

ENGINE REMOVAL & INSTALLATION



SECTION ER

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ER



1. Follow the procedure below to remove the engine to zero.

CAUTION:
Before disconnecting fuel lines, ensure fuel pressure is zero.

(1) Start the engine.
(2) Remove fuel pump relay with engine running.
(3) After engine stalls, wait the engine to stop or five times.
(4) Turn ignition switch off.

Note: If the engine will not start, more fuel pump relay and crank the engine for about 5 seconds.
Then turn the ignition switch off.

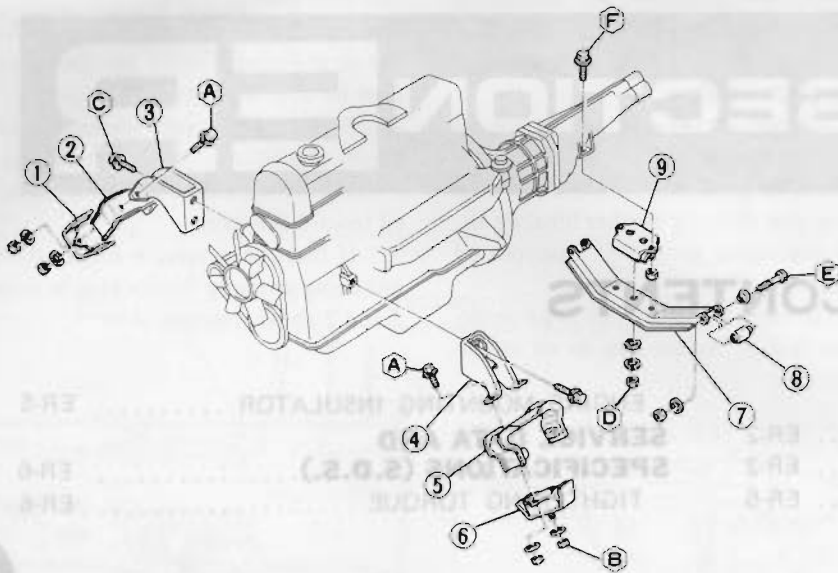
REMOVAL

It is most easy to remove engine and attachment in a work shop than to remove only engine from the engine compartment. After removal, the engine can be repaired from the rear, inside securely and with assembly.

WARNING:
A floor wheel stands in front of front wheel and in rear of rear wheel.
A. Be sure to hold engine in a safe position.
B. You should not remove engine with exhaust system hot. Slightly cooled off. Otherwise, you may burn yourself and/or the next person who is fuel line.

Note: Front cover should be fixed in position for bodywork.

ENGINE REMOVAL AND INSTALLATION



- 1 Engine mounting front insulator R.H.
- 2 Stopper
- 3 Engine mounting front bracket R.H.
- 4 Engine mounting front bracket L.H.
- 5 Stopper
- 6 Engine mounting front insulator L.H.
- 7 Engine mounting rear member
- 8 Engine mounting rear bushing
- 9 Engine mounting rear insulator

Tightening torque N·m (kg·m, ft·lb)

- (A) : 16 - 21 (1.6 - 2.1, 12 - 15)
- (B) : 31 - 42 (3.2 - 4.3, 23 - 31)
- (C) : 30 - 40 (3.1 - 4.1, 22 - 30)
- (D) : 31 - 42 (3.2 - 4.3, 23 - 31)
- (E) : 31 - 42 (3.2 - 4.3, 23 - 31)
- (F) : 31 - 42 (3.2 - 4.3, 23 - 31)

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Fig. ER-1 Engine Mounting

REMOVAL

It is much easier to remove engine and transmission as a single unit than to remove only engine from the engine compartment. After removal, the engine can be separated from the transmission assembly and clutch assembly.

WARNING:

- a. Place wheel chocks in front of front wheels and in rear of rear wheels.
- b. Be sure to hoist engine in a safe manner.
- c. You should not remove engine until exhaust system has completely cooled off. Otherwise, you may burn yourself and/or fire may break out in fuel line.

Note: Fender covers should be used to protect car body.

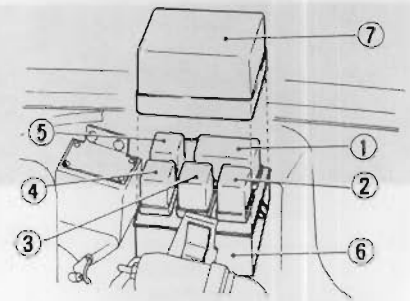
1. Follow the procedure below to reduce fuel pressure to zero.

CAUTION:

Before disconnecting fuel hose, release fuel pressure from fuel line to eliminate danger.

- (1) Start the engine.
- (2) Remove fuel pump relay-2 with engine running.
- (3) After engine stall, crank the engine twice or three times.
- (4) Turn ignition switch off.

Note: If the engine will not start, remove fuel pump relay-2 and crank the engine for about 5 seconds. Then turn the ignition switch off.

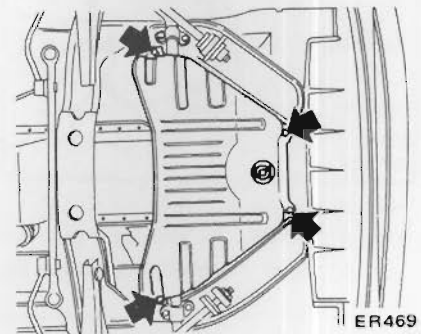


- 1 Fuel pump relay-2
- 2 Lighting relay
- 3 Bulb check relay
- 4 Air conditioner relay
- 5 Inhibitor relay
- 6 Relay bracket
- 7 Relay bracket cover

EF380A

Fig. ER-2 Fuel Pump Relay

2. Disconnect battery ground cable from battery terminal.
3. Remove engine lower splash board.



ER469

Fig. ER-3 Removing Splash Board

4. Drain engine coolant.
5. Remove hood as follows:

CAUTION:

Have an assistant help you so as to prevent damage to body.

- (1) Mark hood hinge locations on hood to facilitate proper reinstallation.
- (2) Support hood with hand and remove bolts securing it to hood hinge, taking care not to let hood slip when bolts are removed.

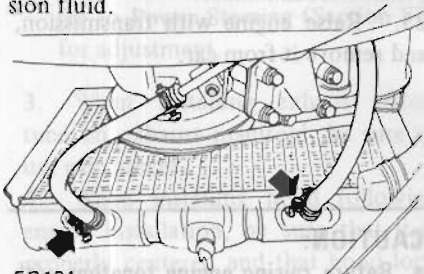


Fig. ER-4 Removing Hood

- (3) Remove hood assembly.
6. Disconnect radiator upper and lower hose.
7. Remove radiator upper and lower shrouds.

On automatic transmission models:

Disconnect oil cooler hoses at oil cooler installed at the lower end of radiator and drain automatic transmission fluid.



ER121

Fig. ER-5 Removing Oil Cooler Hoses

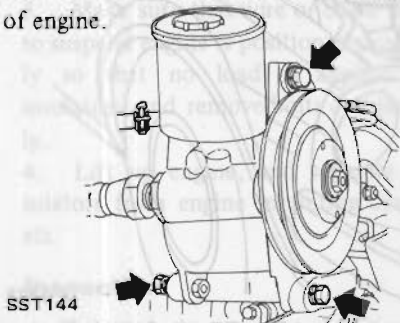
8. Remove reservoir tank hose from radiator and then remove radiator.
9. On power steering equipped models:

Note: Never drain power steering oil while work is being performed.

- (1) Remove oil pump belt. To remove, loosen idler pulley lock nut and adjusting bolt.

Refer to Power Steering Gear and Oil Pump (Section ST) for removal and installation.

- (2) Remove oil pump retaining bolts and fasten oil pump to hood ledge with suitable wire to facilitate removal of engine.



SST144

Fig. ER-6 Removing Oil Pump

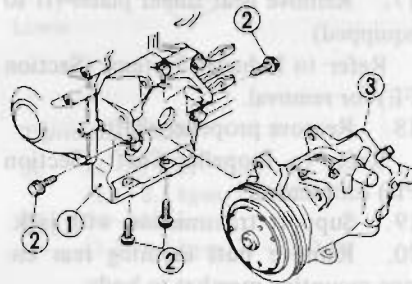
10. On air conditioner equipped models:

Note: Never discharge gas from compressor while work is being performed.

- (1) Remove compressor belt. To remove, loosen idler pulley lock nut and adjusting bolt.

Refer to Air Conditioning (Section HA) for removal.

- (2) Remove compressor retaining bolts and fasten compressor to hood ledge with suitable wire to facilitate removal of engine.



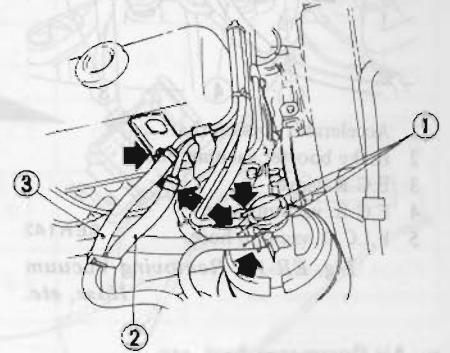
- 1 Compressor bracket
- 2 Compressor retaining bolt
- 3 Compressor

ER443

Fig. ER-7 Removing Compressor Away from Engine

11. Disconnect following cables, wires, harness and hoses at the engine connection end.

- Wire to alternator.
- Wire to oil pressure sending unit.
- Wire and cable to starter motor.
- Wire to auxiliary cooling fan (If so equipped)
- Heater inlet and outlet hoses.
- Fuel hoses and canister hoses.

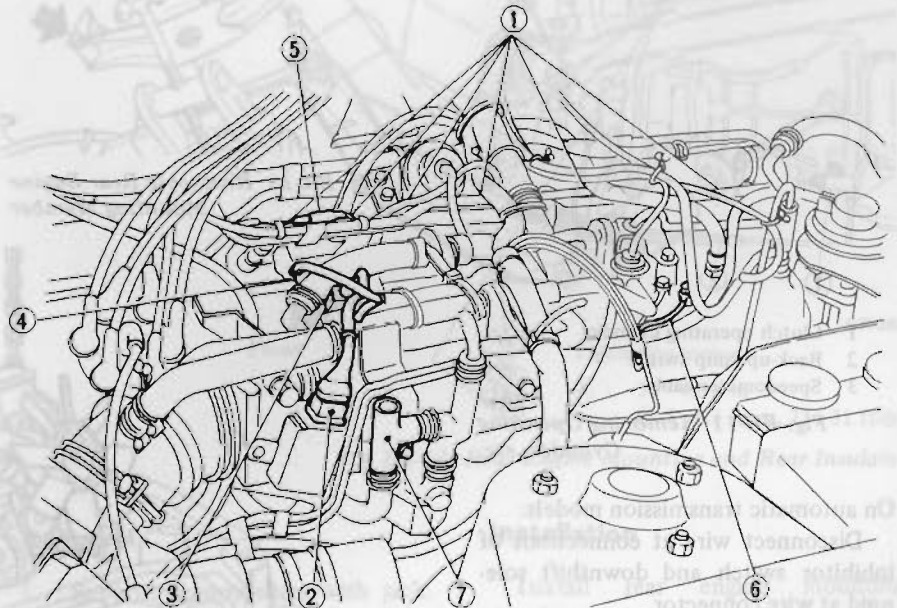


- 1 Hoses from canister
- 2 Fuel return hose
- 3 Fuel charge hose

ER357

Fig. ER-8 Removing Fuel Hose

- E.F.I. harness and connector.



- 1 Injector connector
- 2 Throttle valve switch connector
- 3 Cold start valve connector
- 4 Air regulator connector
- 5 EFI sub-harness connector
- 6 Engine ground
- 7 Idle speed adjusting screw unit

SER141

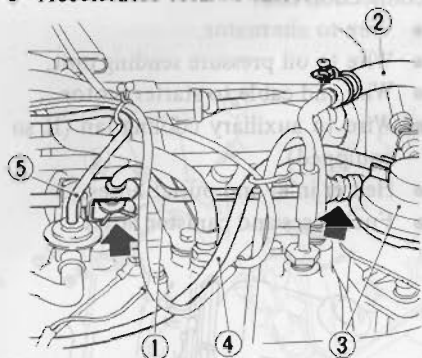
Fig. ER-9 Removing E.F.I. Harness

- High tension cable (Between ignition coil and distributor).
- Harness to distributor.
- Wires to thermal transmitter and water temp. sensing switch.

- F.I.C.D. vacuum hose (Air conditioner equipped model).
- A.S.C.D. vacuum hose (If so equipped)
- Vacuum hose to intake manifold.

Engine Removal & Installation

- Brake booster vacuum hose at intake manifold.
- Accelerator torsion shaft.



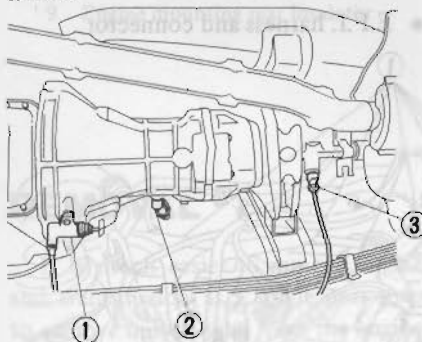
- 1 Accelerator torsion shaft
- 2 Brake booster vacuum hose
- 3 E.G.R. valve
- 4 E.G.R. vacuum hose
- 5 F.I.C.D. vacuum hose.

SER142

Fig. ER-10 Removing Vacuum Hose, etc.

- Air flowmeter duct, etc.

12. Disconnect speedometer cable from rear extension housing and wire for back-up lamp switch.
13. Remove clutch operating cylinders.



- 1 Clutch operating cylinder
- 2 Back-up lamp switch
- 3 Speedometer cable

ER473

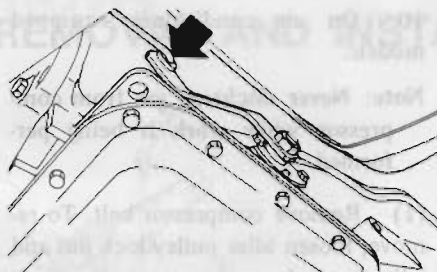
Fig. ER-11 Removing Operating Cylinder, etc.

On automatic transmission models:

Disconnect wire at connections of inhibitor switch and downshift solenoid at wire connector.

14. Remove control lever boot from center console.
15. Remove C-ring and control lever pin from transmission striking rod guide, and remove control lever. (Manual transmission only)

For car equipped with automatic transmission, disconnect range selector rod.



ER445

Fig. ER-12 Disconnecting Selector Rod

16. Remove exhaust front tube. Refer to Exhaust Systems (Section FE) for removal.

17. Remove heat shield plate. (If so equipped)

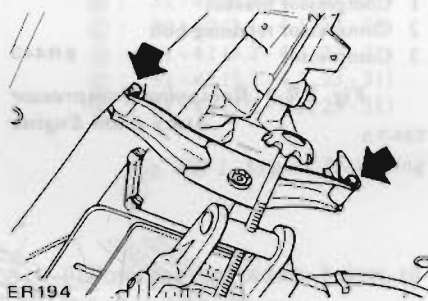
Refer to Exhaust Systems (Section FE) for removal.

18. Remove propeller shaft.

Refer to Propeller Shaft (Section PD) for removal.

19. Support transmission with jack.

20. Remove nuts securing rear engine mounting member to body.



ER194

Fig. ER-13 Removing Rear Engine Mounting Member

CAUTION:

In this operation, care should always be taken to prevent the unit from hitting any adjacent parts.

21. Connect suitable wires of hoist to engine slingers.

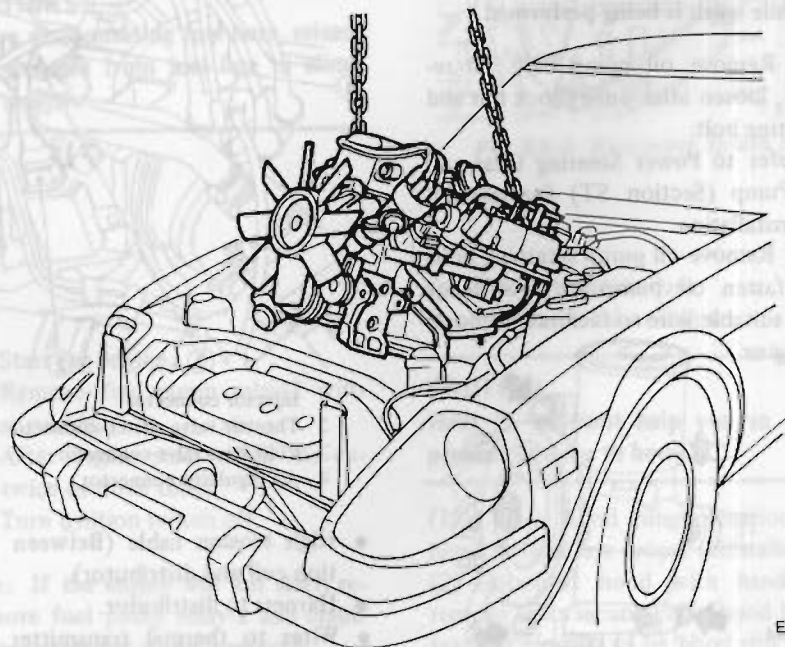
Note: For safety in subsequent steps, tension of wire or chain should be slackened against engine.

22. Remove nuts securing engine mounting front insulator to front suspension crossmember.

23. Raise engine with transmission, and remove it from car.

CAUTION:

- a. Before raising engine together with transmission, make sure that all hoses and wires connected thereto are disconnected or removed.
- b. When raising engine, be especially careful not to knock it against adjacent parts.



ER475

Fig. ER-14 Lifting Engine

INSTALLATION

Install in the reverse order of removal, observing the following:

Note: When installing, be sure to check that electrical harnesses are connected correctly.

1. When installing, first secure rear engine mounting member to body.
2. Refer to applicable section when installing and adjusting any parts.

- For installation of air conditioner compressor and belt adjustment. Refer to Air Conditioning (Section HA) for adjustment.
- For installation of power steering oil pump and belt adjustment. Refer to Power Steering (Section ST) for adjustment.

3. When installing exhaust front tube on exhaust manifold, be sure to use new gasket.
4. When installing hood following engine installation, be sure that it is properly centered and that hood lock operates securely. Refer to Hood (Section BF) for adjustment.
5. Add enough engine coolant.
6. On automatic transmission models, add the same amount of automatic transmission fluid as was drained.

ENGINE MOUNTING INSULATOR

FRONT INSULATOR

Removal

1. Disconnect battery ground cable.
2. Loosen front engine mounting insulator lower and upper nuts and bolts (on both sides).
3. Make sure that wire or chain used to suspend engine is positioned properly so that no load is applied to insulators, and remove bolts completely.
4. Lift up engine, and separate insulators from engine mounting brackets.

Inspection

If there is damage, deterioration or

separation of bounded surface, replace.

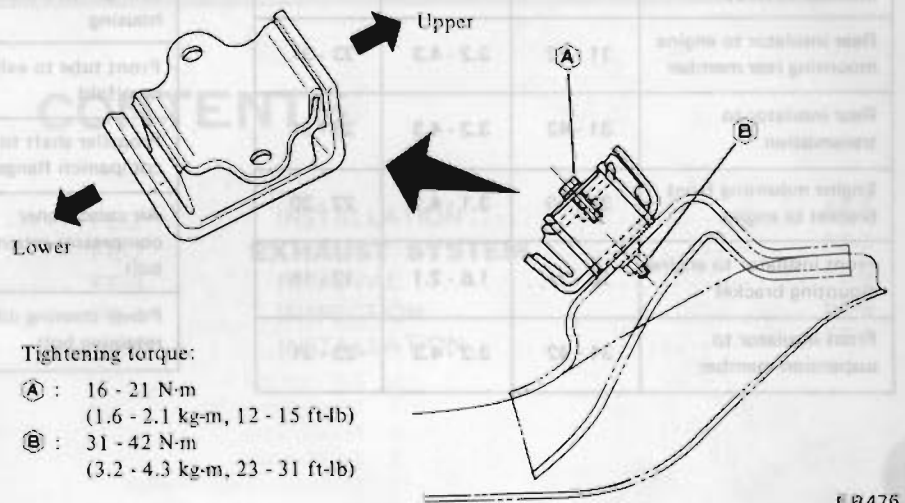
Installation

Install front insulators in reverse order of removal, noting the following:

1. Both the left and right front

insulators are used commonly. However, when installing them, pay attention to their upper and lower directions.

2. The shape of the right side bracket differs from that of the left side bracket. Tighten the bolts and nuts correctly and securely.

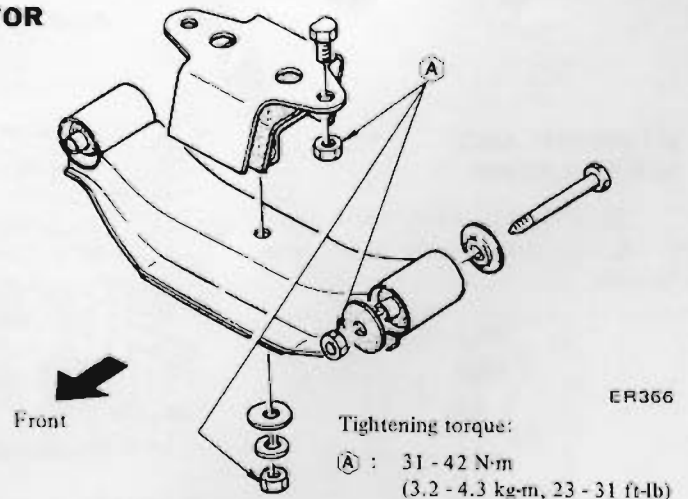


Tightening torque:

- Ⓐ : 16 - 21 N·m
(1.6 - 2.1 kg-m, 12 - 15 ft-lb)
- Ⓑ : 31 - 42 N·m
(3.2 - 4.3 kg-m, 23 - 31 ft-lb)

Fig. ER-15 Front Engine Mounting Insulator

REAR INSULATOR



Tightening torque:

- Ⓐ : 31 - 42 N·m
(3.2 - 4.3 kg-m, 23 - 31 ft-lb)

Fig. ER-16 Rear Engine Mounting and Rear Insulator

Removal

1. Support transmission with jack.
2. Remove rear engine mounting member insulator bolts.
3. Remove bolts, and separate insulator from engine mounting member.

Inspection

If there is damage, deterioration or separation of bounded surface, replace.

Installation

Install rear engine mounting member and insulator in reverse sequence of removal, noting the following:

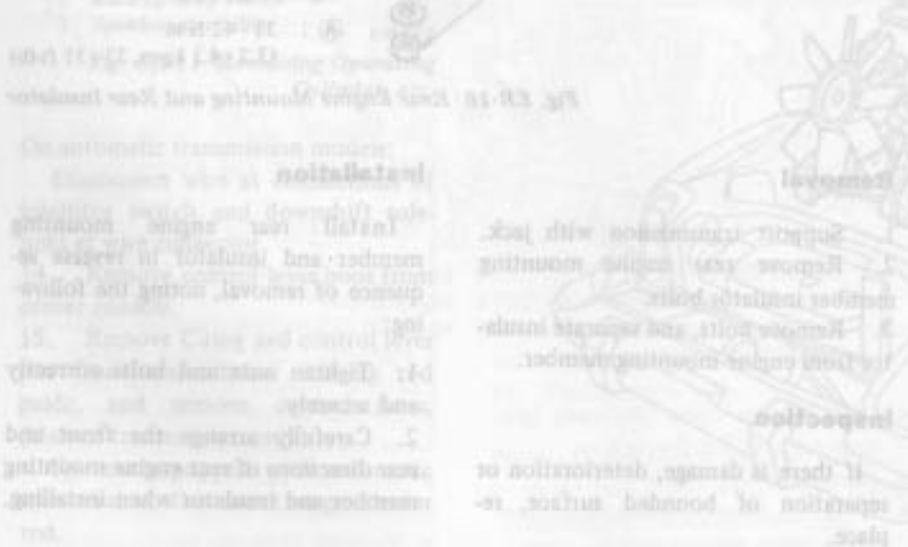
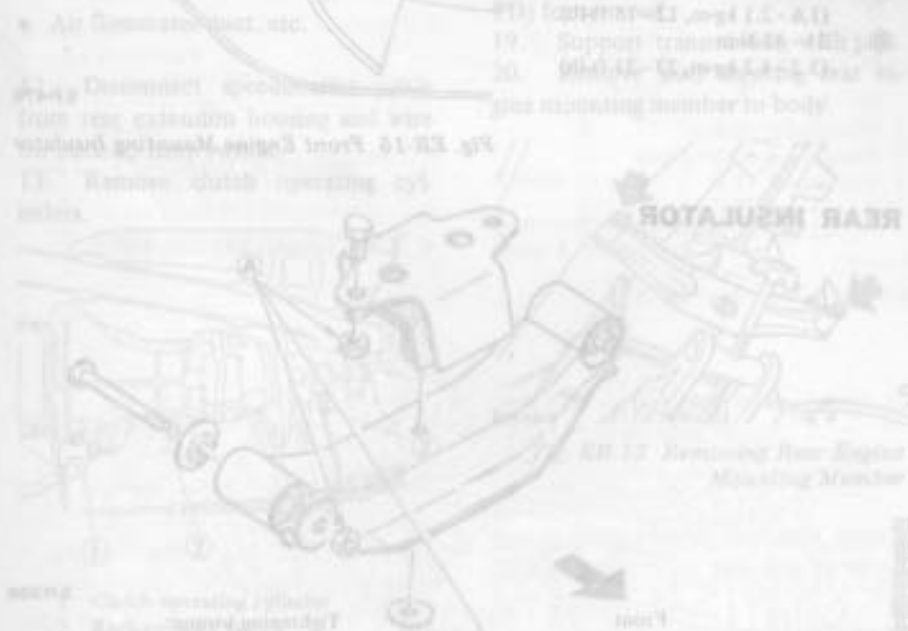
1. Tighten nuts and bolts correctly and securely.
2. Carefully arrange the front and rear directions of rear engine mounting member and insulator when installing.

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

TIGHTENING TORQUE

Unit	N·m	kg·m	ft·lb
Engine mounting rear member to body	31 - 42	3.2 - 4.3	23 - 31
Rear insulator to engine mounting rear member	31 - 42	3.2 - 4.3	23 - 31
Rear insulator to transmission	31 - 42	3.2 - 4.3	23 - 31
Engine mounting front bracket to engine	30 - 40	3.1 - 4.1	22 - 30
Front insulator to engine mounting bracket	16 - 21	1.6 - 2.1	12 - 15
Front insulator to suspension member	31 - 42	3.2 - 4.3	23 - 31

Unit	N·m	kg·m	ft·lb
Clutch operating cylinder to clutch housing	30 - 40	3.1 - 4.1	22 - 30
Front tube to exhaust manifold	45 - 60	4.6 - 6.1	33 - 44
Propeller shaft to companion flange	34 - 44	3.5 - 4.5	25 - 33
Air conditioner compressor retaining bolt	44 - 54	4.5 - 5.5	33 - 40
Power steering oil pump retaining bolt	19 - 25	1.9 - 2.6	14 - 19



REMOVAL

1. Disconnect battery negative terminal.
2. Loosen front engine mounting member and insulator in reverse order of removal, noting the location of each bolt.
3. Mark rear suspension member with chalk.
4. Loosen rear engine mounting member insulator bolts.
5. Remove rear engine mounting member and rear engine mounting insulator.
6. Loosen front engine mounting member and front engine mounting insulator.
7. Loosen front engine mounting member and front engine mounting insulator.
8. Loosen front engine mounting member and front engine mounting insulator.
9. Loosen front engine mounting member and front engine mounting insulator.
10. Loosen front engine mounting member and front engine mounting insulator.

INSPECTION

If there is damage, deterioration or separation of bonded surface, replace.