3.8—6.4 m·kg, 27—46 ft·lb)**



86U01X-190

3. Install the A/C compressor.
4. Install the A/C compressor upper bracket.

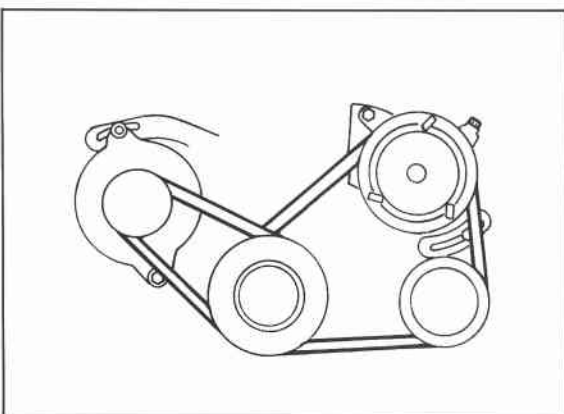
### Tightening torque:

**37—63 N·m (3.8—6.4 m·kg, 27—46 ft·lb)**

5. Tighten to the lock nut and mounting bolts.

### Tightening torque:

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

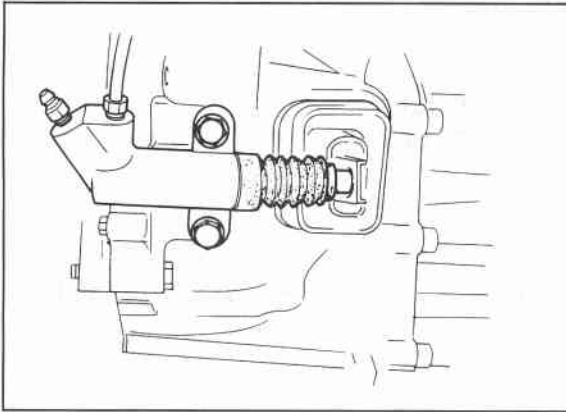


76G01A-096

## Drive Belt

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

# 1A INSTALLATION



86U01X-192

## Clutch Release Cylinder (MTX)

1. Set the pipe bracket in position.

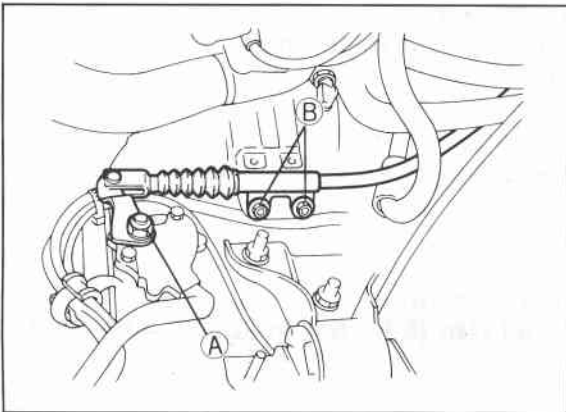
### Tightening torque:

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

2. Install the clutch release cylinder.

### Tightening torque:

**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**



76G01A-097

## Control Cable (ATX)

Install the control cable and adjust the shift selector position. (Refer to Section 7.)

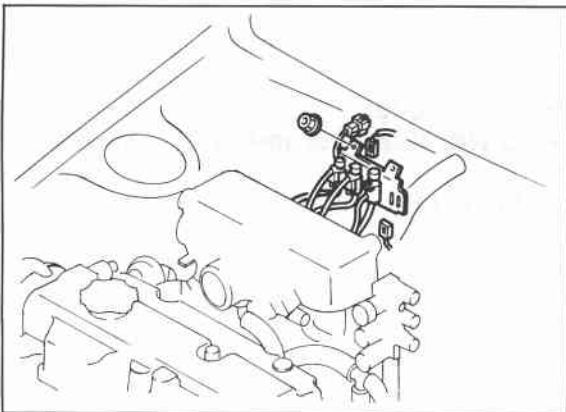
### Tightening torque

**A : 44—64 N·m  
(4.5—6.5 m·kg, 33—47 ft·lb)**

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

## Speedometer Cable

Install the speedometer cable.



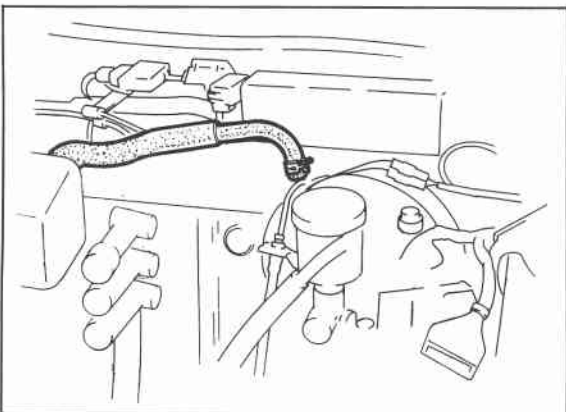
76G01A-098

## Three-Way Solenoid Assembly

Install the three-way solenoid assembly.

### Tightening torque:

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



86U01X-195

## Brake Vacuum Hose

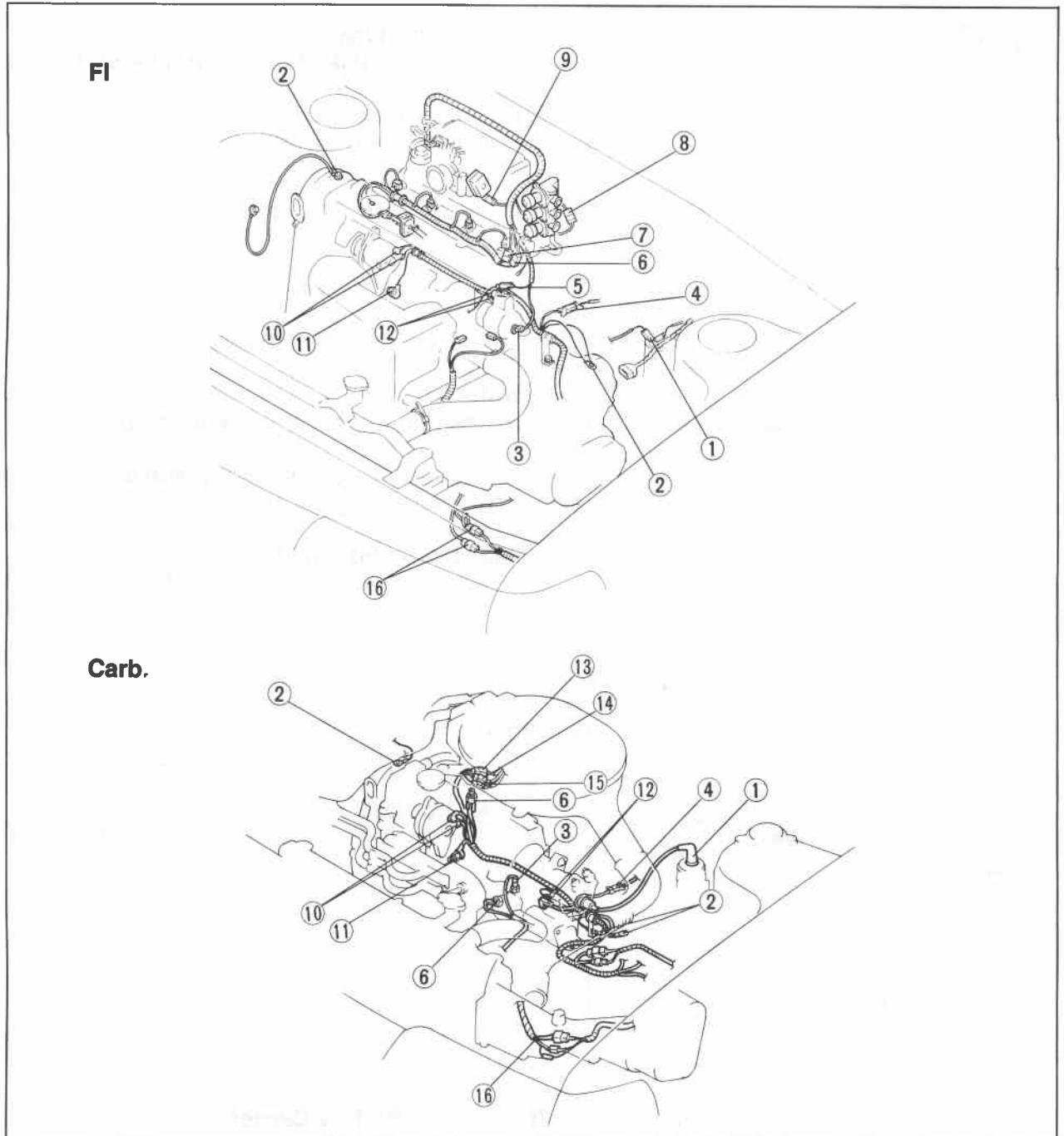
Connect the brake vacuum hose.

## Canister Hose

Connect the canister hoses.

## Connector Location

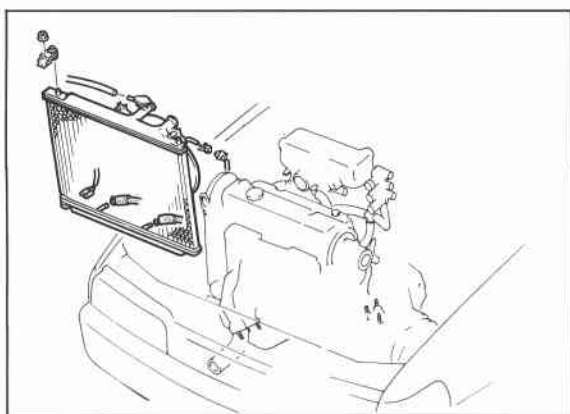
Install each harness as shown in the figure.



76G01A-146

- |                             |                                       |
|-----------------------------|---------------------------------------|
| 1. IG coil                  | 9. Throttle position sensor (FI)      |
| 2. Engine ground            | 10. Alternator                        |
| 3. Water temperature sensor | 11. Oil pressure switch               |
| 4. P/S switch               | 12. Starter                           |
| 5. Oxygen sensor (FI)       | 13. P.T.C. heater (carb.)             |
| 6. Water thermo switch      | 14. Solenoid valve (Slow cot) (carb.) |
| 7. Injection harness (FI)   | 15. Solenoid valve (carb.)            |
| 8. F/I solenoid (FI)        | 16. Transmission harness              |

# 1A INSTALLATION



76G01A-147

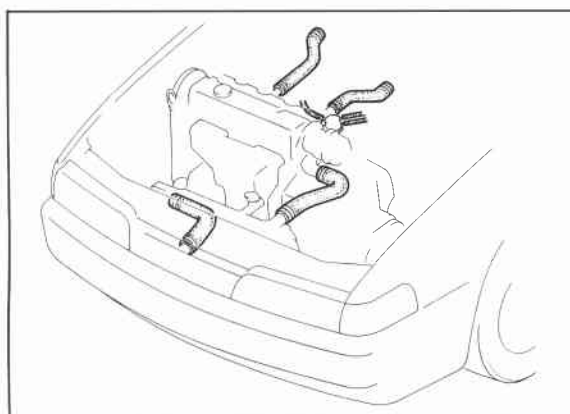
## Radiator

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.
3. Connect the ATF hoses (ATX).



86U01X-199

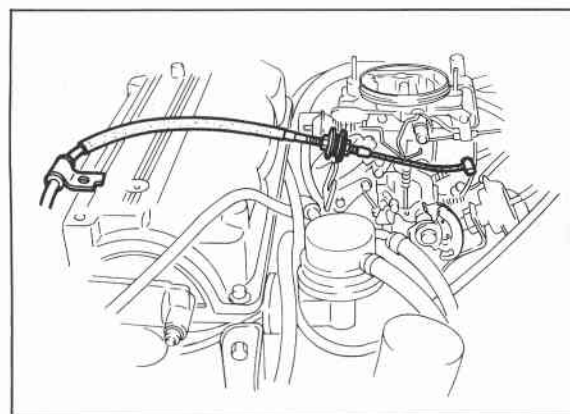
4. Connect the upper and lower radiator hoses.

### 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.

## Heater Hose and Fuel Hose

Connect the heater hoses and the fuel hoses.



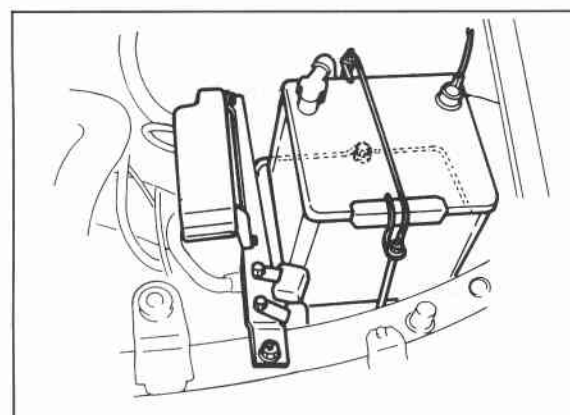
86U01X-200

## High-Tension Lead

Connect the high-tension lead to the ignition coil.

## Accelerator Cable

Install the accelerator cable and the throttle cable (ATX).



76G01A-148

## Battery and Battery Carrier

1. Install the battery carrier.

### Tightening torque:

**9—13 N·m (90—130 cm·kg, 78—113 in·lb)**

2. Install the fuse box.

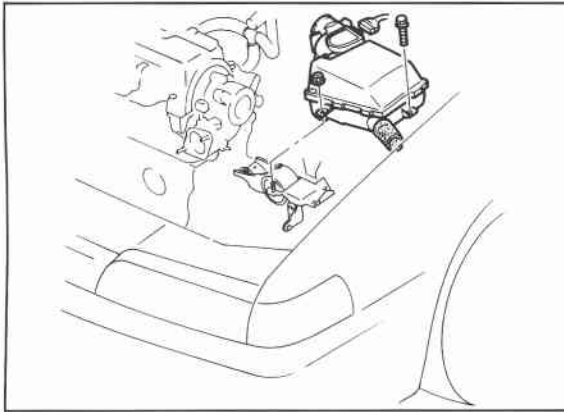
### Tightening torque:

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

3. Install the battery tray and battery.

### Tightening torque:

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



76G01A-099

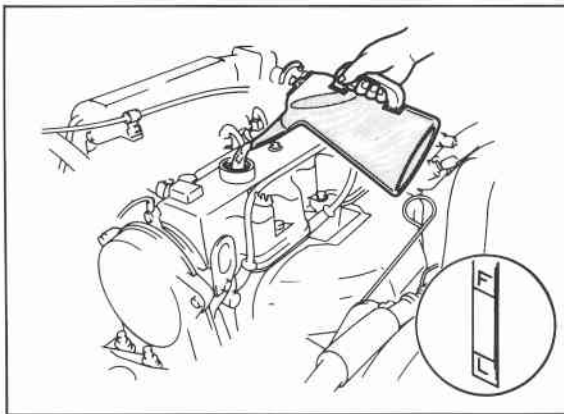
## Air Cleaner Assembly

1. Install the air cleaner assembly.

### Tightening torque:

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

2. Connect the air flow sensor connector and air intake pipe (FI).



76G01A-100

## Engine Oil

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

## Coolant

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



86U01X-204

## 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.