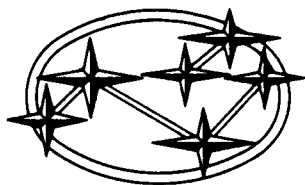


ENGINE AND TRANSMISSION MOUNTING SYSTEM

2-11

SUBARU

1988



	Page
COMPONENT PARTS	2
Engine Mounting	2
Transmission Mounting	3
SERVICE PROCEDURE	5
General Precaution	9
Engine	9
Transmission	18

This chapter applies to the 2700 cc model. For service procedures regarding the 1800 cc model, refer to section 2-11 of the 1987 Service Manual.

COMPONENT PARTS

Engine Mounting

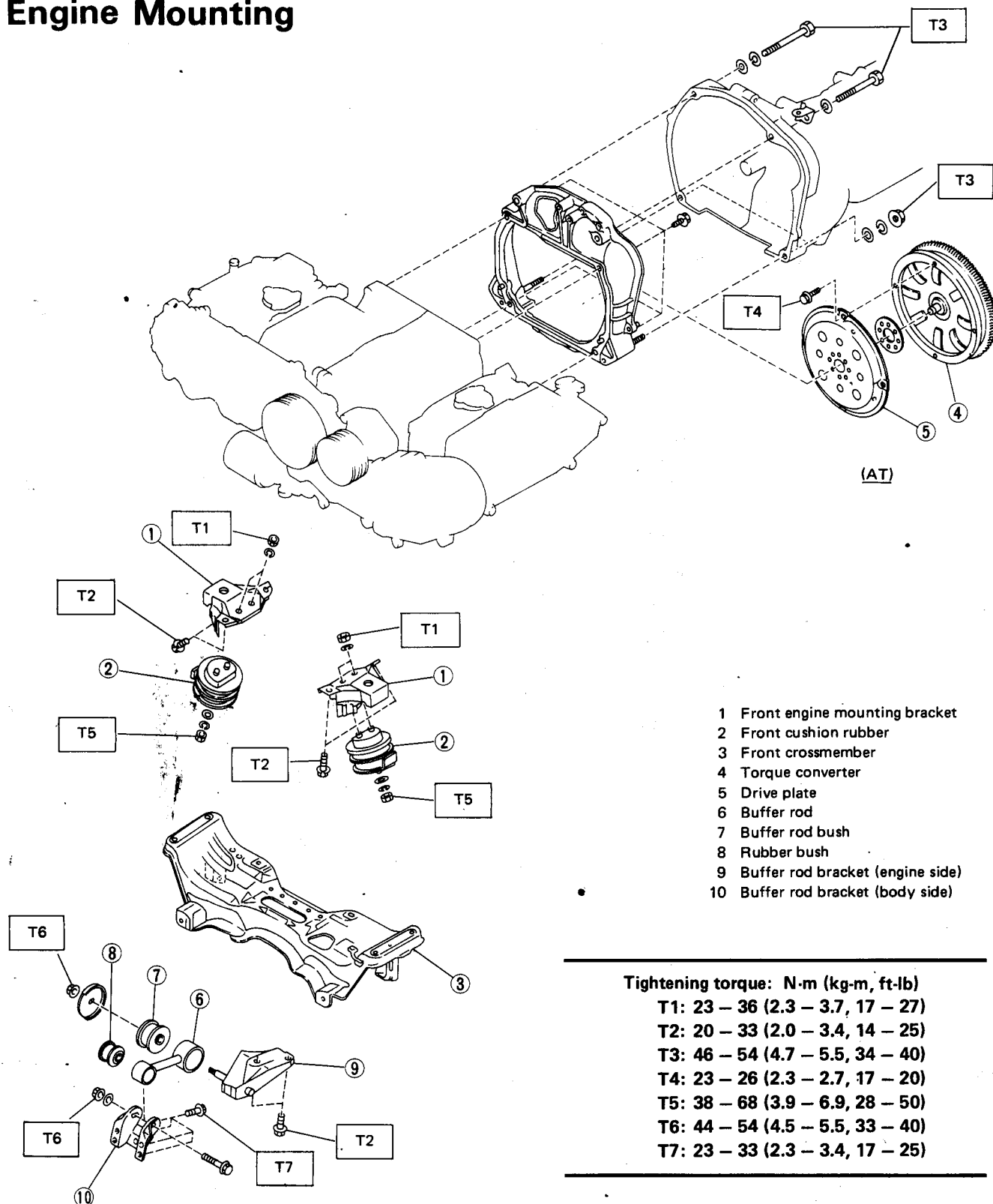


Fig. 1

L2-1416

Transmission Mounting

MT Model

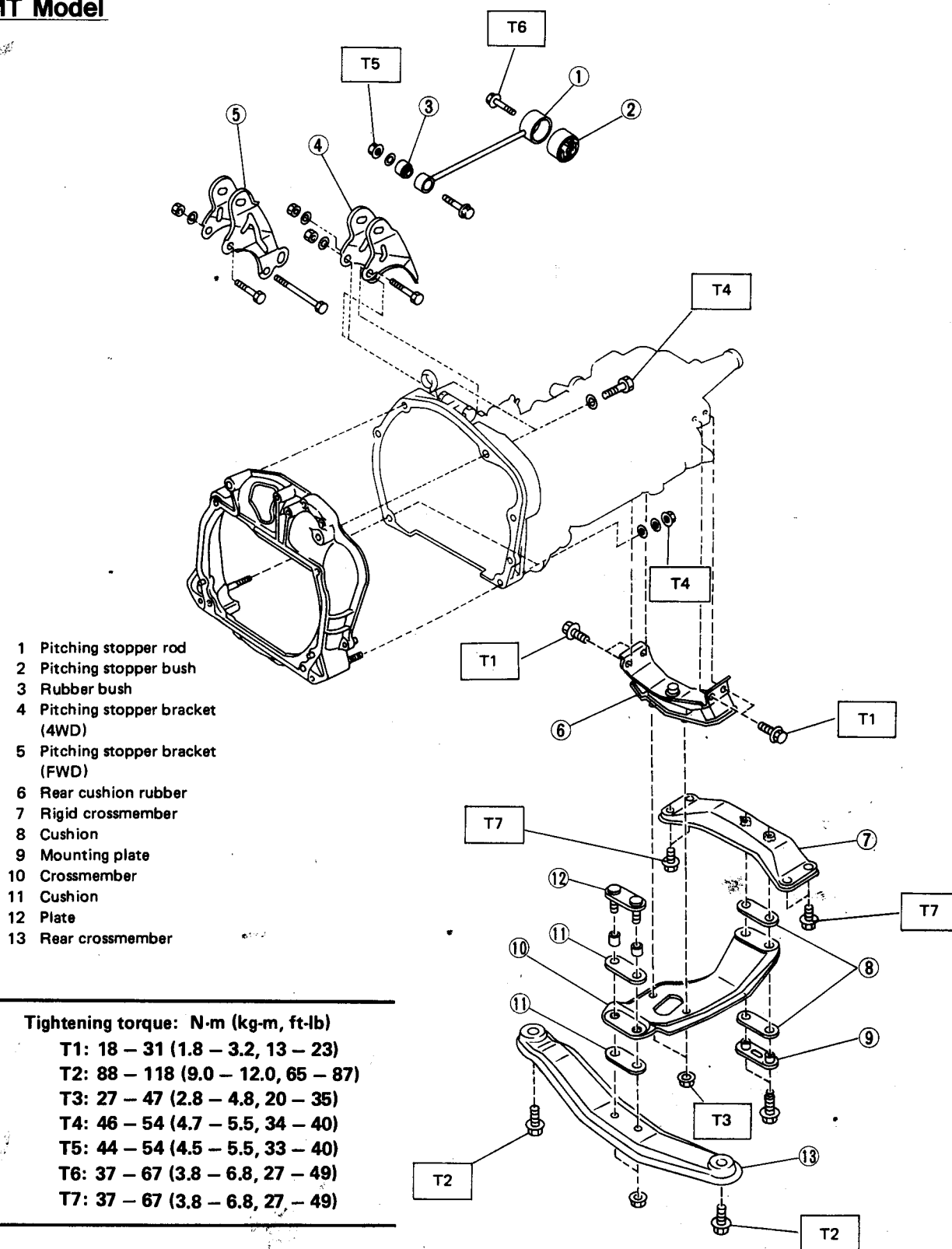
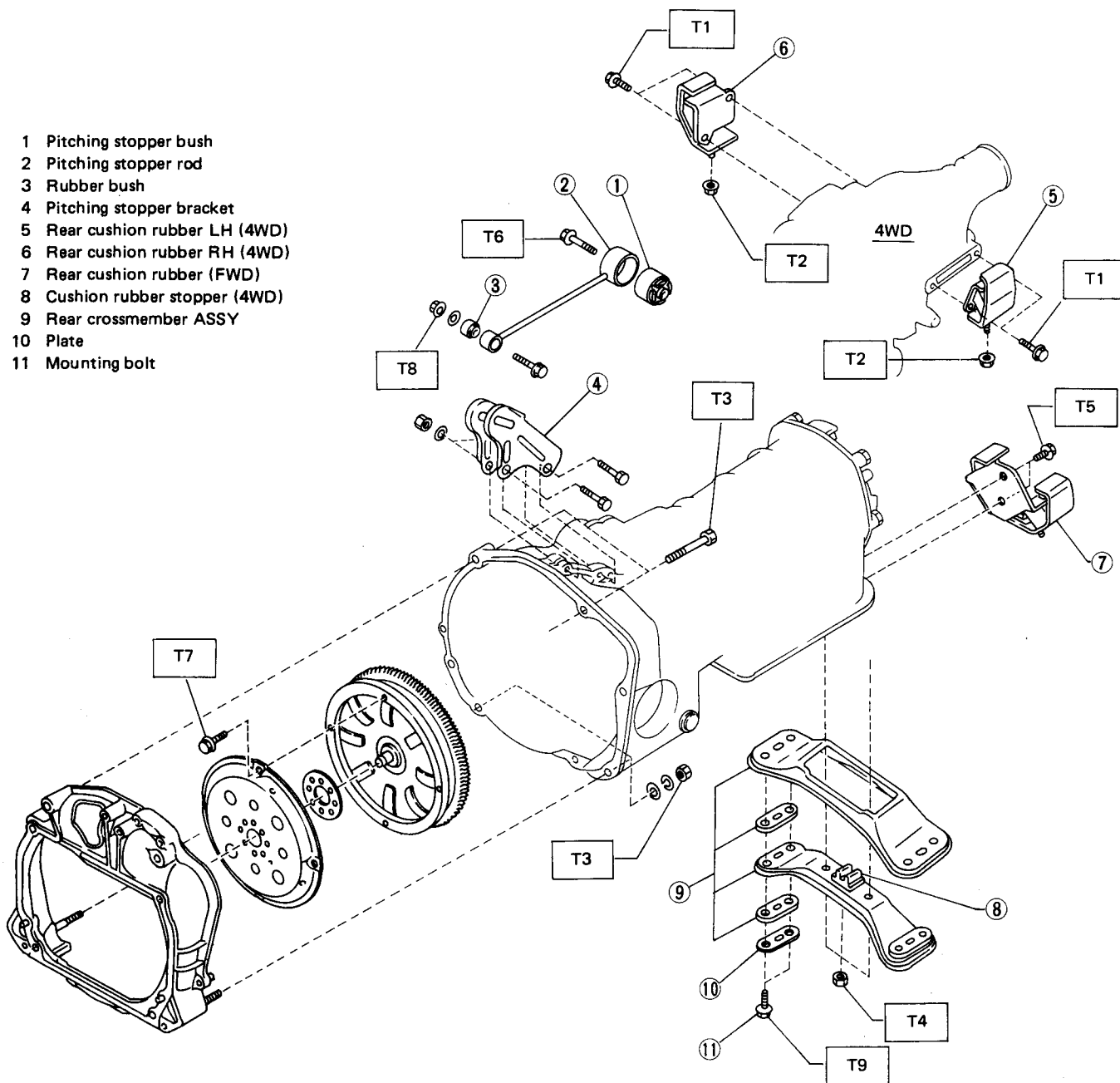


Fig. 2

L2-1417

AT Model**Tightening torque: N·m (kg-m, ft-lb)**

T1:	18 – 31 (1.8 – 3.2, 13 – 23)
T2:	27 – 47 (2.8 – 4.8, 20 – 35)
T3:	46 – 54 (4.7 – 5.5, 34 – 40)
T4:	13 – 23 (1.3 – 2.3, 9 – 17)
T5:	20 – 33 (2.0 – 3.4, 14 – 25)
T6:	37 – 67 (3.8 – 6.8, 27 – 49)
T7:	23 – 26 (2.3 – 2.7, 17 – 20)
T8:	44 – 54 (4.5 – 5.5, 33 – 40)
T9:	53 – 67 (5.4 – 6.8, 39 – 49)

Fig. 3

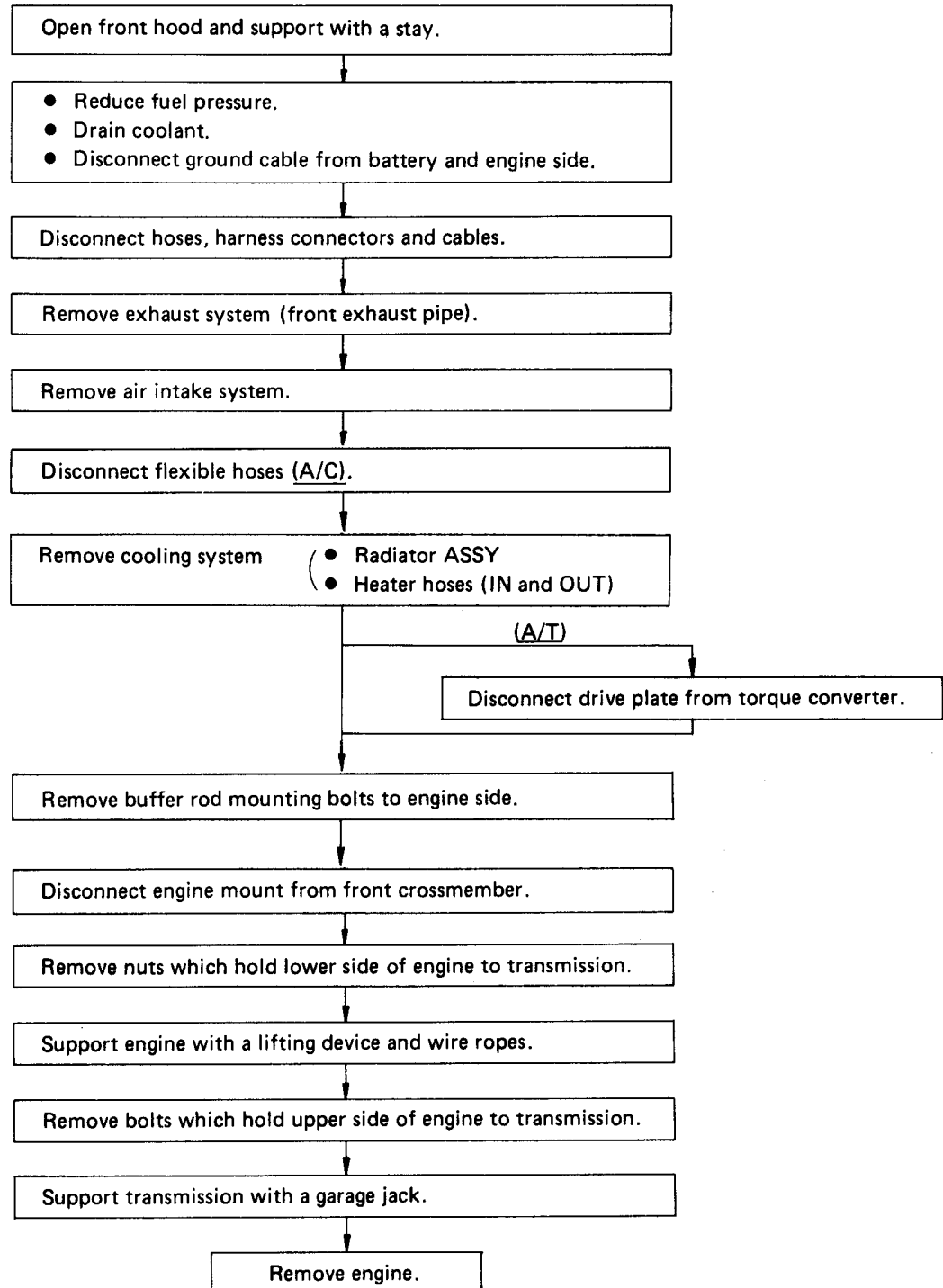
SERVICE PROCEDURE

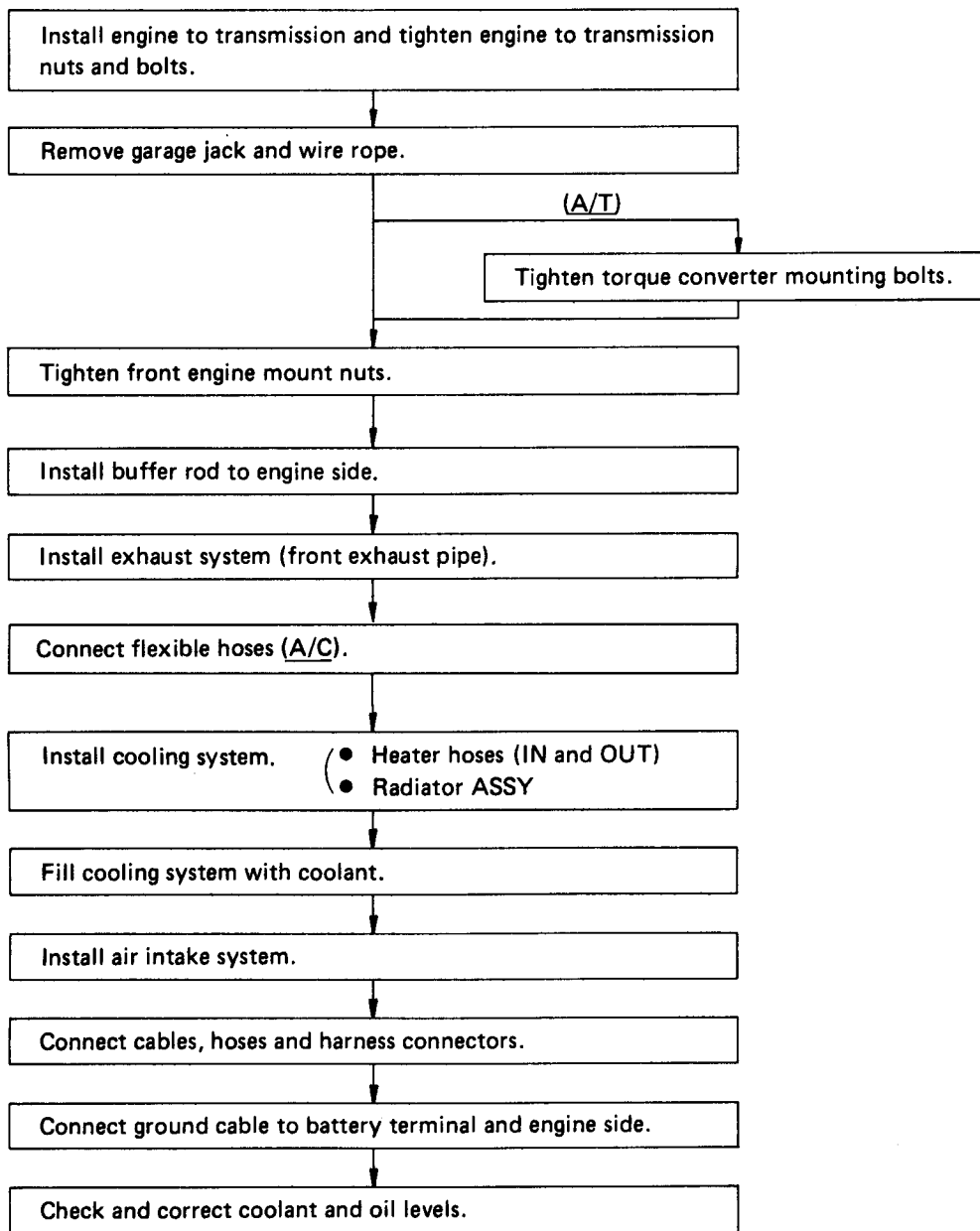
All descriptions in this chapter apply to the 2700 cc model.
For service procedures regarding the 1800 cc model, refer to

section 2-11 "Engine and Transmission Mounting System" of
the 1987 Service Manual.

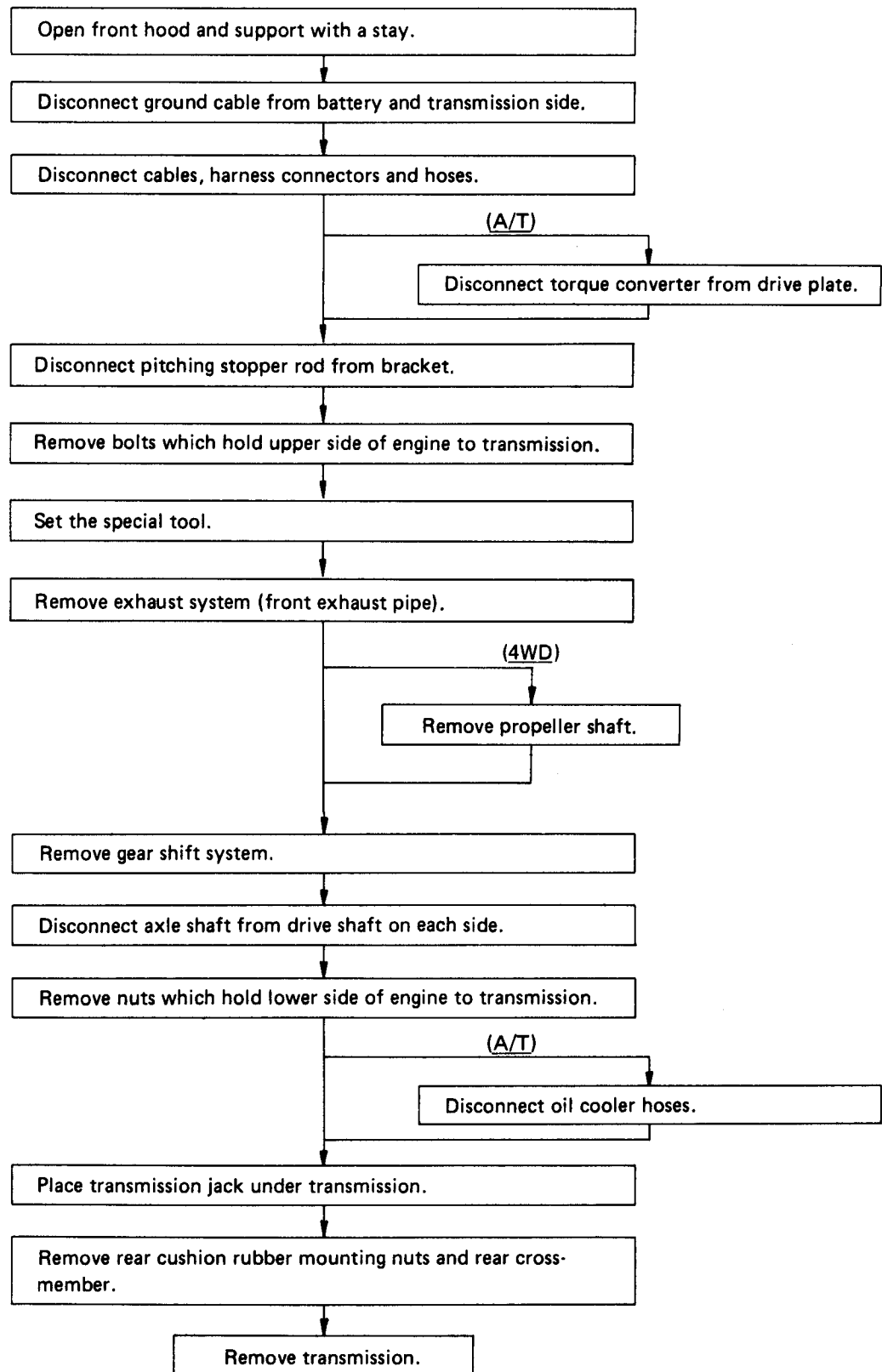
Procedure Chart for Removing and Installing Engine and Related Parts

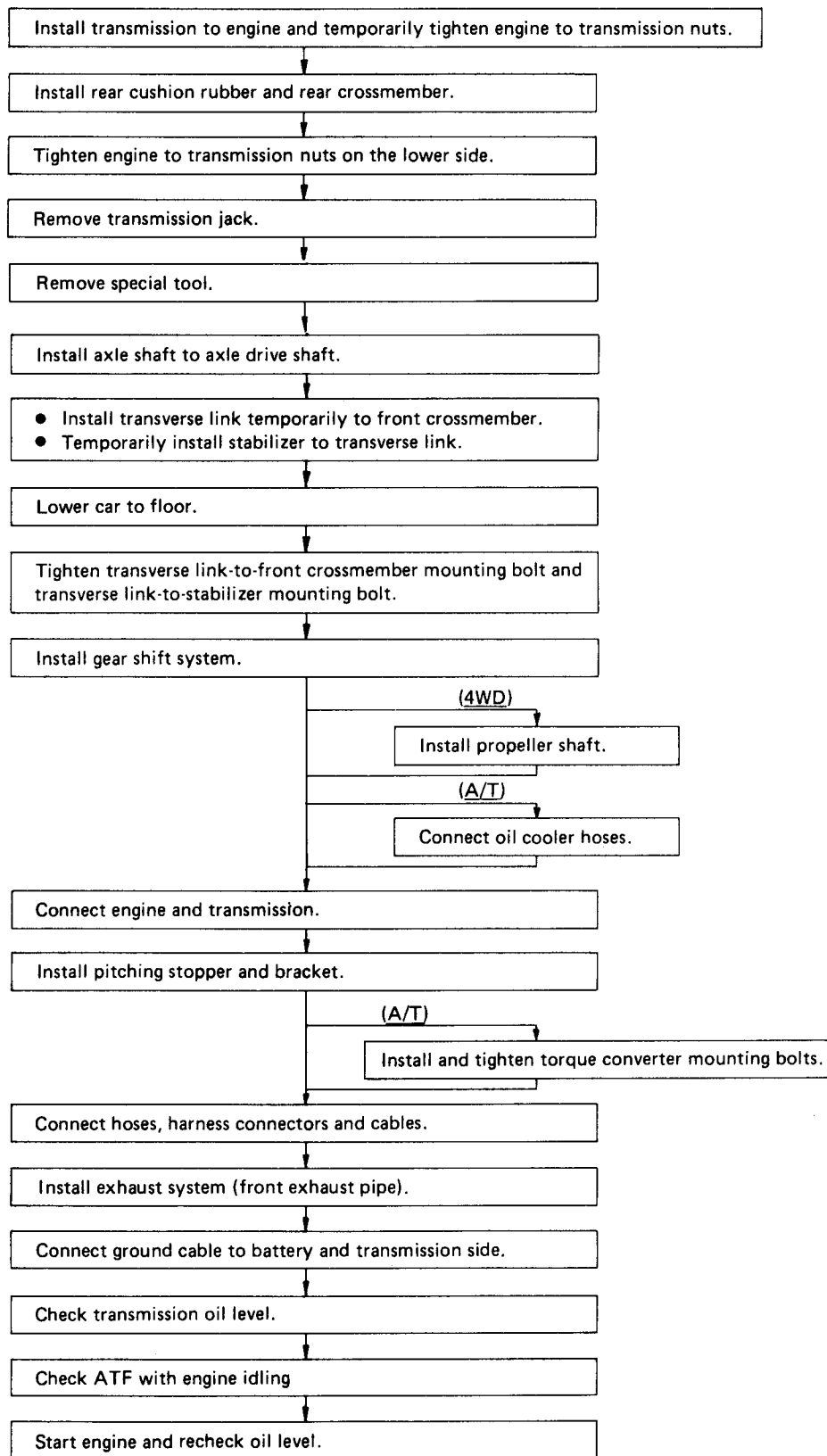
REMOVAL



INSTALLATION

This flowchart shows the main procedure for removing and installing the engine and its related parts. For details, refer to the text.

Procedure Chart for Removing and Installing Transmission and Related Parts**REMOVAL**

INSTALLATION

This flowchart shows the main procedures for removing and installing the transmission and its related parts. For details, refer to the text.

General Precaution

- 1) Remove or install engine and transmission in an area where chain hoists, lifting devices, etc. are available for ready use.
- 2) Be sure not to damage coated surfaces of body panels with tools or stain seats and windows with coolant or oil. Place a cover over fenders, as required, for protection.
- 3) Prior to starting work, prepare the following: Service tools, clean cloth, containers to catch coolant and oil, wire ropes, chain hoist, transmission jacks, etc.
- 4) Lift up or down car when necessary. Make sure to support the correct positions. (Refer to Chapter 1-3 "General Information".)

- 2) Reduce fuel pressure.
 - (1) Raise car positioned at side sill location.
 - (2) Disconnect fuel pump wiring connector.

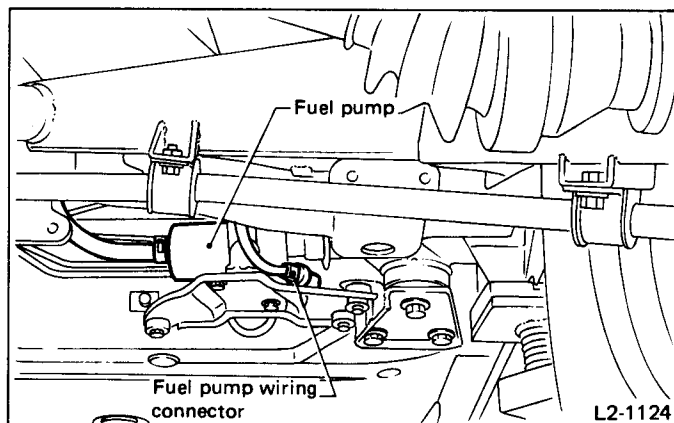


Fig. 5

Engine

REMOVAL

- 1) Open front hood and support with a stay.

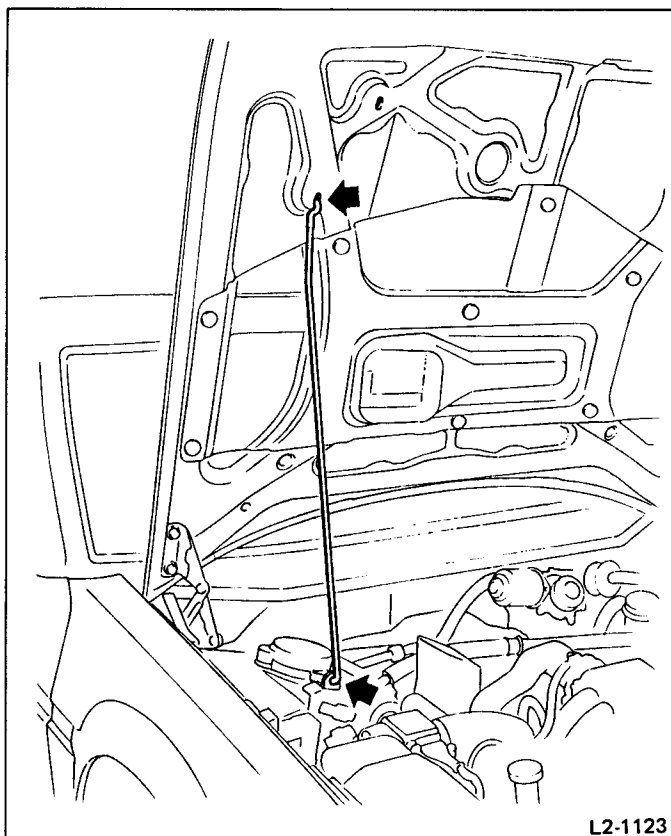


Fig. 4

- (3) Lower car to floor.
- (4) Start engine.
- (5) After engine has stopped, crank engine for approximately five seconds and then turn ignition switch to OFF.
- (6) Raise car again.
- (7) Connect fuel pump wiring connector.
- 3) Drain coolant.
 - (1) Loosen drain cock.

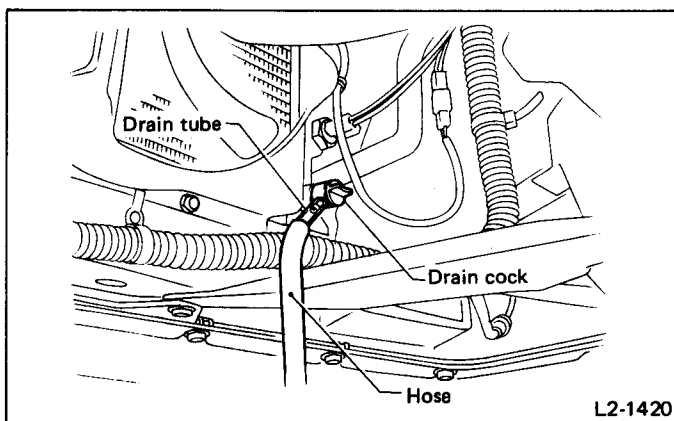


Fig. 6

- (2) Lower car to floor.
- (3) Place a container to catch coolant.
- (4) Loosen radiator cap.
- 4) Disconnect ground cable from battery and engine side.

5) Disconnect the following hoses.

- Canister hoses and hose bracket
- Fuel hoses (delivery, return and evaporation lines)

Place a container to catch fuel from fuel hoses.

- Brake booster vacuum hose
- Diff. lock vacuum hose (M/T Full-Time 4WD)

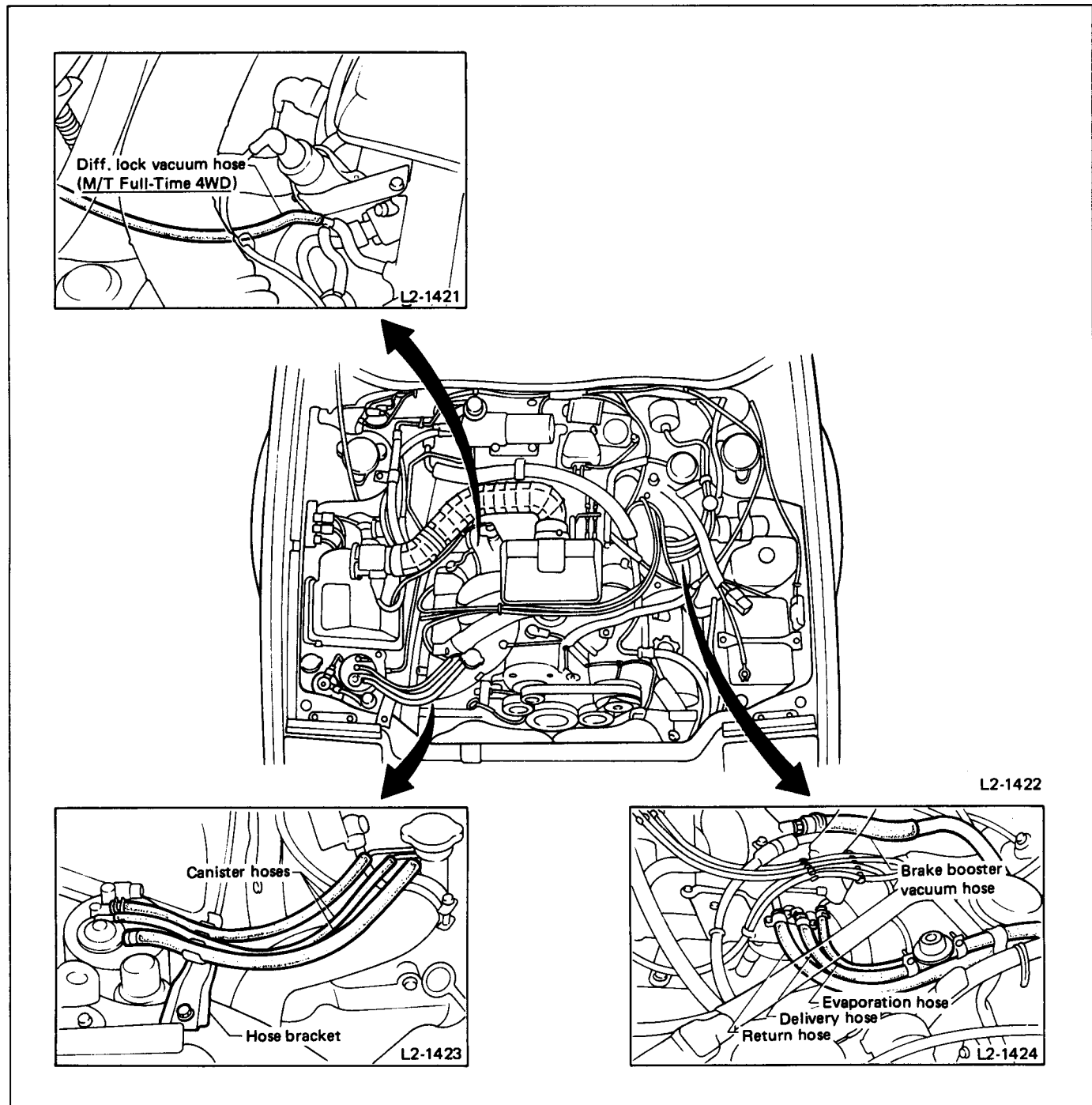


Fig. 7

6) Disconnect the following harness connectors. Also remove clips.

- Engine wiring harness connectors
- O₂ sensor connector
- By-pass air control valve connector
- High-tension cord (to ignition coil)
- Distributor connector (to crank sensor)
- Alternator connector and terminal
- Compressor connector (A/C)
- Pulser coil connector (A/C)
- Engine ground terminal
- Radiator fan motor connector
- Thermo switch connector
- Condenser fan motor connector (A/C)

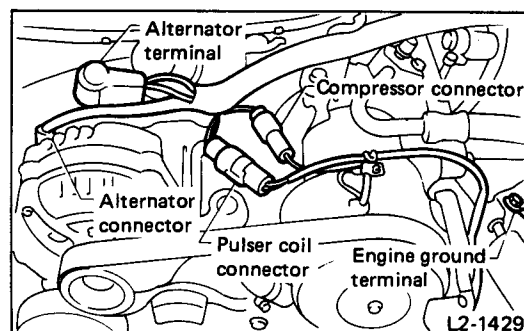
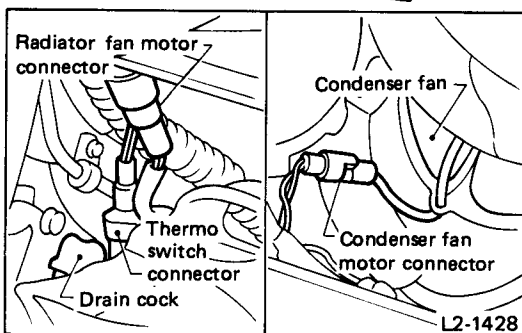
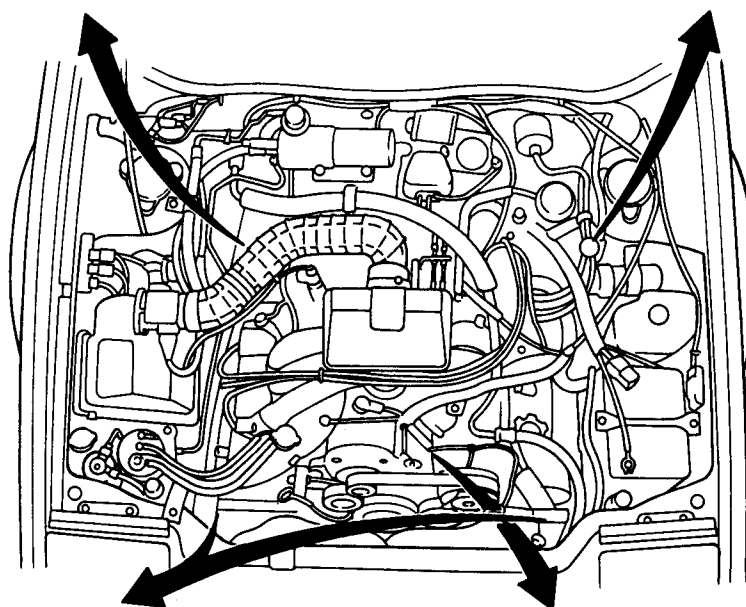
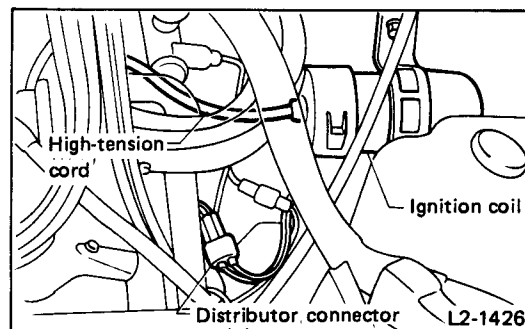
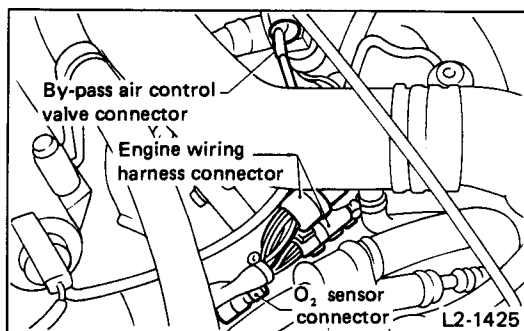


Fig. 8

7) Disconnect the following cables.

- Accelerator cable
- Cruise control cable (Cruise control model)
- Hill-holder cable (M/T)

Disconnect hill-holder cable at connection on clutch release fork side, and remove cable clamps.

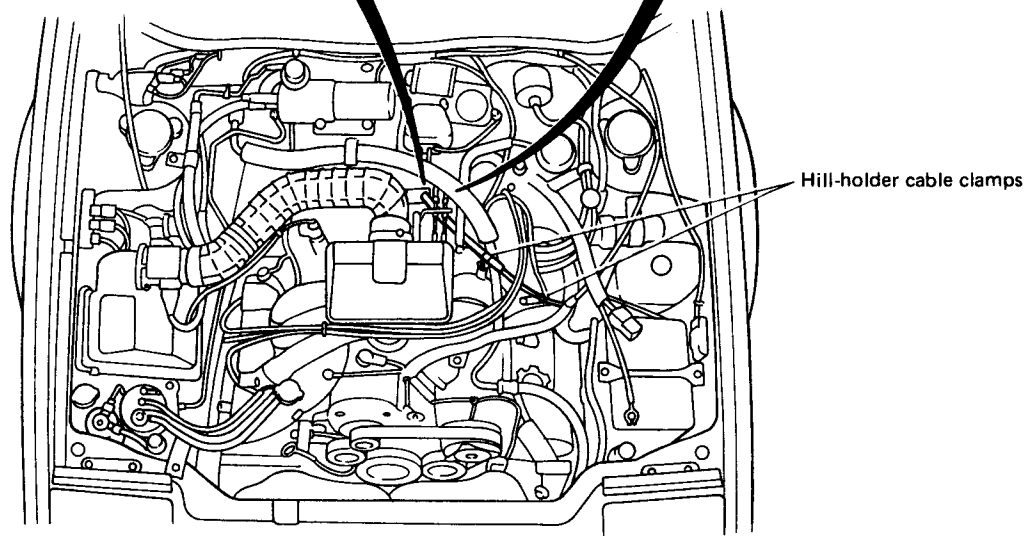
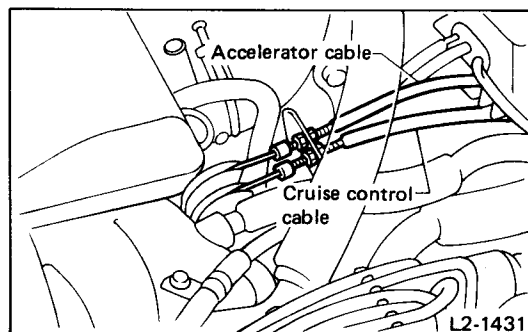
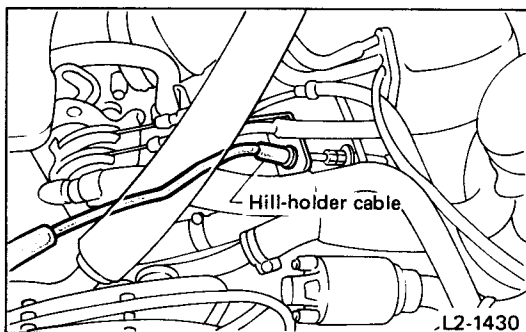


Fig. 9

8) Remove front exhaust pipe.

- (1) Raise car.
- (2) Disconnect front exhaust pipe from engine.

Remove all nuts except one. (This nut is used to temporarily hold exhaust pipe.)

- (3) Disconnect front-to-rear exhaust pipe connection.
- (4) Disconnect front exhaust pipe at transmission and hanger locations.
- (5) Remove the nut which was used to temporarily hold exhaust pipe in step (1) above, and disconnect front exhaust pipe.

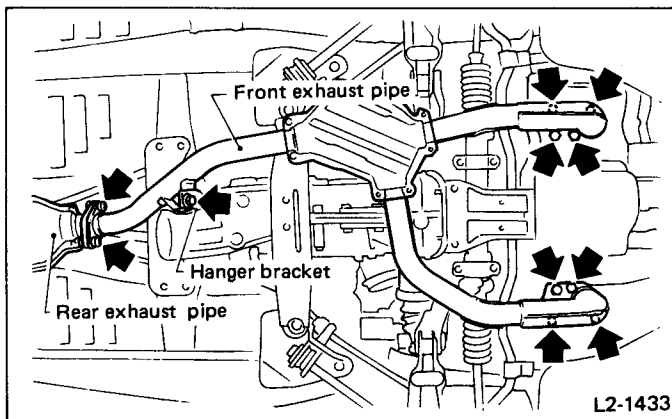


Fig. 10

10) Disconnect flexible hoses. (Refer to 4-7 "Air Conditioning System".)

- (1) Discharge refrigerant at low-pressure service valve.
- (2) Disconnect flexible hoses (low- and high-pressure hoses) from compressor side and remove clamp.

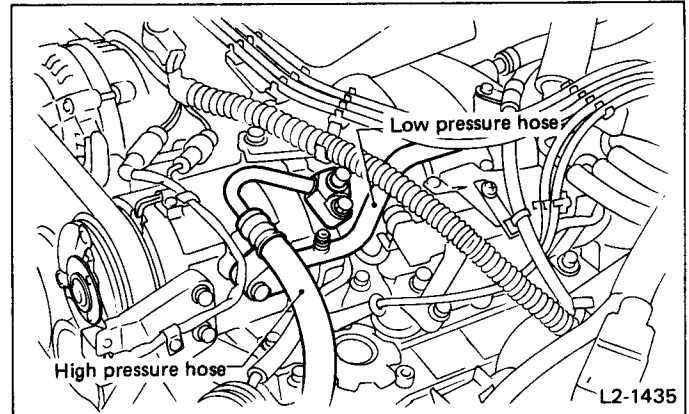


Fig. 12

Plug the opening to prevent foreign matter from entering.

11) Remove radiator ASSY.

- (1) Remove radiator and condenser fan shroud.
- (2) Disconnect radiator hoses (IN and OUT) and reservoir hose.

Place a container to catch coolant.

- (3) Disconnect oil cooler hoses (IN and OUT) from radiator side. (A/T)

Plug the opening hoses to prevent oil from flowing out.

9) Remove air intake boot, upper air cleaner case and element, disconnect air flow meter connector.

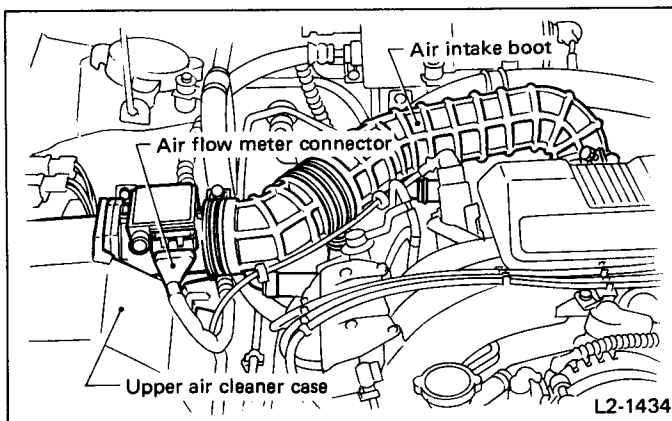


Fig. 11

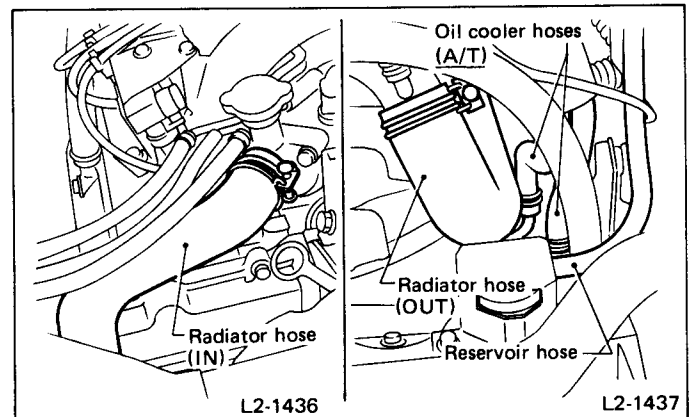


Fig. 13

- (4) Remove the bolts from the upper side of the radiator, then remove the radiator.

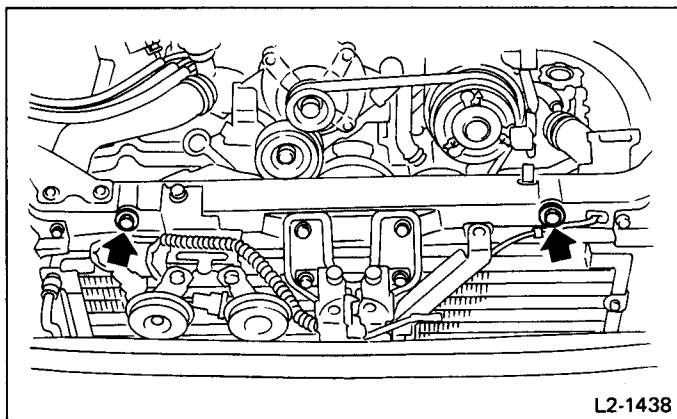


Fig. 14

- 14) Remove buffer rod mounting bolts to engine side.

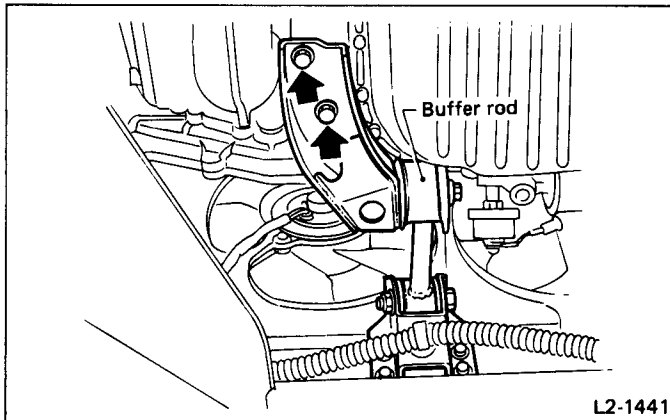


Fig. 17

- 12) Disconnect heater hoses (IN and OUT).

- a. Catch remaining coolant.
b. Be sure to disconnect heater hoses from engine side.

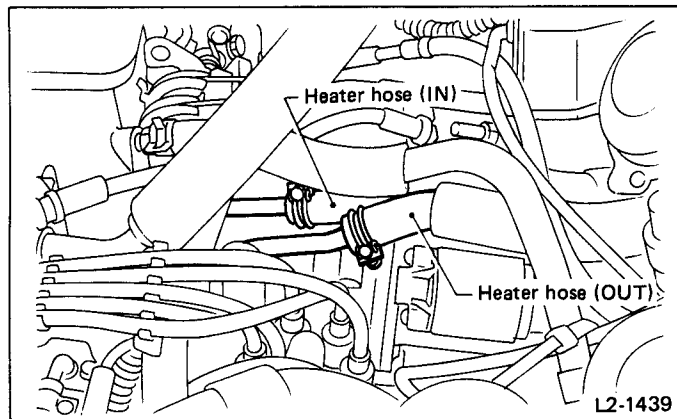


Fig. 15

- 15) Remove nuts which hold engine mount to front crossmember.

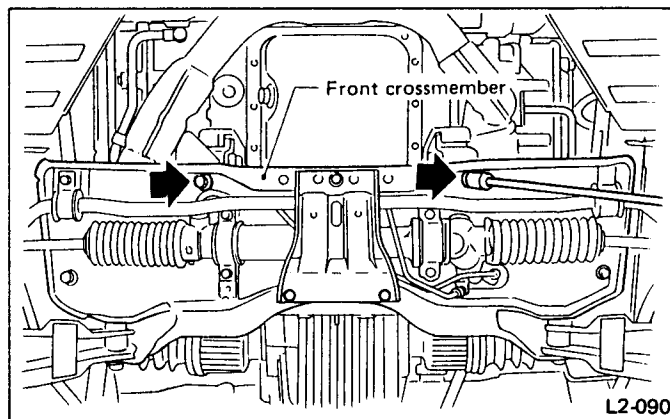


Fig. 18

- 13) Remove timing hole plug and remove four bolts which hold torque converter to drive plate. (A/T)

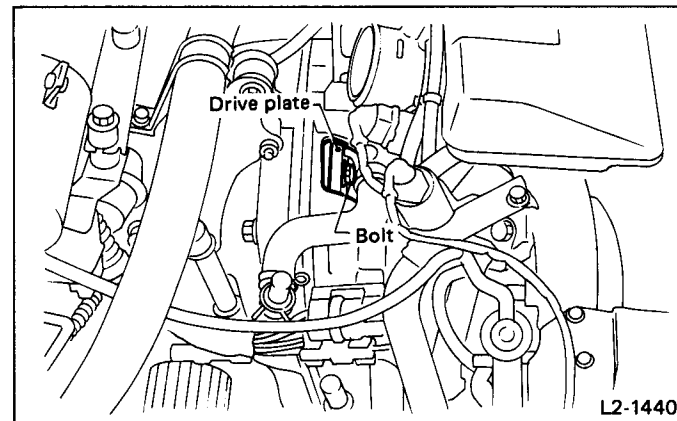


Fig. 16

- 16) Remove nuts which hold lower side of engine to transmission.

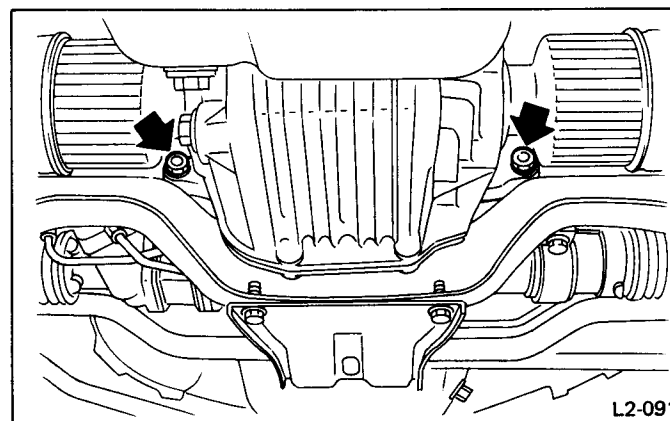


Fig. 19

17) Support engine with a lifting device and wire ropes.

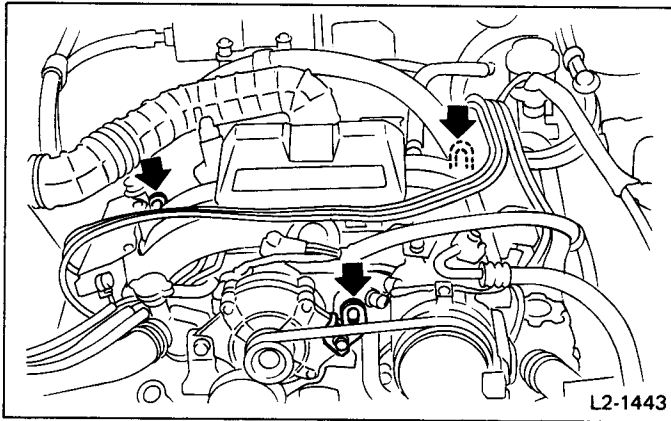


Fig. 20

19) Support transmission with a garage jack.

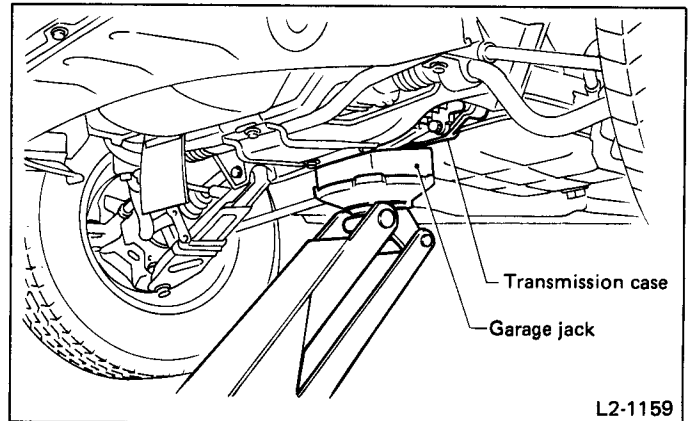


Fig. 22

Before moving engine away from transmission, check to be sure no work has been overlooked. Doing this is very important in order to facilitate re-installation and because transmission lowers under its own weight.

18) Remove bolts which hold upper side of engine to transmission.

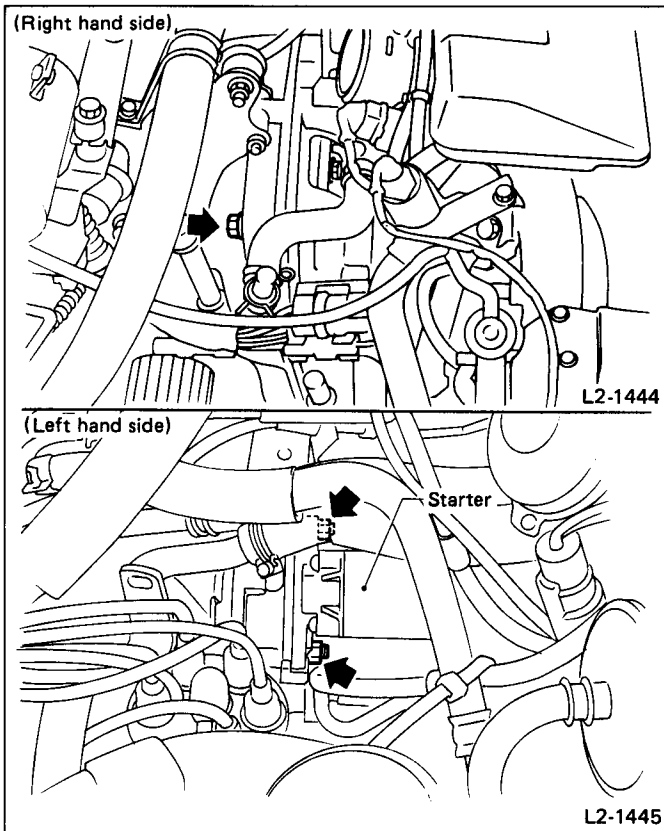


Fig. 21

20) Remove engine itself.

- (1) Slightly raise engine.
- (2) Raise transmission with a garage jack.
- (3) Move engine in the direction of the arrow in the figure.

Move engine in axial direction until mainshaft is withdrawn from clutch cover. (M/T)

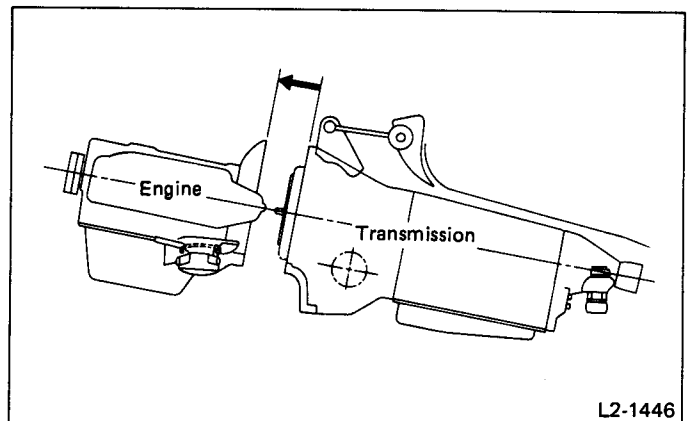
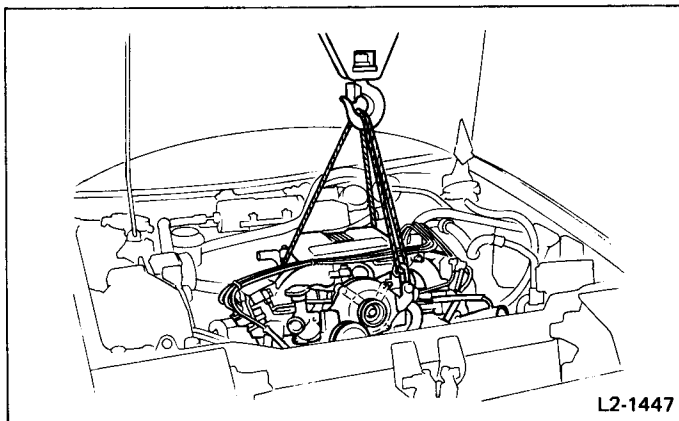


Fig. 23

- (4) Slowly lifting engine away from engine compartment.

Be careful not to damage adjacent parts or body panels with crank pulley, oil pressure gauge, etc.



L2-1447

Fig. 24

INSTALLATION

- 1) Install engine to transmission.

- (A/T) Position engine in engine compartment and align it with transmission.

Be careful not to damage adjacent parts or body panels with crank pulley, oil pressure gauge, etc.

- (M/T) Rotate crank pulley two or three turns until mainshaft and clutch disc are properly engaged at their splines.

a. Apply a small amount of grease to splines of mainshaft in advance.

b. Be careful not to strike mainshaft against diaphragm springs to prevent deformation or damage.

- 2) Tighten engine-to-transmission nuts and bolts.
- (1) Temporarily tighten bolt to hold the right upper side.
 - (2) Temporarily tighten bolt to hold starter to engine.
 - (3) Remove garage jack and set front engine mount on crossmember.
 - (4) Remove wire rope.
 - (5) Raise car and tighten nuts on the lower side.
 - (6) Lower car to floor and tighten nuts and bolts in step (1) and (2) above.

Tightening torque:

46 – 54 N·m (4.7 – 5.5 kg·m, 34 – 40 ft-lb)

- 3) Tighten torque converter mounting bolts. (A/T)

- (1) Align torque converter with drive plate at mounting holes.
- (2) While cranking engine, tighten bolts securely — one at a time.

Be careful not to drop bolts into torque converter housing.

Tightening torque:

23 – 26 N·m (2.3 – 2.7 kg·m, 17 – 20 ft-lb)

- (3) Install timing hole plug.

- 4) Tighten front engine mount nuts.

Be sure to tighten front rubber cushion mounting bolt in the innermost elliptical hole in the front crossmember.

Tightening torque:

38 – 68 N·m (3.9 – 6.9 kg·m, 28 – 50 ft-lb)

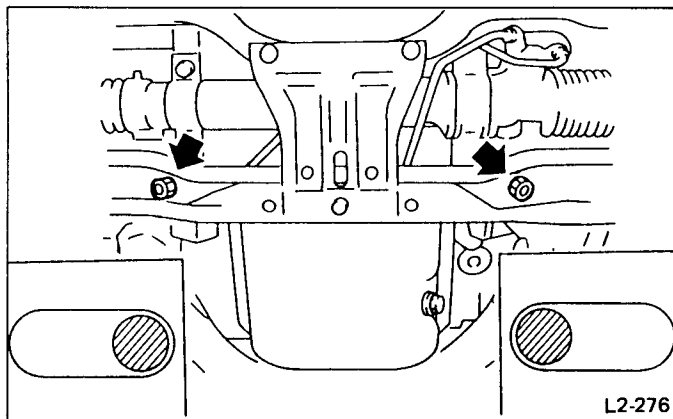


Fig. 25

- 5) Install buffer rod to engine side, and tighten mounting bolts.

Tightening torque:

20 – 33 N·m (2.0 – 3.4 kg·m, 14 – 25 ft-lb)

- 6) Install front exhaust pipe.

a. Be sure to use new gasket.

b. Position front exhaust pipe in hanger bracket, and properly align it with adjacent parts.

c. Tighten all parts in numerical sequence, as shown in figure below, to specified torque.

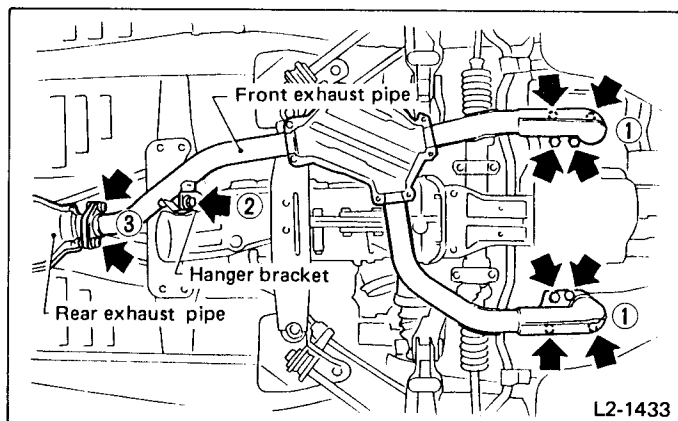


Fig. 26

Tightening torque:**Front exhaust pipe to cylinder head:**

25 – 29 N·m (2.6 – 3.0 kg-m, 19 – 22 ft-lb)

Front exhaust pipe to hanger bracket:

25 – 34 N·m (2.5 – 3.5 kg-m, 18 – 25 ft-lb)

Front exhaust pipe to rear exhaust pipe:

13 – 23 N·m (1.3 – 2.3 kg-m, 9 – 17 ft-lb)

Also check to be sure there is no gas leakage after installation is completed.

7) Connect flexible hoses. (Refer to 4-7 "Air Conditioning System".)

(1) Connect flexible hoses (low- and high-pressure hoses).

Tightening torque:

15 – 25 N·m (1.5 – 2.5 kg-m, 11 – 18 ft-lb)

(2) Charge refrigerant into system.

After charging refrigerant, test operation of air conditioning system.

8) Connect both IN and OUT heater hoses.

9) Install radiator ASSY.

- Radiator
- Radiator hoses (IN and OUT), reservoir hose
- Oil cooler hoses (IN and OUT) (A/T)
- Radiator fan shroud
- Condenser fan shroud

Tightening torque:**Radiator mounting bolt:**

10 – 18 N·m (1.0 – 1.8 kg-m, 7 – 13 ft-lb)

Radiator fan shroud bolt:7.3 – 7.7 N·m (0.74 – 0.79 kg-m,
5.4 – 5.7 ft-lb)**Condenser fan shroud bolt:**

5 – 10 N·m (0.5 – 1.0 kg-m, 3.6 – 7.2 ft-lb)

10) Fill cooling system with coolant.

11) Install air cleaner element, upper case and air intake boot.

12) Connect air flow meter connector.

13) Connect accelerator cable and adjust its tension using adjusting nut.

a. Be careful not to bend the cable bracket.

b. Check to be sure that throttle lever opens to full-throttle.

14) Connect cruise control cable. (Cruise control model)

15) Connect hill-holder cable to clutch release fork. (M/T)

After connecting, test operation of hill-holder on an upgrade.

16) Connect the following hoses.

- Fuel hoses (delivery, return and evaporation lines)
- Canister hoses and hose bracket
- Brake booster vacuum hose
- Diff. lock vacuum hoses (M/T Full-Time 4WD)

17) Connect the following harness connectors and hold with clips where necessary.

- Engine wiring harness connectors
- O₂ sensor connector
- By-pass air control valve connector
- High-tension cord
- Distributor connector (to crank sensor)
- Alternator connector and terminal
- Compressor connector (A/C)
- Pulser coil connector (A/C)
- Engine ground terminal
- Radiator fan motor connector
- Thermo switch connector
- Condenser fan motor connector (A/C)

18) Connect ground cable to battery terminal and engine side.

19) Check and correct coolant and oil levels.

Use only genuine SUBARU coolant and recommended oil.

Transmission

REMOVAL

- 1) Open front hood and support with a stay.

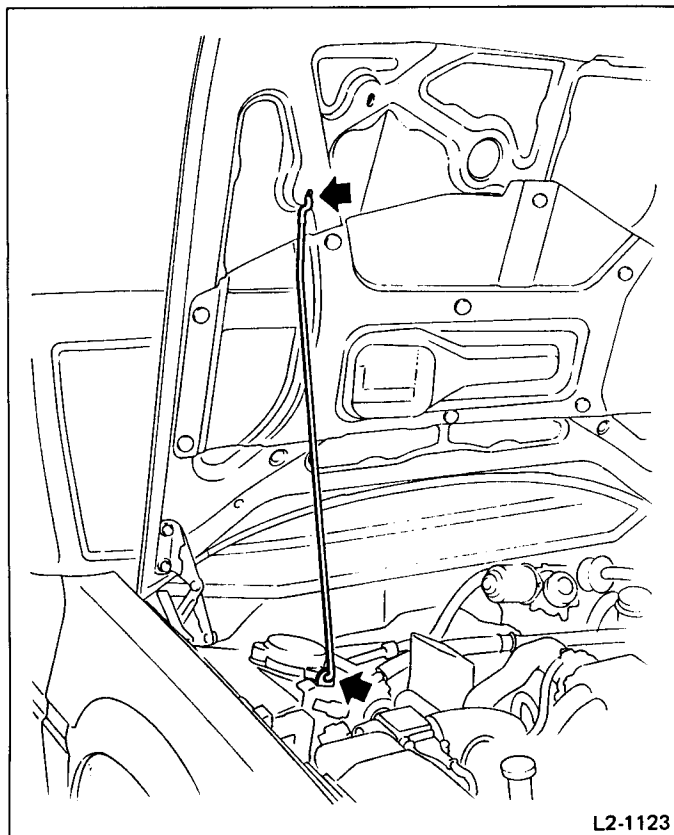


Fig. 27

- 2) Disconnect ground cable from battery and transmission side.

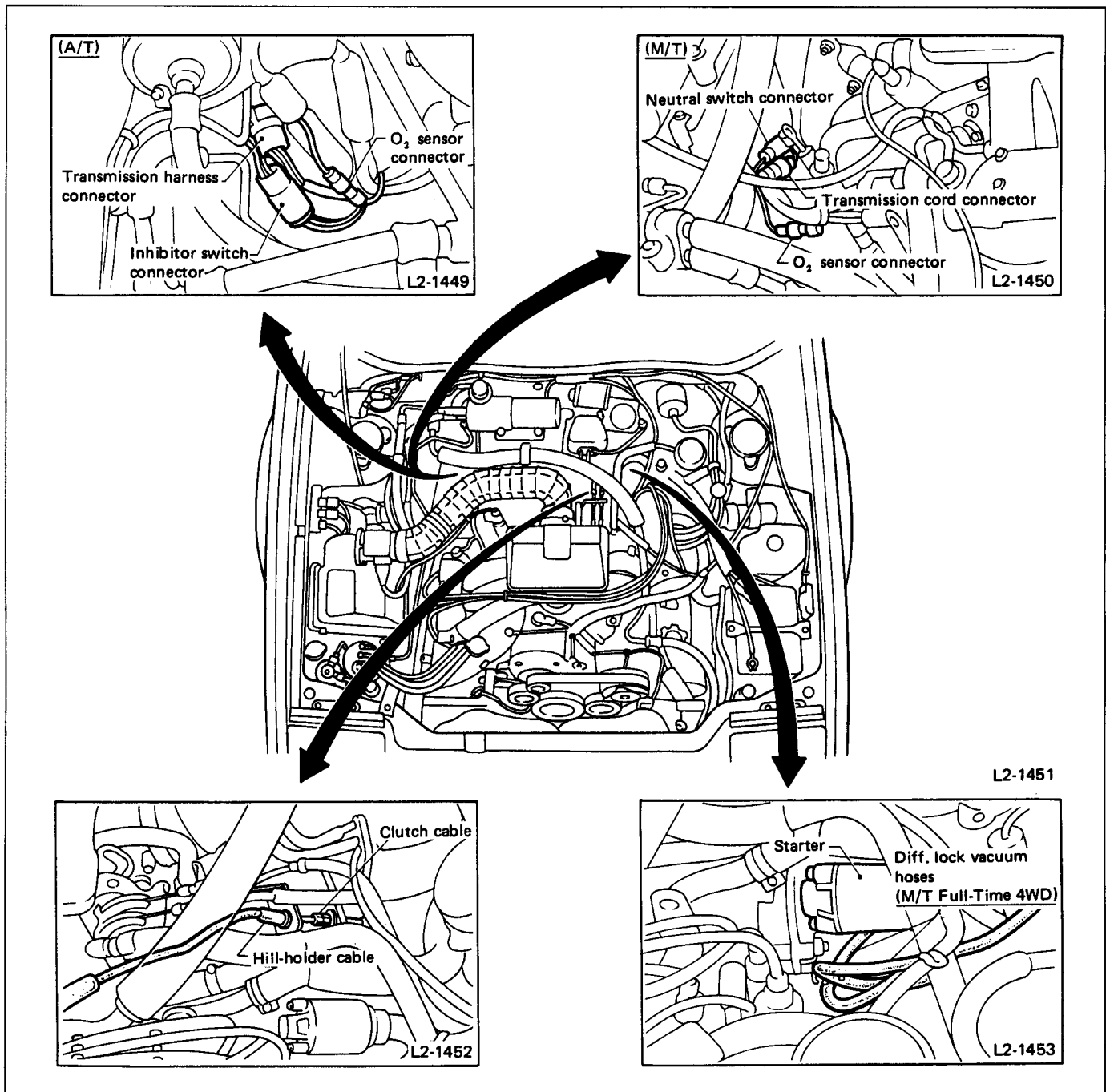


Fig. 28

3) Remove clutch cable and hill-holder cable. (M/T)

4) Remove meter cable.

5) Disconnect the following harness connectors.

(A/T)

- O₂ sensor connector
- Transmission harness connector
- Inhibitor switch connector
- Revolution sensor connector (4WD)

(M/T)

- O₂ sensor connector
- Neutral switch connector

- Transmission cord connector (back-up and diff. lock indicator light switch) (Full-Time 4WD)

6) Disconnect the following hoses.

- Diff. lock vacuum hose (M/T Full-Time 4WD)

Remove clip band which secures air breather hose to pitching stopper in advance. (A/T)

- 7) Remove starter from transmission case.
- 8) Remove air intake boot.

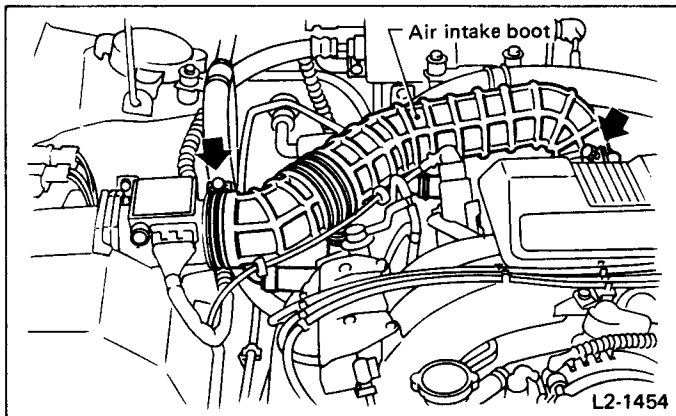


Fig. 29

- 11) Remove engine-to-transmission mounting bolt on the right side.

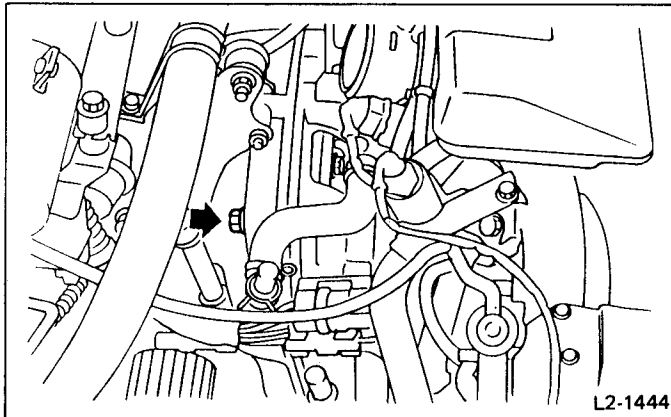


Fig. 32

- 9) Remove timing hole plug and four torque converter attaching bolts. (A/T)

Be careful not to slip wrench off bolt. It may strike and damage bolt head.

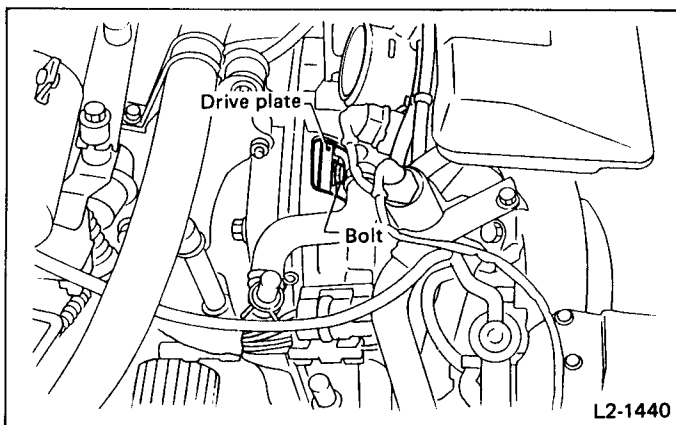
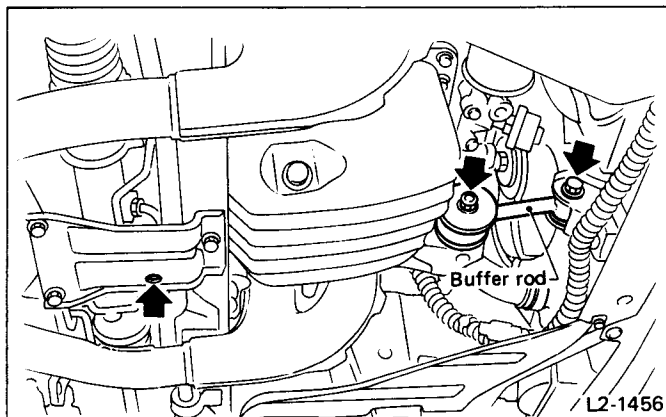


Fig. 30

- 12) Set the special tool.

- (1) Raise the car.
- (2) Remove buffer rod from engine and body side bracket.
- (3) Install ENGINE SUPPORT BRACKET (927160000) to the body side bracket of buffer rod ASSY.
- (4) Install ENGINE SUPPORT (927150000).



- 10) Disconnect pitching stopper rod from bracket.

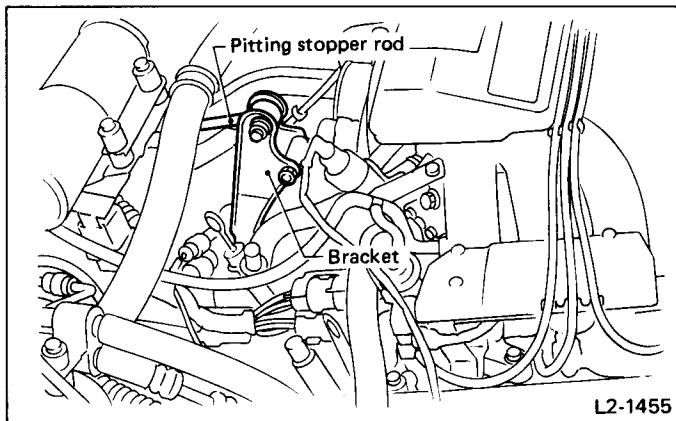


Fig. 31

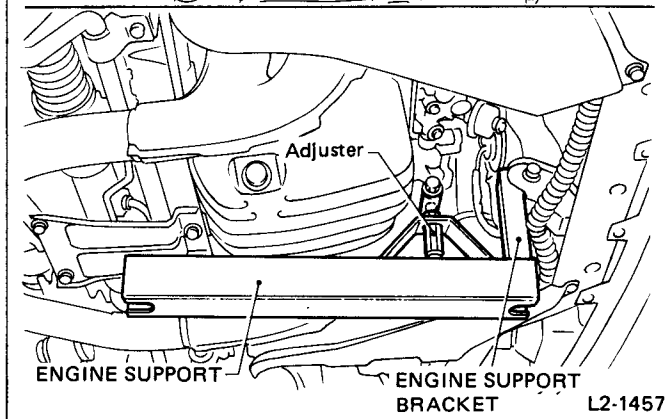


Fig. 33

Before attaching ENGINE SUPPORT to ENGINE SUPPORT BRACKET and front crossmember, connect adjuster to buffer rod ASSY bracket (on engine side).

- 13) Remove front exhaust pipe.
 (1) Disconnect front exhaust pipe from engine.

Remove all nuts except one. (This nut is used to temporarily hold exhaust pipe.)

- (2) Disconnect front-to-rear exhaust pipe connection.
 (3) Disconnect front exhaust pipe at transmission and hanger locations.
 (4) Remove the nut which was used to temporarily hold exhaust pipe in step (1) above, and disconnect front exhaust pipe.

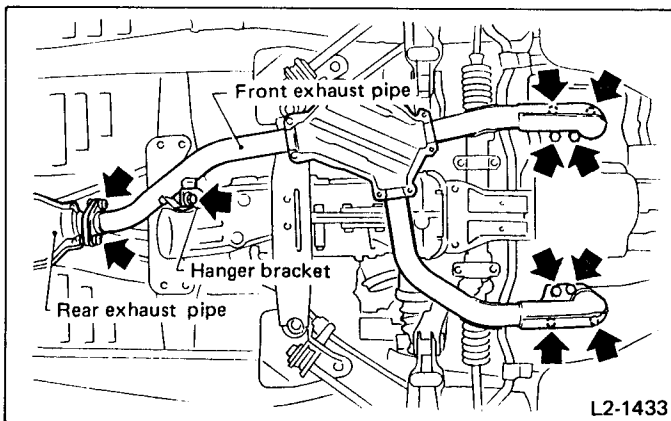


Fig. 34

- 14) Remove propeller shaft. (4WD)

- a. Before removing propeller shaft, scribe alignment marks on connections of rear differential companion flange and propeller shaft.
 b. Plug the opening at rear of extension to prevent oil from flowing out.

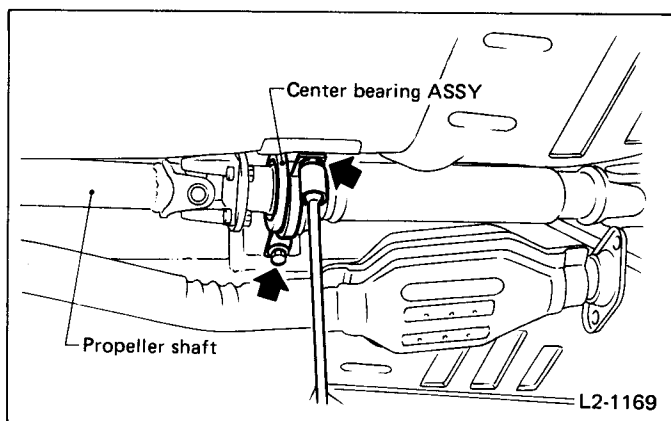


Fig. 35 - ①

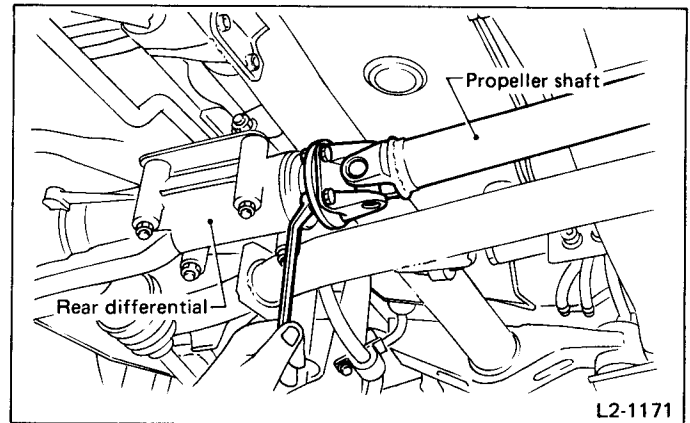


Fig. 35 - ②

- 15) Remove gear shift system, as follows:

(M/T)

- (1) Remove spring.
 (2) Disconnect stay CP from transmission.
 (3) Disconnect rod CP from transmission.

(A/T)

- (1) Disconnect cable from select lever.
 (2) Loosen nut which holds cable to bracket.
 (3) Disconnect cable while moving inhibitor switch to 2nd position.

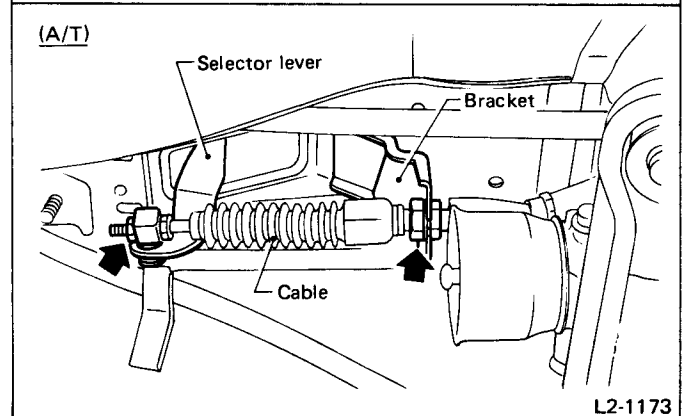
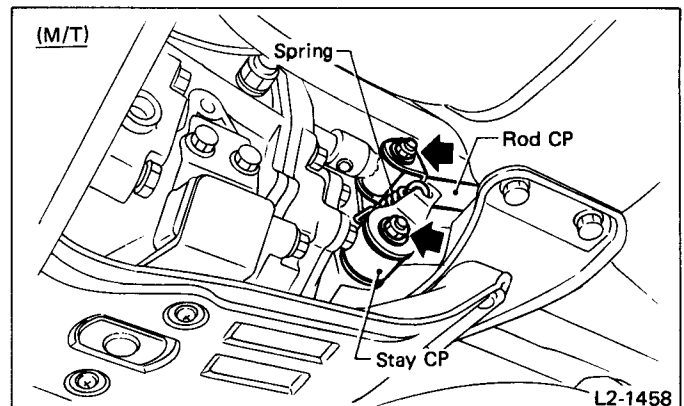


Fig. 36

16) Disconnect axle shaft from drive shaft on each side.

- (1) Loosen upper bolt and nut from plate which secures transverse link to stabilizer, and remove lower bolt. Separate transverse link and stabilizer.

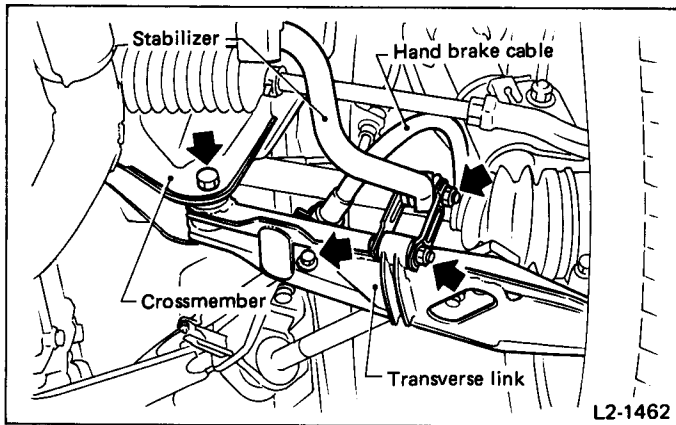


Fig. 37

- (2) Remove hand brake cable bracket from transverse link.
- (3) Remove bolt holding transverse link to crossmember on each side.
- (4) Lower transverse link.
- (5) Remove spring pin and separate axle shaft from drive shaft on each side.

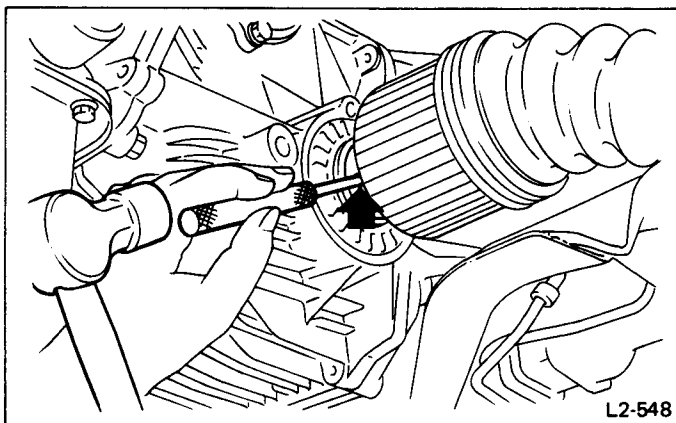


Fig. 38

- a. Use REMOVER 2 (398791700) to remove spring pin.
- b. Discard old spring pin and install new one.
- c. Be sure to remove axle shaft from drive shaft by pushing the rear of tire outward.

17) Remove engine-to-transmission mounting nuts.

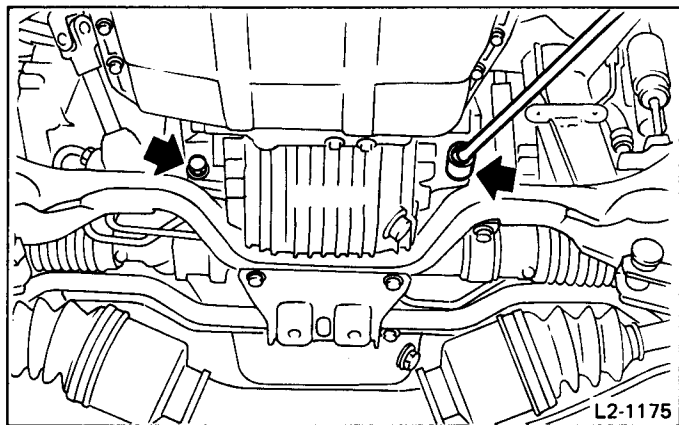


Fig. 39

18) Disconnect oil cooler hoses. (A/T)

Place a container to catch oil.

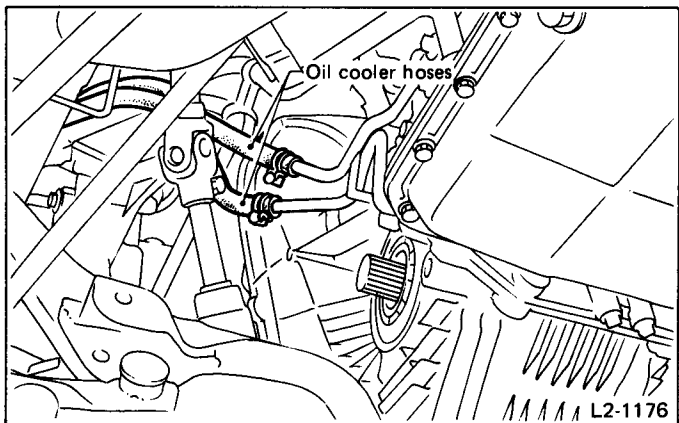


Fig. 40

19) Place transmission jack under transmission.

Always support transmission case with a transmission jack. Do not place support under oil pan; otherwise oil pan may be damaged. (A/T)

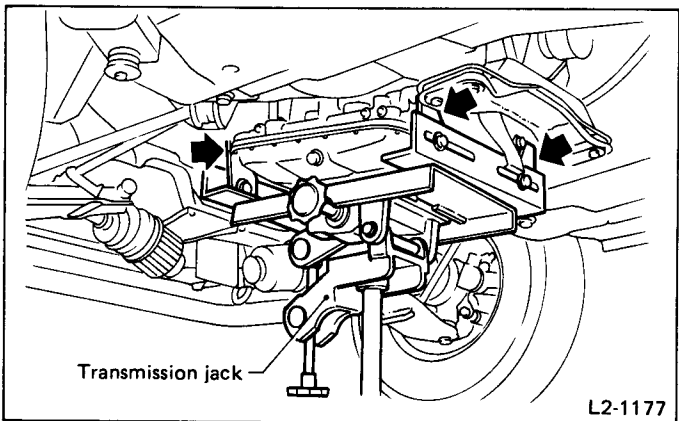


Fig. 41

20) Remove rear cushion rubber mounting nuts, and rear crossmember.

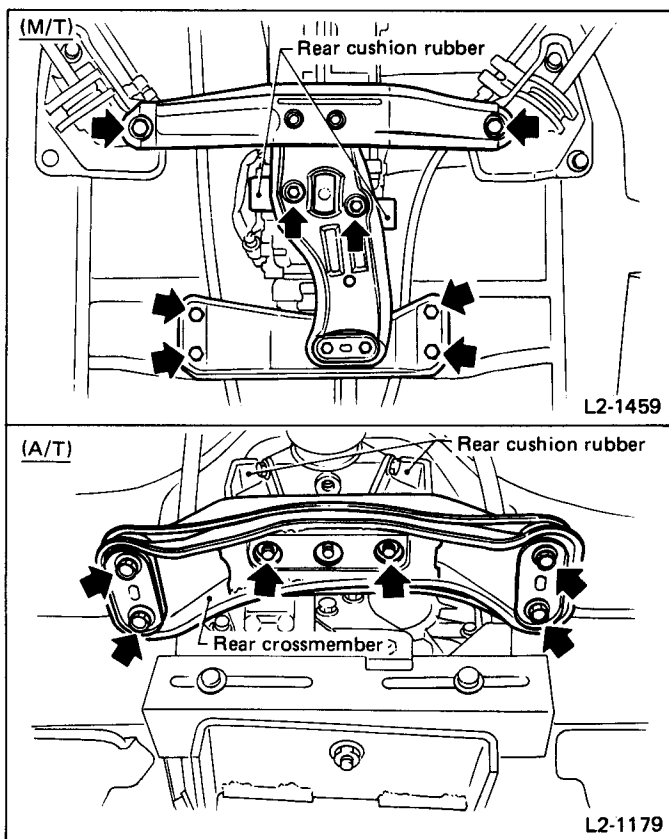


Fig. 42

21) Turn ENGINE SUPPORT adjuster counterclockwise to raise the front of engine slightly.

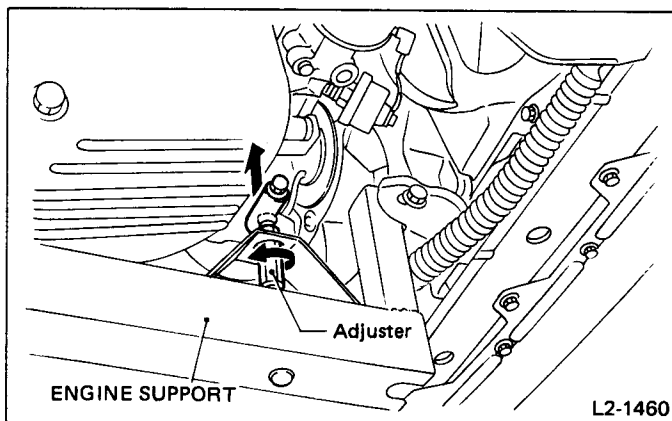


Fig. 43

22) Remove transmission.

- Move transmission jack toward rear until mainshaft is withdrawn from clutch cover. (M/T)
- Move torque converter and transmission as a unit away from the engine. (4A/T)

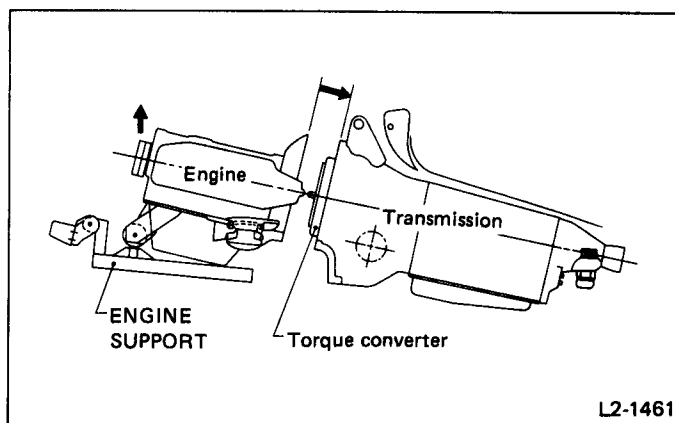


Fig. 44

INSTALLATION

1) Install transmission to engine and temporarily tighten engine-to-transmission mounting nuts.

- Gradually raise transmission with a transmission jack until mainshaft is aligned with clutch disc at their splines. Engage them at splines. If they are not aligned properly, rotate crankshaft as required. (M/T)
- Be sure not to strike mainshaft against clutch cover. (M/T)

2) Install rear crossmember to rear cushion rubber.

Align rear cushion rubber guide with rear crossmember guide hole and tighten nuts. (A/T)

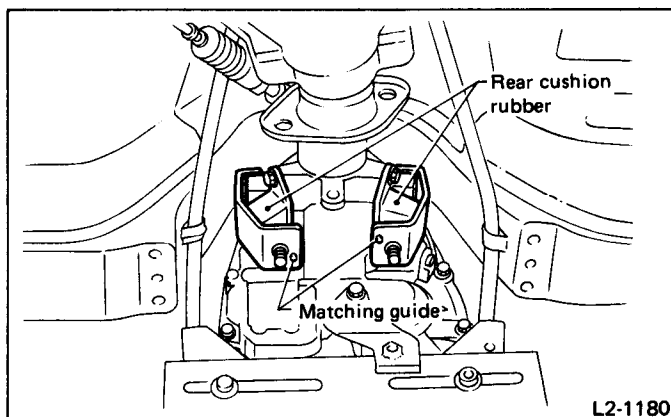


Fig. 45

Tightening torque (Cushion rubber nut):

(A/T FWD):

13 – 23 N·m (1.3 – 2.3 kg·m, 9 – 17 ft·lb)

(A/T 4WD, M/T):

27 – 47 N·m (2.8 – 4.8 kg·m, 20 – 35 ft·lb)

- 3) Install rear crossmember to car body.

Be careful not to damage threads.

Tightening torque (Rear crossmember bolt):

(A/T)

53 – 67 N·m (5.4 – 6.8 kg·m, 39 – 49 ft·lb)

(M/T)

(Front):

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

(Rear):

37 – 67 N·m (3.8 – 6.8 kg·m, 27 – 49 ft·lb)

- 4) Tighten engine-to-transmission nuts on the lower side.

Tightening torque:

46 – 54 N·m (4.7 – 5.5 kg·m, 34 – 40 ft·lb)

- 5) Remove transmission jack.

- 6) Remove ENGINE SUPPORT and ENGINE SUPPORT BRACKET, and install buffer rod to brackets.

- 7) Install axle shaft to axle drive shaft and drive spring pin into place.

- a. Use new spring pin.

- b. Be sure to align two shafts at chamfered holes and engage shaft splines.

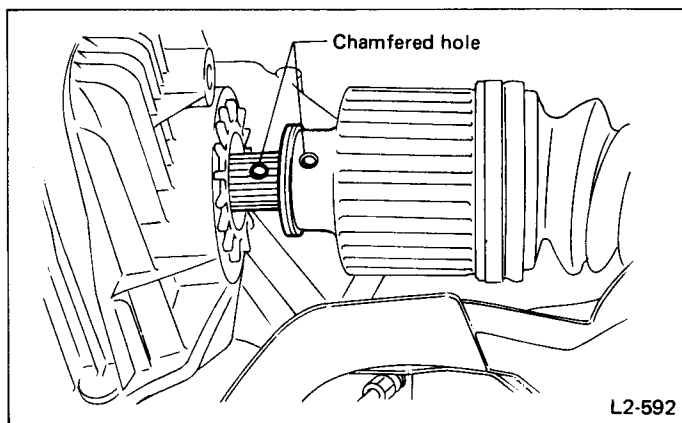


Fig. 46

- 8) Install transverse link temporarily to front crossmember by using bolt and self-locking nut.

- a. Align bolt holes using a cross-head screwdriver, insert bolt into holes from the front side.

- b. Use new self-locking nut.

- 9) Temporarily install stabilizer to transverse link.
10) Install hand brake cable bracket to transverse link.

Tightening torque:

10 – 16 N·m (1.0 – 1.6 kg·m, 7 – 12 ft·lb)

- 11) Lower car to floor.

- 12) Tighten transverse link-to-front crossmember mounting bolt, transverse link-to-stabilizer mounting bolt.

Tighten nuts with the tires placed on the ground when the vehicle is not loaded.

Tightening torque:

Transverse link to front crossmember

(self-locking nut):

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

Transverse link to stabilizer:

20 – 29 N·m (2.0 – 3.0 kg·m, 14 – 22 ft·lb)

- 13) Raise car.

- 14) Install gear shift system.

(M/T)

- (1) Connect rod CP to transmission.

- (2) Install spring.

- (3) Connect stay CP to transmission.

(A/T)

- (1) Tighten nut which holds cable to bracket.

- (2) Connect cable to select lever.

When connecting cable to select lever, set the location of the select lever and inhibitor switch to "N".

Tightening torque:

Rod CP (M/T)

9 – 15 N·m (0.9 – 1.5 kg·m, 6.5 – 10.8 ft·lb)

Stay CP (M/T)

14 – 22 N·m (1.4 – 2.2 kg·m, 10 – 16 ft·lb)

Cable to bracket (A/T)

13 – 23 N·m (1.3 – 2.3 kg·m, 9 – 17 ft·lb)

Cable to select lever (A/T)

10 – 18 N·m (1.0 – 1.8 kg·m, 7 – 13 ft·lb)

After completion of the fitting, make sure that the lever operates smoothly all across the operating range. (A/T)

- 15) Install propeller shaft. (4WD)

Align marks and connect propeller shaft to rear differential.

Tightening torque:

Propeller shaft to rear differential

24 – 32 N·m (2.4 – 3.3 kg·m, 17 – 24 ft·lb)

Center bearing location

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

- 16) Connect oil cooler hoses. (A/T)
 17) Connect engine and transmission, and tighten bolt on the right side.

Tightening torque:

46 – 54 N·m (4.7 – 5.5 kg-m, 34 – 40 ft-lb)

- 18) Install starter.

Tightening torque:**Upper bolt:**

46 – 54 N·m (4.7 – 5.5 kg-m, 34 – 40 ft-lb)

Lower nut:

30 – 36 N·m (3.1 – 3.7 kg-m, 22 – 27 ft-lb)

- 19) Install pitching stopper.

Tightening torque**Transmission side:**

44 – 54 N·m (4.5 – 5.5 kg-m, 33 – 40 ft-lb)

- 20) Install and tighten torque converter mounting bolts. (A/T)

- (1) Align torque converter with drive plate at mounting holes.
- (2) While manually cranking engine, tighten torque converter-to-drive plate mounting bolts securely — one at a time.

Be careful not to drop bolts into torque converter housing.

Tightening torque:

23 – 26 N·m (2.3 – 2.7 kg-m, 17 – 20 ft-lb)

- (3) Install timing hole plug.
- 21) Install air intake boot.
- 22) Connect the following hoses.
 - Diff. lock vacuum hose (M/T Full-Time 4WD)

Secure air breather hose to pitching stopper with a clip band.

- 23) Connect the following harness connectors.

(A/T)

- O₂ sensor connector
- Transmission harness connector
- Inhibitor switch connector
- Revolution sensor connector (4WD)

(M/T)

- O₂ sensor connector
- Neutral switch connector
- Back-up light switch connector (FWD)
- Transmission cord connector (back-up and diff. lock indicator light switch) (Full-Time 4WD)

- 24) Connect meter cable.

Manually tighten cable nut all the way and then turn it approximately 30° more with a wrench.

- 25) Connect clutch cable and hill-holder cable. (M/T)

After connecting, test operation of hill-holder on an upgrade.

- 26) Install front exhaust pipe.

- a. Be sure to use new gasket.
- b. Position front exhaust pipe in hanger bracket, and align it with adjacent parts.
- c. Tighten all parts in numerical sequence, as shown in figure below, to specified torque.

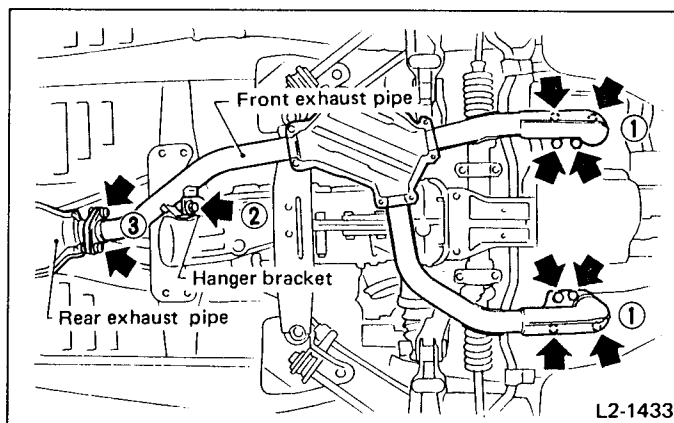


Fig. 47

Tightening torque:**Front exhaust pipe to engine:**

25 – 29 N·m (2.6 – 3.0 kg-m, 19 – 22 ft-lb)

Front exhaust pipe to bracket:

25 – 34 N·m (2.6 – 3.5 kg-m, 19 – 25 ft-lb)

Front exhaust pipe to rear exhaust pipe:

13 – 23 N·m (1.3 – 2.3 kg-m, 9 – 17 ft-lb)

Also check to be sure there is no gas leakage after installation is completed.

- 27) Connect ground cable to battery and transmission side.
- 28) Check transmission oil level.
Add gear oil if necessary.
- 29) Check ATF with engine idling.
If lower than the specified level, stop engine and add ATF.
- (A/T)
- 30) Start engine and re-check oil levels.