HOW TO USE THIS MANUAL

To assist in finding your way through the manual, the Section Title and major heading are given at the top of every page.

An **INDEX** is provided on the first page of each section to guide you to the item to be repaired.

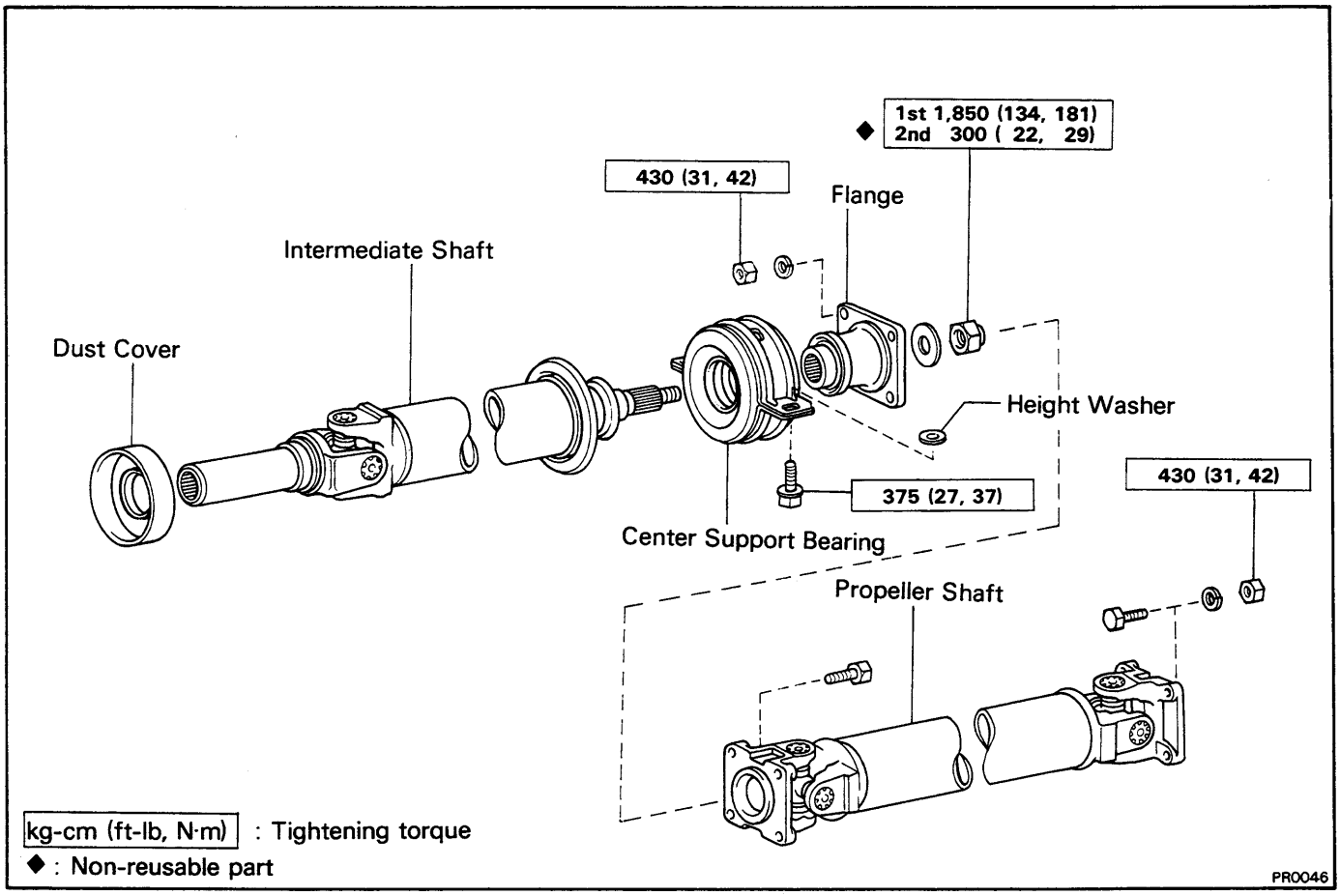
At the beginning of each section, **PRECAUTIONS** are given that pertain to *all* repair operations contained in that section. ***Read these precautions before starting any repair task.***

TROUBLESHOOTING tables are included for each system to help you diagnose the system problem and find the cause. The repair for each possible cause is referenced in the remedy column to quickly lead you to the solution.

REPAIR PROCEDURES

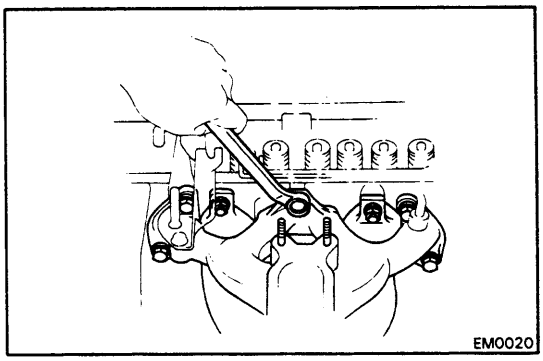
Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

Example:



TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Engine overheats	Cooling system faulty	Troubleshoot cooling system	CO-2
	Incorrect ignition timing	Reset timing	IG-13
Engine will not crank or cranks slowly	Starting system faulty	Troubleshoot starting system	ST-2
Engine will not start/ Hard to start (cranks OK)	No fuel supply to carburetor	Check fuel line	
	Carburetor problems	Troubleshoot fuel system	FU-2
	Ignition problems	Troubleshoot ignition system	IG-2
	Vacuum leaks ● HIC line ● PCV line ● EGR line ● MC line ● Intake manifold	Repair as necessary	
	Compression low	Check compression	EM-6
	Feed back system problems	Check air bleed feed back system	EM-32
Rough idle or stalls	Vacuum leaks ● PCV line ● MC line ● EGR line ● Intake manifold ● HAC line	Repair as necessary	
	Ignition problems	Troubleshoot ignition system	IG-2
	Carburetor problems	Troubleshoot fuel system	FU-3
	HAI system faulty	Check HAI system	EC-43
	Engine overheats	Troubleshoot cooling system	CO-2
	EGR valve faulty	Check EGR valve	EC-20
	Incorrect valve clearance	Adjust valve clearance	EM-35
	Compression low	Check compression	EM-6
	Feed back system problems	Check air bleed feed back system	EC-32
Engine hesitates/ Poor acceleration	Ignition problems	Troubleshoot ignition system	IG-2
	Vacuum leaks ● HIC line ● PCV line ● EGR line ● HAC line ● Intake manifold ● Carburetor hoses	Repair as necessary	
	Air cleaner clogged	Check air filter	MA-5
	Fuel line clogged	Check fuel line	
	Carburetor problems	Troubleshoot fuel system	FU-2
	Emission control system problem		
	● HAI system always on (hot engine)	Check HAI system	EC-43
	● AAP system faulty (cold engine)	Check AAP system	EC-54
	● EGR system always on (cold engine)	Check EGR system	EC-20
	● HAC system faulty	Check HAC system	EC-40
	● CMH system faulty (cold engine)	Check CMH system	EC-61



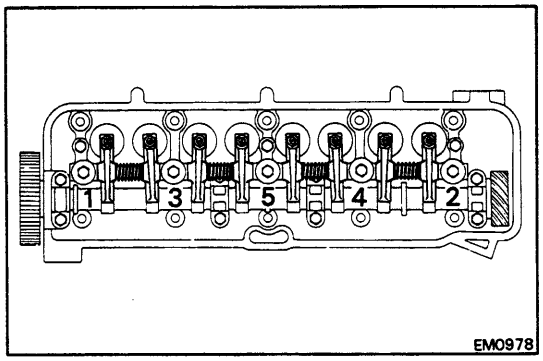
DISASSEMBLY OF CYLINDER HEAD

(See page EM-14)

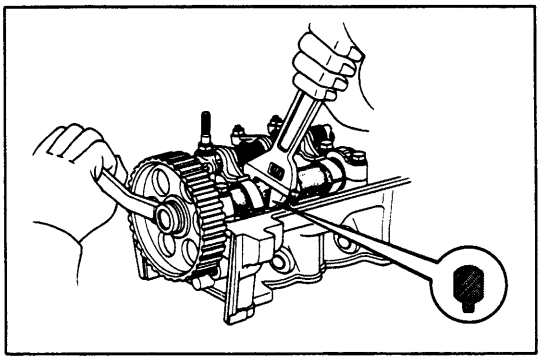
1. **REMOVE CARBURETOR (See page FU-7)**

2. **REMOVE FUEL PUMP**

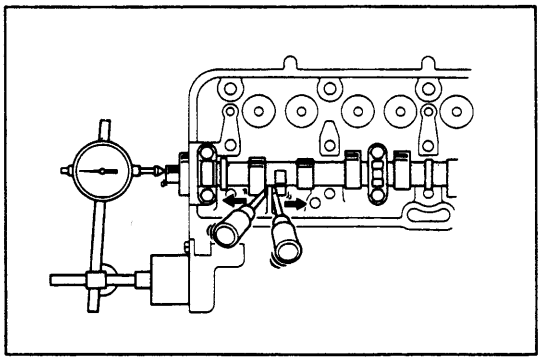
3. **REMOVE INTAKE AND EXHAUST MANIFOLDS**
   (a) Remove the nuts and bolts.
   (b) Remove the vacuum pipes with hoses, and remove the manifolds.



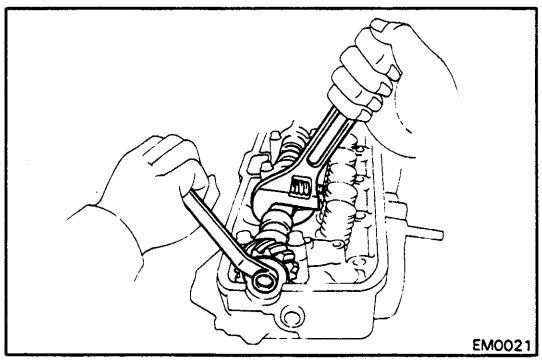
4. **REMOVE ROCKER ARM ASSEMBLY**
   (a) Uniformly loosen and remove each support bolt in several passes and in sequence shown.
   (b) Remove the rocker arm assembly.



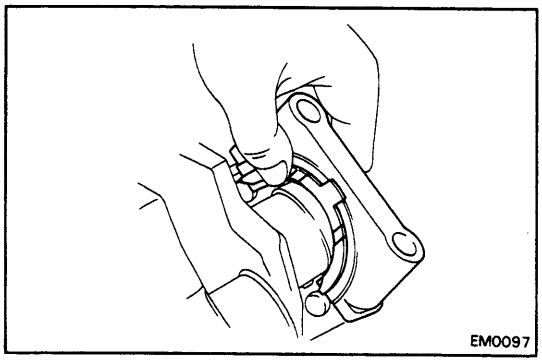
5. **REMOVE CAMSHAFT TIMING PULLEY FROM CAMSHAFT**
   Secure the camshaft and remove the camshaft timing pulley mount bolt, plate washer and pulley.



6. **MEASURE CAMSHAFT THRUST CLEARANCE**
   Standard clearance: 0.08 — 0.18 mm (0.0031 — 0.0071 in.)
   Maximum clearance: 0.25 mm (0.0098 in.)
   If clearance is greater than maximum, replace the head.



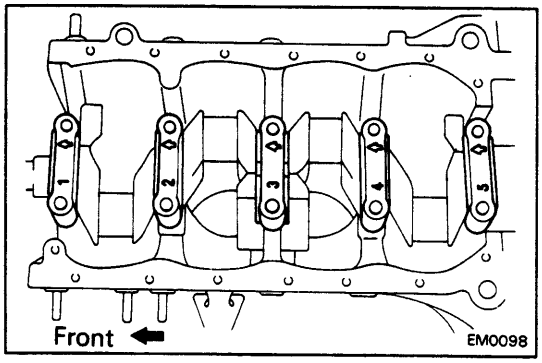
7. **REMOVE BEARING CAPS AND CAMSHAFT**
   (a) Secure the camshaft and loosen the IIA drive gear bolt.



4. INSTALL MAIN BEARING CAPS

NOTE: Each main bearing cap is numbered.

(a) Install the upper thrust washers on the No. 3 main bearing cap with the oil grooves facing outward.



(b) Install the main bearing caps in numerical order with the arrows facing forward.

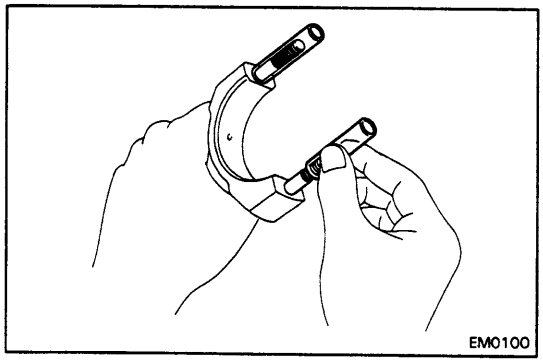
(c) Apply a light coating of engine oil on the threads and under the connecting rod cap bolt heads.

(d) Install and uniformly tighten the cap bolts in several passes, in the sequence shown.

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

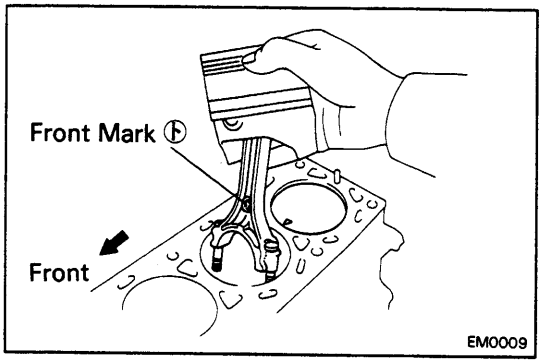
(e) Check that the crankshaft turns.

(f) Check the crankshaft thrust clearance. (See page EM-43)

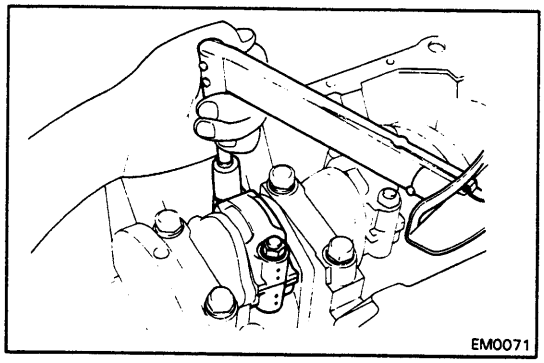


5. INSTALL PISTON AND CONNECTING ROD ASSEMBLIES

(a) Cover the rod bolts with a short piece of hose to protech the crankshaft and cylinder bore from damage.



(b) Using a piston ring compressor, push the correctly numbered piston and connecting rod assembly into the cylinder. Make sure the marks on the connecting rod and piston are facing forward.



6. INSTALL CONNECTING ROD BEARING CAPS

(a) Match the numbered connecting rod cap with the numbered connecting rod.

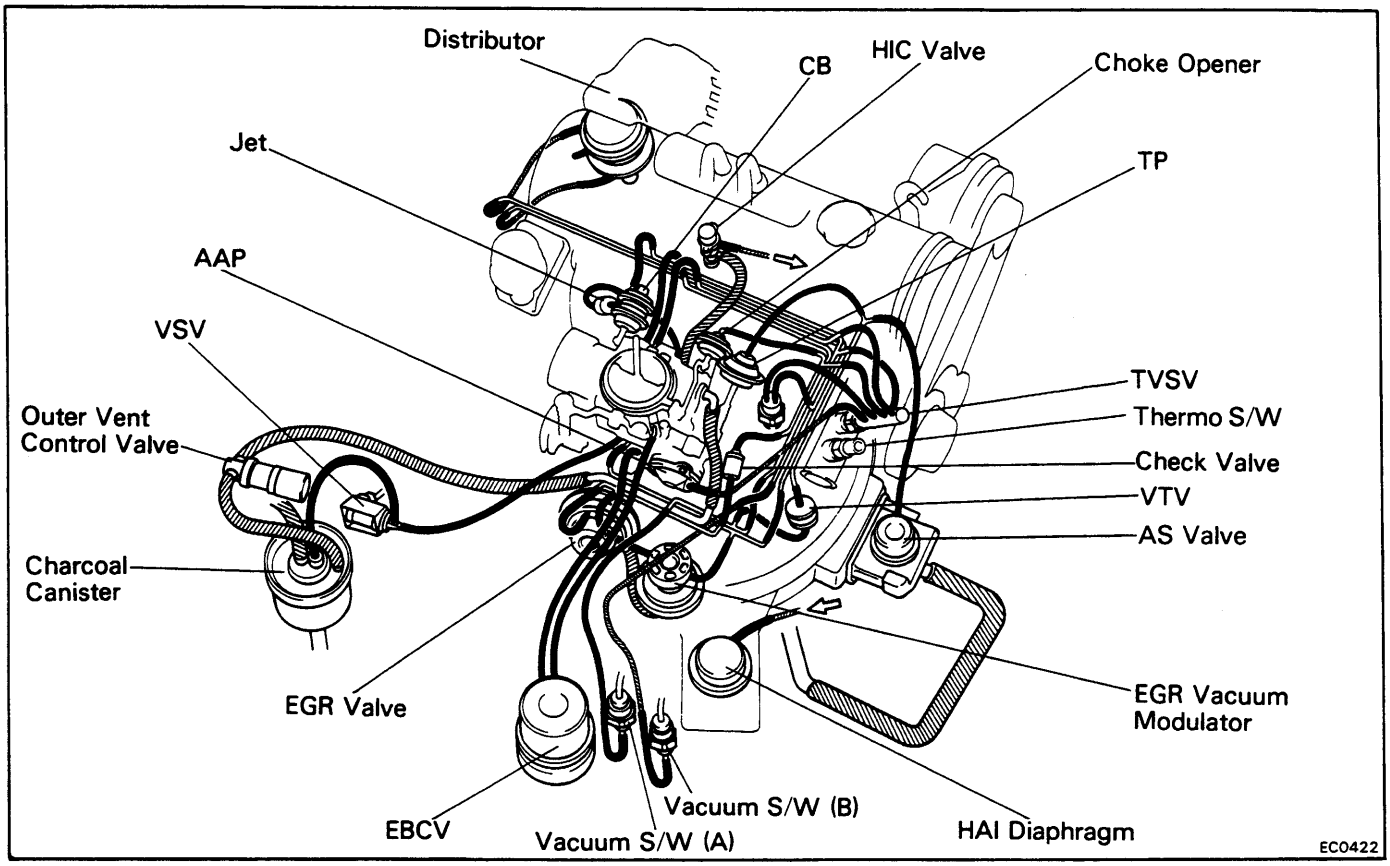
(b) Align the marks punched on the connecting rod and cap and install.

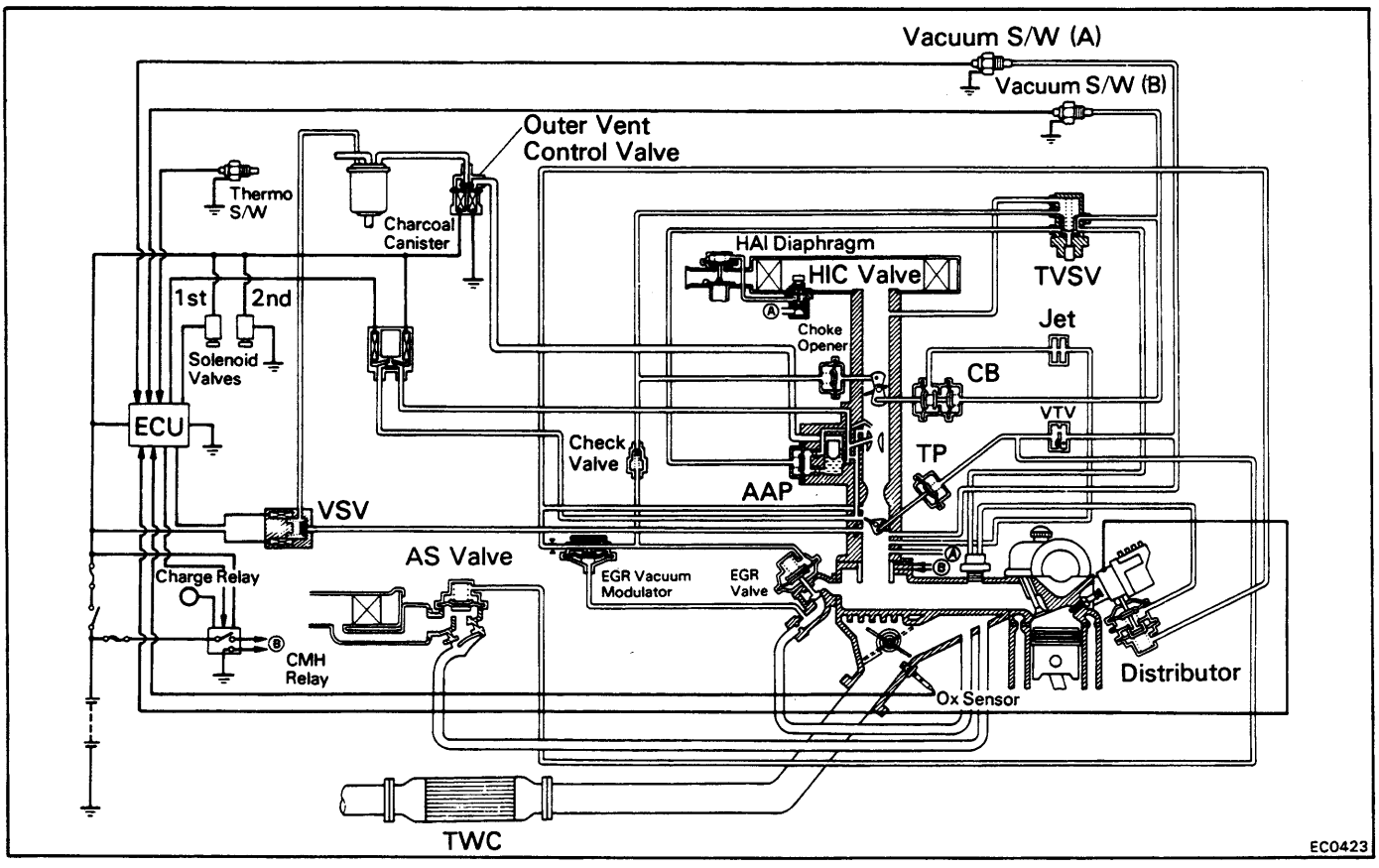
(c) Apply a light coat of the engine oil on the threads and under the rod nuts.

(d) Install and alternately tighten the connecting rod nuts and in several passes.

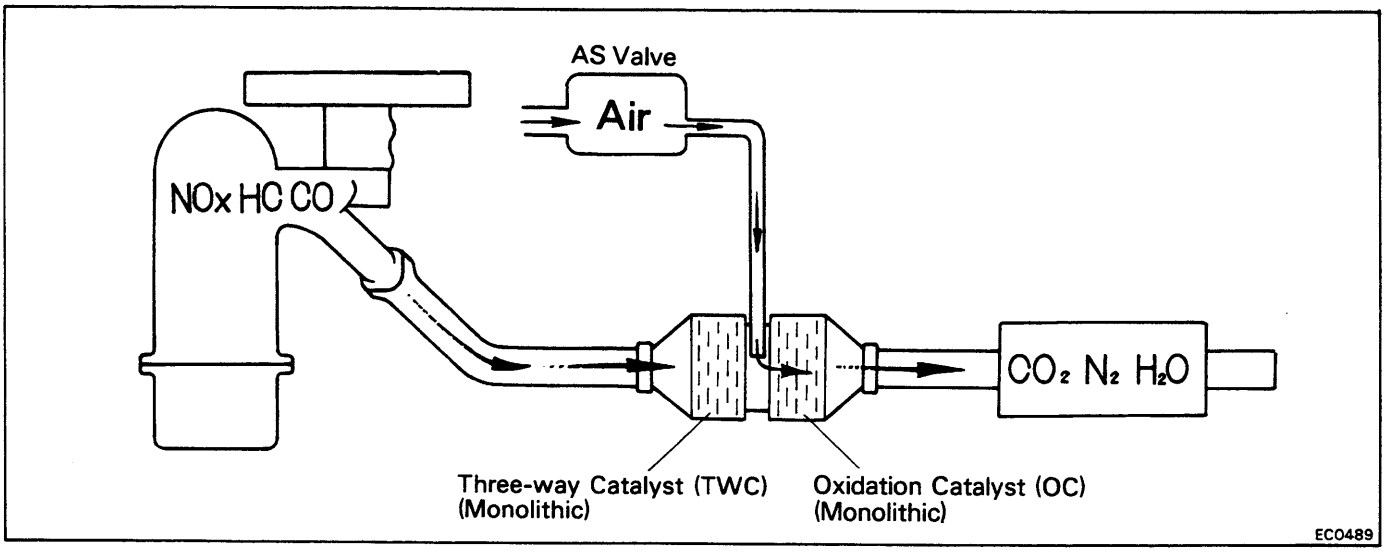
Torque: 500 kg-cm (36 ft-lb, 49 N·m)

COMPONENT LAYOUT AND SCHEMATIC DRAWING (California Vehicles and Canada 3A-C Engine 4-Speed & Wagon A/T)





THREE-WAY AND OXIDATION CATALYST (TWC-OC) SYSTEM (Federal Vehicles)

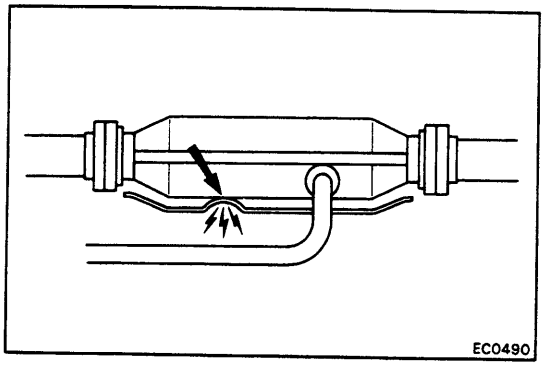


To reduce HC, CO and NOx emissions, they are oxidized, reduced and converted to nitrogen (N_2), carbon dioxide (CO_2) and water (H_2O) by the catalyst.

Exhaust Port		Three-way Catalyst	Air	Oxidation Catalyst (OC)		Exhaust Gas
HC, CO and NOx	⇒	Oxidation and reduction	⇒	Oxidation	⇒	CO_2 H_2O N_2

INSPECTION OF EXHAUST PIPE ASSEMBLY

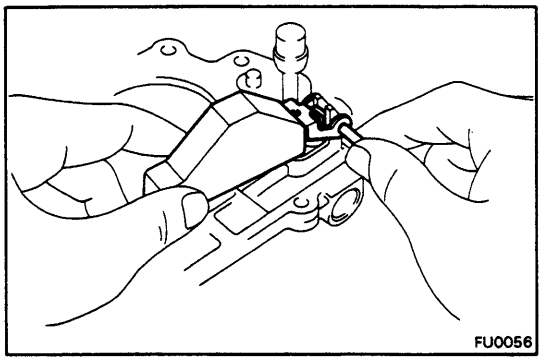
1. **CHECK CONNECTIONS FOR LOOSENESS OR DAMAGE**
2. **CHECK CLAMPS FOR WEAKNESS, CRACKS OR DAMAGE**



INSPECTION OF CATALYTIC CONVERTER

CHECK FOR DENTS OR DAMAGE

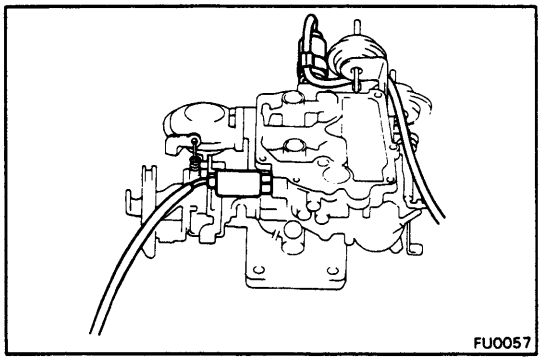
If any part of the protector is damaged or dented to the extent that it contacts the catalyst, repair or replace it.



8. INSTALL NEEDLE VALVE AND FLOAT

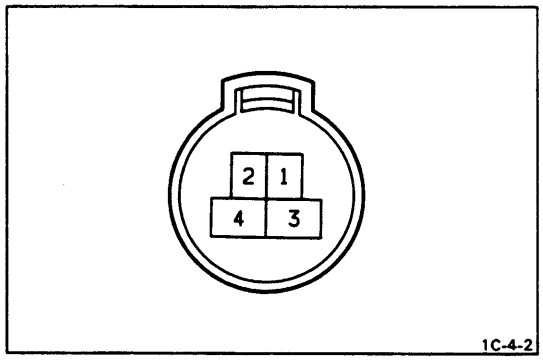
(a) Install the needle valve into the seat.

(b) Insert the float lip between the plunger and clip, and install the float with the pivot pin.



9. ASSEMBLE AIR HORN AND BODY

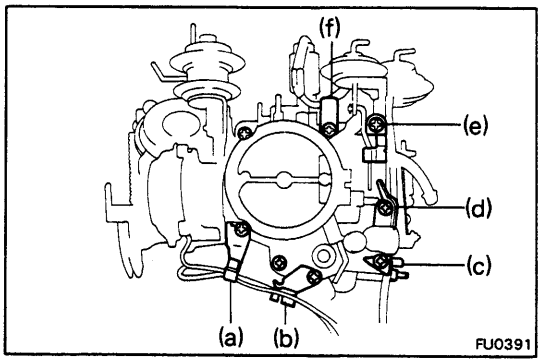
Install the solenoid valves with new gaskets into the carburetor body. Clamp the wire for the secondary solenoid valve (3A-C) to the throttle positioner bracket.



10. INSTALL COIL HOUSING AND SECOND FUEL CUT SOLENOID VALVE (3A-C) WIRES TO CONNECTOR

USA
(1) 1st fuel cut solenoid valve (Black and white)
(2) Coil housing (Red)
(3) 1st fuel cut solenoid valve(Black)
(4) 2nd fuel cut solenoid valve (Black)

Canada
(1) 2nd fuel cut solenoid valve (White and black)
(2) Coil housing (Red)
(3) 2nd fuel cut solenoid valve (Black)
(4) 1st fuel cut solenoid valve (Black)



11. CONNECT CHOKE OPENER LINK

12. INSTALL EIGHT SCREWS TOGETHER WITH OTHER PARTS AS FOLLOWS:

(a) Choke and solenoid wire clamp

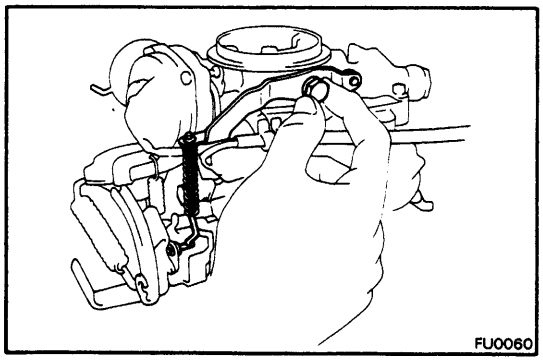
(b) Choke and solenoid wire clamp

(c) Solenoid wire clamp (3A-C)

(d) Choke opener link guide

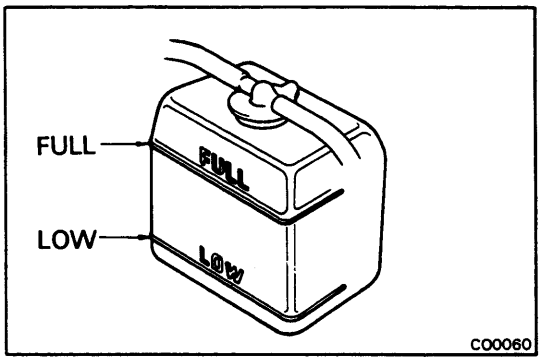
(e) ● Choke opener link cover (3A-C)
● Number plate (3A)

(f) Number plate (3A-C)



13. INSTALL ACCERELATOR PUMP ARM

Install the pump arm to the air horn with the pump plunger hole and lever end aligned.

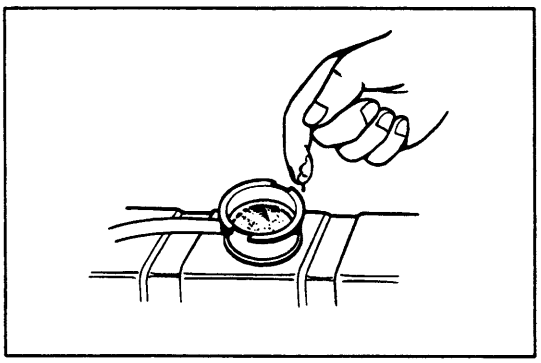


CHECK AND REPLACEMENT OF ENGINE COOLANT

1. CHECK ENGINE COOLANT LEVEL AT RESERVE TANK

The coolant level should be between the "LOW" and "FULL" lines.

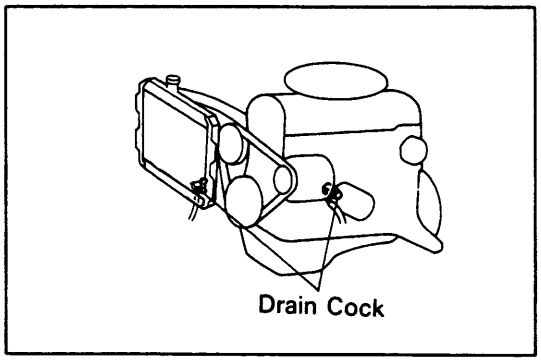
If low, check for leaks and add coolant up to the "FULL" line.



2. CHECK ENGINE COOLANT QUALITY

There should not be any excessive deposit of rust or scales around the radiator cap or radiator filler hole, and the coolant should be free from oil.

If excessively dirty, replace the coolant.



3. REPLACE ENGINE COOLANT

(a) Remove the radiator cap.

(b) Drain the coolant from radiator and engine drain cocks. (Engine drain is at left rear of engine block.)

(c) Close the drain cocks.

(d) Fill the system with coolant.
Use a good brand of ethylene-glycol base coolant, mixed according to the manufacturer's directions.

Capacity (w/ Heater or air conditioner):
5.3 liters (5.6 US qts, 4.7 Imp.qts)

(e) Install the radiator cap.

(f) Start the engine and check for leaks.

(g) Recheck the coolant level and refill as necessary.

PRECAUTIONS

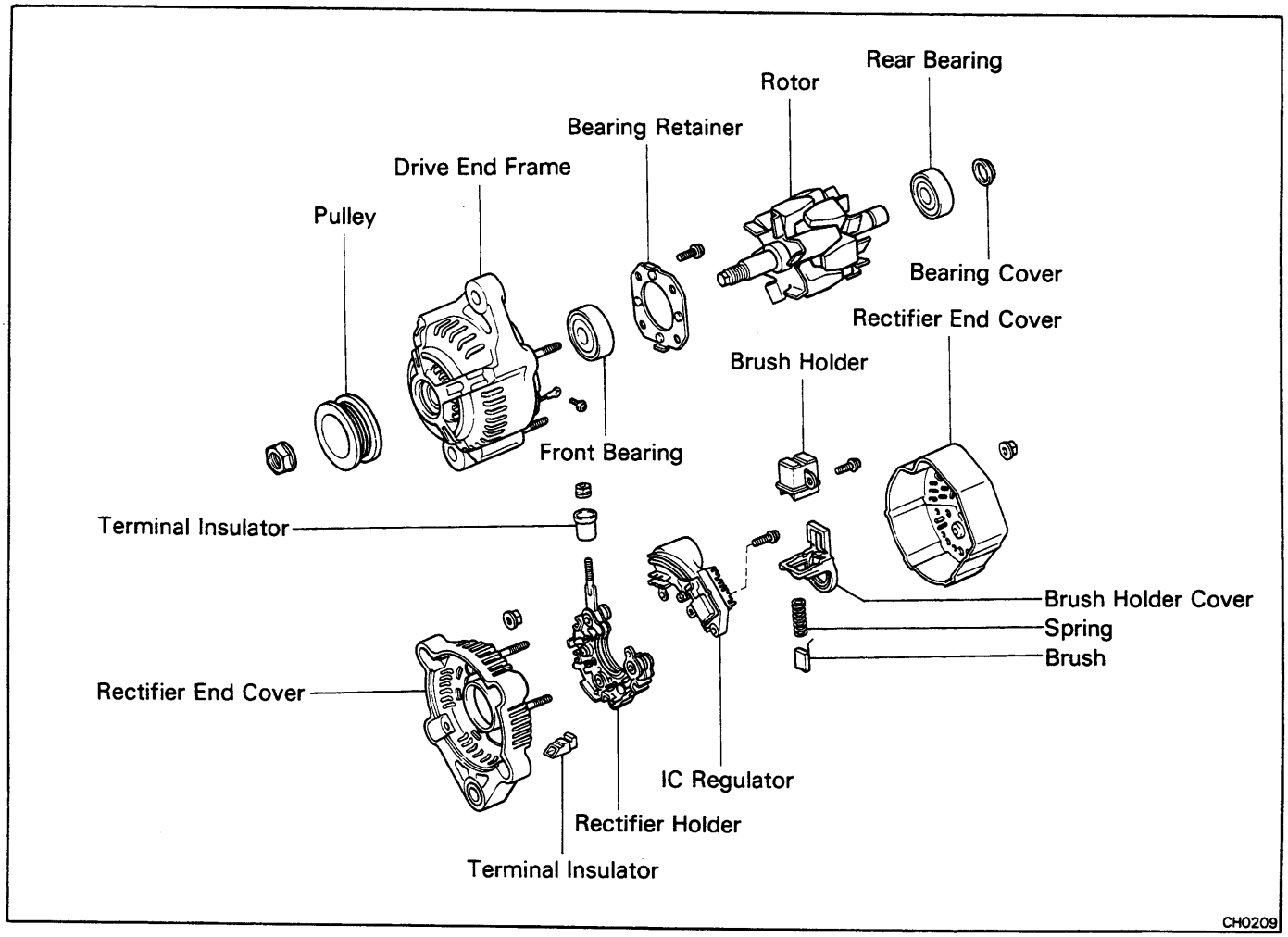
1. **Do not keep the ignition switch "ON" for more than 10 minutes if the engine will not start.**
2. **When using a tachometer, connect the tachometer test probe to the service connector of the IIA.**
3. **It is recommended that you consult with the manufacturer before using a tachometer as some are not compatible with this system.**
4. **NEVER allow the ignition coil terminals to touch ground as it could result in damage to the igniter and/or ignition coil.**
5. **Do not disconnect the battery while the engine is running.**
6. **Make sure that the igniter is properly grounded to the body.**

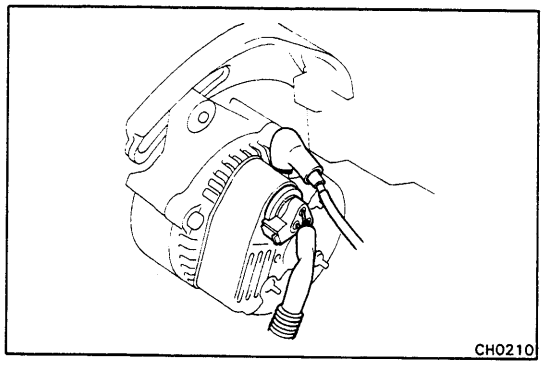
TROUBLESHOOTING

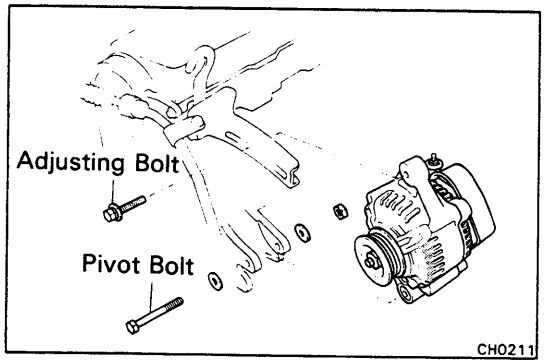
Problem	Possible cause	Remedy	Page
Engine will not start/ Hard to start (cranks OK)	Incorrect ignition timing	Reset timing	IG-13
	Ignition coil faulty	Inspect coil	IG-4
	Igniter faulty	Inspect igniter	IG-5
	Distributor faulty	Inspect distributor	IG-6
	High-tension cord faulty	Inspect high-tension cord	IG-4
	Spark plugs faulty	Inspect plugs	IG-4
	Ignition wiring disconnected or broken	Inspect wiring	
Rough idle or stalls	Spark plugs faulty	Inspect plugs	IG-4
	Ignition wiring faulty	Inspect wiring	
	Incorrect ignition timing	Reset timing	IG-13
	Ignition coil faulty	Inspect coil	IG-4
	Igniter faulty	Inspect igniter	IG-5
	Distributor faulty	Inspect distributor	IG-6
	High-tension cord faulty	Inspect high-tension cord	IG-4
Engine hesitates/ Poor acceleration	Spark plugs faulty	Inspect plugs	IG-4
	Ignition wiring faulty	Inspect wiring	
	Incorrect ignition timing	Reset timing	IG-13
Engine dieseling (runs after ignition switch is turned off)	Incorrect ignition timing	Reset timing	IG-13
Muffler explosion (after fire) all the time	Incorrect ignition timing	Reset timing	IG-13
Engine backfires	Incorrect ignition timing	Reset timing	IG-13
Poor gasoline mileage	Spark plugs faulty	Inspect plugs	IG-4
	Incorrect ignition timing	Reset timing	IG-13
Engine overheats	Incorrect ignition timing	Reset timing	IG-13

w/ IC Regulator

COMPONENTS







REMOVAL OF ALTERNATOR

1. **DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**

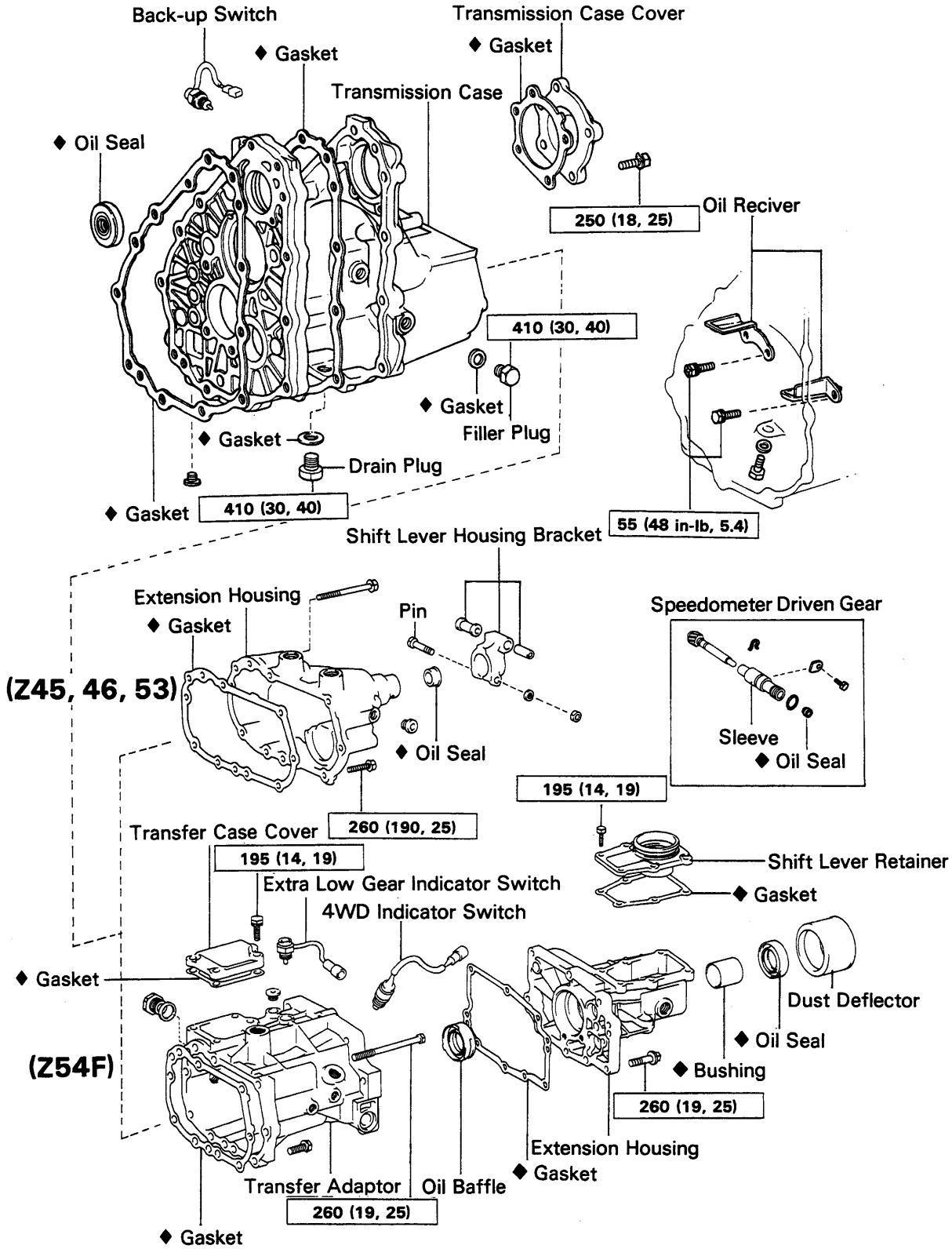
2. **DISCONNECT CONNECTOR AND WIRE FROM ALTERNATOR**

3. **DISCONNECT DRIVE BELT FROM ALTERNATOR**
   (a) Loosen the adjusting and pivot bolts.
   (b) Disconnect the drive belt.

4. **REMOVE ALTERNATOR**
   (a) Remove the adjusting and pivot bolts.
   (b) Remove the alternator

COMPONENTS

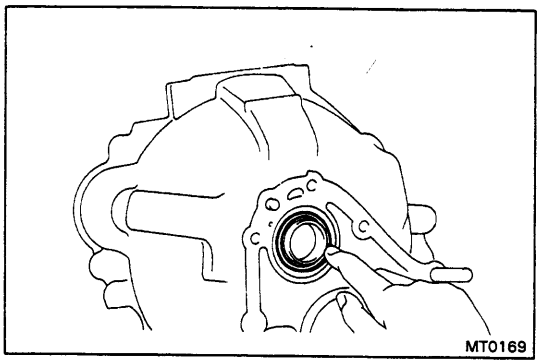
Z45, 46, 53, 54F



kg-cm (ft-lb, N·m) : Tightening torque

◆ : Non-reusable part

ZM0065



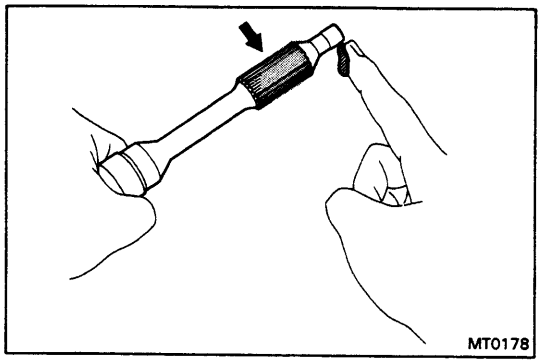
INSTALLATION OF TRANSMISSION (FWD)

1. INSTALL O-RING

Place a new O-ring in position on the transaxle case groove.

2. INSTALL TRANSMISSION CASE GASKET

Place a new gasket in position on the transaxle case.



3. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO. 2) OR MP GREASE TO INPUT SHAFT

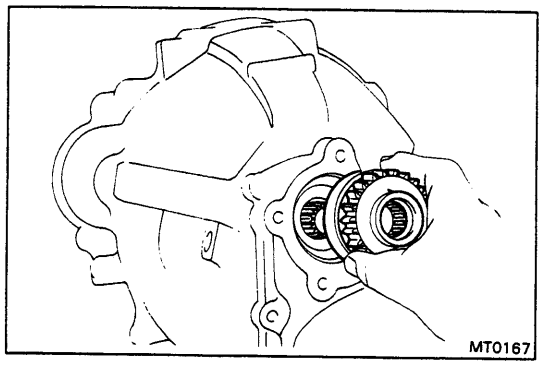
(a) Apply molybdenum disulphide lithium base grease to the input shaft spline.

(b) Apply MP grease to the input shaft end.

4. ALIGN TRANSMISSION AT INSTALLATION POSITION

5. CONNECT TRANSMISSION TO DIFFERENTIAL CARRIER

Align the splines of the sleeve yoke and differential drive pinion.



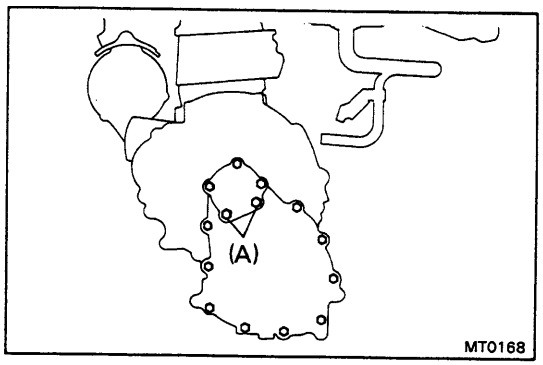
6. INSTALL INPUT SHAFT

(a) Align the splines of the input shaft and clutch disc.

(b) Insert the input shaft into transmission case.

7. INSTALL TRANZMISSION CASE COVER

Place the case cover together with a new gasket in position on the transmission case.



8. INSTALL TRANSMISSION MOUNT BOLTS AND NUTS

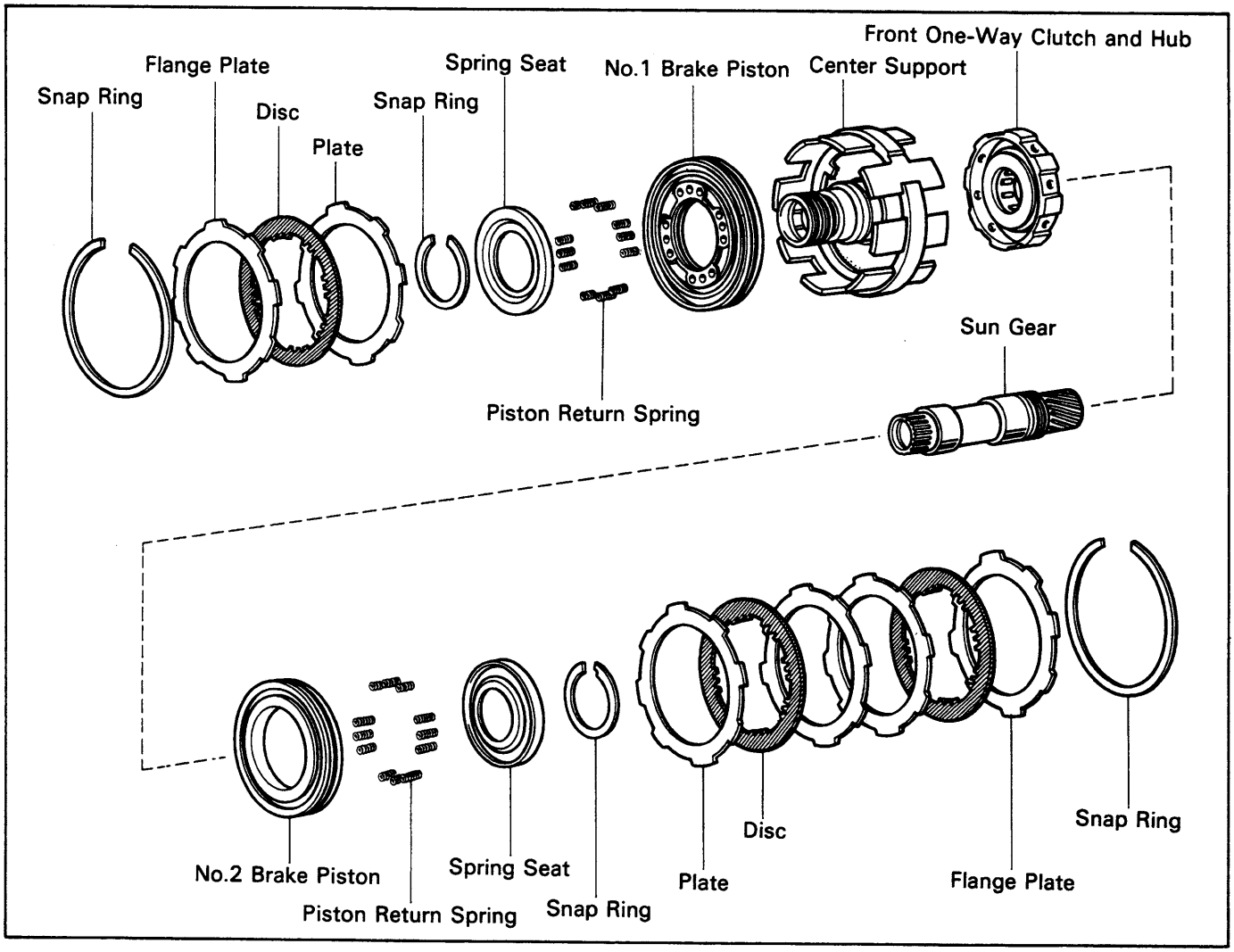
Torque: 250 kg-cm (18 ft-lb, 25 N·m)

9. INSTALL INPUT SHAFT MOUNT BOLTS (A)

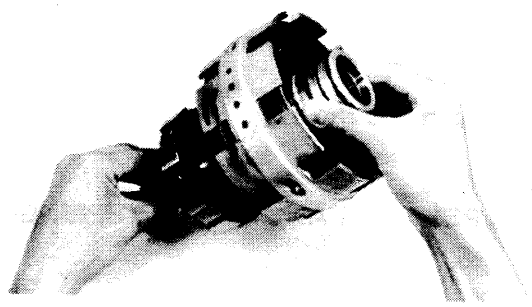
Apply liquid sealer on the threads and under the bolt heads.

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

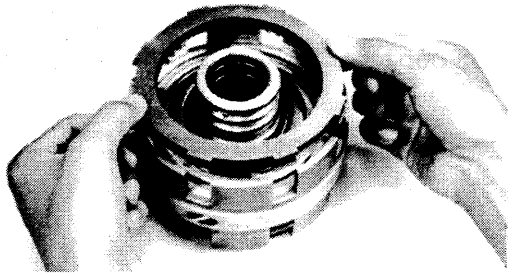
Center Support Assembly



DISASSEMBLY OF CENTER SUPPORT ASSEMBLY



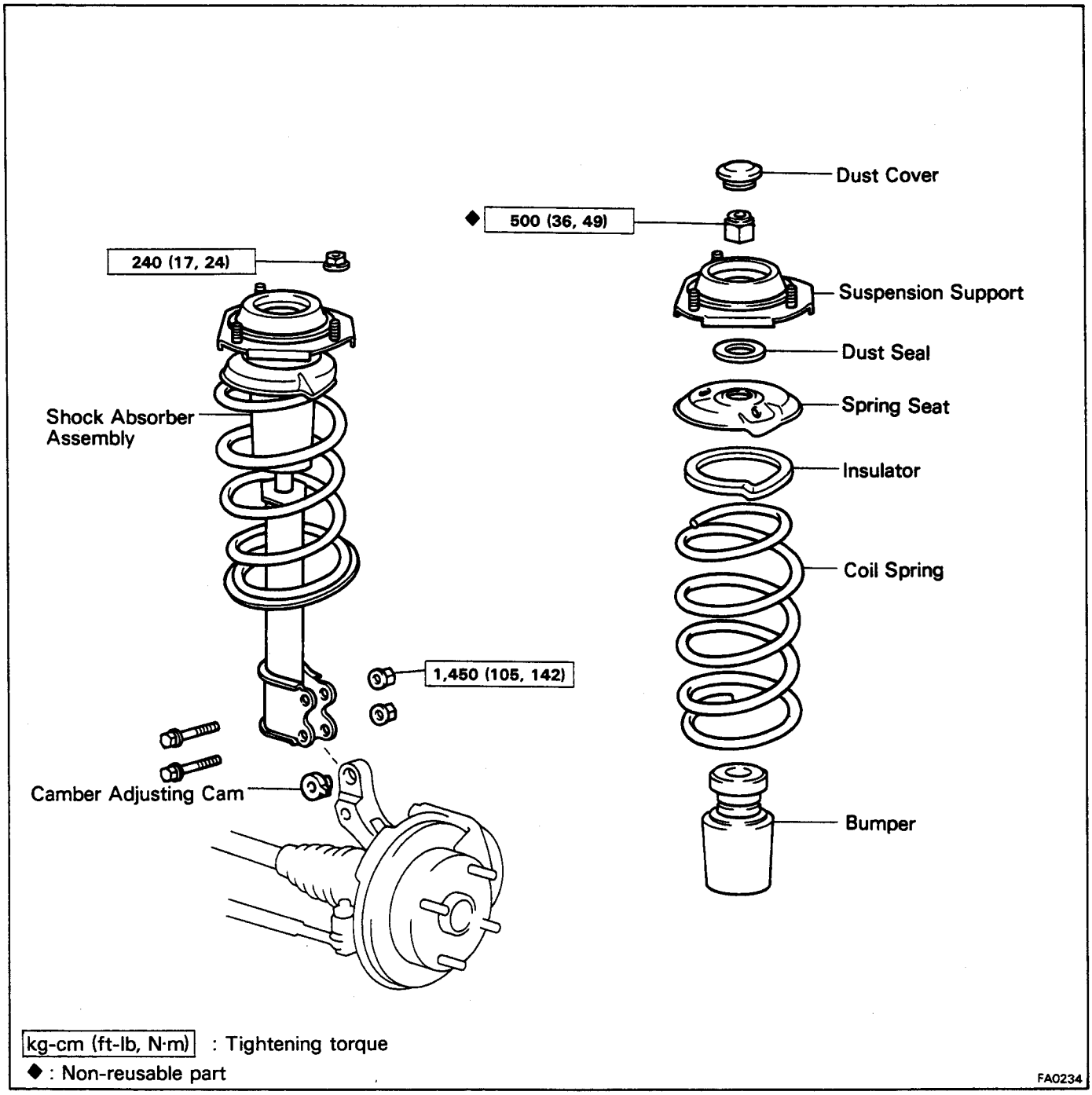
1. **PULL CENTER SUPPORT ASSEMBLY FROM SUN GEAR**

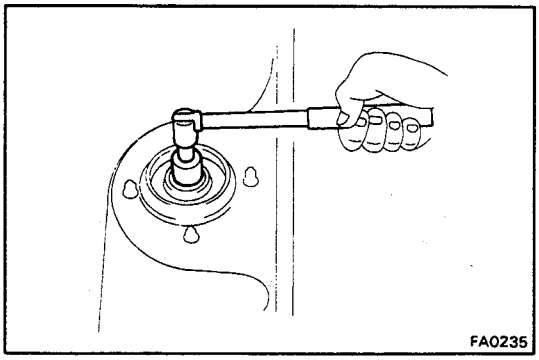


2. **REMOVE SNAP RING FROM FRONT OF CENTER SUPPORT ASSEMBLY (NO. 1 BRAKE)**
3. **REMOVE CLUTCH FLANGE, DISC AND PLATE (NO. 1 BRAKE)**

FRONT SHOCK ABSORBER

COMPONENTS



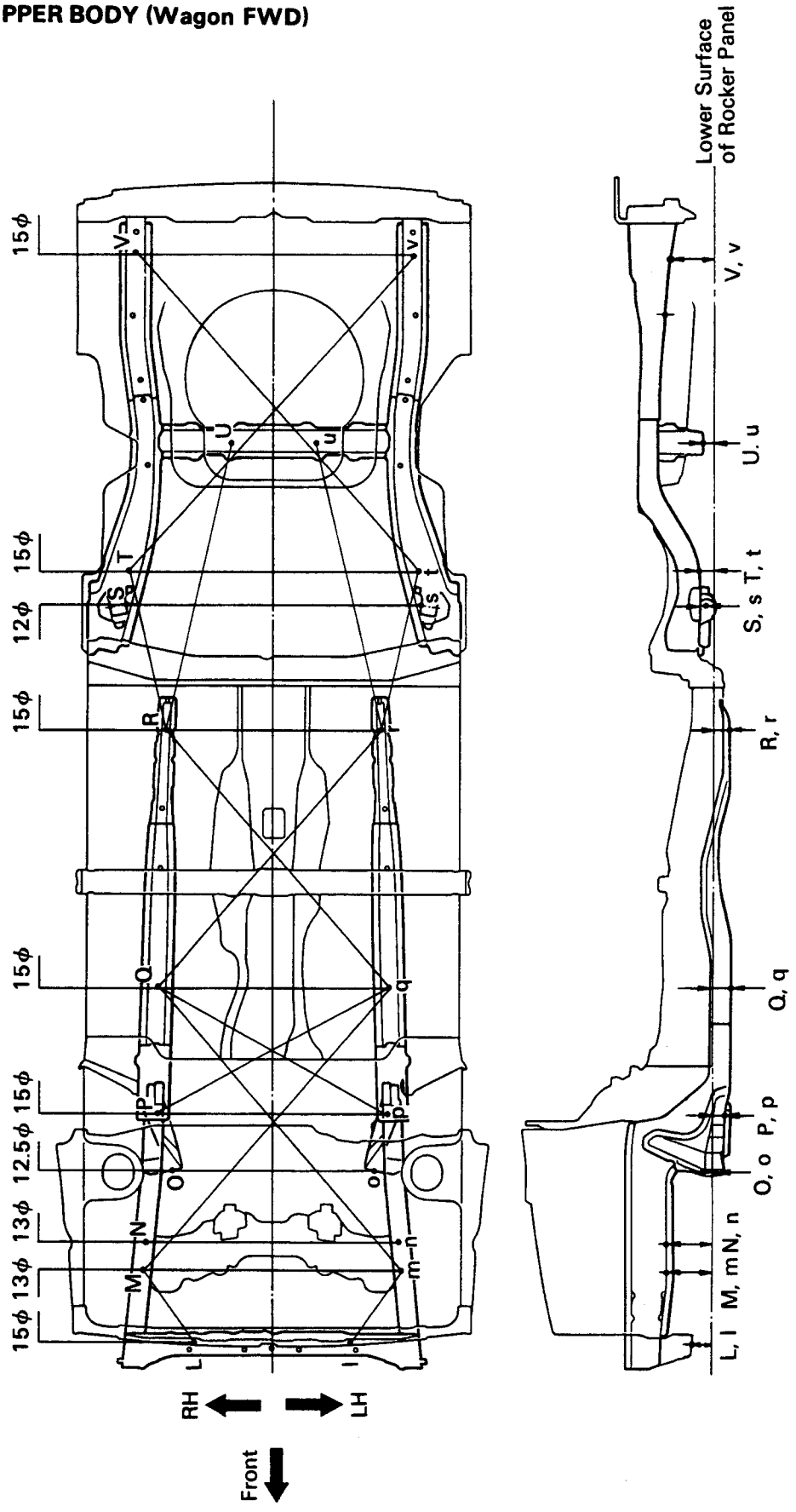


REMOVAL DISASSEMBLY OF FRONT SHOCK ABSORBER ASSEMBLY

1. **DISCONNECT STEERING KNUCKLE FROM SHOCK ABSORBER (See step 6 on page FA-8)**

2. **REMOVE SHOCK ABSORBER ASSEMBLY FROM BODY**
   (a) Remove the dust cover from the suspension support.
   (b) Loosen the nut. Do not remove the nut yet.

UPPER BODY (Wagon FWD)



Point symbol	Reference length mm (in.)
L — M l — m	313 (12.32)
M — m	853 (33.58)
M — q m — Q	1,270 (50.00)
N — n	835 (32.87)
O — o	675 (26.57)
P — p	760 (29.92)
P — Q p — q	425 (16.73)
P — q p — Q	873 (34.37)
Q — q	764 (30.08)
Q — R q — r	870 (34.25)
Q — r q — R	1,141 (44.92)
R — r	714 (28.11)
R — T r — t	563 (22.17)
R — t r — T	1,002 (39.45)
R — U r — u	998 (39.29)
S — s	974 (38.35)
T — t	964 (37.95)
T — V t — v	1,096 (43.15)
T — v t — V	1,445 (56.89)
V — v	920 (36.22)
L, l	67 (2.64)
M, m	153 (6.02)
N, n	153 (6.02)
O, o	8 (0.31)
P, p	35 (1.38)
Q, q	55 (2.17)
R, r	49 (1.93)
S, s	30 (1.18)
T, t	49 (1.93)
U, u	39 (1.54)
V, v	163 (6.42)