FUEL AND EMISSION CONTROL SYSTEM (DIESEL)

76G04D-001

OUTLINE

The Mazda 626 offers two diesel engines; a Comprex supercharged RF-CX engine, and a normally aspirated RF-N engine.

SPECIFICATIONS

Item \ Engine model		ECE		UK, GENERAL
		RF-CX	RF-N	
Fuel tank	Capacity liters (US gal, Imp gal)	60 (15.9, 13.2)		
Fuel filter	Type	Cartridge, paper element		
Sedimenter	Type	With detector		
Injection pump	Type	Bosch VE distributor		
	Manufacturer	Diesel Kiki Co., Ltd.		
	Direction of rotation	Clockwise		
	Drive method	Timing belt		
	Plunger diameter mm (in)	9.0 (0.35)	8.0 (0.31)	
	Cam lift mm (in)	2.2 (0.087)		
Injection nozzle	Type	Throttle		
	Injection pressure kPa (kg/cm^2, psi)	13,240 (135 , 1,920)		
Injection timing		ATDC 1°	TDC 0°	
Idle speed	rpm	720 $^{+30}_{-20}$		
Fast idle speed (A/C ON)	rpm	700—750		
Cold start device	Engine speed rpm	1.100		
	Advance degree	6°		
Air cleaner	Type	Cartridge, paper element		
		Wet	Dry	
PCV system	Type	Open	Closed	

76G04D-002

TROUBLESHOOTING GUIDE

Condition	Condition Cause	Remedy
Hard starting	**Fuel filter**	
	Clogged	Replace
	Water or air in filter	Repair
	Fuel injection pump	
	Faulty fuel cut solenoid	Replace
	Incorrect injection timing	Adjust
	Air in pump	Bleed
	Faulty pump	Replace
	Fuel injection nozzle	
	Seized needle valve	Replace
	Fuel dripping from nozzle	Replace
	Incorrect valve opening pressure	Adjust
	Faulty glow plug	Replace
	Faulty cold start device	Adjust or replace
	Faulty supercharging system	Refer to page 4D—10
Rough idle	**Fuel filter** (Refer to "Hard starting")	
	Fuel injection pump (Refer to "Hard starting")	
	Fuel injection nozzle	
	Seized needle valve	Replace
	Incorrect valve opening pressure	Adjust
	Improper mounting to nozzle holder	Repair
	Leakage of nozzle holder copper washer	Replace
	Fuel injection pipe	
	Cranks	Replace
	Leaking from joint	Repair
	Improper idle speed adjustment	Adjust
Engine knocking	Incorrect injection timing	Adjust
	Low quality fuel	Replace
	Incorrect injection nozzle opening pressure	Ajust
	Seized injection nozzle needle valve	Replace
	Fuel dripping from injection nozzle	Replace
	Faulty supercharging system	Refer to page 4D—10
High fuel consumption	**Fuel injection pump**	
	Incorrect injection timing	Adjust
	High idle speed	Adjust, Inspect the dashpot
	Fuel injection nozzle	
	Incorrect valve opening pressure	Repair
	Fuel dripping from nozzle	Replace
	Leakage of nozzle holder copper washer	Replace
	Fuel leaking from connection	Repair
	Clogged fuel filter	Replace
	Clogged air cleaner	Replace
Poor acceleration	**Fuel injection nozzle** (Refer to "Hard starting")	
	Fuel injection pump (Refer to "Hard starting")	
	Fuel injection pipe (Refer to "Rough idle")	
	Fuel filter (Refer to "Hard starting")	
	Clogged air cleaner	Clean or replace
	Faulty supercharging system	Refer to page 4D—10
Excessive exhaust smoke	Clogged air cleaner	Clean or replace
	Improper injection timig	Adjust
	Faulty nozzle or nozzle holder	Adjust or replace
	Faulty supercharging system	Refer to page 4D—10

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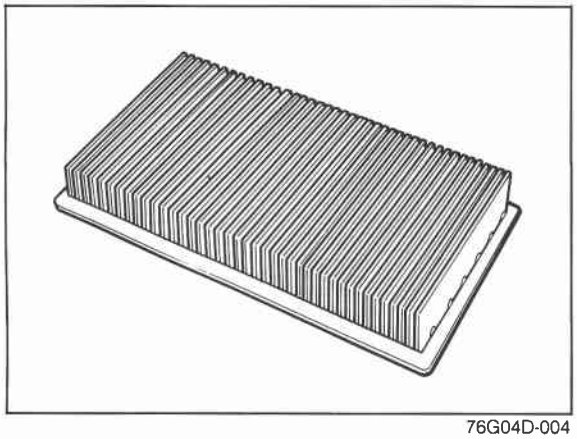

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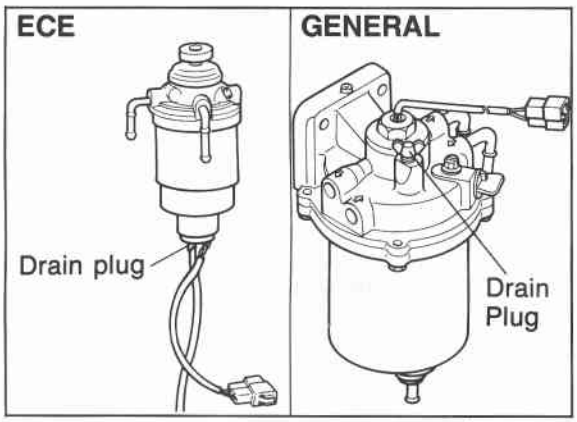

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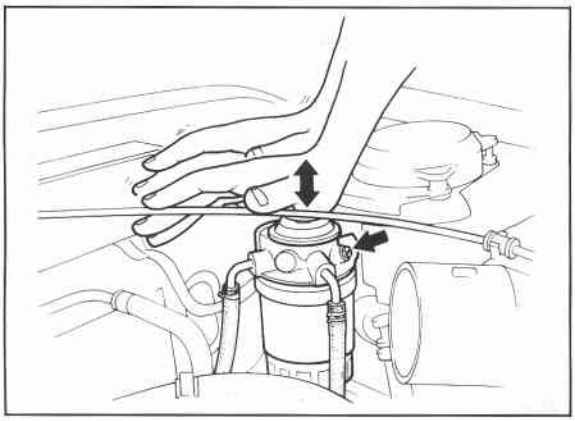

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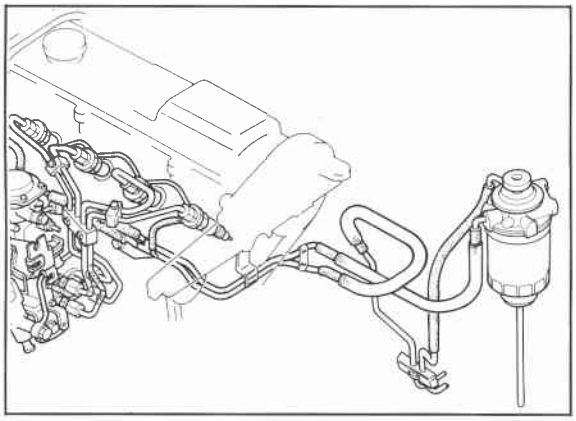

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ON-VEHICLE MAINTENANCE

AIR CLEANER ELEMENT

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

Caution
(Wet type)
Do not clean the air cleaner element with compressed air, replace if necessary.

(Dry type)
When cleaning the air cleaner element, blow dust off from the inside first, then blow off the outside.

WATER DRAINING

(ECE)

1. Loosen the drain plug of the fuel filter.
2. Pump the priming pump.
3. Bleed air from the fuel filter.

(General)

1. Loosen the drain plug of the sedimenter and let the water drain. If necessary loosen the air bleeding plug.
2. Bleed air from the sedimenter.

AIR BLEEDING

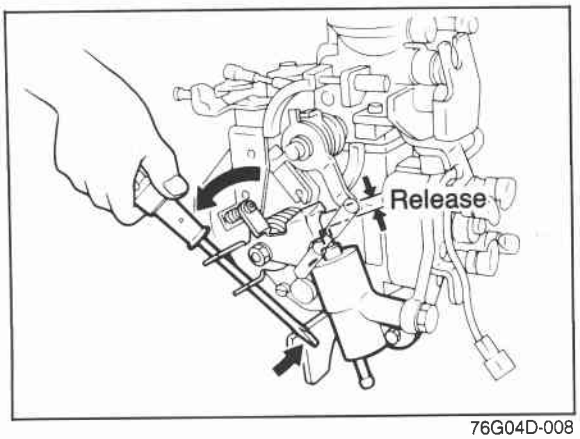
From Fuel Tank to Fuel Filter

1. Loosen the air bleeding plug of the fuel filter.
2. Pump the priming pump until no air bubbles flow from the air bleeding plug hole.
3. Depress the priming pump and tighten the air bleeding plug.

Note
Open only the air bleeding plug of the filter.

From Fuel Filter to Injection Pump

Pump the priming pump until it becomes hard to pump.



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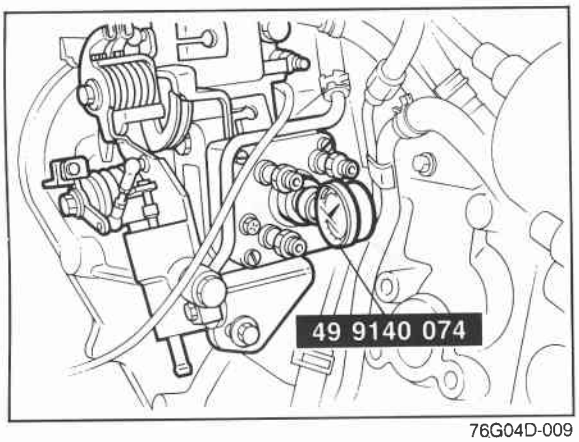
INJECTION TIMING

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



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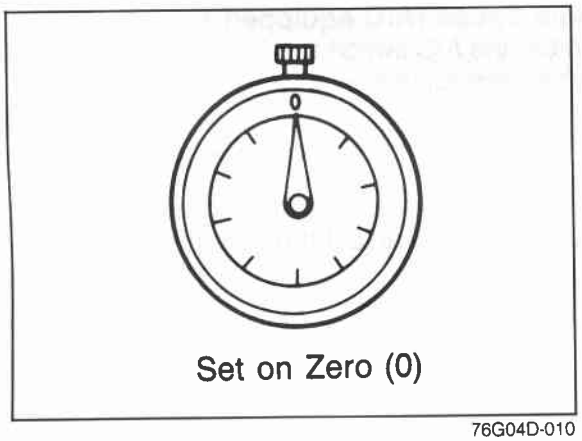
6. Remove the hydraulic head plug from the injection pump.
7. Mount the **SST** into the plug hole on the hydraulic head so the tip of the dial gauge pointer touches the plunger end of the pump and the dial gauge indicates **approx. 2.0 mm (0.08 in).**



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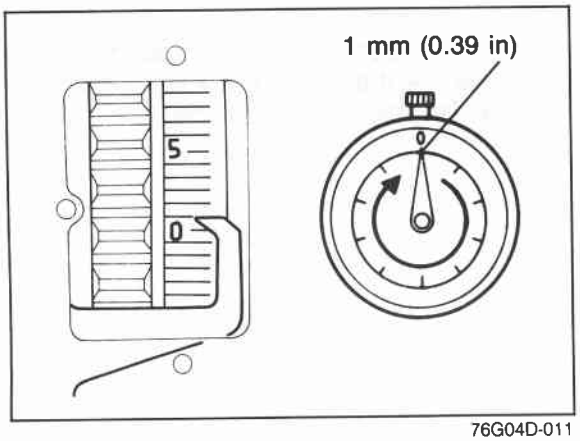
8. Turn the crankshaft slowly counterclockwise to 30—50° BTDC.
9. Make sure the dial indicator pointer no longer moves by slightly turning the crankshaft.
10. Set the dial gauge scale to Zero at the pointer.



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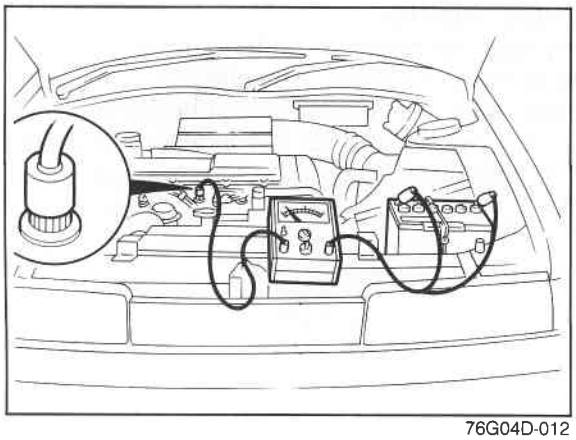
11. Turn the crankshaft clockwise to align the indicator pin at **ATDC 1° (RF-CX), TDC 0° (RF-N)**.
12. Read the dial gauge.

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

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



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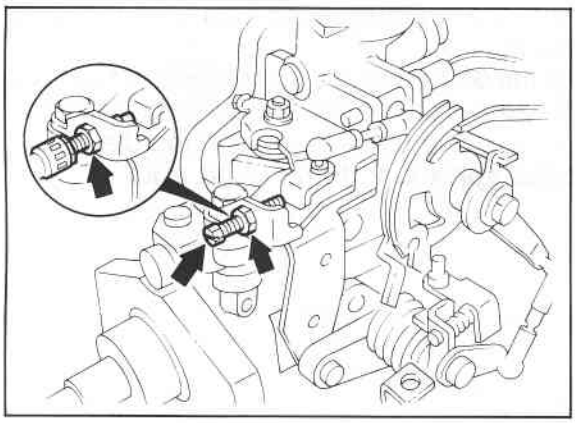
IDLE SPEED

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

Idle speed: 720 $^{+30}_{-20}$ rpm



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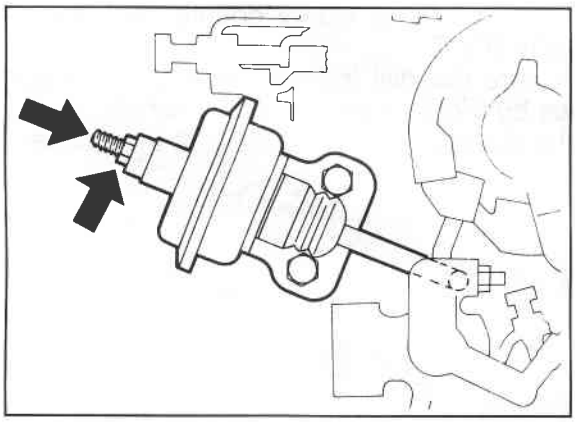
4. If necessary, adjust the idle by turning the idle adjusting screw.



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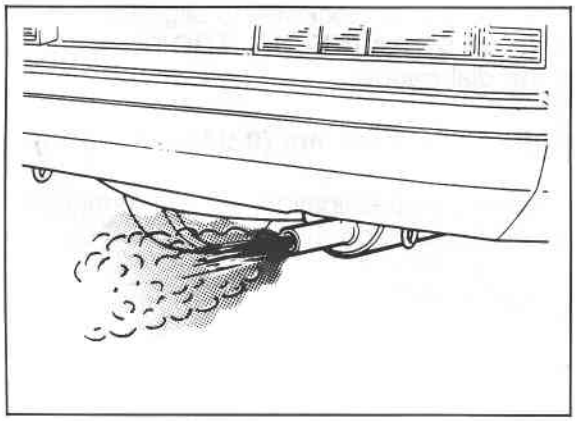
Fast Idle Speed (A/C equipped model)

1. Turn ON the A/C switch and blower motor switch.
2. Check the engine speed.

Fast idle speed: 725 ± 25 rpm

3. If necessary, turn the adjusting screw on the idle-up actuator, and adjust the fast idle speed.



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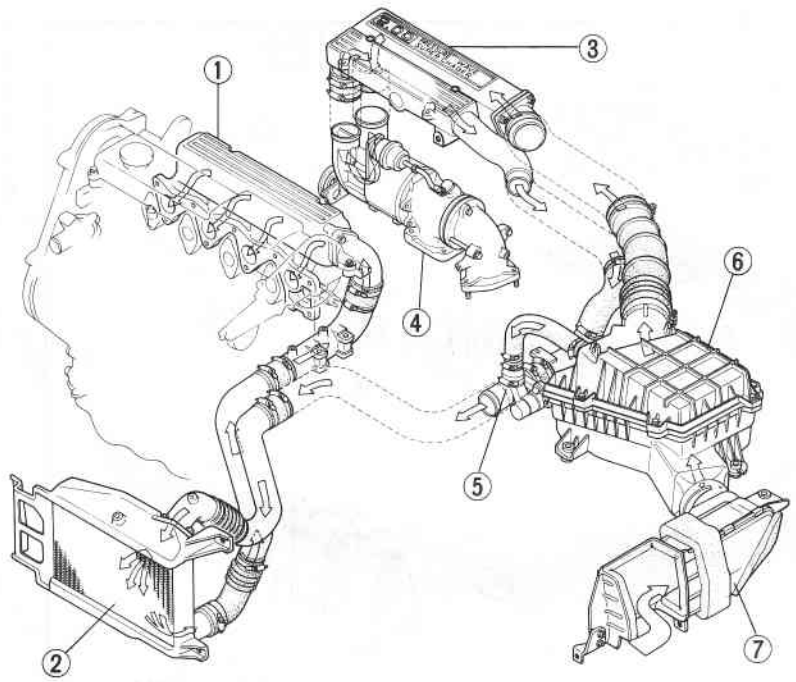
EXHAUST SMOKE

Increase and decrease the engine speed several times and check that there is no black smoke. If there is, refer to the Troubleshooting Guide.

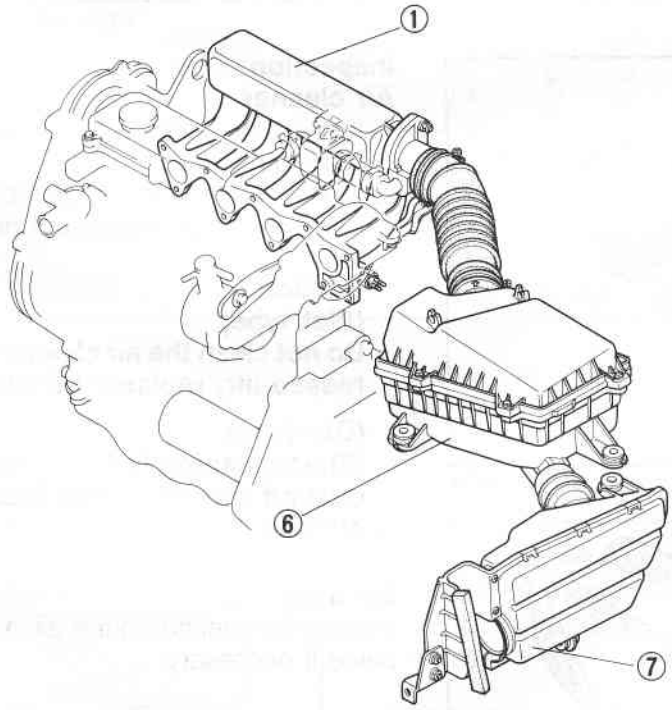
INTAKE AIR SYSTEM

STRUCTURAL VIEW

RF-CX



RF-N



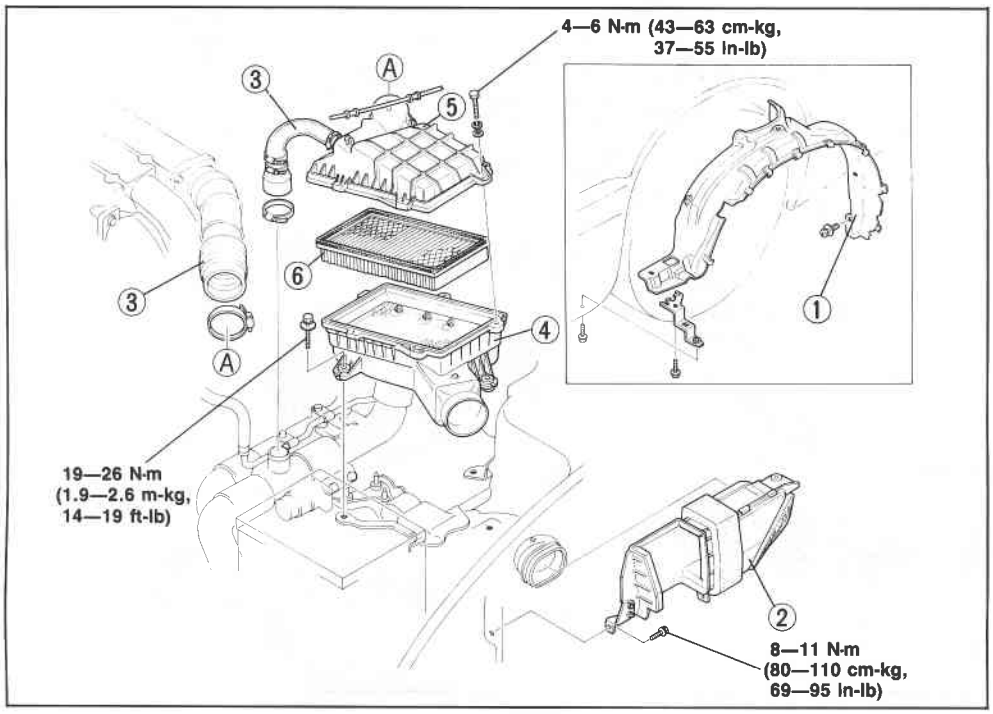
76G04D-016

1. Intake manifold
2. Intercooler
3. Air funnel assembly
4. Comprex supercharger
5. Starting valve
6. Air cleaner
7. Air duct

AIR DUCT AND AIR CLEANER

Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for air leakage.



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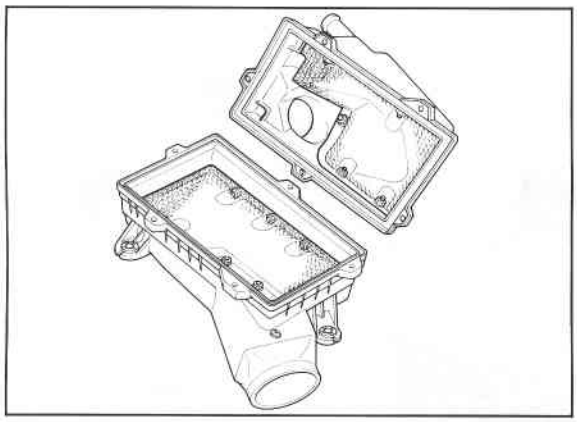
1. Tire house cover
2. Air duct
3. Air hose
4. Air cleaner case
5. Air cleaner cover
6. Air cleaner element



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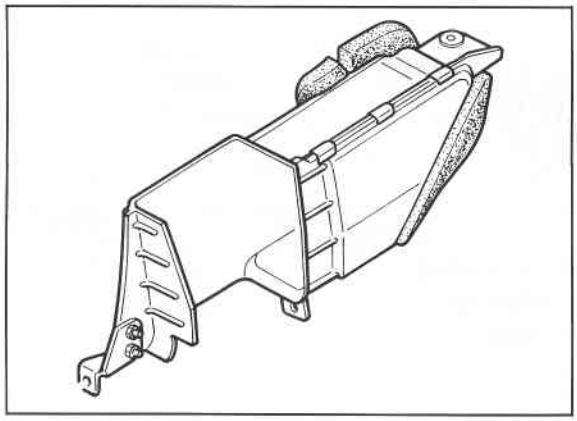

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Inspection

Air cleaner

1. Inspect the silencer in the air cleaner cover for damage.
2. Inspect the air cleaner element for excessive dirt, damage, or oil. Replace if necessary.

Caution
(Wet type)
Do not clean the air cleaner element with compressed air, replace it if necessary.

(Dry type)
When cleaning the air cleaner element, blow dust off from the inside first, then blow off the outside.

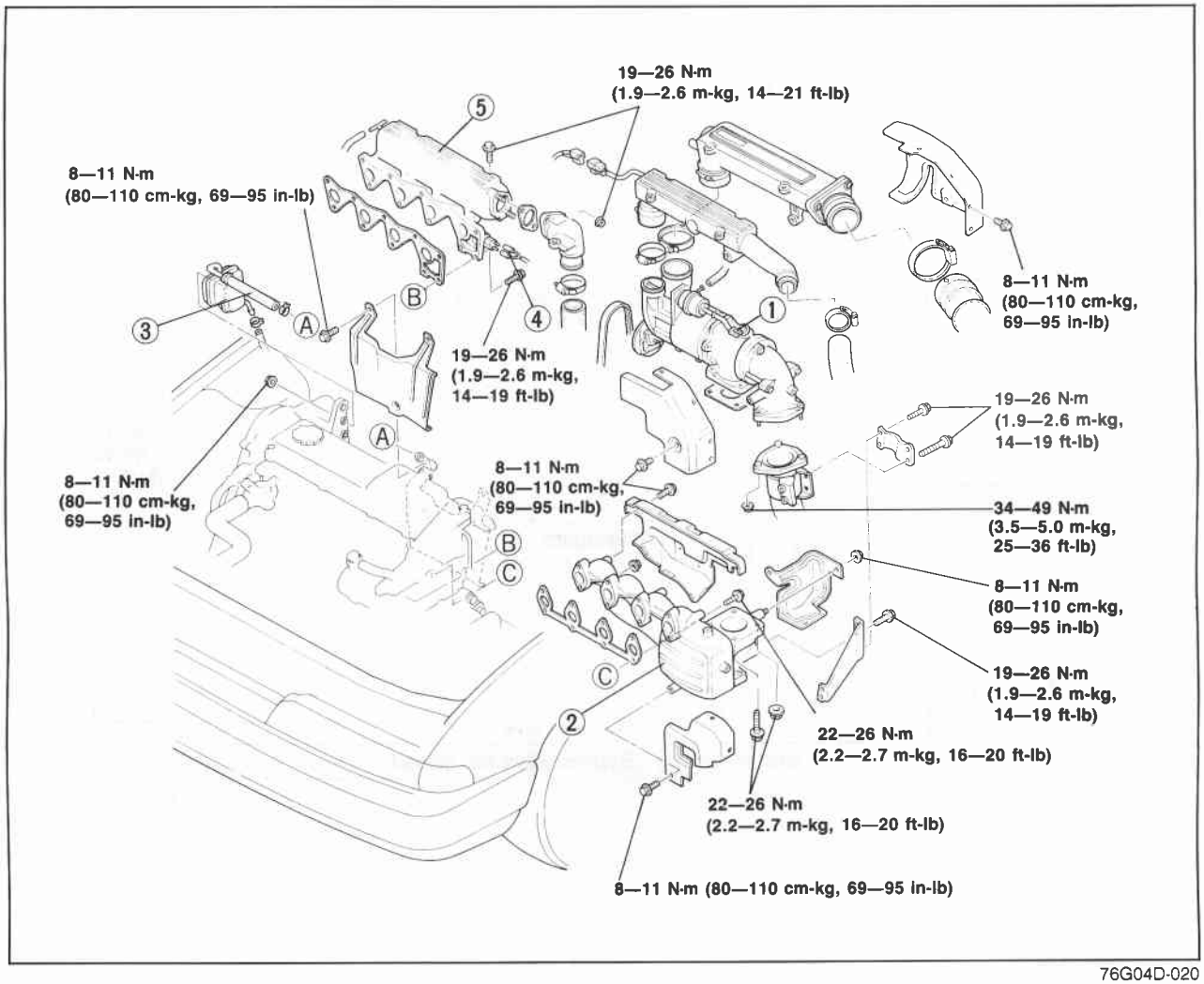
Air duct

Inspect the silencer in the air duct for damage. Replace if necessary.

INTAKE MANIFOLD

Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for air/exhaust leakage.



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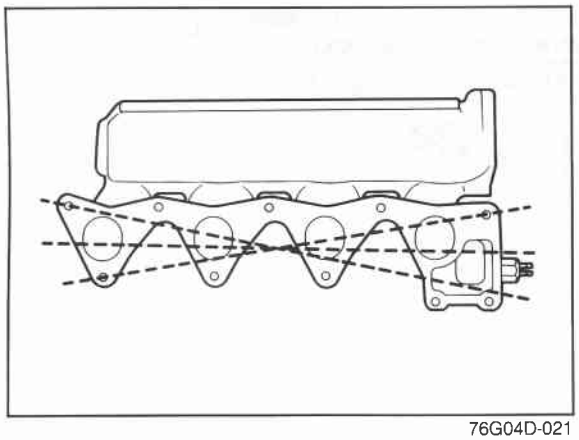
1. Comprex supercharger
   (Refer to page 4D—13.: RF-CX)
2. Exhaust manifold
   (Refer to page 4D—19.: RF-CX)
3. Vacuum hose (RF-CX)
4. Water thermo switch connector
5. Intake manifold



76G04D-021

Inspection

1. Check the intake manifold for cracks and damage.
2. Inspect the flatness of the mounting surface using a straight edge and a feeler gauge. Replace if necessary.

Distortion: 0.05 mm (0.002 in) max.

SUPERCHARGING SYSTEM (RF-CX)

TROUBLESHOOTING GUIDE

Engine hard starting	Poor acceleration	Excessive blue smoke	Excessive black smoke	Excessive compressed air temperature (Buzzser sounds)	Excessive noise	Possible Cause	Remedy (reference page)
*	*					Comprex supercharger Rotor stuck Casing damaged Rotor bearing damaged	Replace (4D—14)
*	*		*			Drive system of Comprex supercharger Drive belt loose or worn	Repair or replace (4D—12)
*						Idler pulley damaged	
*						Pulley bolt loose or worn	
				*		Wastegate Valve not open	Clean or repace (4D—12)
	*		*			Valve not closed	
	*		*			Starting valve Valve not open	Repair or replace (4D—15)
*		*				Valve not closed	
*						Bypass valve not open	
	*		*			Bypass valve not closed	
	*					Intercooler dirty	Clean or replace (4D—16)
*	*	*	*			Intake air system Fresh air side clogged (Air cleaner element, etc.)	Repair or replace
				*		Compressed air side clogged (Intercooler, etc.)	
					*	Fresh air side leaks	
	*		*		*	Compressed air side leaks	
					*	Exhaust system Exhaust gas breaked	Repair
*	*	*	*		*	Exhaust pipe clogged	
					*	Silencer damaged (in fender, in air cleaner, in air funnel, Comprex insulator)	Repair or replace
					*	Bolt and nut loosend	Repair

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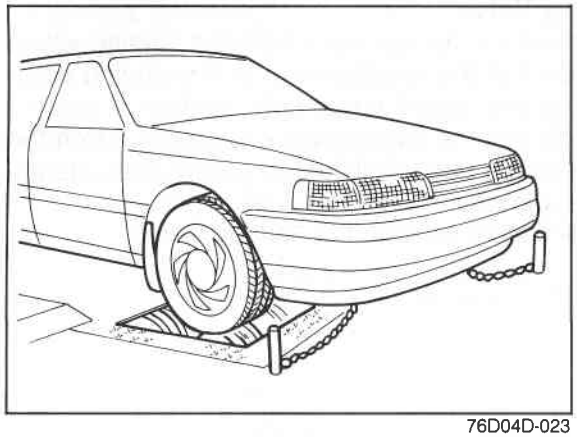
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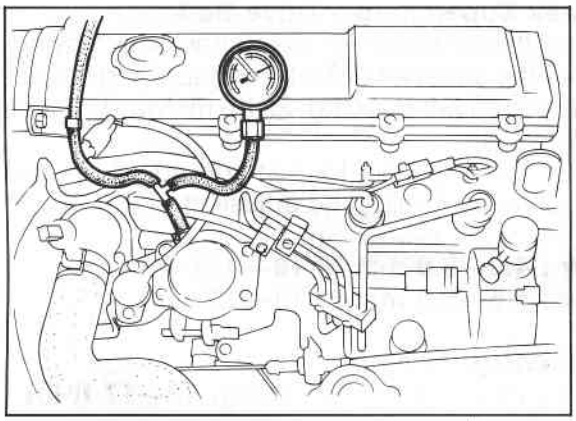
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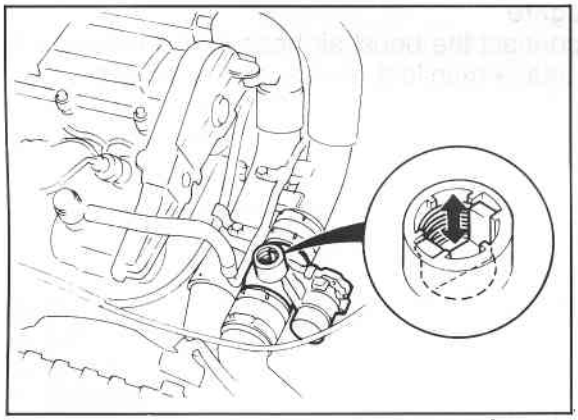
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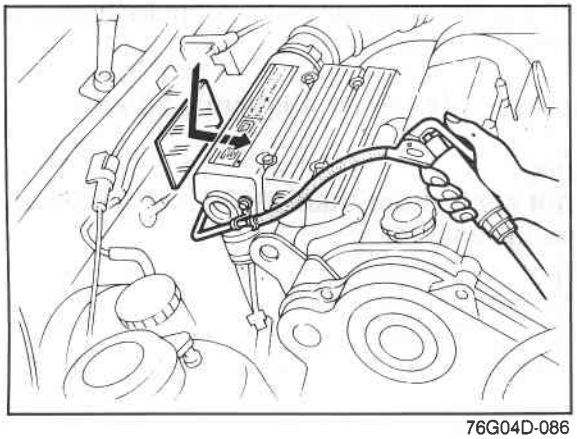
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ON-VEHICLE INSPECTION

Boost Pressure

1. Connect a pressure gauge to the hose from the intake manifold.
2. (On chassis dynomometer, full load)
   (1) Set the vehicle on a chassis dynomometer.
   (2) Run the vehicle in gear at **3,000 rpm** with the acceleration pedal fully depressed.
   (3) Measure the boost pressure.

   Boost pressure:
   82 kPa (0.87 kg/cm^2, 8.1 psi)

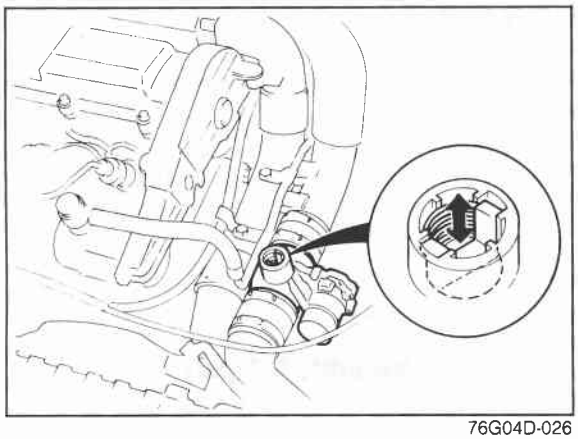
   Note
   The above inspection should be done on a chassis dynomometer. If a dynomometer is not available follow the below procedure.

3. (Off chassis dynomometer, no load)
   (1) Shift the transaxle out off gear.
   (2) Run the engine in neutral at **3,000 rpm** of the engine no load.
   Measure the boost pressure.

   Boost pressure:
   5 kPa (0.05 kg/cm^2, 0.7 psi)

   Note
   The boost pressure is varied by engine speed and engine load.

   (3) Remove the starting valve bypass hose.
   (4) Check that the bypass valve is closed at 3,000 rpm.
4. If the pressure is below specification, check the following. Replace the Comprex supercharger if necessary.
   (1) Intake air and exhaust passages leakage
   (2) Intake air and exhaust passages clogged
   (3) Wastegate (Refer to 4D—12.)
   (4) Starting valve (Refer to 4D—15.)
   (5) Fuel system (Injection nozzle... refer to page 4D—31, injection pump...refer to page 4D—24, etc.)
5. If the pressure exceeds specification, check the wastegate operation. (Refer to page 4D—12.)



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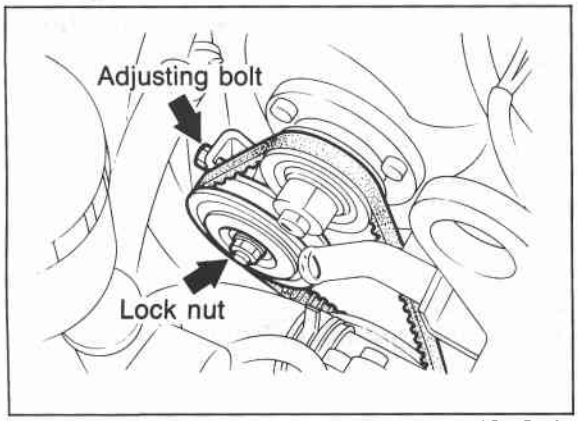
Starting Valve

1. Remove the bypass hose from the starting valve.
2. Check that the bypass valve in the starting valve opens and closes repeatedly at idle.
3. Check that the bypass valve is closed when the accelerator pedal is fully depressed when the engine speed is more than 3,000 rpm.
4. If necessary replace the starting valve.



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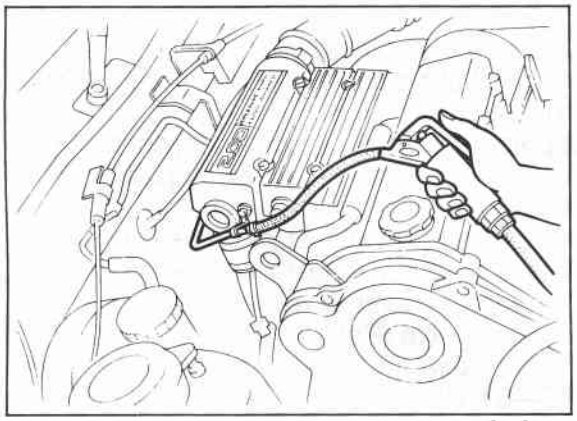
Comprex Supercharger Drive Belt

1. Check the drive belt for wear, cracks, or fraying.
2. Check the drive belt deflection by applying moderate pressure **(98 N, 10 kg, 22 lb)** midway between the pulleys.
3. If necessary, loosen the bolt and adjust the belt deflection by turning the adjusting bolt.

New : 4.0—5.0 mm (0.16—0.20 in)
Used: 4.5—5.5 mm (0.18—0.22 in)

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



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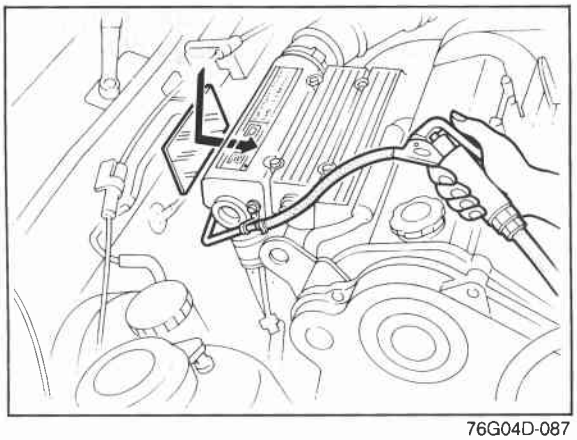
Wastegate

1. Disconnect the boost air hose from wastegate to the intake manifold, and apply compressed air.



76G04D-087

2. Check that the wastegate actuator pulls the rod at the specified pressure.

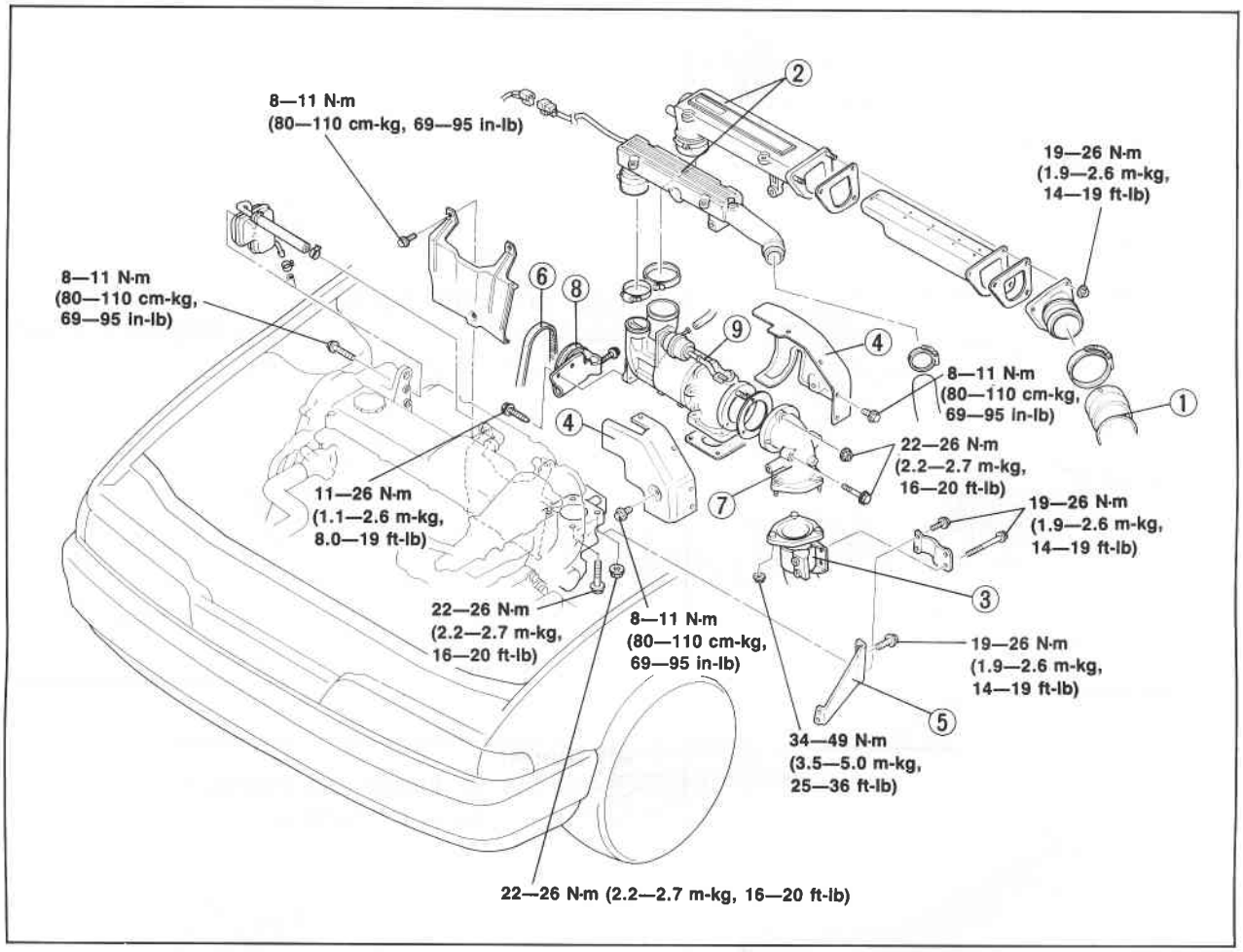
Pressure: 137 kPa (1.4 kg/cm^2, 20 psi)

Caution
Do not apply more than 196 kPa (2.0 kg/cm^2, 28 psi) pressure.

COMPREX SUPERCHARGER

Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for air/exhaust leakage.



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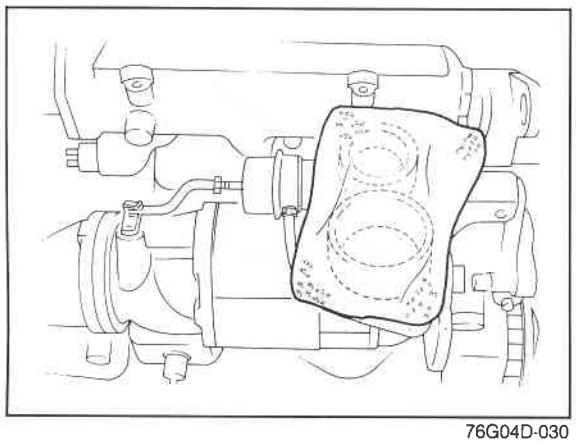
1. Air hose
2. Air funnel assembly
3. Exhaust pipe
4. Supercharger insulator
5. Exhaust manihold stay
6. Drive belt
7. Exhaust joint pipe
8. Idle pulley
9. Comprex supercharger



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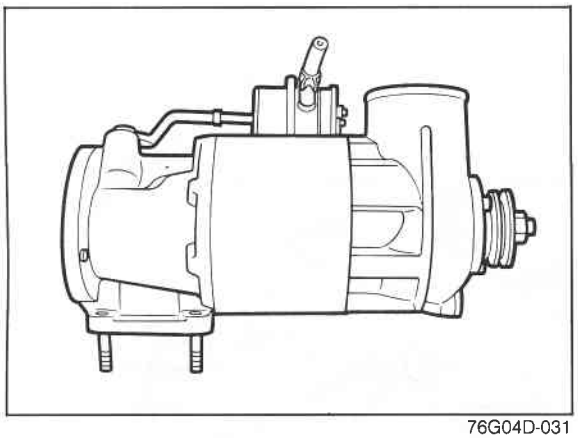
Caution

a) Be careful not to bend the rod or bracket of the wastegate.

b) Cover the intake and exhaust ports to prevent dirt or other material from entering.



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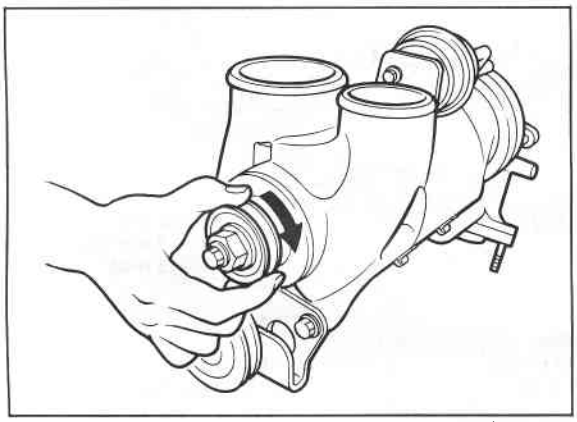
Inspection

Air casing, exhaust casing, rotor housing

Check the air casing, exhaust casing, and rotor housing for cracks or damage. Replace the Comprex supercharger if necessary.



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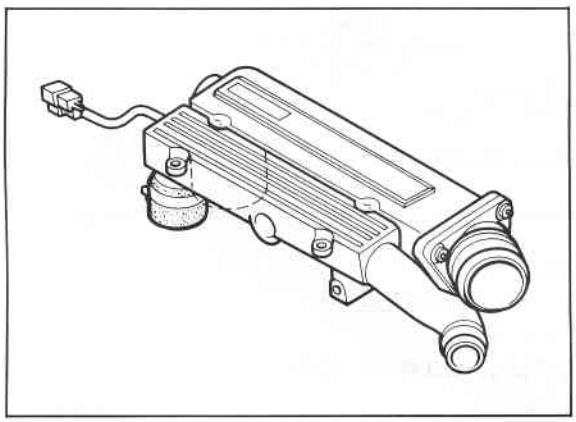
Rotor and rotor bearing

Check that the rotor turns smoothly. Replace the Comprex supercharger if necessary.



76G04D-033

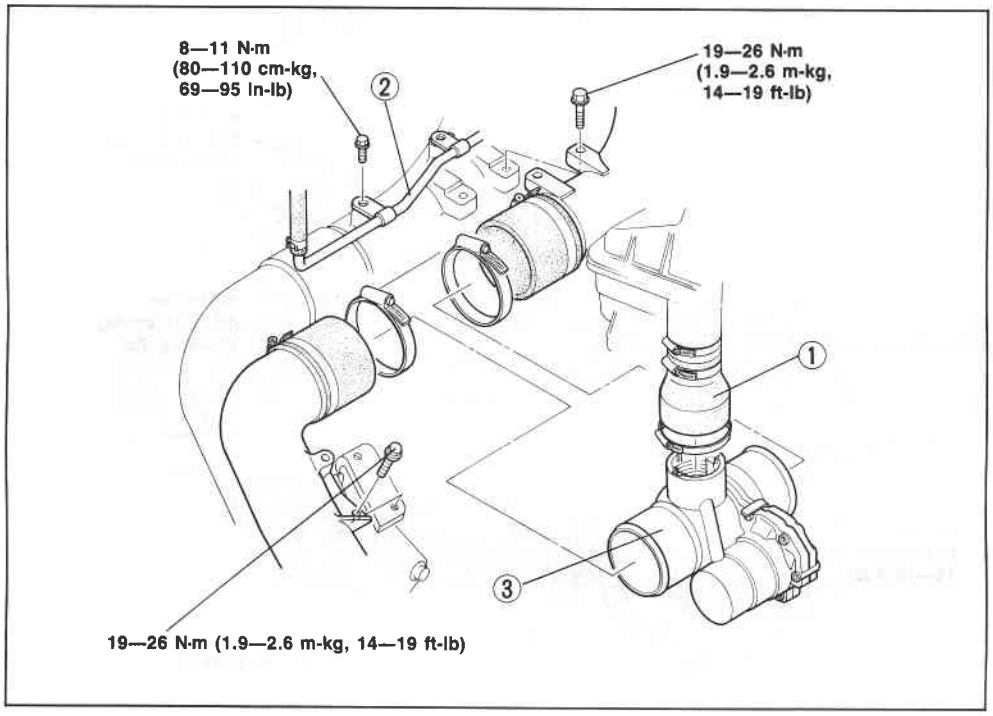
Air funnel

Check the air funnel and insulator for cracks or damaged. Replace if necessary.

STARTING VALVE

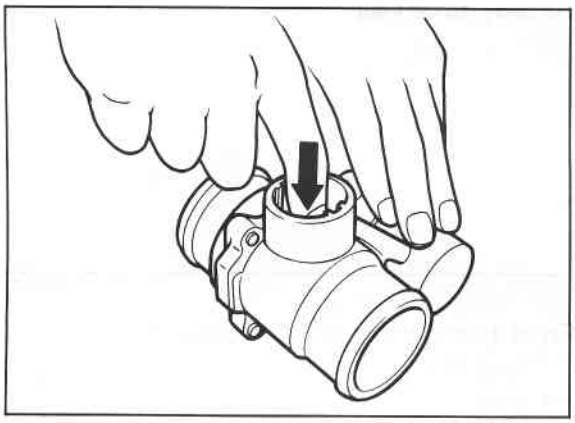
Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for air leakage.



76G04D-034

1. Air hose
2. Vacuum pipe
3. Starting valve

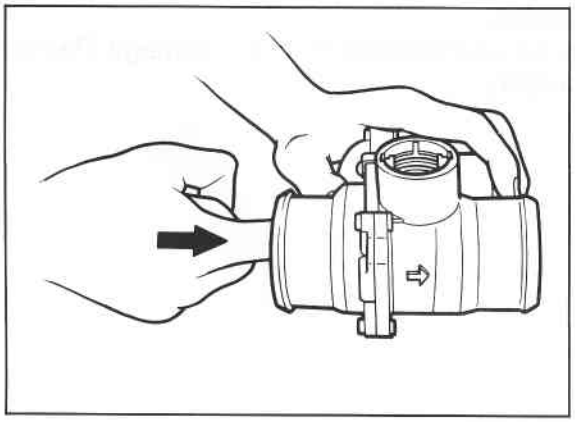


76G04D-035

Inspeciton

Bypass valve

Check that the bypass valve opens smoothly.
Replace the starting valve if necessary.



76G04D-036

Starting valve

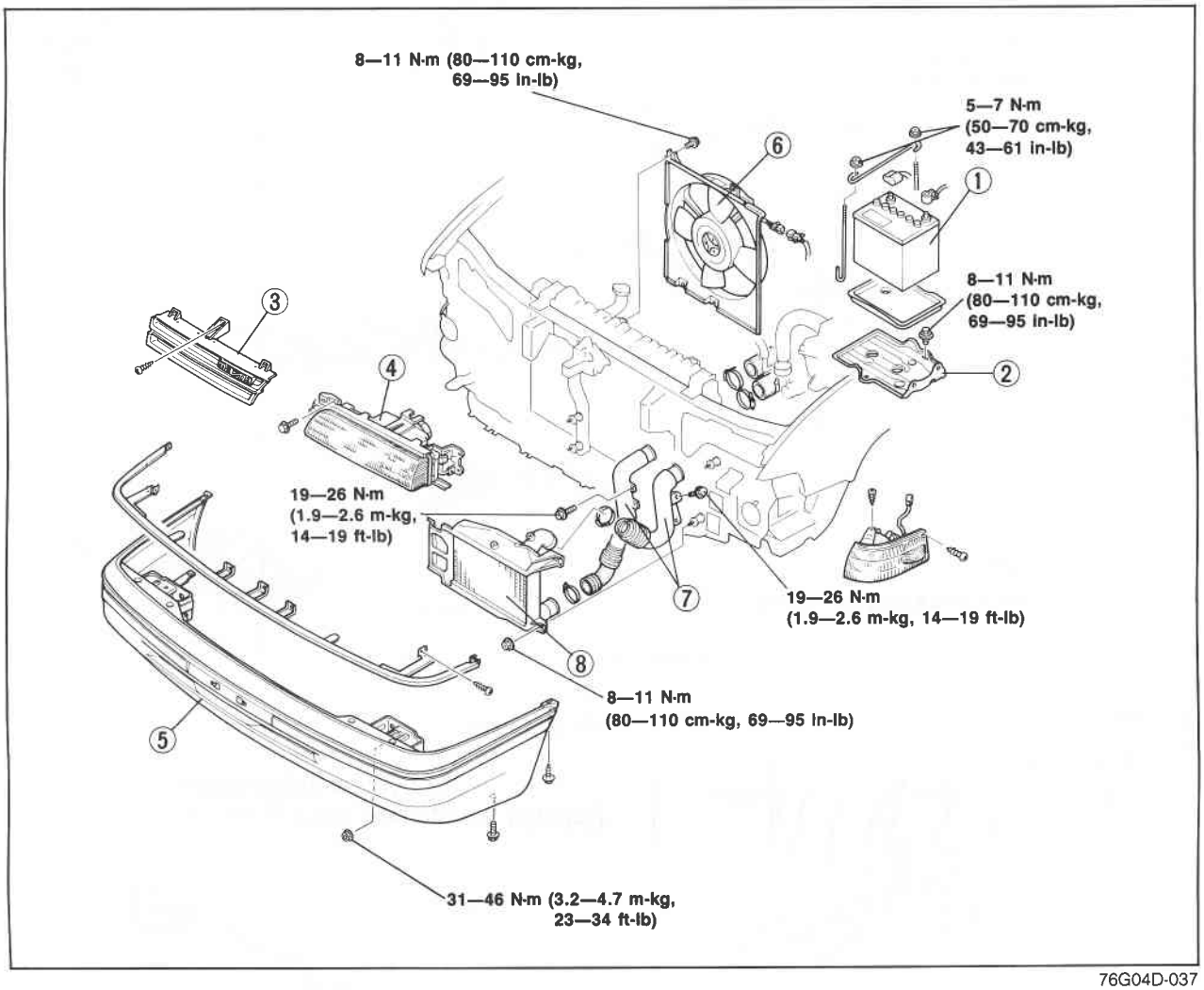
Check that the starting valve opens smoothly.
Replace the starting valve if necessary.

Note
Resistance will be felt because of the magnet when opening the valve.

INTERCOOLER

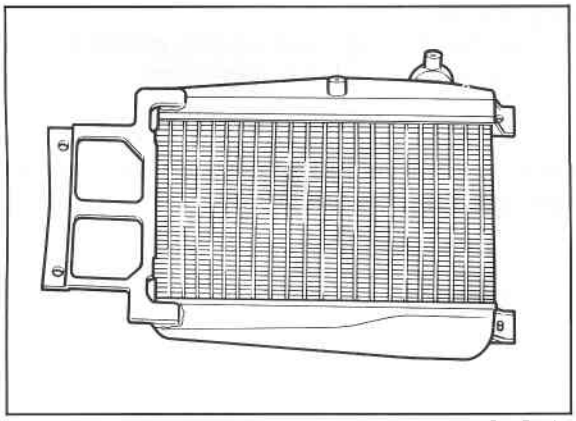
Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for air leakage.



76G04D-037

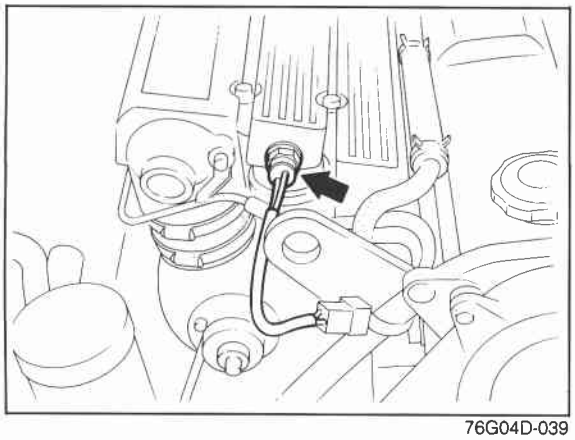
1. Battery
2. Battery carrier
3. Front grille (Refer to Section 14.)
4. Headlight (Refer to Section 14.)
5. Front bumper (Refer to Section 14.)
6. Cooling fan
7. Air pipe
8. Intercooler



76G04D-038

Inspection

Check the intercooler for cracks or damage. Replace if necessary.

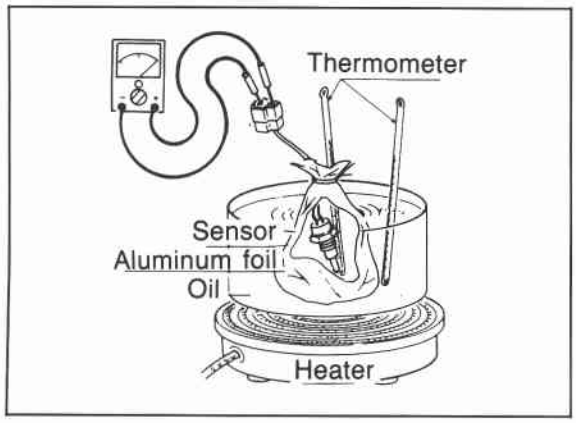


76G04D-039

BOOST AIR TEMPERATURE SENSOR

Removal

Remove the boost air temperature sensor from the compressed air funnel.

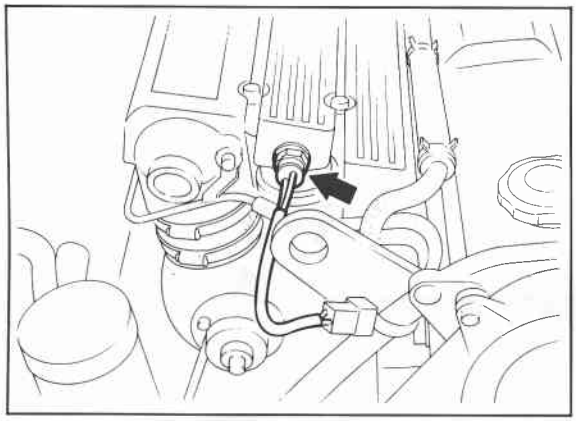


76G04D-040

Inspection

1. Place the boost air temperature sensor in oil.
2. Heat the oil and check continuity of the sensor with an ohmmeter. Replace if necessary.

Continuity : over 150°C (302°F)
No continuity: below 143°C (289°F)



76G04D-041

Installation

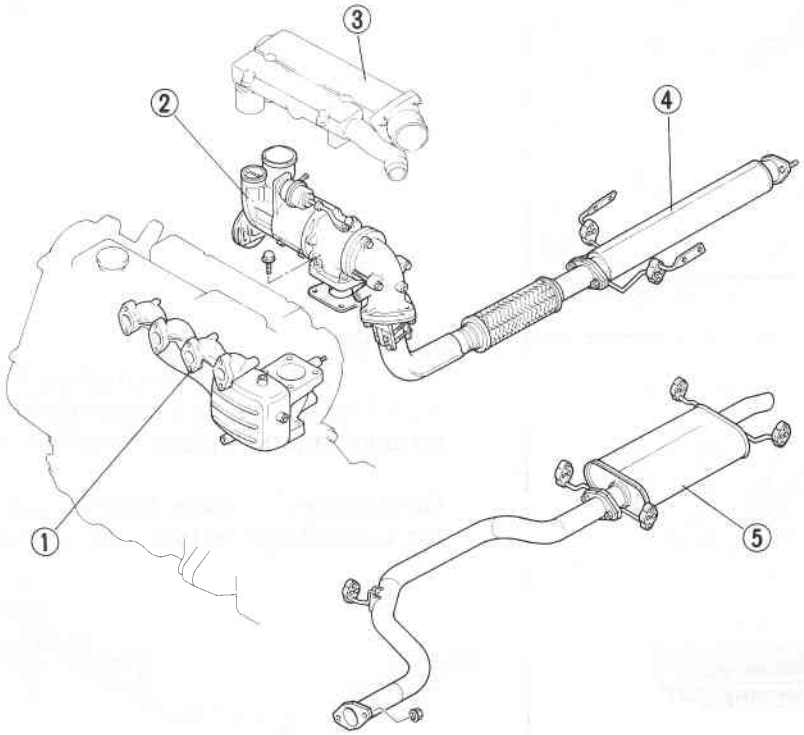
Install the boost air temperature sensor in the compressed air funnel.

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

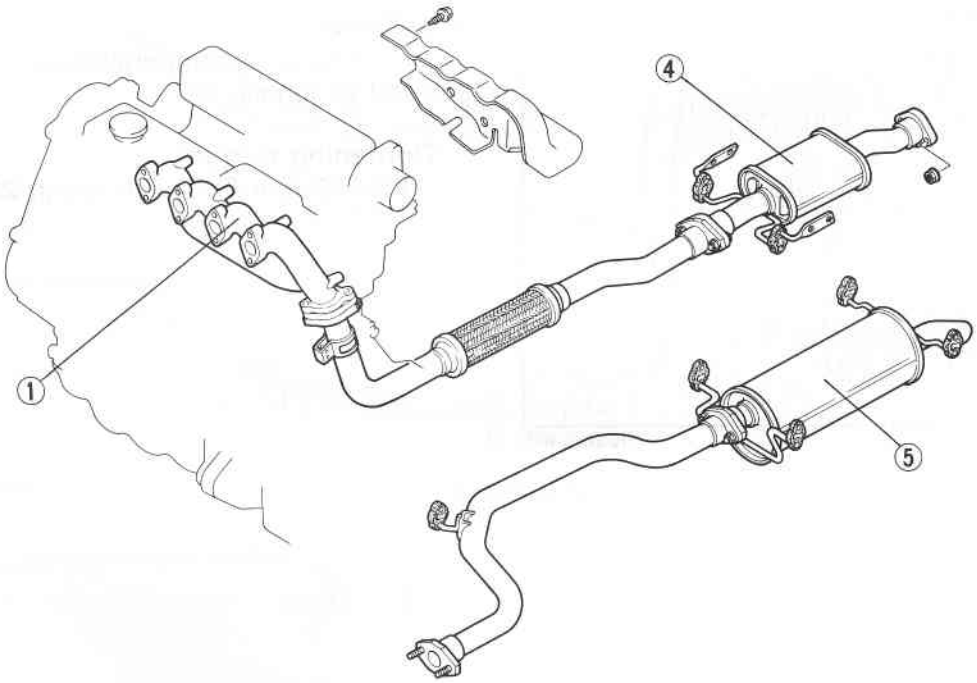
EXHAUST SYSTEM

STRUCTURAL VIEW

RF-CX



RF-N



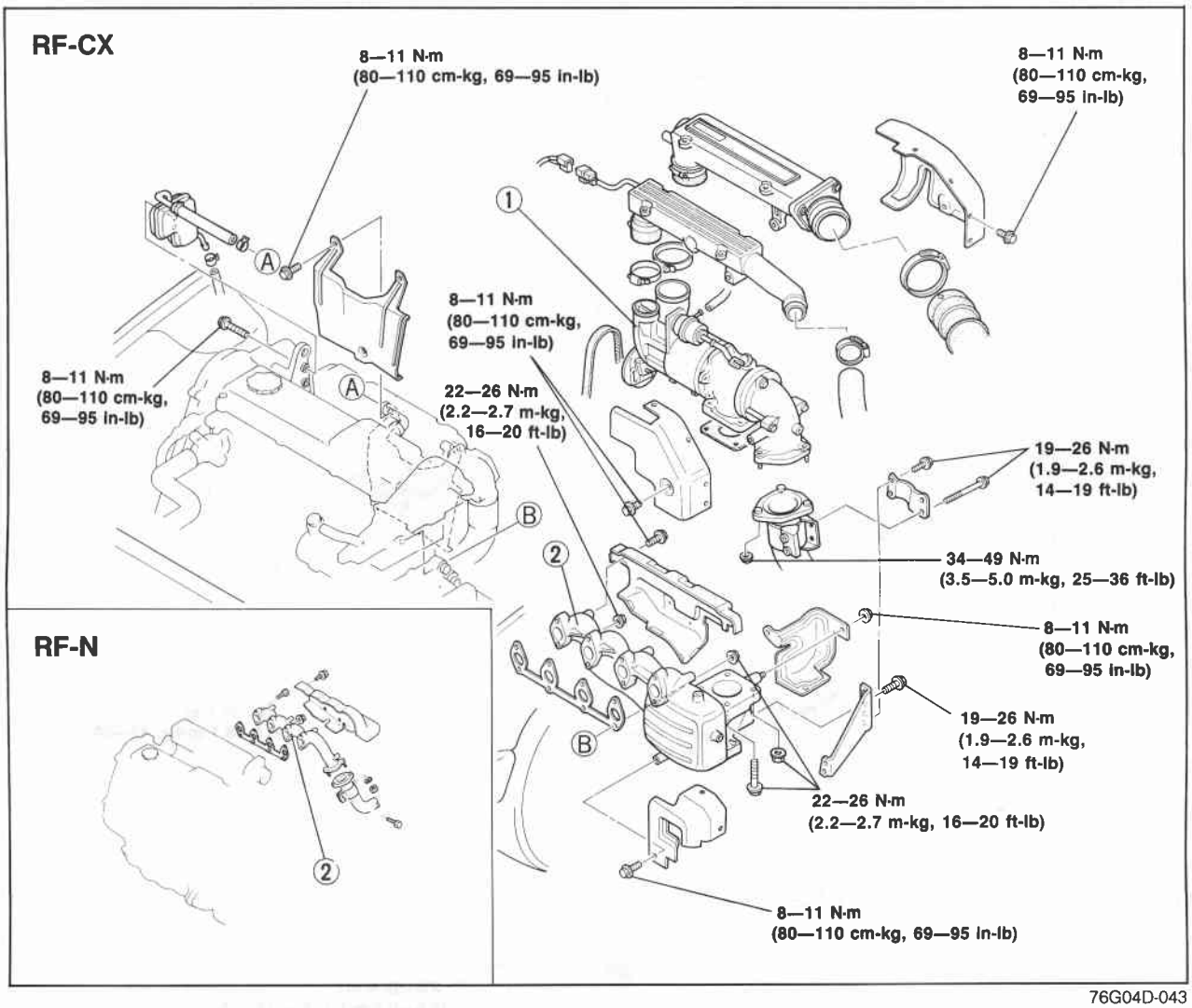
76G04D-042

1. Exhaust manifold
2. Comprex supercharger (RF-CX)
3. Air funnel assembly
4. Pre-silencer
5. Main silencer

EXHAUST MANIFOLD

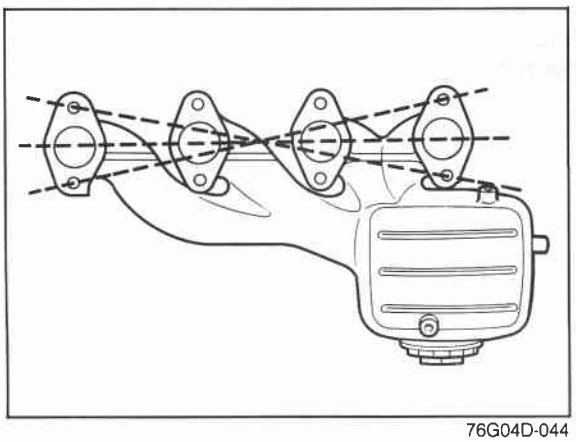
Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for exhaust leakage.



76G04D-043

1. Comprex supercharger (Refer to page 4D—13.: only RF-CX)
2. Exhaust manifold



76G04D-044

Inspection

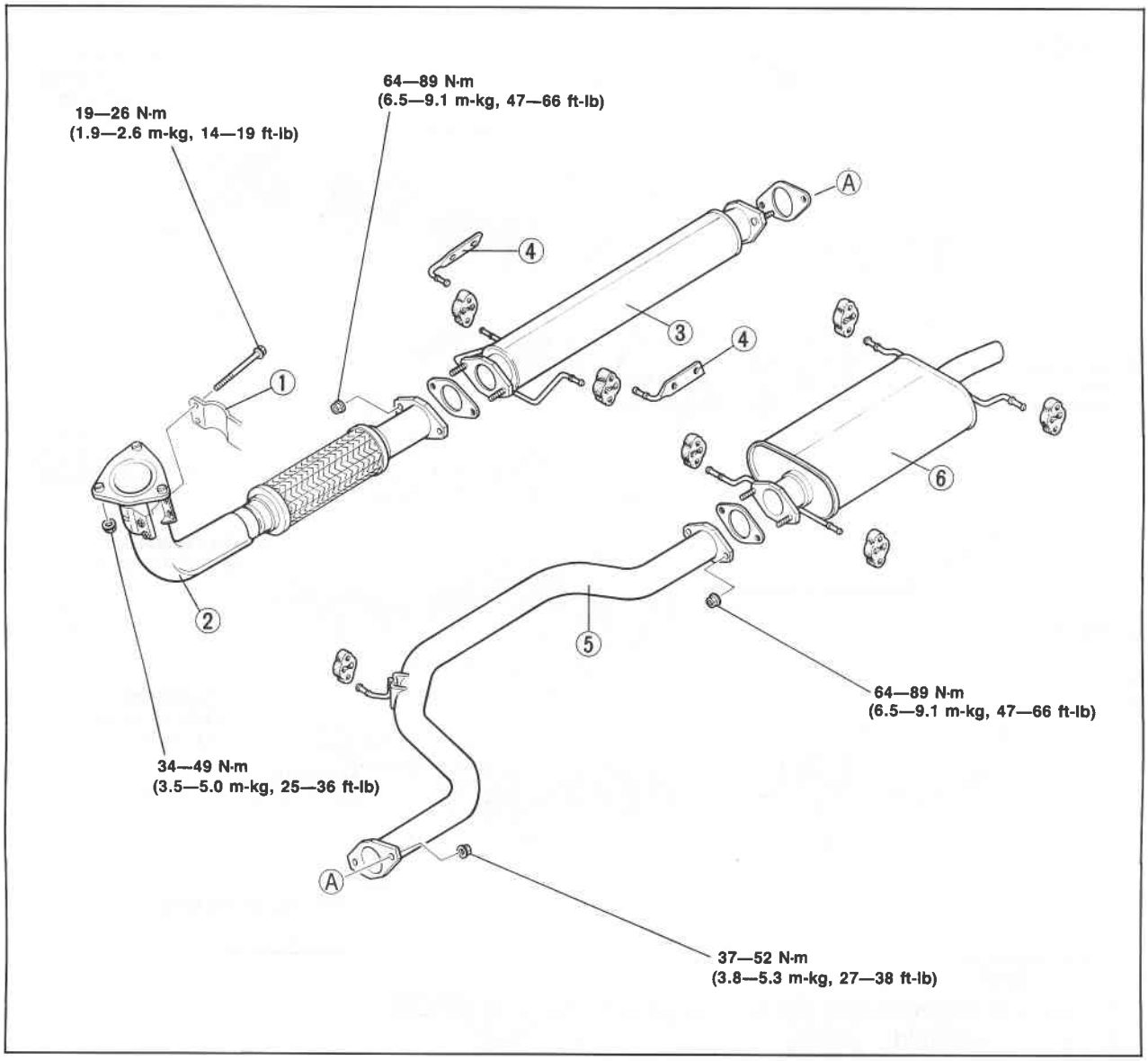
1. Check the exhaust manifold for cracks and damage.
2. Inspect the flatness of the mounting surface using the straight edge and a feeler gauge. Replace if necessary.

Distortion: 0.05 mm (0.002 in) max.

EXHAUST PIPE AND MAIN SILENCER

Removal and Installation

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.
3. Check for exhaust leakage.



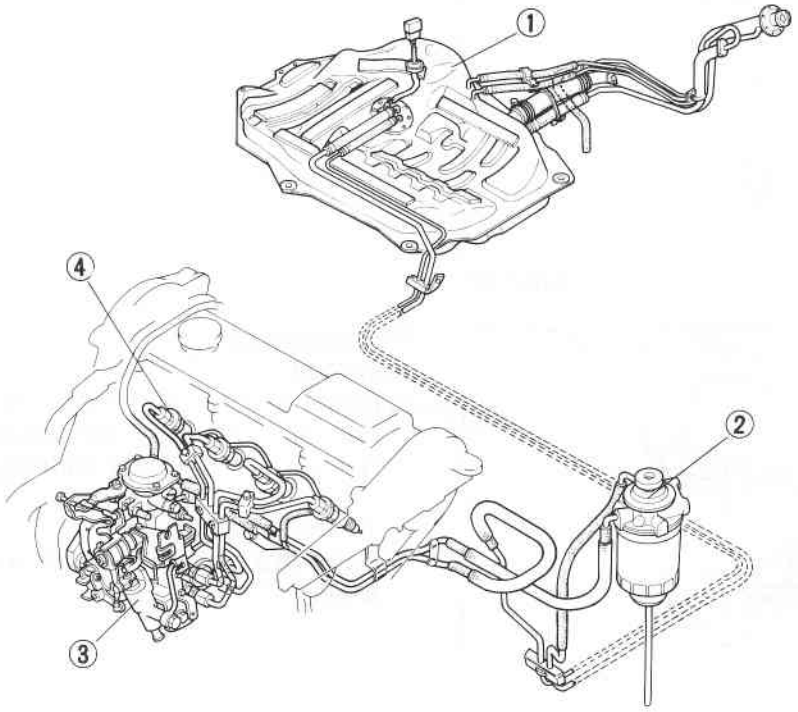
76G04D-045

1. Front exhaust pipe bracket
2. Front exhaust pipe
3. Pre-silencer
4. Silencer hanger
5. Middle pipe
6. Main silencer

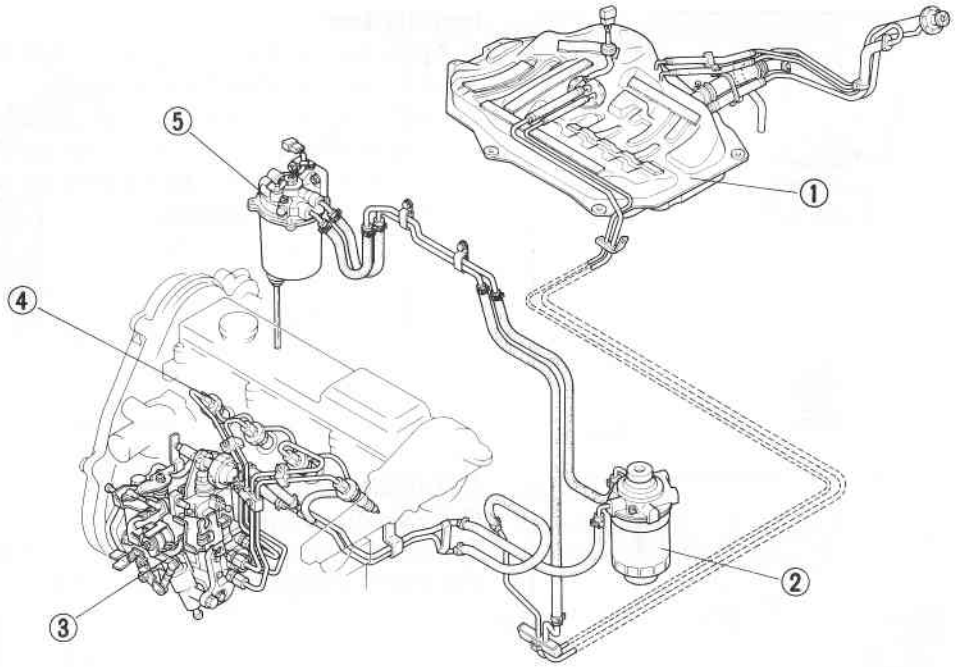
FUEL SYSTEM

STRUCTURAL VIEW

RF-CX

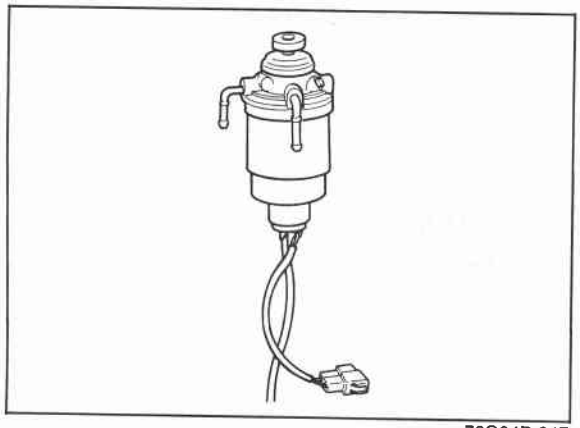


RF-N



76G04D-046

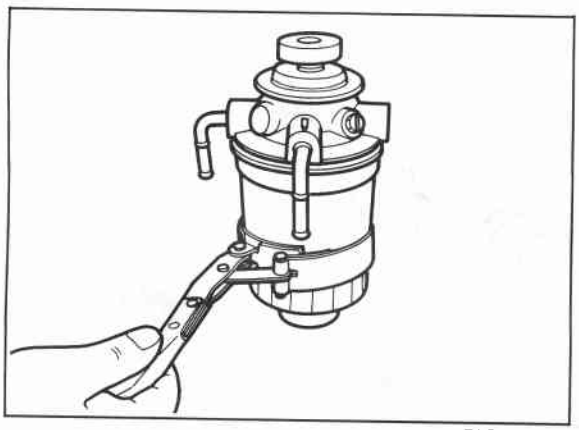
1. Fuel tank
2. Fuel filter
3. Fuel injection pump
4. Fuel injection nozzle
5. Sedimenter


76G04D-047

FUEL FILTER

On-Vehicle Inspection

Check for water in the fuel filter. If present drain the water. (Refer to page 4D—4.)

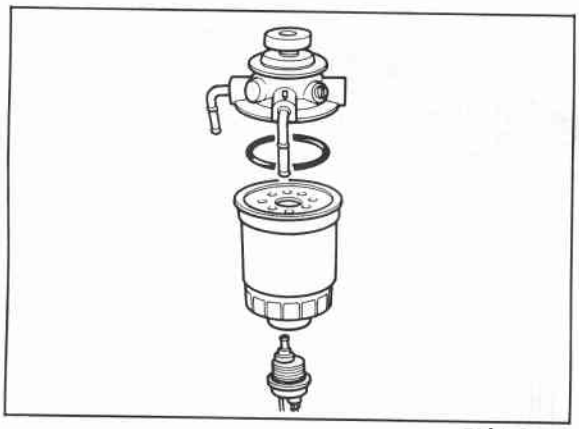

76G04D-048

Replacement

Removal

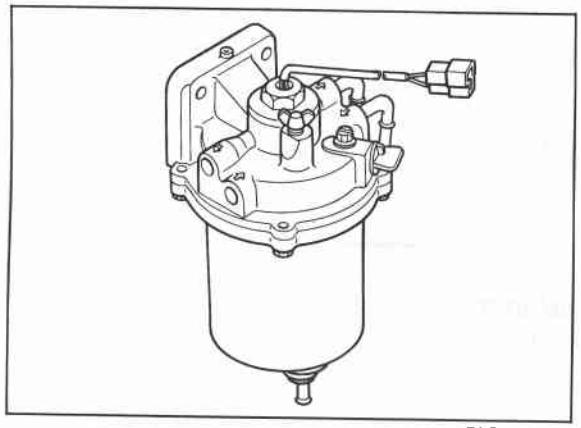
1. Disconnect the water level sensor connector (ECE).
2. Remove the water level sensor. (ECE).
3. Remove the fuel filter cartridge.

Warning
Keep fire and open flame away from the fuel area.


76G04D-049

Installation

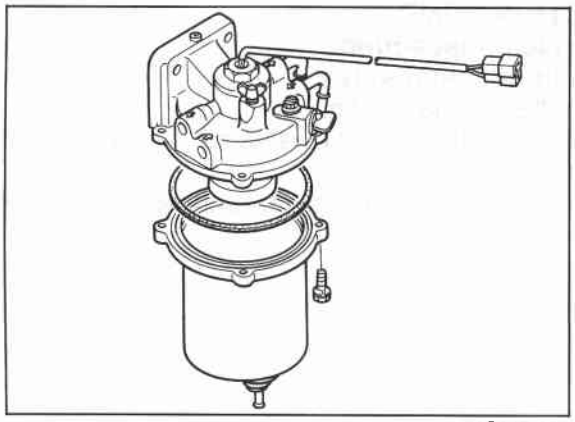
1. Apply fuel to the O-ring of the fuel filter cartridge and install it onto the filter body.
2. Install the water level sensor (ECE).
3. Connect the water level sensor connector (ECE).
4. Bleed air from fuel filter. (Refer to page 4D—4.)
5. Check for fuel leakage.


76G04D-050

SEDIMENTER (GENERAL)

On-Vehicle Inspection

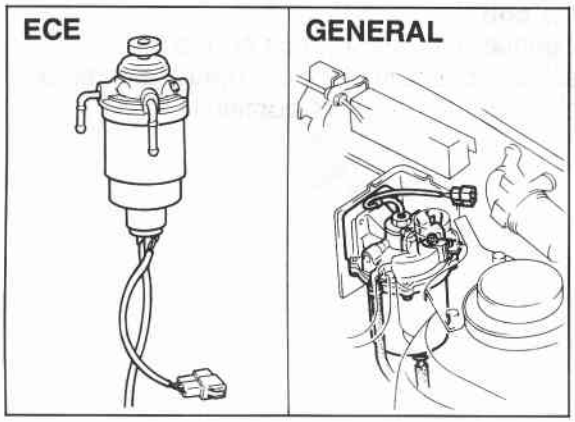
Check for water in the sedimenter. If present, drain the water. (Refer to page 4D—4.)



76G04D-051

Replacement

1. Remove the sedimenter from the body.
2. Apply fuel to a new O-ring, and install it onto the sedimenter body with water level sensor.

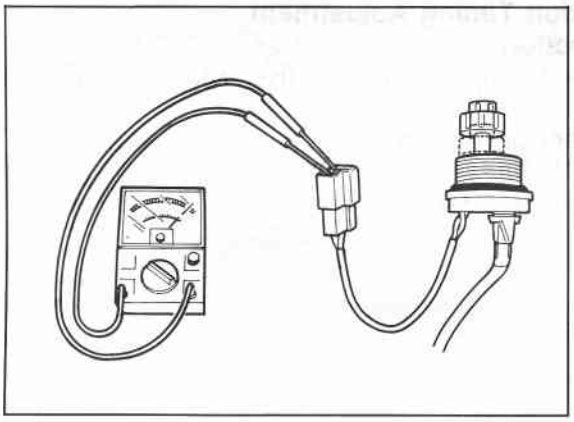


76G04D-052

WATER LEVEL SENSOR

Inspection

1. Remove the water level sensor.
   (ECE)
   Remove the water level sensor from the fuel filter.
   (GENERAL)
   Remove the water level sensor from the sedimenter body.

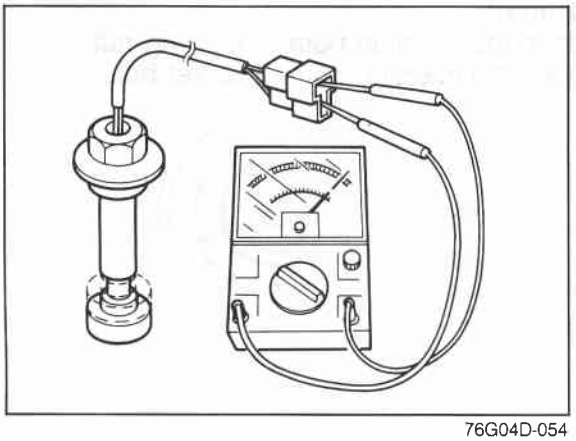


76G04D-053

2. Check the water level sensor for continuity with an ohmmeter. Replace if necessary.

ECE

Continuity : Pulled condition
No continuity: Pushed condition

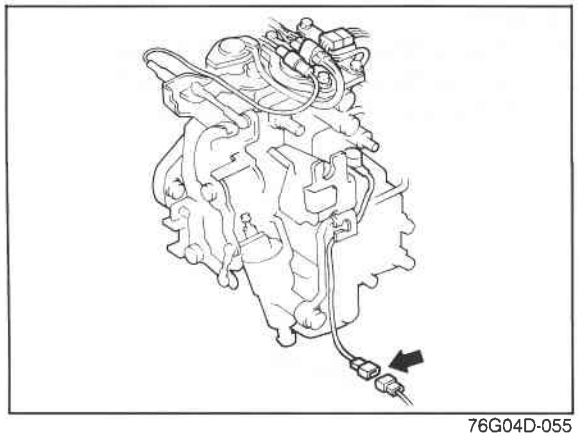


76G04D-054

GENERAL

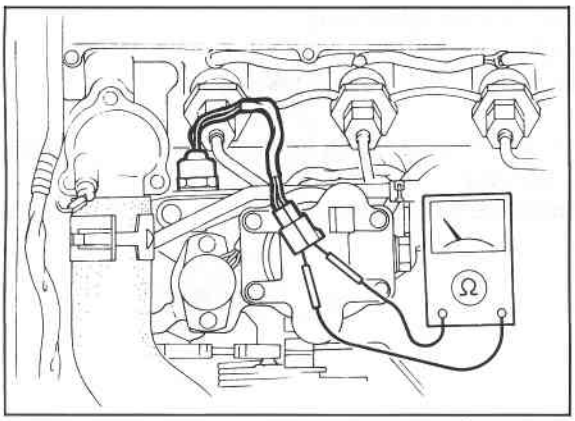
Continuity : Pushed condition
No continuity: Pulled condition

3. Apply fuel to a new O-ring and install it onto the sensor.
4. Install the water level sensor to the fuel filter (ECE) or the sedimenter (General).
5. Check for fuel leakage.



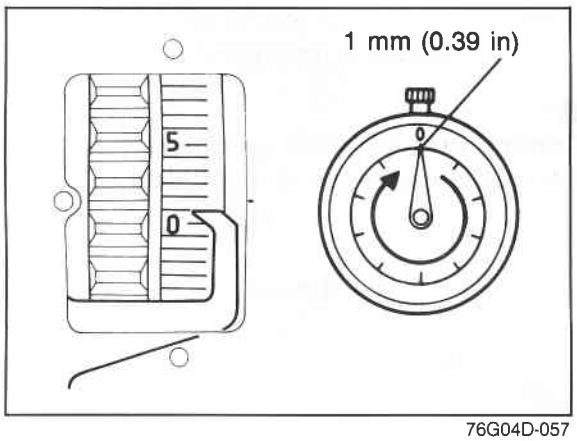
76G04D-055

INJECTION PUMP
On-Vehicle Inspection
Fuel cut solenoid valve
1. Run the engine at idle.
2. Disconnect the solenoid valve connector, and let the engine stop.
3. If the engine does not stop, replace the fuel cut solenoid valve.



76G04D-056

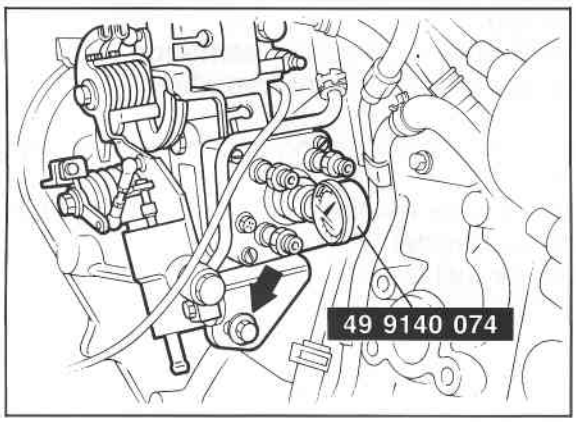
Pick up coil
1. Disconnect the pick up coil connector.
2. Check for continuity of the coil using an ohmmeter.
3. Replace it if there is not continuity.



76G04D-057

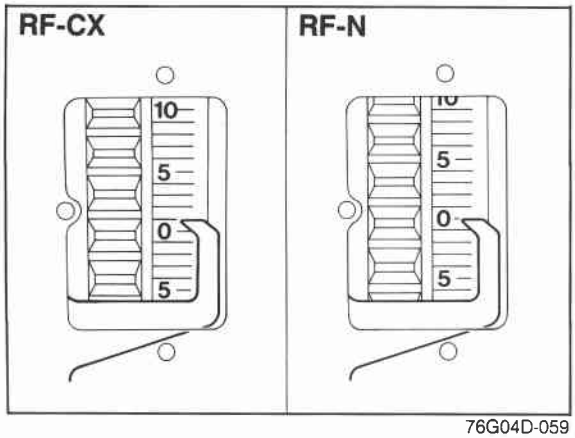
Injection Timing Adjustment
Inspection
Check the injection timing. (Refer to page 4D—5.)

Injection timing
RF-CX: ATDC 1°
RF-N : TDC 0°



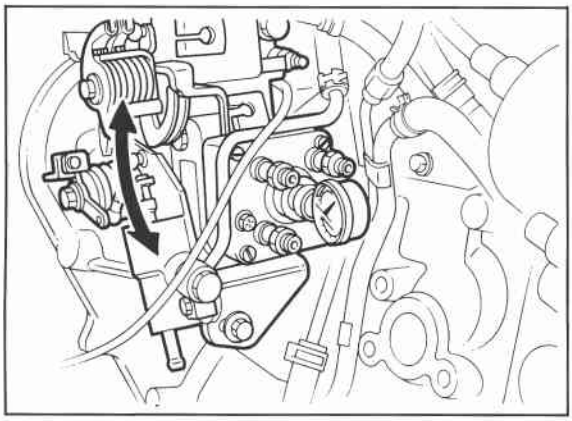
76G04D-058

Adjustment
1. Loosen the injection pump mounting nut.
2. Loosen the injection pump bracket bolt.



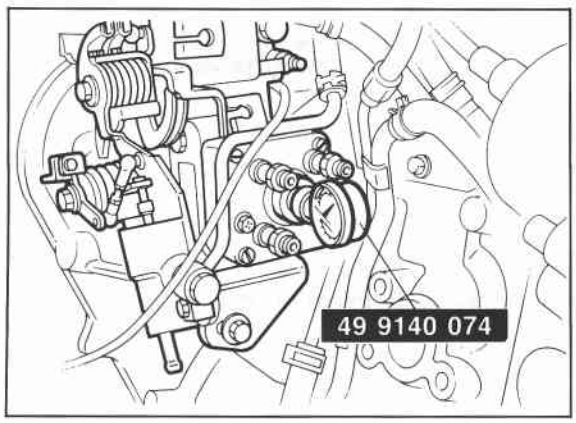
76G04D-059

3. Turn the crankshaft, and align the flywheel indicator pin at ATDC 1° (RF-CX), or TDC 0° (RF-N).


76G04D-060

4. Turn the injection pump until the dial indicator indicates **1 mm (0.04 in)**.

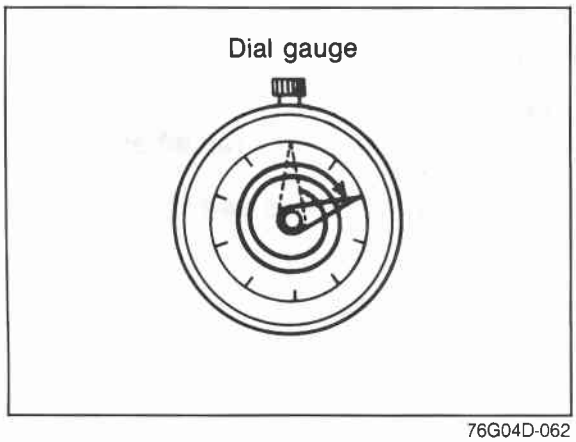
Note
Refer to page 4D—4 for initial setting of the dial indicator.



76G04D-061

Cam Height Inspection

1. Set the **SST** into the injection pump as for injection timing adjustment. (Refer to page 4D—4.)



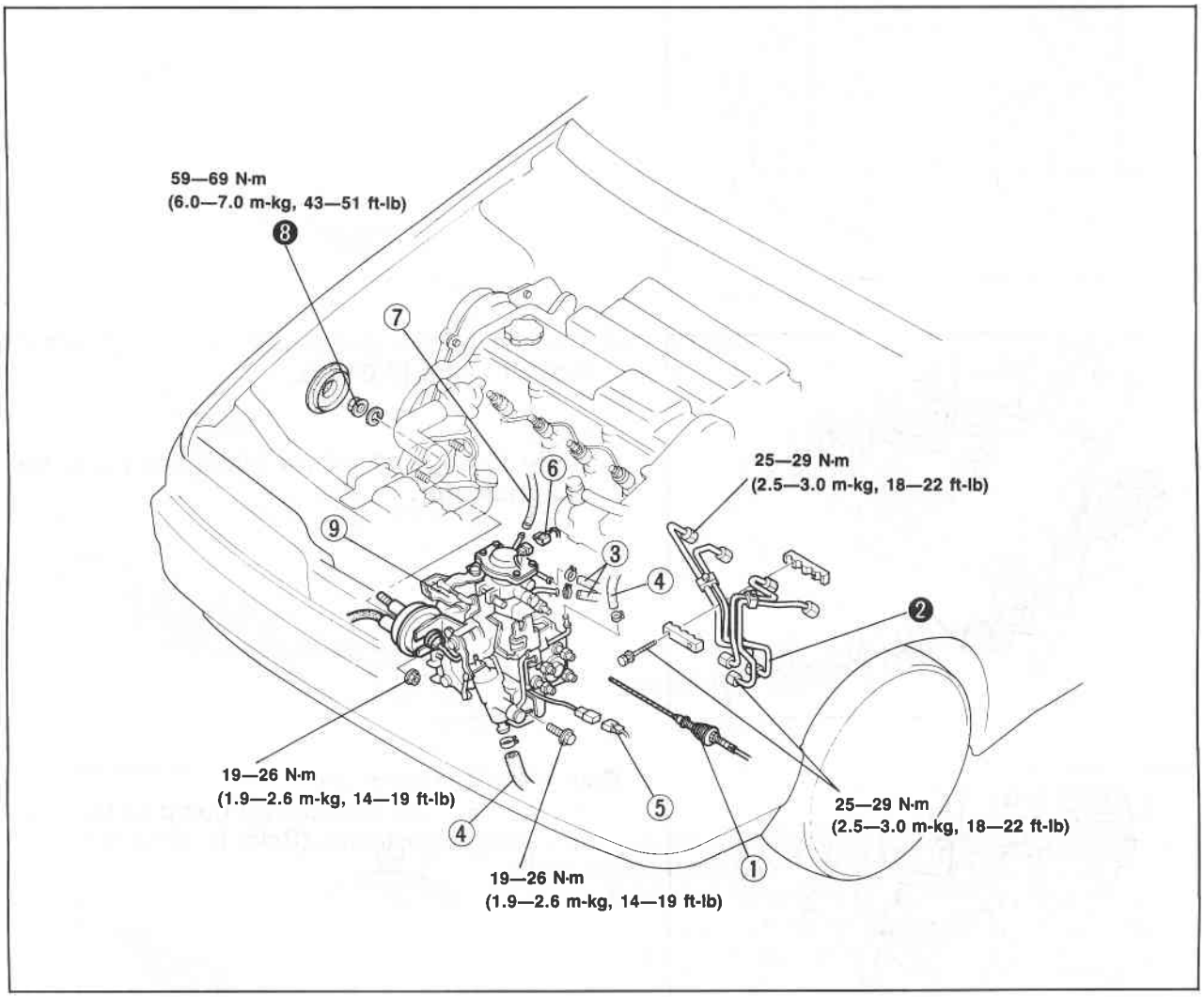
76G04D-062

2. Turn the crankshaft clockwise and read the maximum difference of the indicator value, which gives the cam height.

Cam height: 2.2 mm (0.08 in)

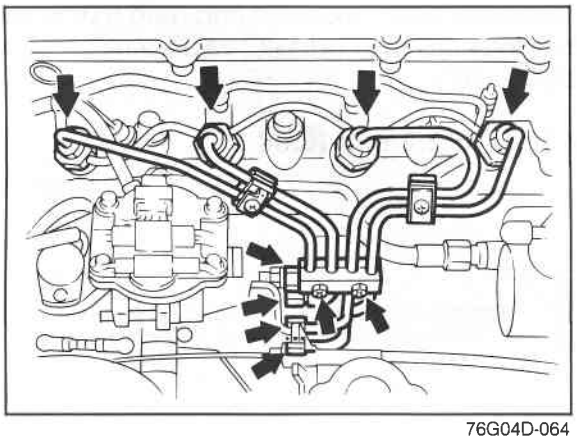
Removal and Installation

1. Remove in the sequence shown in the figure, referring to the removal note for specially marked parts.
2. Install in the reverse order of removal.



76G04D-063

1. Accelerator cable
2. Injection pipe
3. Fuel hose
4. Water hose
5. Fuel cut solenoid valve connector
6. Pick-up coil connector
7. Boost air hose (RF-CX)
8. Injection pump pulley lock nut
9. Injection pump

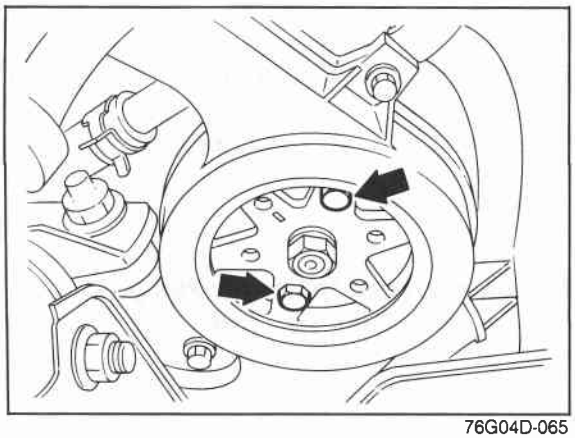


76G04D-064

Removal note
Injection pipe

Warning
a) Catch leaking fuel with a rag when removing the injection pipes.
b) Keep fire and open flame away from the fuel area.

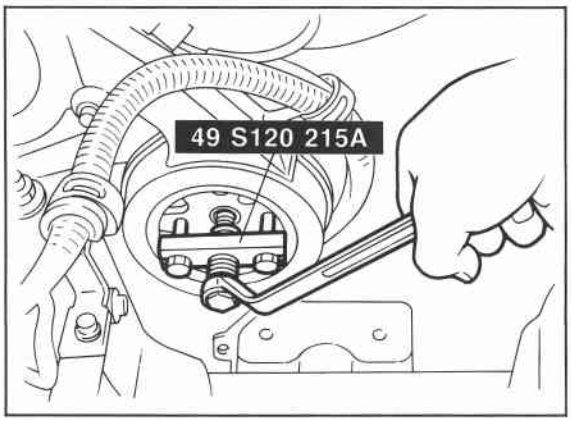
Remove the injection pipes.



76G04D-065

Injection pump pulley

1. Put two 35—40 mm (1.3—1.6 in) long bolts through the injection pump pulley and affix them in the threaded holes of the injection pump bracket.
2. Loosen the injection pump pulley bolt.



76G04D-066

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

Steps after installation

1. After installation adjust the injection timing. (Refer to page 4D—24.)
2. Bleed air from the fuel line.
3. Check for fuel leakage.

76G04D-067

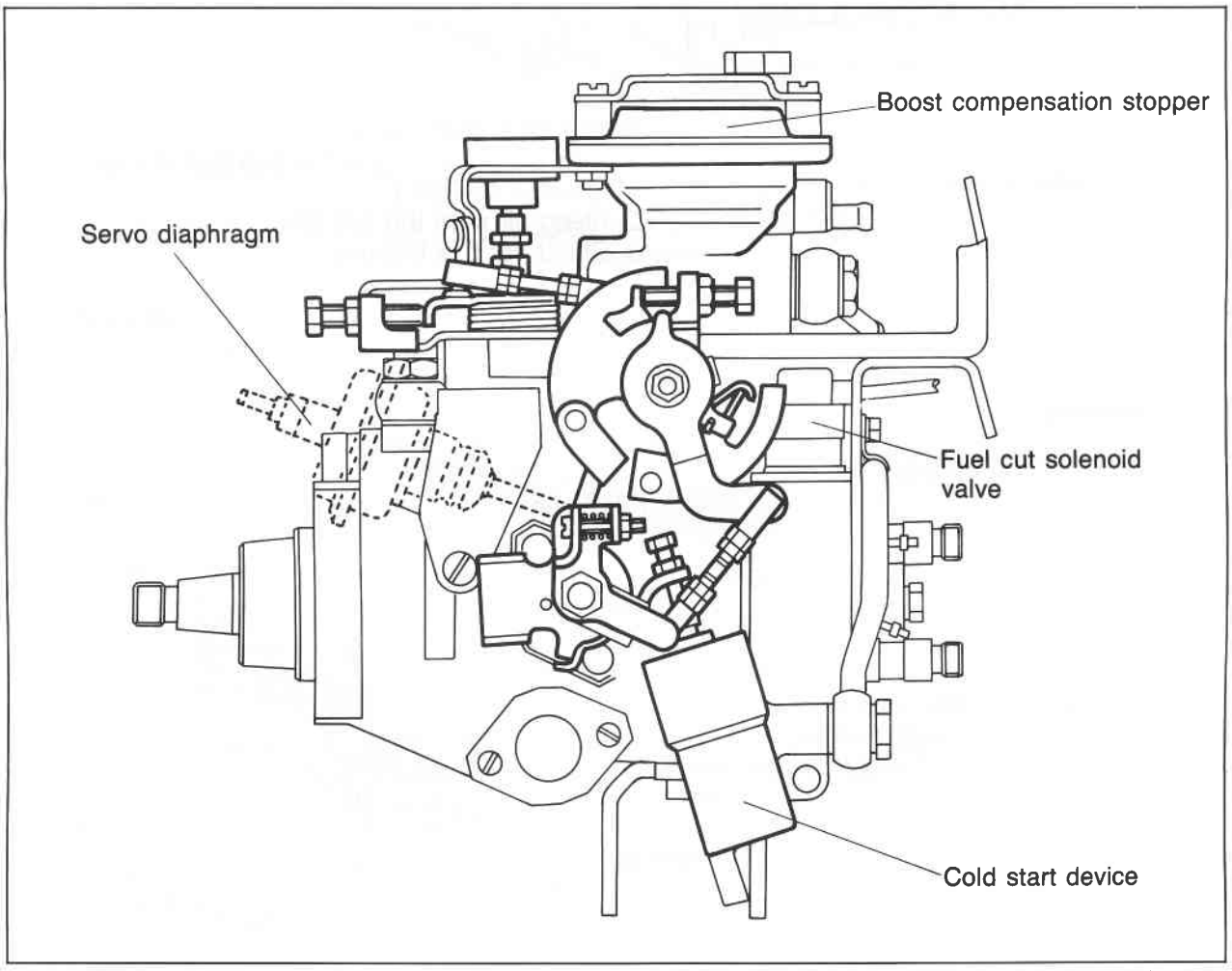
Overhaul
Service point
1. For overhauling the injection pump, see the "Repair Service and Maintenance" manual prepared by the manufacturer of the pump.
2. If the inside of the injection pump is disassembled for maintenance, be sure to properly use the checking device such as the pump tester.

76G04D-068

63G04D-312

Manufacturer of Injection Pump:
Diesel Kiki Co., Ltd.

Construction of VE Injection Pump



63G04D-313

Injection Pump Characteristic (RF-CX)

VE-TYPE RF71 13 800C: 104749-0343 For RF-CX
☆ TEST OIL SAE Standard test oil (SEA 967C)

Fuel injection amount

Item	Pump speed (RPM)	Fuel injection amount (cm^3/stroke)
Start	100	More than 55/1,000
Full load	600	33.9—38.9/1,000
	1,000	48.9—50.9/1,000
	2,150	39.7—44.7/1,000
	2,250	32.7—37.7/1,000
	2,550	8.0—15.0/1,000
Idling	360	7.6—10.6/1,000

Chamber pressure and timer stroke

Pump speed (RPM)	Chamber pressure (kg/cm^2)	Timer stroke (mm)
500	———	———
1,250	4.5—5.1	2.7—3.9
1,500	5.2—5.8	4.3—4.9
2,150	6.8—7.4	7.6—8.8

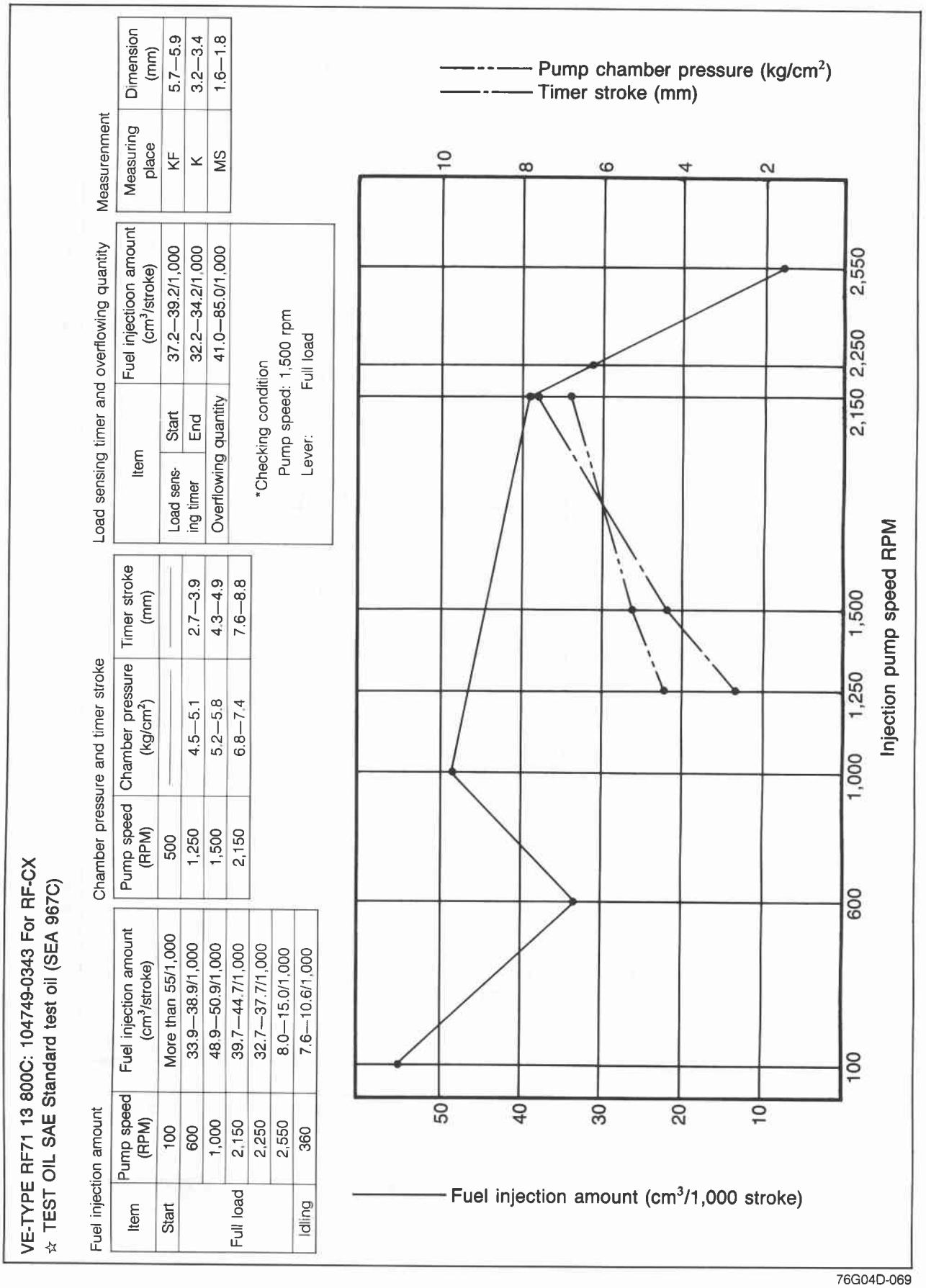
Load sensing timer and overflowing quantity

Item		Fuel injectioon amount (cm^3/stroke)
Load sensing timer	Start	37.2—39.2/1,000
	End	32.2—34.2/1,000
Overflowing quantity		41.0—85.0/1,000

*Checking condition
Pump speed: 1,500 rpm
Lever: Full load

Measurenment

Measuring place	Dimension (mm)
KF	5.7—5.9
K	3.2—3.4
MS	1.6—1.8



76G04D-069

Injection Pump Characteristic (RF-N)

VE-TYPE RF79 13 800A: 104748-0343 For RF-N ENGINE
☆ TEST OIL SAE Standard test oil (SEA 967C)

Fuel injection amount

Item	Pump speed (RPM)	Fuel injection amount (cm³/stroke)
Start	100	More than 42/1,000
Full load	600	29.0—33.0/1,000
	1,375	34.9—36.9/1,000
	2,325	30.2—34.2/1,000
	2,600	9.8—15.8/1,000
	2,700	Max. 6.0/1,000
Idling	360	8—12/1,000

Chamber pressure and timer stroke

Pump speed (RPM)	Chamber pressure (kg/cm²)	Timer stroke (mm)
600	2.2—2.8	———
1,375	4.4—5.0	3.9—4.5
1,800	5.6—6.2	6.1—7.3
2,325	6.9—7.5	7.2—8.4
———	———	———

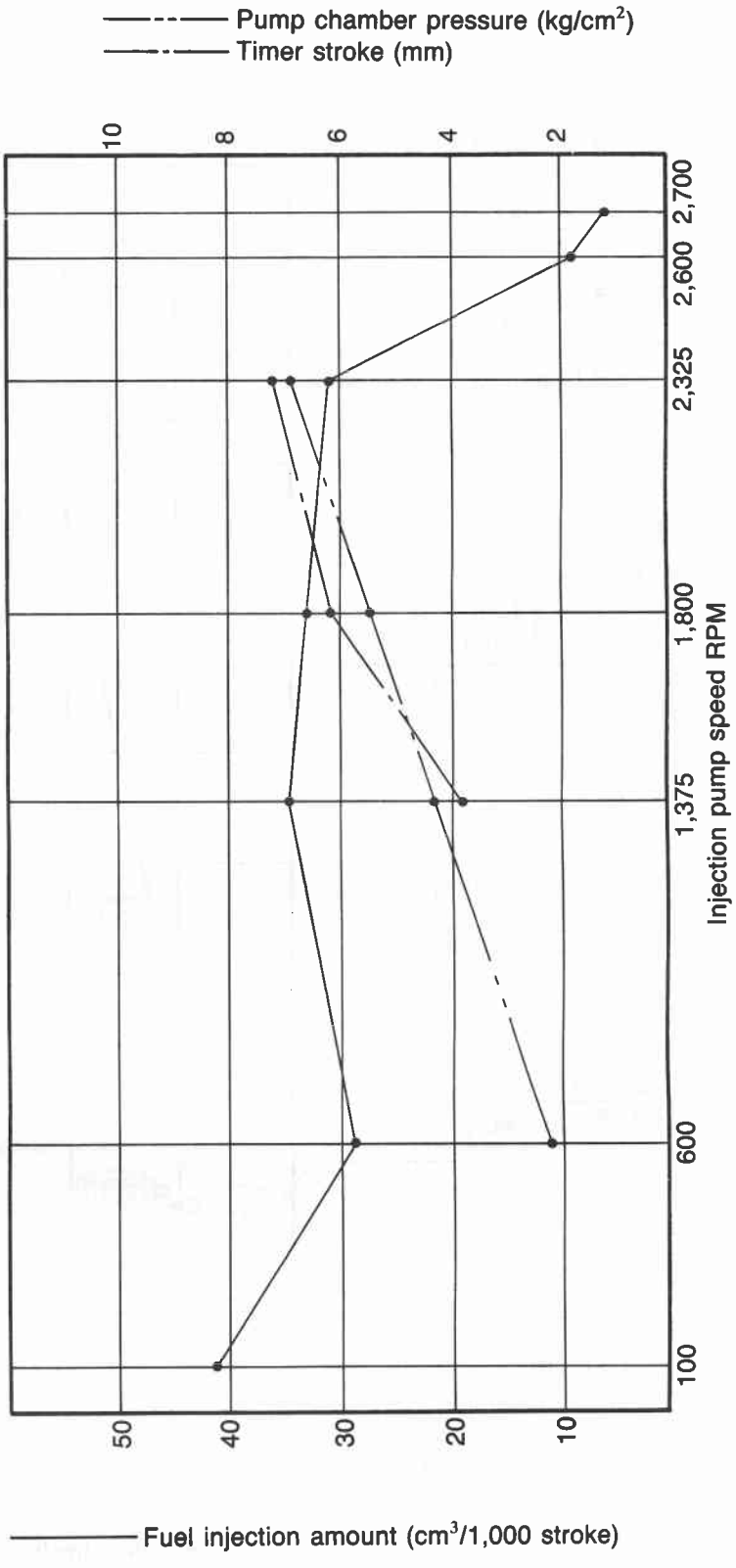
Load sensing timer and overflowing quantity

Item		Fuel injectioon amount (cm³/stroke)
Load sensing timer	Start	26.7—29.7/1,000
	End	14.6—17.6/1,000
Overflowing quantity		46.3—90.3/1,000

*Checking condition
Pump speed: 1,375 rpm
Lever: Full load

Measurenment

Measuring place	Dimension (mm)
KF	5.8—5.9
K	3.2—3.4
MS	1.4—1.6

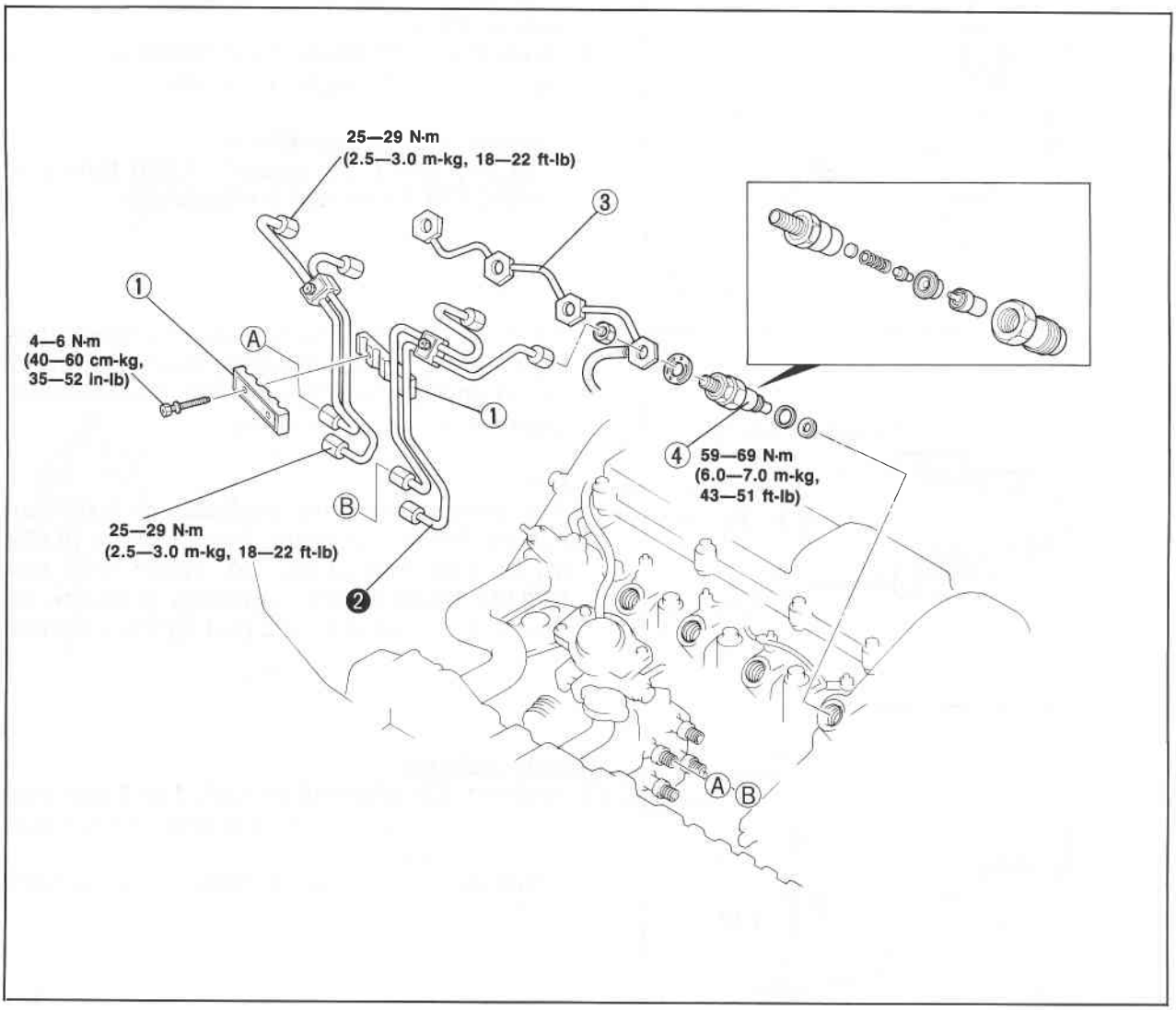


76G04D-070

INJECTION NOZZLE

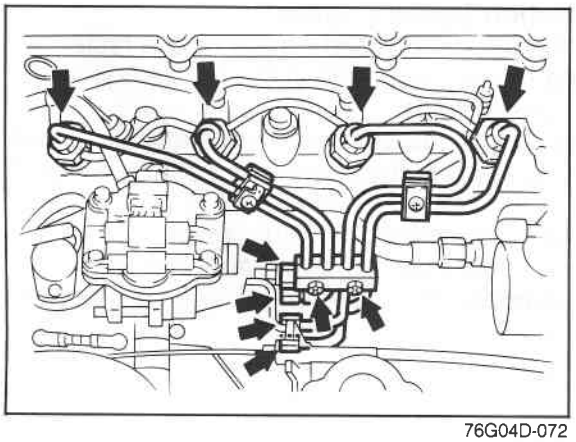
Removal

Remove in the sequence shown in the figure, referring to the removal note for the specially marked parts.



76G04D-071

1. Injection pipe bracket
2. Injection pipe
3. Fuel leak pipe
4. Fuel injection nozzle

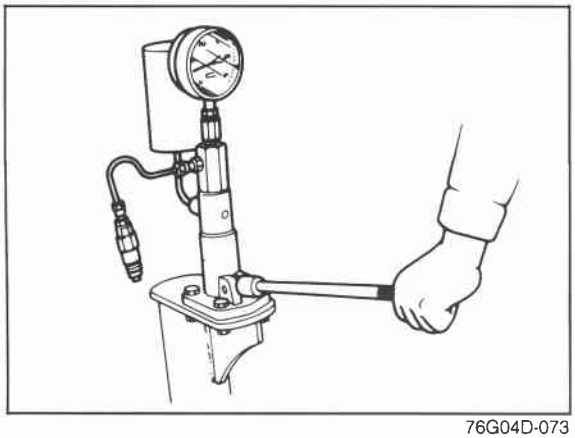


76G04D-072

Removal note
Injection pipe

Warning
a) Catch leaking fuel leakage with a rag when removing the injection pipes.
b) Keep fire and open flame away from the fuel area.

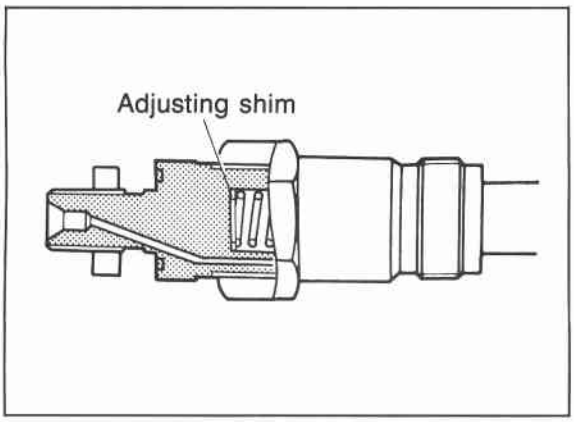
Remove the injection pipes.



76G04D-073

Inspection
Injection starting pressure
1. Set the nozzle on the nozzle tester.
2. Bleed the air by pumping the nozzle tester handle several times.
3. Slowly lower the nozzle tester handle and check the pressure when injection starts.

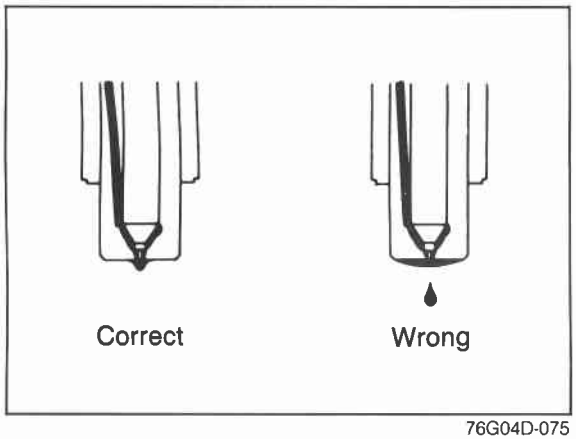
Injection starting pressure:
13,200 kPa (135 kg/cm^2, 1,920 lb/in^2) at 20°C (36°F) of fuel temperature



76G04D-074

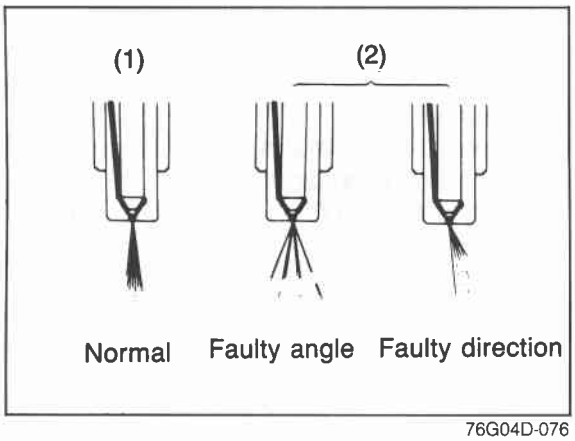
4. If the injection starting pressure is higher than specification, increase the shim thickness. If the injection starting pressure is lower than specification, decrease the shim thickness.

Note
Adjusting shims are availabe in 0.05 mm (0.0197 in) thicknesses, from 1.0 mm (0.039 in) to 1.95 mm (0.077 in). When 0.05 mm (0.0197 in) is added, injection pressure increases approx. 490 kPa (5.0 kg/cm^2, 70 psi).



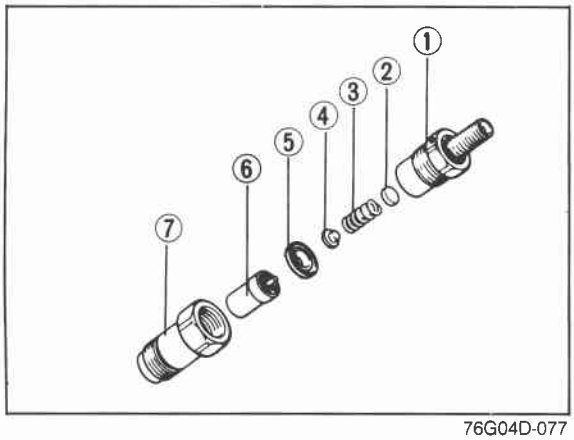
76G04D-075

Nozzle leakage
1. Apply **11,300 kPa (115 kg/cm^2, 1.640 psi)** pressure to the injection nozzle, and check for fuel leaks from the injection hole.
2. If fuel leaks, overhaul or replace the injection nozzle.



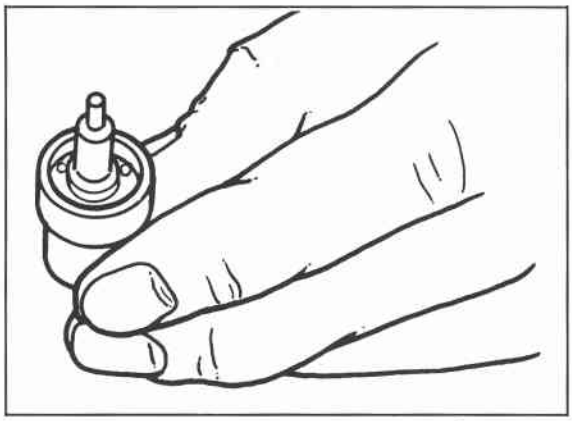
76G04D-076

Atomization (spray pattern)
1. Set the injection nozzle on the nozzle tester.
2. Bleed the air by operating the nozzle tester handle several times.
3. Lower the handle several times as quickly as possible so that a pulsating whistling sound is heard, and check the atomization.
   (1) Uniform and proper atomization
   (2) Incorrect injection angle and direction
4. If necessary, overhaul or replace the injection nozzle.



76G04D-077

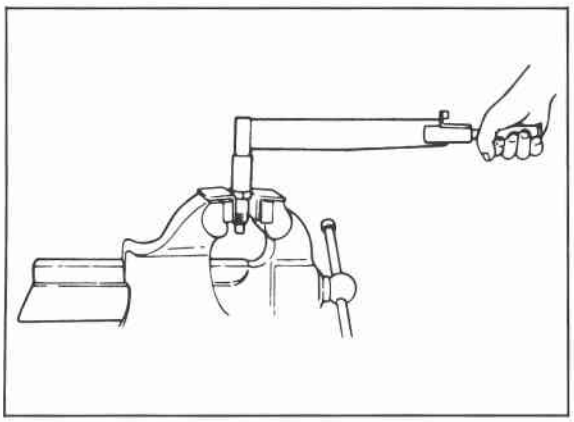
Injection Nozzle Disassembly
Disassemble the injection nozzle.
1. Nozzle holder
2. Adjusting shim
3. Pressure spring
4. Pressure pin
5. Distance piece
6. Nozzle
7. Retaining ring



76G04D-078

Cleaning
Clean the parts in clean test oil.

Injection Nozzle Inspection
1. Check the needle valve, nozzle body, and other parts for damage.
2. Hold the nozzle body upright and insert approximately two thirds of the needle valve, and check that the needle valve drops to the valve seat by its own weight.

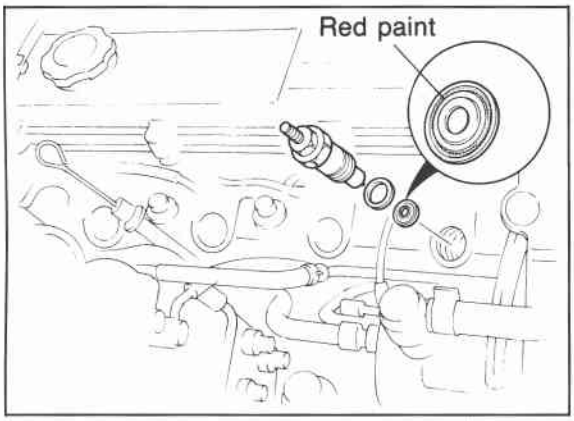


76G04D-079

Injection Nozzle Assembly
1. Assemble the injection nozzle.

   Tightening torque of nozzle body:
   29—49 N·m (3.0—5.0 m-kg, 22—36 ft-lb)

2. Check the injection starting pressure, and atomization. (Refer to page 4D—32.)



76G04D-080

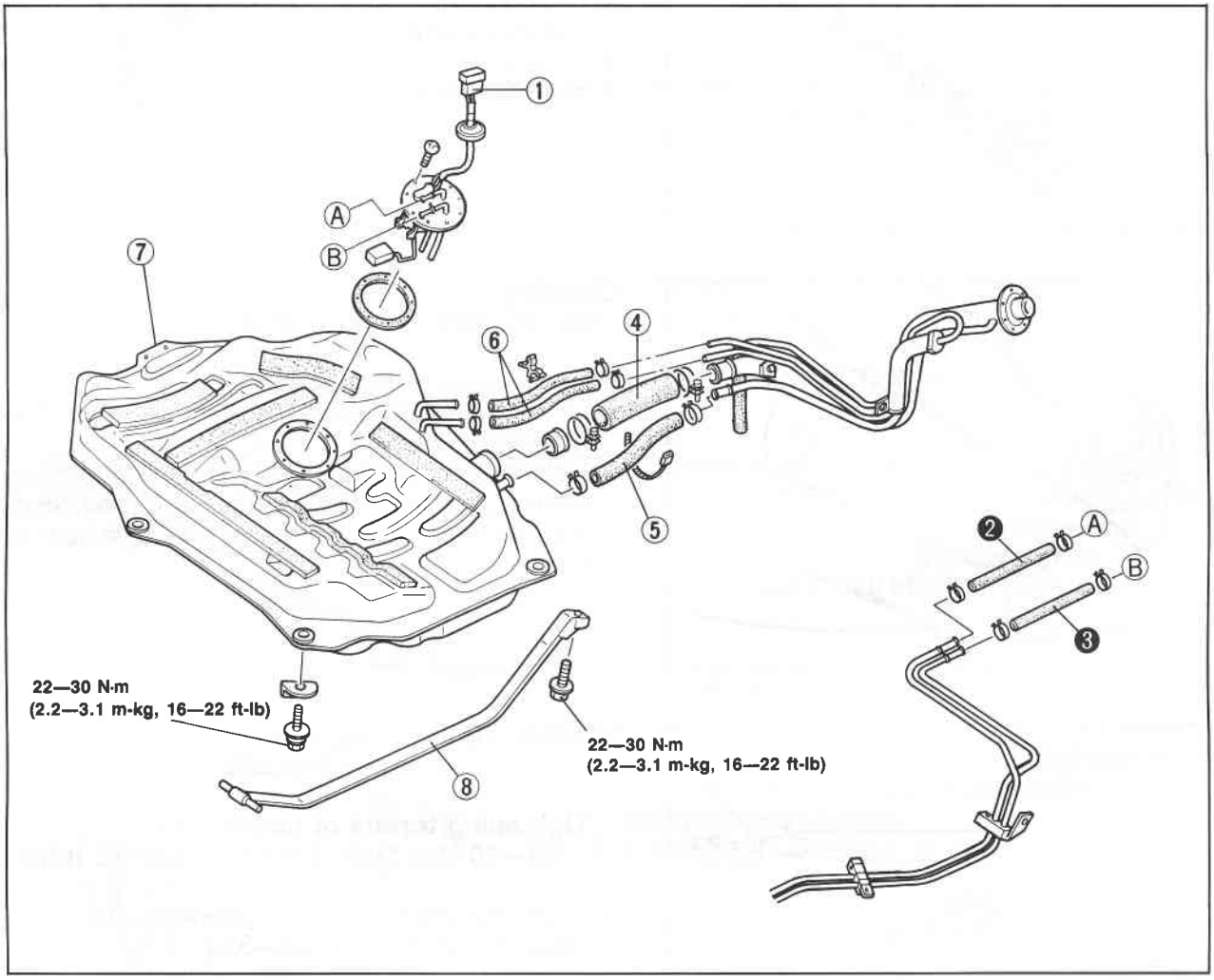
Injection Nozzle Installation
1. Install in the reverse order of removal, referring to the installation note.
2. Check for fuel leakage.

Installation note
Nozzle gasket
Install a new gasket with the red face toward the nozzle.

FUEL TANK

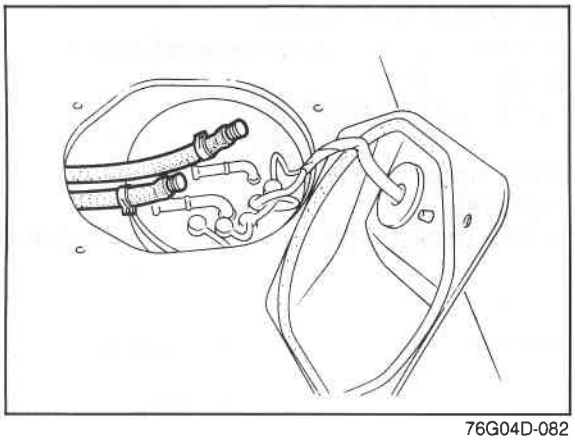
Removal and Installation

1. Drain the fuel from the fuel tank.
2. Remove in the sequence shown in the figure, referring to the removal note for the specially marked parts.



76G04D-081

1. Fuel level gauge connector
2. Fuel main hose
3. Fuel return hose
4. Joint hose
5. Ventilation hose
6. Breather hose
7. Fuel tank
8. Fuel tank pad



76G04D-082

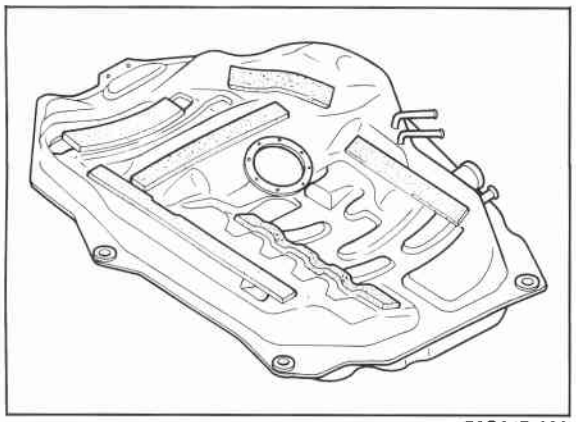
Removal note

Fuel main and return hoses

1. Remove the service hole cover from the body.
2. Disconnect the fuel main and return hoses and plug them.

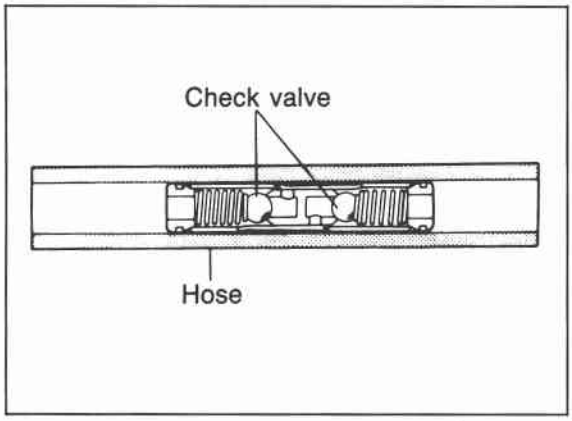
Warning

Keep fire and open flame away from the fuel area.



76G04D-083

Inspection
Fuel tank
Check the fuel tank for cracks or damage. Replace if necessary.



76G04D-084

Two way check valve
1. Diconncect the hose from the fuel tank.
2. Check that the air flows in both directions through the valve.
3. Replace the fuel vent hose if necessary.

Installation
1. Install in the reverse order of removal.
2. Bleed air from fuel line.
3. Check for fuel leakage.

76G04D-085