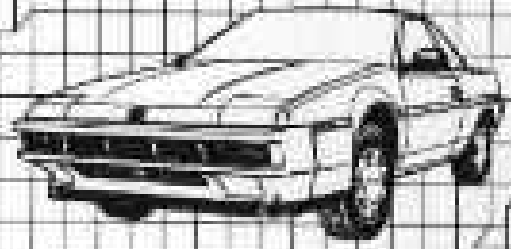
# SUBARU®

# XT

# 1988 SERVICE MANUAL

SECTION 1



FUJI HEAVY INDUSTRIES LTD.

# FOREWORD

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU XT.

The manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and trouble-shooting for guidance of both the fully qualified and the less-experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicles in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication approval.

We reserve the right to make changes at any time without prior notice.

**FUJI HEAVY INDUSTRIES LTD.**

## How to use this manual

This service manual is divided into four volumes. Each volume consists of Section 1, Section 2, 3, Section 4, 5, and Section 6 respectively.

Each chapter, beginning with the Engine section, is basically made up of the following five areas.

1. Mechanism and function
2. Specifications and service data
3. Component parts
4. Service procedure
5. Trouble-shooting

"ABBREVIATION LIST" is provided at the back page of quick reference index in each volume.

"ALPHABETICAL INDEX" is also provided at the last page in each volume.

This service manual applies to SUBARU XT, and explains all equipments including factory options. Therefore, you may find some explanations for equipments not installed on the vehicle.

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# 1988

# SERVICE MANUAL

## 1 GENERAL SECTION



# ABBREVIATION LIST

| | |
|---|---|
| A/C | Air Conditioner |
| ACC | Accessory |
| A/C pulley | Air Conditioner compressor pulley |
| ALT pulley | Alternator pulley |
| API | American Petroleum Institute |
| Approx | Approximately |
| ASSY | Assembly |
| ASV | Air Suction Valve |
| AT | Automatic Transmission |
| ATF | Automatic Transmission Fluid |
| BILEV | Bi-level |
| BJ | Bell Joint |
| BP | British Petroleum |
| BTDC | Before Top Dead Center |
| Calif. | California |
| Carb. | Carburetor |
| CP | Complete |
| C/P | Crankshaft Pulley |
| CTR | Center |
| CVJ | Constant Velocity Joint |
| CW | Curb Weight |
| DIFF | Differential |
| DOJ | Double Offset Joint |
| D/R | Dual-range |
| DSPD | Dry Single Plate Diaphragm |
| ECS | Electric Control System |
| EGR | Exhaust Gas Recirculation |
| FF drive | Front wheel drive (2WD) |
| FMVSS | Federal Motor Vehicle Safety Standards |
| GVWR | Gross Vehicle Weight Rating |
| HI | High (Speed) |
| HP | Horse Power |
| IG-COIL | Ignition Coil |
| IG SWITCH | Ignition Switch |
| INT | Intermittent (Wiper) |
| I/P | Idler Pulley |
| LH | Left-hand |
| LO | Low (Speed) |
| LSD | Limited Slip Differential |
| MPFI | Multi Point Fuel Injection |
| MT | Manual Transmission |
| PCV | Positive Crankcase Ventilation |
| PHV | Pressure Holding Valve |
| P/N | Parts Number |
| P/S pulley | Power Steering oil pump pulley |
| RAD FAN | Radiator Fan |
| R-DEF | Rear Defogger |
| RH | Right-hand |
| SAE | Society of Automotive Engineers In |
| S/R | Single-range |
| TC | Torque Converter |
| TEMP GAUGE | Temperature Gauge |
| TP | Theft Prevention |
| VGR | Variable Gear Ratio |
| VIN | Vehicle Identification Number |
| W/height control | With height control |
| W/P pulley | Water Pump pulley |

# SUBARU

## 1988

## • XT

| ITEM \ MODEL | | | | 1800 | | | | 2700 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FWD | | | 4WD | FWD | 4WD | |
| | | | | DL | GL | GL | GL | XT6 | Full time 4WD XT6 | Full time 4WD XT6 |
| | | | | MPFI 5MT | MPFI 5MT | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT |
| Overall length | | | mm (in) | 4,510 (177.6) | | | | | | |
| Overall width | | | mm (in) | 1,690 (66.5) | | | | | | |
| Overall height | | | mm (in) | 1,255 (49.4) | | | 1,330 (52.4) | 1,255 (49.4) | 1,335 (52.6) | |
| Compartment | Leg room | Front Max. | mm (in) | 1,100 (43.3) | | | | | | |
| | | Rear Min. | mm (in) | 665 (26.2) | | | | | | |
| | Head room | Front | mm (in) | 950 (37.4) | | | | | | |
| | | Rear | mm (in) | 875 (34.4) | | | | | | |
| | Shoulder room | | mm (in) | 1,340 (52.8) | | | | | | |
| Wheelbase | | | mm (in) | 2,465 (97.0) | | | | | | |
| Tread | | Front | mm (in) | 1,435 (56.5) | | | 1,420 (55.9) | 1,445 (56.9) | 1,435 (56.5) | |
| | | Rear | mm (in) | 1,425 (56.1) | | | | | 1,440 (56.7) | |
| Ground clearance | | | mm (in) | 120 (4.7) | | | 155 (6.1) | 125 (4.9) | 165 (6.5) | |
| Weight kg (lb) | Curb weight | U.S.A. | Front | *1 640 (1,410) | *2 650 (1,435) | *2 705 (1,555) | *2 680 (1,500) | *3 810 (1,785) | *3 790 (1,740) | *3 825 (1,820) |
| | | | Rear | *1 435 (965) | *2 455 (1,000) | *2 455 (1,005) | *2 510 (1,125) | *3 460 (1,010) | *3 510 (1,125) | *3 515 (1,135) |
| | | | Total | *1 1,075 (2,375) | *2 1,105 (2,435) | *2 1,160 (2,560) | *2 1,190 (2,625) | *3 1,270 (2,795) | *3 1,300 (2,865) | *3 1,340 (2,955) |
| | | CANADA | Front | – | *1 640 (1,405) | *1 695 (1,525) | *1 670 (1,470) | *3 800 (1,765) | *3 785 (1,725) | *3 820 (1,805) |
| | | | Rear | – | *1 445 (985) | *1 450 (995) | *1 500 (1,105) | *3 455 (1,000) | *3 505 (1,115) | *3 510 (1,125) |
| | | | Total | – | *1 1,085 (2,390) | *1 1,145 (2,520) | *1 1,170 (2,575) | *3 1,255 (2,765) | *3 1,290 (2,840) | *3 1,330 (2,930) |
| | Gross vehicle weight | | Front | 740 (1,630) | 870 (1,920) | 870 (1,920) | 885 (1,950) | 925 (2,040) | 945 (2,080) | 945 (2,080) |
| | | | Rear | 660 (1,460) | 690 (1,520) | 690 (1,520) | 745 (1,640) | 695 (1,530) | 750 (1,660) | 750 (1,660) |
| | | | Total | 1,400 (3,090) | 1,560 (3,440) | 1,560 (3,440) | 1,630 (3,590) | 1,620 (3,570) | 1,695 (3,740) | 1,695 (3,740) |
| Seating capacity | | | persons | 2 | 4 | | | | | |

*1: The weight of power steering is included.
*2: The weight of power steering and power window is included.
*3: The weight of air conditioner and cruise control is included.

| ITEM \ MODEL | | 1800 | | | | 2700 | | |
|---|---|---|---|---|---|---|---|---|
| | | FWD | | | 4WD | FWD | 4WD | |
| | | DL | GL | GL | GL | XT6 | Full time 4WD XT6 | Full time 4WD XT6 |
| | | MPFI 5MT | MPFI 5MT | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT |
| Engine type | | Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine with multi-point fuel injection | | | | Horizontally opposed, liquid cooled, 6-cylinder, 4-stroke gasoline engine with multi-point fuel injection | | |
| Valve arrangement | | Overhead camshaft type | | | | | | |
| Bore x stroke | mm (in) | 92 x 67 (3.62 x 2.64) | | | | | | |
| Displacement | $cm^3$ (cu in) | 1,781 (108.68) | | | | | 2,672 (163.05) | |
| Compression ratio | | 9.5:1 | | | | | | |
| Firing order | | 1-3-2-4 | | | | 1-6-3-2-5-4 | | |
| Ignition timing at idling speed | BTDC/rpm *1 | 20° ± 2°/700 | | 20° ± 2°/800 | 20° ± 2°/700 | | 20° ± 2°/750 | |
| Idling speed at neutral, N or P position | rpm | 700 ± 100 | | 800 ± 100 | 700 ± 100 | | 750 ± 100 | |
| Spark plug | Type and manufacturer | For U.S.A.: BPR6ES-11 (or BPR5ES-11, BPR7ES-11) ..... NGK<br>W20EPR-U11 (or W16EPR-U11, W22EPR-U11) ..... Nippondenso<br>RN9YC-4 (or RN11YC-4) ..... Champion<br>For Canada: RN9YC-4 (or RN11YC-4) ..... Champion | | | | | | |
| Maximum output | HP/rpm | 97/5,200 | | | | | 145/5,200 | |
| Maximum torque | N-m (kg-m, ft-lb)/rpm | 139 (14.2, 103)/3,200 | | | | | 211 (21.5, 156)/4,000 | |
| Battery | Type | 50D20R (MF) | | 65D23R (MF) | 50D20R (MF) | 75D23R (MF) | 55D23R (MF) | 75D23R (MF) |
| | Reserve capacity (min.) | 78 | | 111 | 78 | 111 | 99 | 111 |
| | Cold cranking ampere (amp.) | 306 | | 420 | 306 | 490 | 356 | 490 |
| Alternator | | 12V - 65A | | | | 12V - 90A | | |
| Clutch type | | DSPD | | TC | DSPD | TC | DSPD | TC |
| Transmission type | | *2 | | *3 | *2 | *3 | *2 | *3 |
| Gear ratio | 1st | 3.636 | | 2.785 | 3.545 | 2.785 | 3.545 | 2.785 |
| | 2nd | 2.105 | | 1.545 | 2.111 | 1.545 | 1.947 | 1.545 |
| | 3rd | 1.428 | | 1.000 | 1.448 | 1.000 | 1.366 | 1.000 |
| | 4th | 1.093 | | 0.694 | 1.088 | 0.694 | 0.972 | 0.694 |
| | 5th | 0.885 | | — | 0.871 | — | 0.780 | — |
| | Reverse | 3.583 | | 2.272 | 3.416 | 2.272 | 3.416 | 2.272 |

DSPD: Dry Single Plate Diaphragm
TC : Torque Converter

*1: With gear in neutral position (MT) or "P" position (AT)
*2: 5-forward speeds with synchromesh and 1-reverse
*3: Full automatic, 4-forwards and 1-reverse

| ITEM | | | MODEL | 1800 | | | | 2700 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FWD | | | 4WD | FWD | 4WD | |
| | | | | DL | GL | GL | GL | XT6 | Full time 4WD XT6 | Full time 4WD XT6 |
| | | | | MPFI 5MT | MPFI 5MT | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT |
| Reduction gear (Front drive) | Final reduction | Type of gear | | Hypoid | | | | | | |
| | | Reduction gear ratio | | 3.700 | | 3.900 | 3.700 | | 3.900 | 3.700 |
| Reduction gear (Rear drive) | Transfer reduction | Type of gear | | – | | | Helical | – | Helical | – |
| | | Reduction gear ratio | | – | | | 1.000 | – | 1.000 | – |
| | Final reduction | Type of gear | | – | | | Hypoid | – | Hypoid | |
| | | Reduction gear ratio | | – | | | 3.700 | – | 3.900 | 3.700 |
| Steering system | Type | | | Rack and pinion | | | | | | |
| | Turns, lock to lock | | | 4.8 | 3.5 | | | 3.2 | | |
| | Minimum turning circle | | m (ft) | 9.7 (31.8) [at tire], 10.8 (35.4) [at bumper] | | | | 10.4 (34.1) [at tire]<br>11.3 (37.1) [at bumper] | | |
| Suspension | Front | | | *1 | | | *2 | *1 | *2 | |
| | Rear | | | *3 | | | *4 | *3 | *4 | |
| Brake | Service brake system | | | Dual circuit hydraulic with vacuum suspended power unit | | | | | | |
| | Front | | | Ventilated disc brake | | | | | | |
| | Rear | | | Drum brake (Leading & trailing type) | | | Disc brake | | | |
| | Parking brake | | | Mechanical on front brake | | | | | | |
| Tire | Size | | | 165SR13 | 185/70HR13 | | | 195/60R14 85H | 205/60R14 87H | |
| | Type | | | Steel belted radial, Tubeless | | | | | | |

*1: MacPherson strut type, Independent, Coil spring
*2: MacPherson strut type, Independent, Pneumatic suspension (CANADA: with height control)
*3: Semi-trailing arm type, Independent, Coil spring
*4: Semi-trailing arm type, Independent, Pneumatic suspension (CANADA: with height control)

| ITEM | | | MODEL | 1800 | | | | 2700 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FWD | | | 4WD | FWD | 4WD | |
| | | | | DL | GL | GL | GL | XT6 | Full time 4WD XT6 | Full time 4WD XT6 |
| | | | | MPFI 5MT | MPFI 5MT | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT | MPFI 5MT S/R | MPFI 4AT |
| Capacity | Fuel tank | | ℓ (US gal, Imp gal) | 60 (15.9, 13.2) | | | | | | |
| | Engine oil | Upper level | ℓ (US qt, Imp qt) | 4.0 (4.2, 3.5) | | | | 5.0 (5.3, 4.4) | | |
| | | Lower level | ℓ (US qt, Imp qt) | 3.0 (3.2, 2.6) | | | | 4.0 (4.2, 3.5) | | |
| | Transmission gear oil | | ℓ (US qt, Imp qt) | 2.6 (2.7, 2.3) | | – | 3.3 (3.5, 2.9) | – | 3.5 (3.7, 3.1) | – |
| | Automatic transmission fluid | | ℓ (US qt, Imp qt) | – | | 9.3 (9.8, 8.2) | – | 9.3 (9.8, 8.2) | – | 9.5 (10.0, 8.4) |
| | AT differential gear oil | | ℓ (US qt, Imp qt) | – | | 1.4 (1.5, 1.2) | – | 1.4 (1.5, 1.2) | – | 1.4 (1.5, 1.2) |
| | 4WD rear differential gear oil | | ℓ (US qt, Imp qt) | – | | | 0.8 (0.8, 0.7) | – | 0.8 (0.8, 0.7) | |
| | Power steering fluid | | ℓ (US qt, Imp qt) | – | 0.7 (0.7, 0.6) | | | | | |
| | Engine coolant | | ℓ (US qt, Imp qt) | 5.5 (5.8, 4.8) | | | | 7 (7.4, 6.2) | | |

# GENERAL INFORMATION

# 1-3

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# General Precautions

### Precautions to take before starting service

1) Be sure to perform the jobs listed in the Periodic Maintenance Schedule.
2) When a vehicle is brought in for maintenance, carefully listen to the owner's explanations of the symptoms exhibited by the vehicle. List the problems in your notebook, and refer to them when trying to diagnose the trouble.
3) All jewelry should be removed. Suitable work clothes should be worn.
4) Be sure to wear goggles.
5) Use fender, floor and seat covers to prevent the vehicle from being scratched or damaged.
6) Never smoke while working.
7) 4WD models (Selective 4WD)

When front wheels are jacked up or placed on test rollers (= chassis dynamometer) for operation, be sure to set "4WD switch" to "OFF".

In addition, disconnect harness connector for 4WD solenoid valve inside engine compartment.

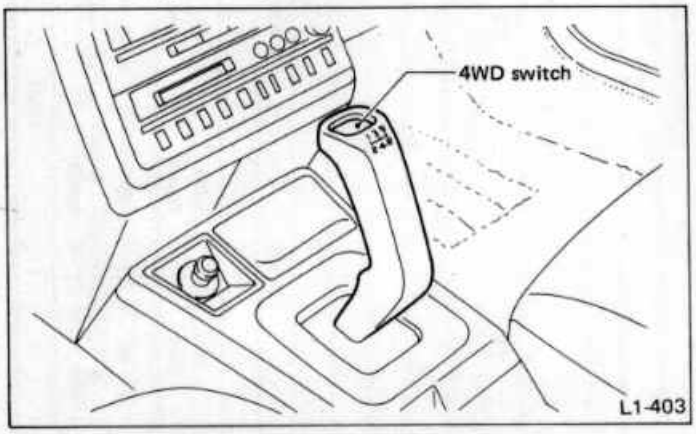



*Fig. 1*

8) Pneumatic suspension models w/height control ..... CANADA model only

These models are provided with height control mechanism. Be sure to return the height control to "Normal" position (low) and support the vehicle with a jack before getting under it for servicing, etc. To check any system other than electrical under the vehicle, disconnect cables from battery in advance.

### Precautions while working

1) When jacking up the vehicle, be sure to use safety stands.
2) When jacking up the front or rear end of the car body, be sure to chock the tires remaining in contact with the ground.
3) Keep the parking brake applied when working on the vehicle. Set the shift lever to REVERSE when the parking brake cannot be applied, such as when the brakes are being worked on.
4) Keep the ignition key turned "OFF" if at all possible.
5) Be cautious while working when the ignition key is "ON"; if the temperature in the engine compartment increases, the cooling fan can start to operate.
6) While the engine is in operation, properly ventilate the workshop.
7) While the engine is in operation, be aware of any moving parts, such as the cooling fan and the drive belt.
8) Keep your hands off any metal parts such as the radiator, exhaust manifold, exhaust pipe, and muffler, to prevent burning yourself.
9) When servicing the electrical system or the fuel system, disconnect the ground cable from the battery.
10) When disassembling, arrange the parts in the order that they were disassembled.
11) When removing a wiring connector, do not pull the wire unit but remove the connector unit by holding it.
12) When removing a hose or tube, remove the clip first. Then, pull the hose or tube while holding its end fitting.
13) Replace the gasket, O-ring, snap ring, lock washer, etc. with new ones.
14) When tightening a bolt or nut, tighten it to the specified torque.
15) When performing work requiring special tools, be sure to use the designated ones.
16) After completing the work, make certain that the hoses, tubes and wiring harnesses are securely connected.
17) After completing the work, be sure to wash the vehicle.

## Precautions in handling a full-time 4WD vehicle

MT

● Speedometer test

Generally, when testing the speedometer of a full-time 4WD vehicle, even if the engine is running at a relatively slow speed, releasing the clutch abruptly may still cause the vehicle to jump off of the test machine. Be especially careful to avoid this.

1) Testing Methods

(1) Jack-up Method

The usual speedometer tester is used and the rear wheels are tested with the front wheels raised off the ground and the center differential locked.

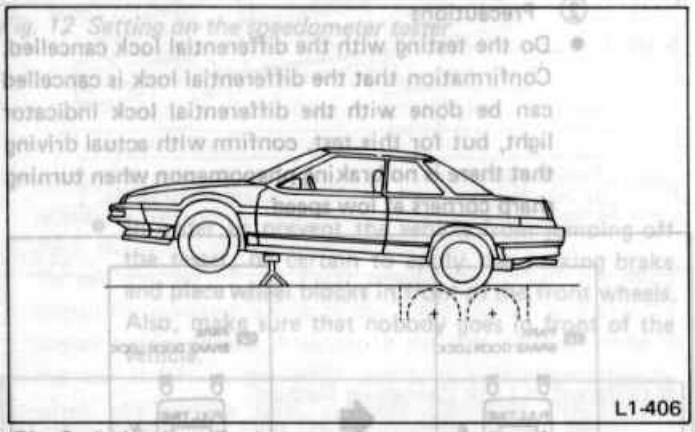



*Fig. 3 Jack-up method*

(2) Adapter Method

An adapter is installed between the vehicle's speedometer and cable, and testing is done using the usual speedometer tester with the center differential operating. The vehicle's speedometer will then indicate 1/2 actual wheel speed. Therefore, an adapter which doubles the speed is necessary.

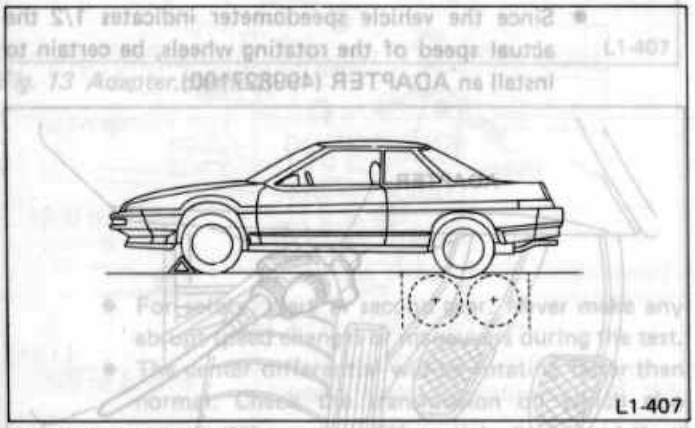



*Fig. 4 Adapter method*

**Use the adapter method only when the jack-up method cannot be employed at the service garage.**

2) Testing Procedures

(1) Jack-up Method

① Equipment

- Speedometer tester ..... 1
- Garage jack ..... 1
- Safety stand ..... 2

② Precautions

- Test the speedometer using the rear wheels. (Vehicle stability is better than with the front wheels.)

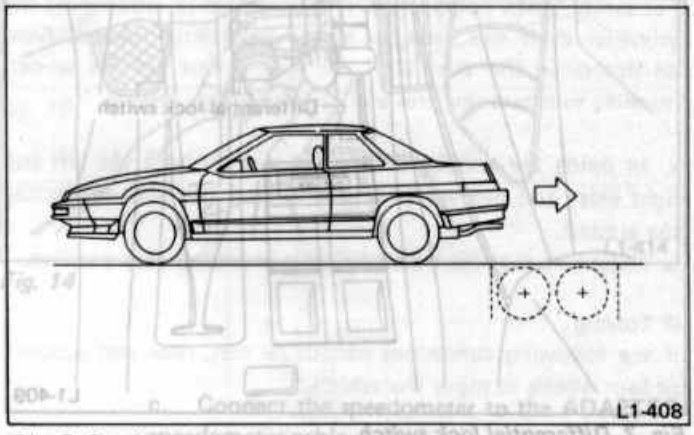



*Fig. 5 Setting on the speedometer tester*

- Place the garage jack and safety stands in their proper positions.
  Also, in order to prevent the vehicle from slipping due to vibration, do not place any wooden blocks or similar items between the safety stands and the vehicle.

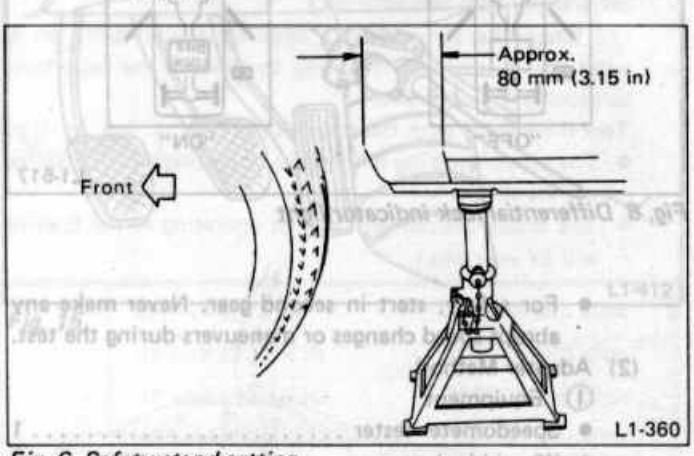



*Fig. 6 Safety stand setting*

- Since the front wheels will also be rotating, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.
- With the center differential locked, confirm that the differential lock indicator light is lit.

If the differential lock switch is in the "ON" position, but the differential lock indicator light is not on, rock the vehicle slightly forward or backward to lock the differential.
Operate the differential lock switch before setting the speedometer tester. Never operate the differential lock switch while the vehicle is on the free rollers. (There is a chance that the vehicle may jump off the rollers.)

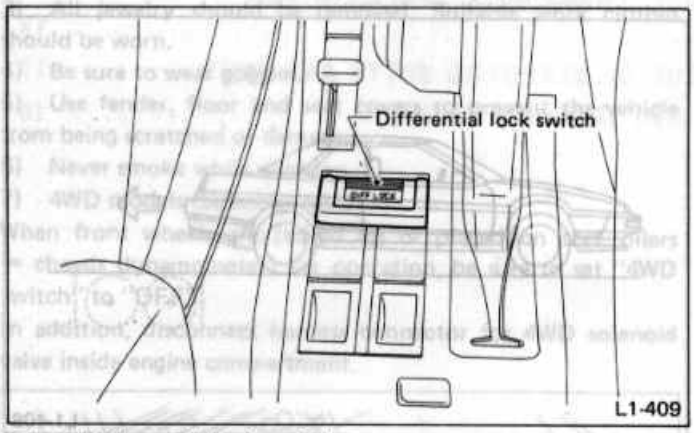



*Fig. 7 Differential lock switch*

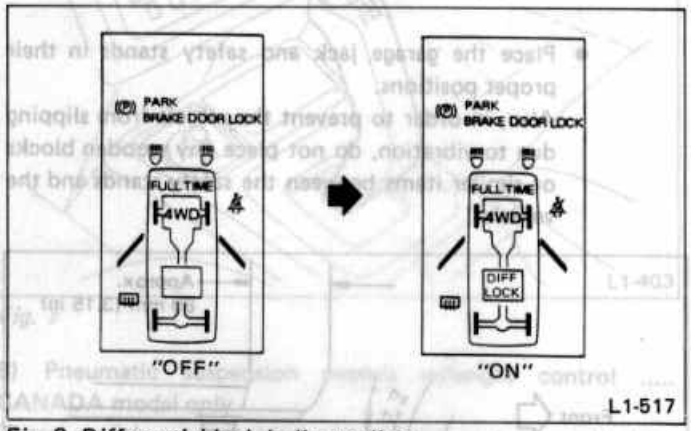



*Fig. 8 Differential lock indicator light*

- For safety, start in second gear. Never make any abrupt speed changes or maneuvers during the test.

(2) Adapter Method

① Equipment

- Speedometer tester ..... 1
- Wheel blocks ..... 2
- ADAPTER (499827100) ..... 1

**Since the speedometer detector is on the engine side of the center differential, if the front wheels are locked, the vehicle's speedometer will only indicate 1/2 the speed of the rear wheels. Thus, an adapter which doubles the speed is necessary.**

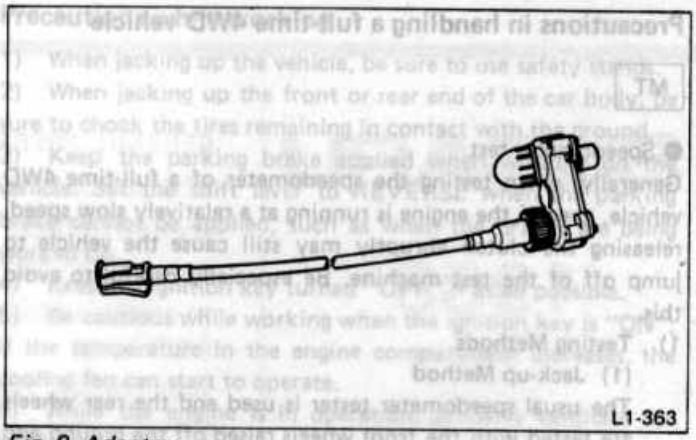



*Fig. 9 Adapter*

② Precautions

- Do the testing with the differential lock cancelled. Confirmation that the differential lock is cancelled can be done with the differential lock indicator light, but for this test, confirm with actual driving that there is no braking phenomenon when turning sharp corners at low speed.

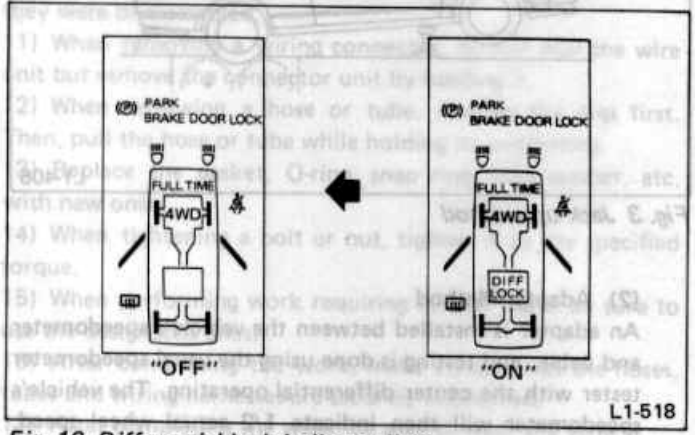



*Fig. 10 Differential lock indicator light*

- Since the vehicle speedometer indicates 1/2 the actual speed of the rotating wheels, be certain to install an ADAPTER (499827100).

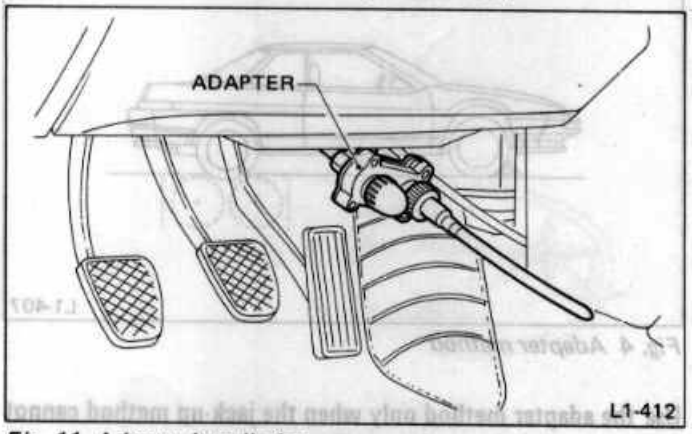



*Fig. 11 Adapter installation*

- Do the test with the rear wheels on the speedometer tester rollers.

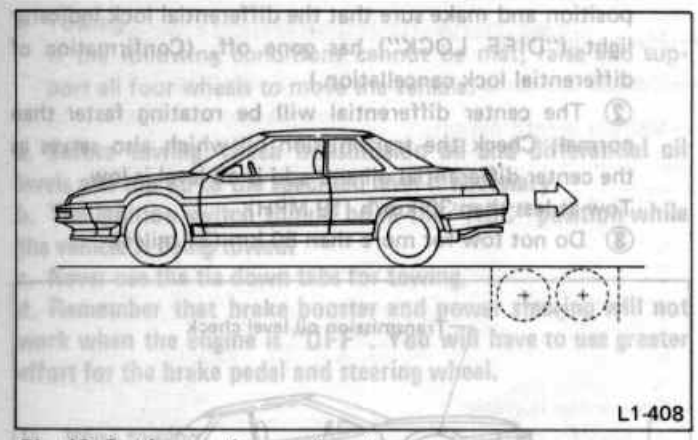



*Fig. 12 Setting on the speedometer tester*

- In order to prevent the vehicle from jumping off the tester, be certain to apply the parking brake and place wheel blocks in front of the front wheels. Also, make sure that nobody goes in front of the vehicle.

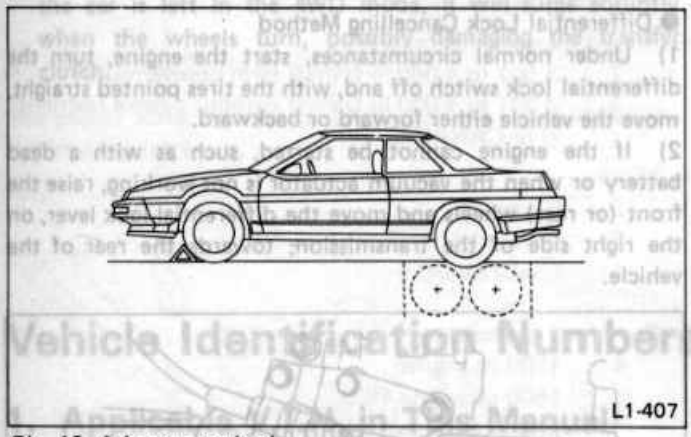



*Fig. 13 Adapter method*

- For safety, start in second gear. Never make any abrupt speed changes or maneuvers during the test.
- The center differential will be rotating faster than normal. Check the transmission oil which also serves as the center differential oil and add if oil level is low.
- Keep maximum speed below 50 km/h (31 MPH) and for less than 1 minute.

③ Adapter Installation Procedures

a. Disconnect the speedometer cable from the speedometer.

b. Connect the speedometer cable to the ADAPTER gear box.

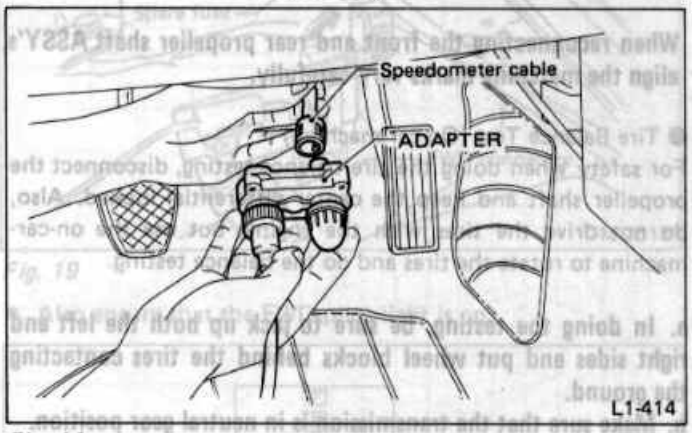



*Fig. 14*

c. Connect the speedometer to the ADAPTER speedometer cable.

**Place the cable so that it does not get in the way when depressing the accelerator pedal.**

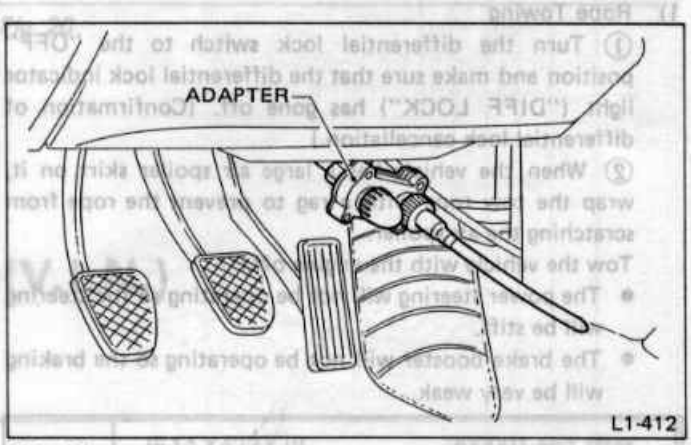



*Fig. 15*

● Brake Test

When using the brake tester, do so with the differential lock cancelled. Turn the differential lock switch off and make sure that the differential lock indicator light ("DIFF LOCK") has gone off.

● Chassis Dynamometer Test

The propeller shaft must be removed and the vehicle made into front wheel drive. To undo the propeller shaft, do not disconnect the front propeller shaft ASSY. Only disconnect the rear propeller shaft ASSY and lock the center differential.

**When reconnecting the front and rear propeller shaft ASSY's, align the matching marks very carefully.**

● Tire Balance Test (On-car-machine)

For safety when doing the tire balance testing, disconnect the propeller shaft and keep the center differential locked. Also, do not drive the tires with the engine, but use the on-car-machine to rotate the tires and do the balance testing.

**a. In doing the testing, be sure to jack up both the left and right sides and put wheel blocks behind the tires contacting the ground.**
**b. Make sure that the transmission is in neutral gear position.**

● Towing

If the following conditions cannot be met, raise and support all four wheels to move the vehicle.

**a. Before towing, check transmission oil and differential oil levels and top up to the specified level if necessary.**
**b. The ignition switch should be in the "ACC" position while the vehicle is being towed.**

1) Rope Towing

① Turn the differential lock switch to the "OFF" position and make sure that the differential lock indicator light ("DIFF LOCK") has gone off. (Confirmation of differential lock cancellation.)

② When the vehicle has a large air spoiler skirt on it, wrap the tow rope with a rag to prevent the rope from scratching the air spoiler.

Tow the vehicle with the engine off.

- The power steering will not be operating so the steering will be stiff.
- The brake booster will not be operating so the braking will be very weak.

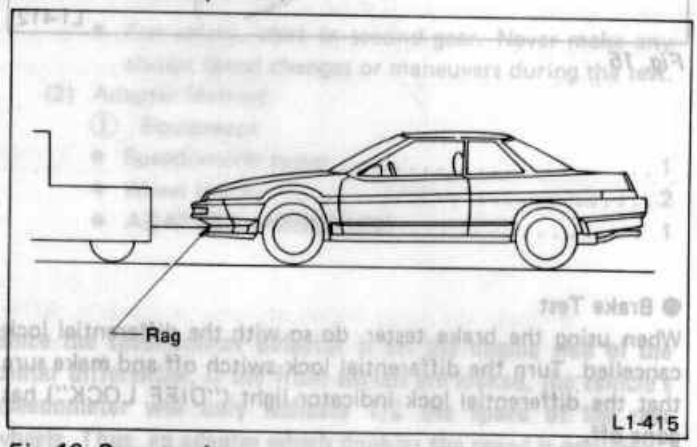



*Fig. 16 Rope towing*

2) Towing with Front Wheels Raised

① Turn the differential lock switch to the "OFF" position and make sure that the differential lock indicator light ("DIFF LOCK") has gone off. (Confirmation of differential lock cancellation.)

② The center differential will be rotating faster than normal. Check the transmission oil which also serves as the center differential oil and add if oil level is low.

Tow at less than 30 km/h (19 MPH).

③ Do not tow for more than 50 km (31 miles).

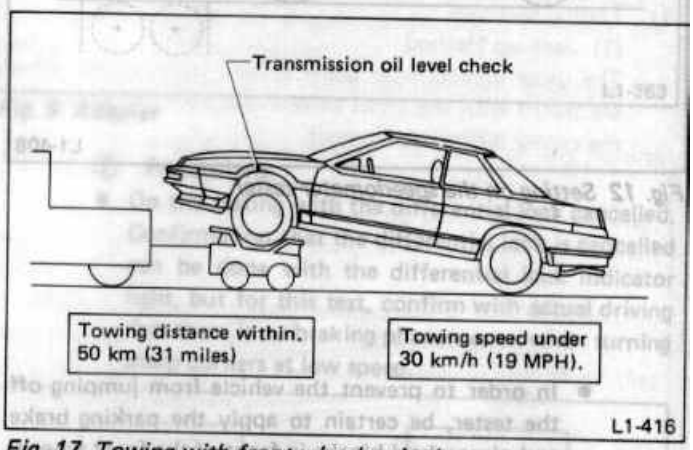



*Fig. 17 Towing with front wheels raised*

● Differential Lock Cancelling Method

1) Under normal circumstances, start the engine, turn the differential lock switch off and, with the tires pointed straight, move the vehicle either forward or backward.

2) If the engine cannot be started, such as with a dead battery or when the vacuum actuator is not working, raise the front (or rear) wheels and move the differential lock lever, on the right side of the transmission, towards the rear of the vehicle.

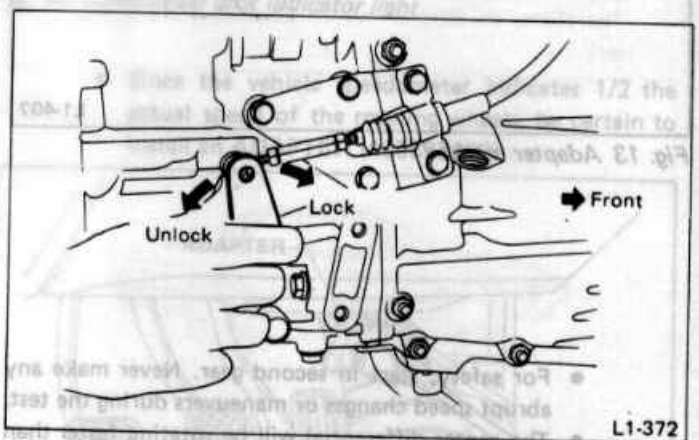



*Fig. 18 Differential lock lever operation*

AT

- Towing
  If the following conditions cannot be met, raise and support all four wheels to move the vehicle.

**a. Before towing, check transmission oil and differential oil levels and top up to the specified level if necessary.**
**b. The ignition switch should be in the "ACC" position while the vehicle is being towed.**
**c. Never use the tie down tabs for towing.**
**d. Remember that brake booster and power steering will not work when the engine is "OFF". You will have to use greater effort for the brake pedal and steering wheel.**

1) Rope towing
   (1) Place the selector lever "N" position and put a spare fuse inside the FWD connector.
   (2) Tow at less than 30 km/h (20 MPH).
   (3) Do not tow for more than 10 km (6 miles).

- Before checking or servicing the car with the front wheels raised or on rollers (brake tester, chassis dynamometer, etc.), always set the car in the FWD mode.
  To set the car in the FWD mode, disconnect the 4WD circuit by inserting a fuse in the FWD connector inside the engine compartment. Also chock the rear wheels firmly. If the car is left in the 4WD mode, it will surge abruptly when the wheels turn, possibly damaging the transfer clutch.

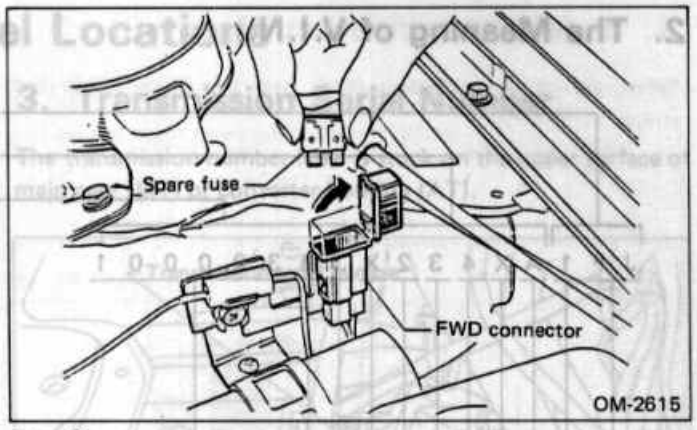



*Fig. 19*

- Also ensure that the FWD pilot light is on.

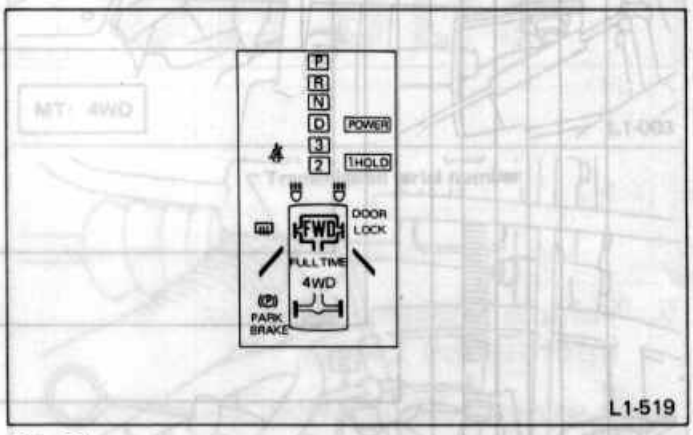



*Fig. 20*

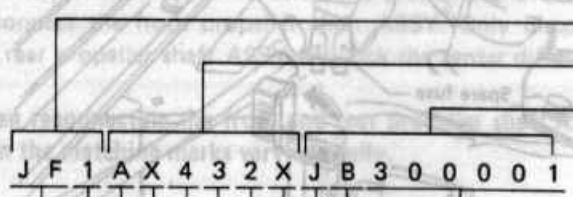
# Vehicle Identification Numbers (V.I.N.)

## 1. Applicable V.I.N. in This Manual

| | | | |
|---|---|---|---|
| 1800 cc Engine | DL (MPFI, 5MT) | JF1AX422XJB | 300001 and after |
| | GL (MPFI, 5MT) | JF1AX432*1XJB | 300001 and after |
| | GL (MPFI, 4AT) | JF1AX432*1XJC | 300001 and after |
| | 4WD GL (MPFI, 5MT, Single-range) | JF1*2AX732*1XJD | 300001 and after |
| 2700 cc Engine | XT6 (MPFI, 4AT) | JF1AX842*1XJC | 300001 and after |
| | FULL TIME 4WD XT6 (MPFI, 5MT, Single-range) | JF1*2AX942*1XJG | 300001 and after |
| | FULL TIME 4WD XT6 (MPFI, 4AT) | JF1*2AX942*1XJH | 300001 and after |

*1: For CANADA, "B" instead of "2"
*2: For CANADA, "2" instead of "1"

## 2. The Meaning of V.I.N.




- Maker identifier
- Vehicle attribute
- Vehicle identification
- Sequential number
  - 300001 and after
- Plant of manufacture and transmission type
  - B : Gunma manufacture – 5MT
  - C : Gunma manufacture – AT
  - D : Gunma manufacture – 4WD 5MT
  - G : Gunma manufacture – Full-time 4WD MT
  - H : Gunma manufacture – Full-time 4WD AT
- Model year
  - J : 1988
- Check digit
  - 0 thru 9 and X, varies
- Weight class and restraint type
  - 2 : 3,001 to 4,000 lb GVWR with passive restraint
  - B : 3,001 to 4,000 lb GVWR without passive restraint (For CANADA)
- Model
  - 2 : DL model
  - 3 : GL model
  - 4 : GL-10 model
- Series and engine type
  - 4 : 1800 cc engine
  - 7 : 1800 cc engine 4WD (model equipped with air suspension)
  - 8 : 2700 cc engine
  - 9 : 2700 cc engine 4WD (model equipped with air suspension)
- Body type
  - X : XT
- Line
  - A : Fuji SUBARU L line
- Type of vehicle
  - 1 : Passenger car
  - 2 : Multipurpose passenger vehicle
- Manufacturer and make
  - Fuji Heavy Industries Ltd. SUBARU

# Identification Number and Label Locations

## 1. Vehicle Identification Number

The vehicle identification number is stamped on the bulkhead panel of the engine compartment.

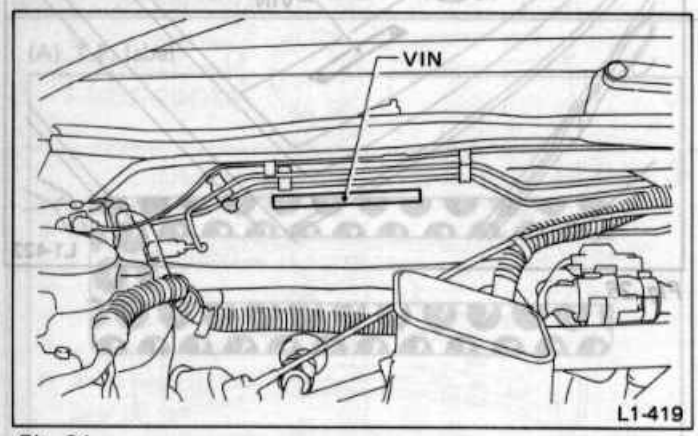



*Fig. 21*

## 2. Engine Serial Number

The engine serial number is stamped on the right side of the crankcase at the front.

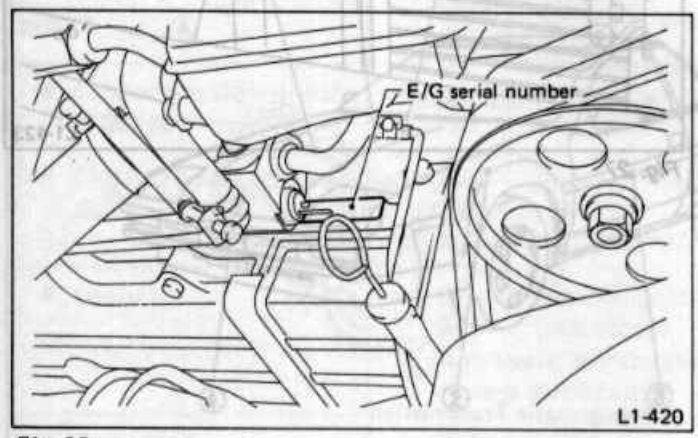
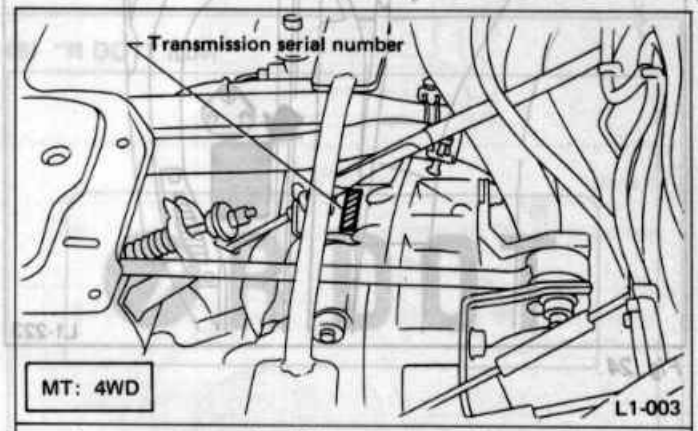
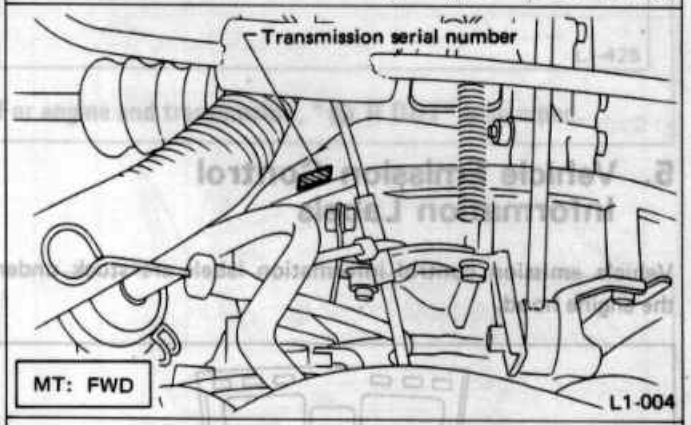



*Fig. 22*

## 3. Transmission Serial Number

The transmission number label is stuck on the upper surface of main case (MT) or converter housing (AT).



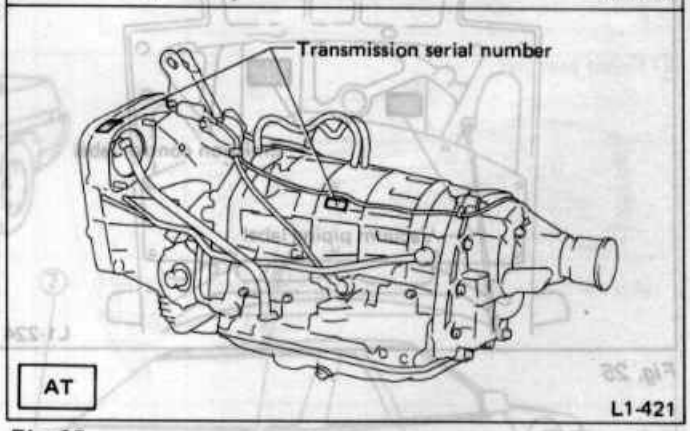




*Fig. 23*

**Engine, transmission and vehicle identification numbers are used for factory communications such as Technical information, Service bulletins and other information.**

## 4. Safety Certification Plate

Safety certification plate is stuck near the driver's side door striker.

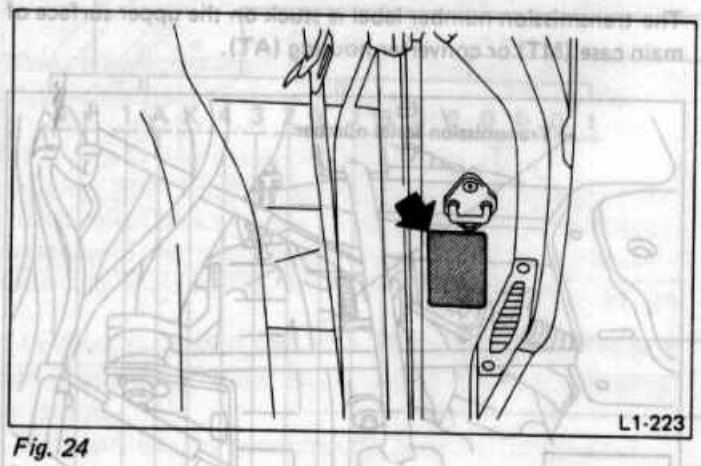



*Fig. 24*

## 5. Vehicle Emission Control Information Labels

Vehicle emission control information labels are stuck under the engine hood.

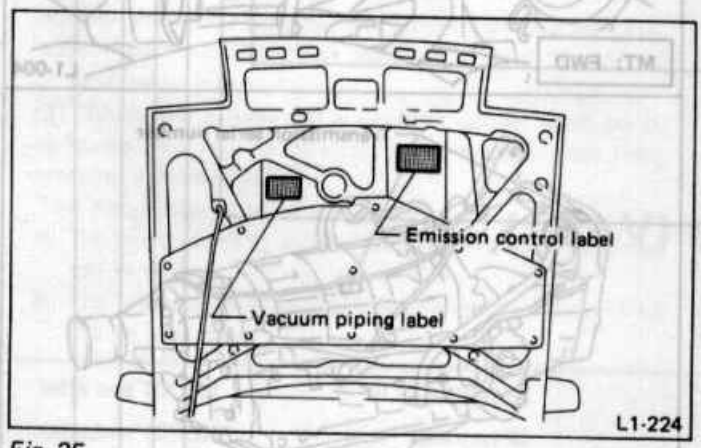



*Fig. 25*

## 6. Vehicle Identification Number Plate

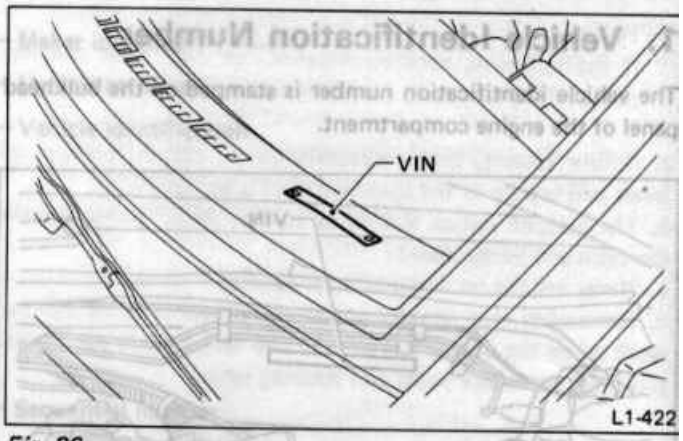



*Fig. 26*

## 7. Color Code Label

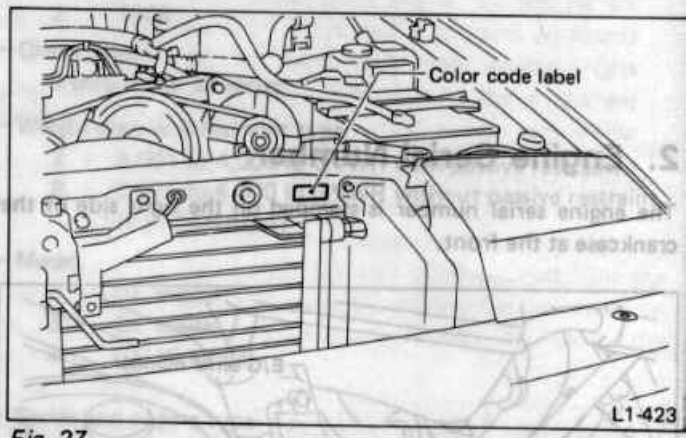


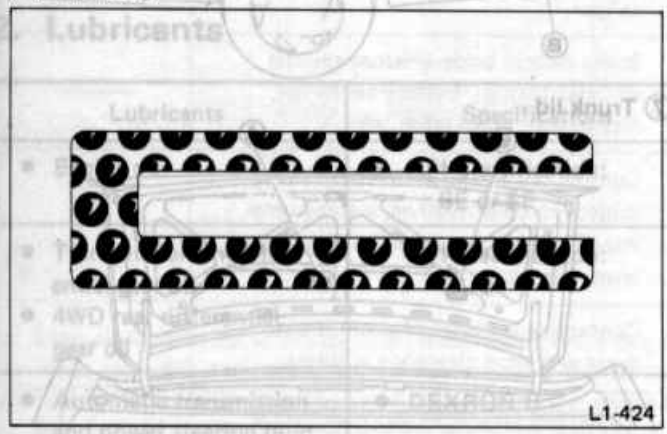

*Fig. 27*

# Theft Prevention

The Theft Prevention (T.P.) label is stuck or V.I.N. is stamped on the main line installed parts shown below.
Additionally, the "R DOT" label is stuck or " ❼ R DOT" is stamped on the main spare parts shown below.

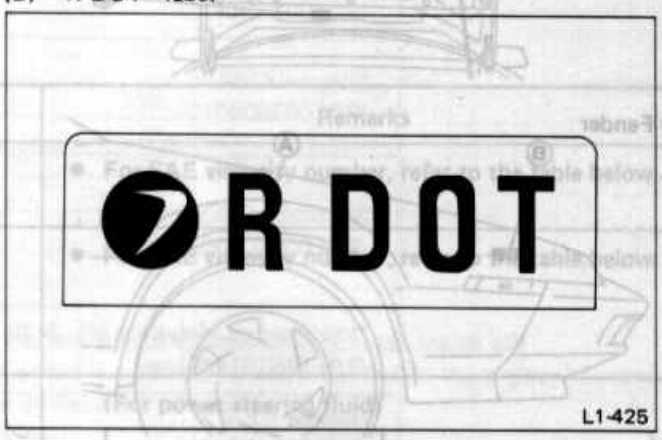
## 1. T.P. label and "R DOT" label

(A) T.P. label




For engine and transmission, "V.I.N." is stamped.

(B) "R DOT" label




For engine and transmission, "❼ R DOT" is stamped.

*Fig. 28*

## 2. Location

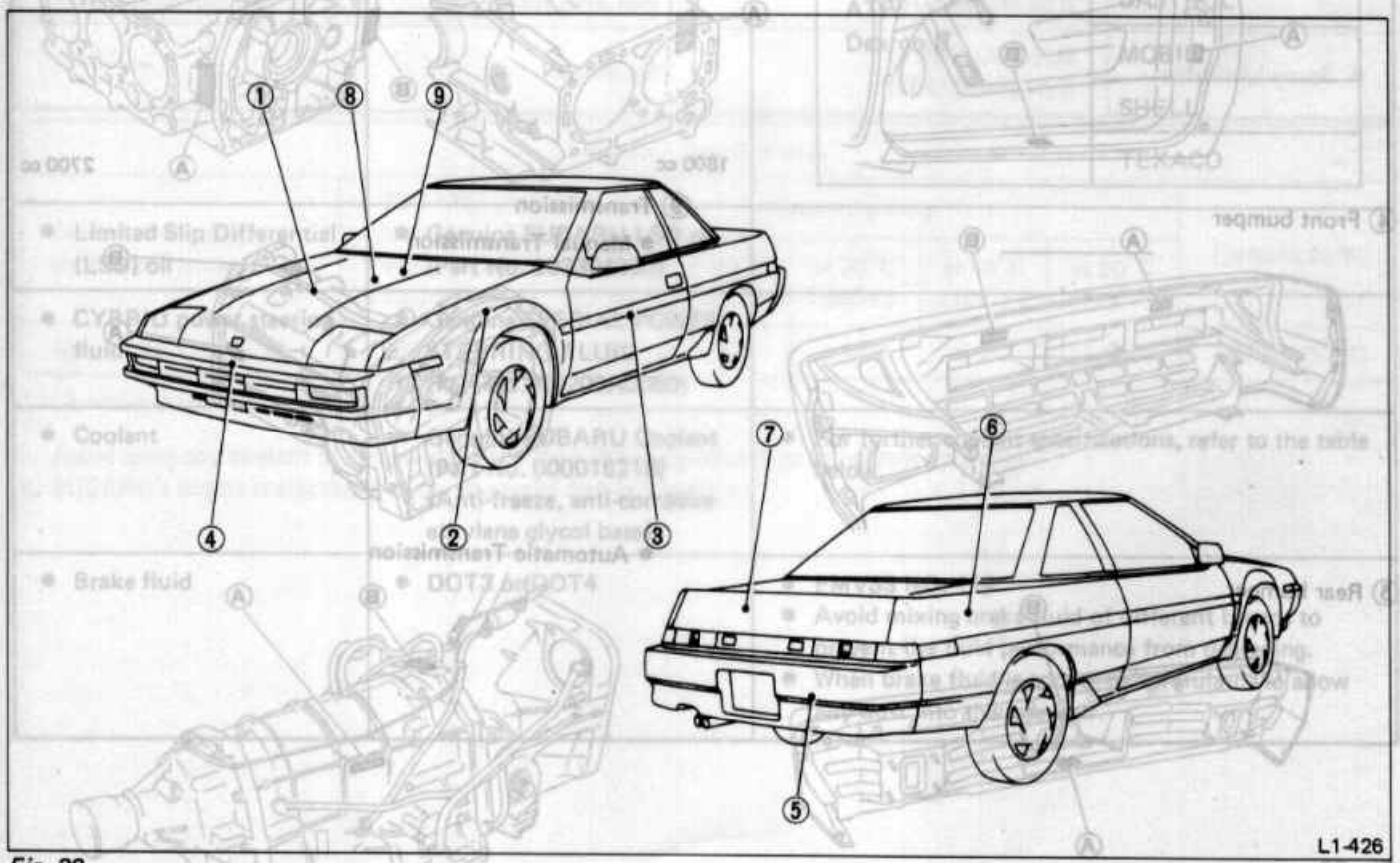
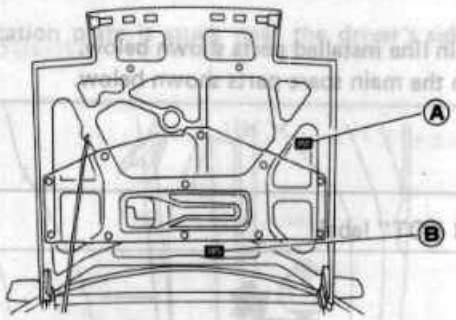
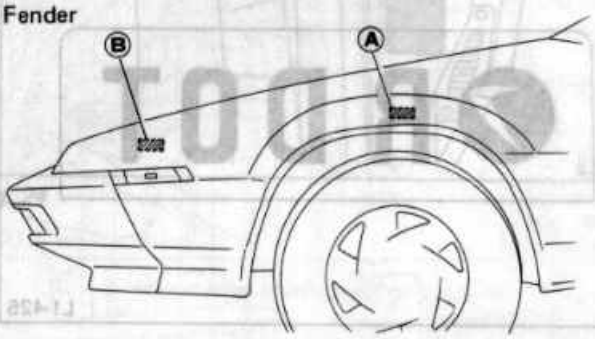



*Fig. 29*

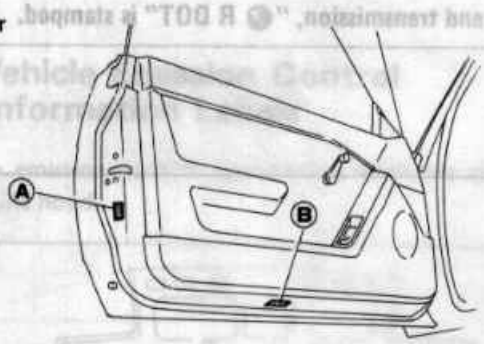
① Front hood



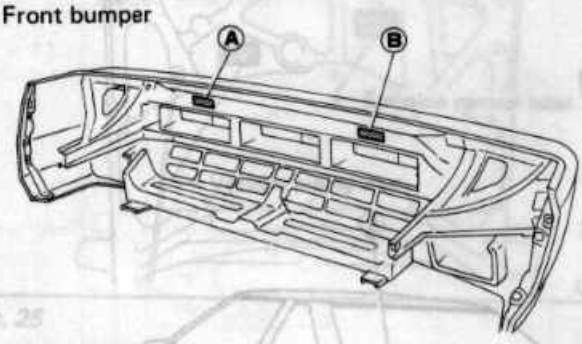

② Fender



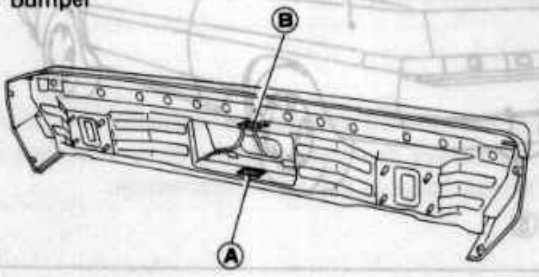

③ Door



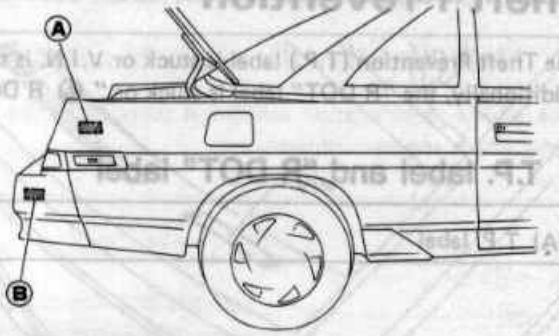

④ Front bumper



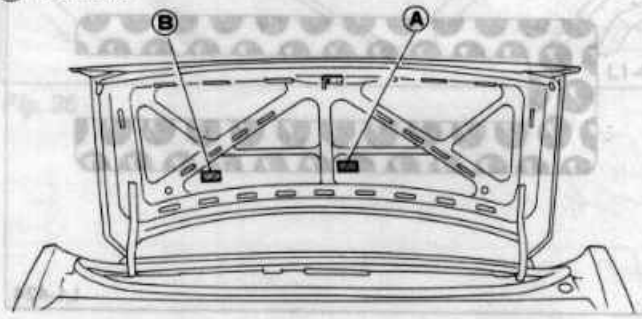

⑤ Rear bumper



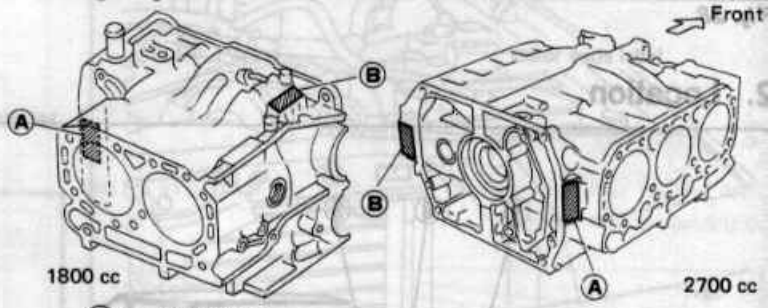

⑥ Rear quarter




⑦ Trunk lid

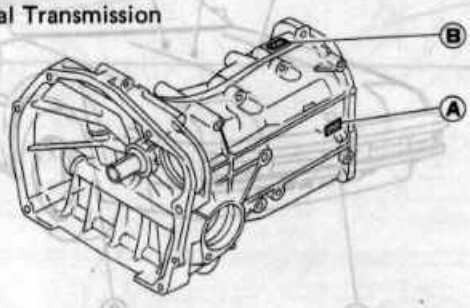



⑧ Engine




⑨ Transmission

• Manual Transmission




• Automatic Transmission

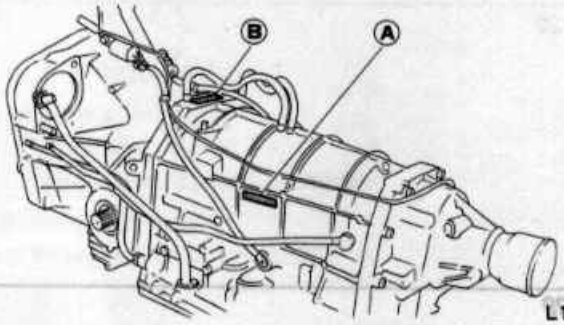



*Fig. 30*

L1-520

# Recommended Fuel, Lubricants, Sealants and Adhesives

## 1. Fuel

The SUBARU engine is designed to give satisfactory engine performance and low exhaust emissions by using gasoline of 87 octane or higher. (Average of Research Octane Number and Motor Octane Number.)

**Use unleaded gasoline only.**

## 2. Lubricants

<table>
<tr><th>Lubricants</th><th>Specifications</th><th>Remarks</th></tr>
<tr><td>• Engine oil</td><td>• API Classification: SE or SF</td><td>• For SAE viscosity number, refer to the table below.</td></tr>
<tr><td>• Transmission and differential gear oil<br>• 4WD rear differential gear oil</td><td>• API Classification: GL-5</td><td>• For SAE viscosity number, refer to the table below.</td></tr>
<tr><td>• Automatic transmission and power steering fluid</td><td>• DEXRON II</td><td>(For power steering fluid)
<table>
<tr><th>Recommended fluid</th><th>Manufacturer</th></tr>
<tr><td rowspan="6">ATF<br>Dexron II</td><td>B.P.</td></tr>
<tr><td>CALTEX</td></tr>
<tr><td>CASTROL</td></tr>
<tr><td>MOBIL</td></tr>
<tr><td>SHELL</td></tr>
<tr><td>TEXACO</td></tr>
</table></td></tr>
<tr><td>• Limited Slip Differential (LSD) oil</td><td>• Genuine SUBARU LSD oil (Part No. 003304300)</td><td>———</td></tr>
<tr><td>• CYBRID power steering fluid</td><td>• Genuine SPECIAL POWER STEERING FLUID (Part No. K0209A0080)</td><td>———</td></tr>
<tr><td>• Coolant</td><td>• Genuine SUBARU Coolant (Part No. 000016218) (Anti-freeze, anti-corrosive ethylene glycol base)</td><td>• For further coolant specifications, refer to the table below.</td></tr>
<tr><td>• Brake fluid</td><td>• DOT3 or DOT4</td><td>• FMVSS NO. 116<br>• Avoid mixing brake fluid of different brands to prevent the fluid performance from degrading.<br>• When brake fluid is added, be careful not to allow any dust into the reservoir.</td></tr>
</table>

| Lubricants | Recommended | Application | Equivalent |
|---|---|---|---|
| • Grease | FX clutch grease (P/N 000040901) | Splines of transmission main shaft. | ——— |
| | Molylex No. 2 (P/N 723223010) | BJ and DOJ joints of axle shafts. | ——— |
| | PBC (P/N 003607000) | Stopper plugs of the front disc brake caliper. | ——— |
| | Silicone KS64 (P/N 003606010) | Brake caliper body (Piston, spindle adjuster O-ring), battery terminals, distributor, hood latch, etc. | ——— |
| | Silicolube G-30M (P/N 004404002) | Control cables and carburetor linkages subject to cold weather, water-pump impeller, door latch, striker, battery terminals, etc. | ——— |
| | Dow Corning Molykote No. 7439 (P/N 725191460) | Contacting surfaces of drum brake shoes and shoe clearance adjuster. | ——— |
| | Niglube RX-2 (P/N 003606000) | Disc brake caliper (lever, connecting link and spindle head). | ——— |
| | Valiant grease M-2 (P/N 003608001) | Steering gearbox (Both manual and power steering) | ——— |
| | SUNLIGHT 2 (P/N 003602010) | Steering shaft bearing, bushing for gear shift system, etc. | ——— |
| • Spray lubricants | SUBARU CRC (P/N 004301003) | $O_2$ sensor. | ——— |

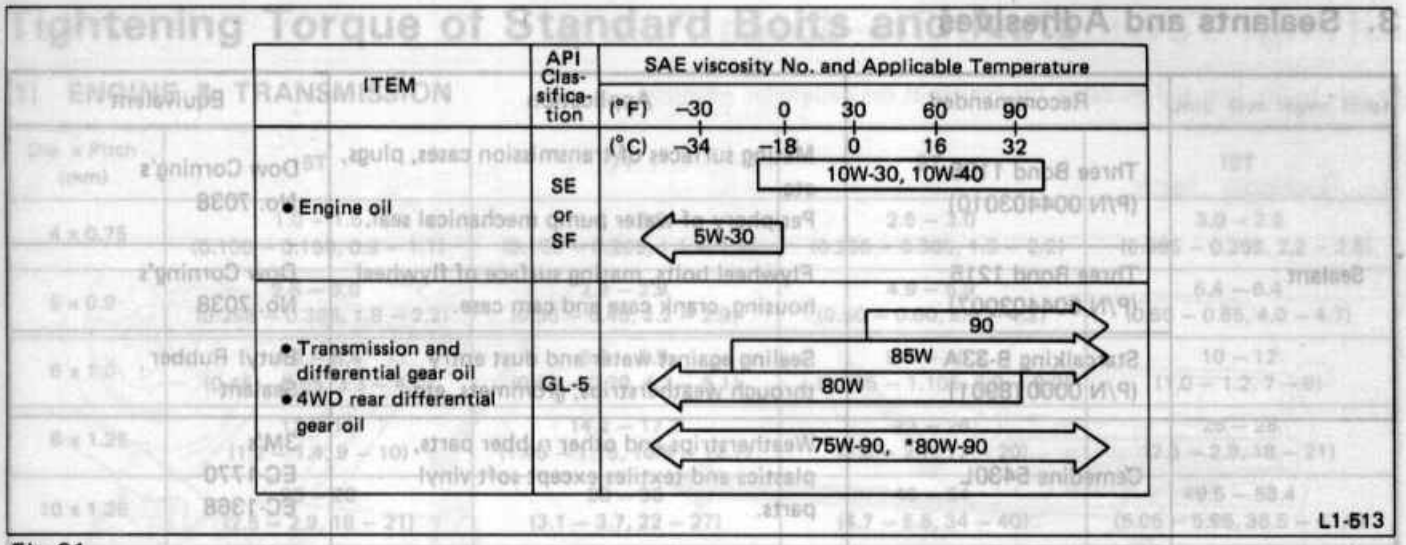



*Fig. 31*

**a. Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands. (Except engine oil)**
**b. When replacing engine oil, it does not matter if the oil to be added is a different brand from that in the engine, however use oil having the API classification and SAE viscosity No. designated by Subaru.**
**c. SAE 50W-30 is not recommended for sustained high speed driving.**
**d. If vehicle is used in desert areas or areas with very high temperatures or for other heavy duty applications, the following viscosity oils may be used:**

**30, 40, 10W-50, 20W-40, 20W-50**

**e. *For differential gear oil (AT)**

| Coolant Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lowest atmospheric anticipated temperature | SUBARU coolant-to-*water ratio (Volume) % | Specific gravity | | | | | Freezing point |
| | | at 10°C (50°F) | at 20°C (68°F) | at 30°C (86°F) | at 40°C (104°F) | at 50°C (122°F) | |
| Above -30°C (-22°F) | 50 – 50 | 1.078 | 1.074 | 1.069 | 1.063 | 1.057 | -36°C (-33°F) |

* It is recommended that distilled water be used.

**a. Avoid using any coolant or only water other than this designated type to prevent corrosion.**
**b. SUBARU's engine is aluminum alloy, so special care is necessary.**

## 3. Sealants and Adhesives

| | Recommended | Application | Equivalent |
|---|---|---|---|
| Sealant | Three Bond 1105 (P/N 004403010) | Mating surfaces of transmission cases, plugs, etc.<br>Periphery of water pump mechanical seal. | Dow Corning's No. 7038 |
| | Three Bond 1215 (P/N 004403007) | Flywheel bolts, mating surface of flywheel housing, crank case and cam case. | Dow Corning's No. 7038 |
| | Starcalking B-33A (P/N 000018901) | Sealing against water and dust entry through weatherstrips, grommets, etc. | Butyl Rubber Sealant |
| Adhesive | Cemedine 5430L | Weatherstrips and other rubber parts, plastics and textiles except soft vinyl parts. | 3M's EC-1770 EC-1368 |
| | Cemedine 540 | Soft vinyl parts, and other parts subject to gasoline, grease or oil (e.g., trim leather, gear shift boot, door inner remote cover, etc.). | 3M's EC-776 EC-847 EC-1022 (Spray Type) |
| | Cemedine 3000 | Bonding metals, glass, plastic and rubber parts. Repairing slightly torn weather-strips, etc. | Armstrong's Eastman 910 |
| | Essex Chemical Corp's Urethane E | Windshield to body panel. | — |

# Tightening Torque of Standard Bolts and Nuts

## (1) ENGINE & TRANSMISSION

Unit: N·m (kg-m, ft-lb)

| Dia. x Pitch (mm) | 5T | 7T | 9T | 10T |
|---|---|---|---|---|
| 4 x 0.75 | 1.0 – 1.5 (0.105 – 0.155, 0.8 – 1.1) | 1.5 – 2.0 (0.155 – 0.205, 1.1 – 1.5) | 2.5 – 3.0 (0.255 – 0.305, 1.8 – 2.2) | 3.0 – 3.5 (0.305 – 0.355, 2.2 – 2.6) |
| 5 x 0.9 | 2.5 – 3.0 (0.255 – 0.305, 1.8 – 2.2) | 2.9 – 3.9 (0.30 – 0.40, 2.2 – 2.9) | 4.9 – 5.9 (0.50 – 0.60, 3.6 – 4.3) | 5.4 – 6.4 (0.55 – 0.65, 4.0 – 4.7) |
| 6 x 1.0 | 4.4 – 5.4 (0.45 – 0.55, 3.3 – 4.0) | 5.9 – 6.9 (0.60 – 0.70, 4.3 – 5.1) | 9.4 – 10.8 (0.955 – 1.105, 6.9 – 8.0) | 10 – 12 (1.0 – 1.2, 7 – 9) |
| 8 x 1.25 | 12 – 14 (1.2 – 1.4, 9 – 10) | 14.2 – 17.2 (1.45 – 1.75, 10.5 – 12.7) | 23 – 26 (2.3 – 2.7, 17 – 20) | 25 – 28 (2.5 – 2.9, 18 – 21) |
| 10 x 1.25 | 25 – 28 (2.5 – 2.9, 18 – 21) | 30 – 36 (3.1 – 3.7, 22 – 27) | 46 – 54 (4.7 – 5.5, 34 – 40) | 49.5 – 58.4 (5.05 – 5.95, 36.5 – 43.0) |
| 12 x 1.5 | 41 – 49 (4.2 – 5.0, 30 – 36) | 53 – 63 (5.4 – 6.4, 39 – 46) | 84 – 98 (8.6 – 10.0, 62 – 72) | 88 – 106 (9.0 – 10.8, 65 – 78) |
| 14 x 1.6 | 71 – 84 (7.2 – 8.6, 52 – 62) | 88 – 106 (9.0 – 10.8, 65 – 78) | 139 – 165 (14.2 – 16.8, 103 – 122) | 147 – 175 (15.0 – 17.8, 108 – 129) |

## (2) BODY

Unit: N·m (kg-m, ft-lb)

| | Dia. (mm) | 4T | 7T | 9T |
|---|---|---|---|---|
|  TC-002 *Fig. 32* | 4 | 1.7 – 2.6 (0.17 – 0.27, 1.2 – 2.0) | | |
| | 5 | 2.9 – 5.9 (0.30 – 0.60, 2.2 – 4.3) | | |
| | 6 | 5.4 – 9.3 (0.55 – 0.95, 4.0 – 6.9) | | |
| | 8 | 12.7 – 22.6 (1.30 – 2.30, 9.4 – 16.6) | 22.6 – 42.2 (2.30 – 4.30, 16.6 – 31.1) | 31.4 – 51.0 (3.20 – 5.20, 23.1 – 37.6) |
| | 10 | 27.5 – 47.1 (2.80 – 4.80, 20.3 – 34.7) | 51.0 – 86.3 (5.20 – 8.80, 37.6 – 63.7) | 62.8 – 107.9 (6.40 – 11.00, 46.3 – 79.6) |
| | 12 | 52.0 – 85.3 (5.30 – 8.70, 38.3 – 62.9) | 88.3 – 156.9 (9.00 – 16.00, 65.1 – 115.7) | 117.7 – 196.1 (12.00 – 20.00, 86.8 – 144.7) |
|  TC-003 *Fig. 33* Including bolt or nut with washer or spring washer only | 4 | 1.2 – 2.2 (0.12 – 0.22, 0.9 – 1.6) | | |
| | 5 | 2.5 – 4.4 (0.25 – 0.45, 1.8 – 3.3) | | |
| | 6 | 4.4 – 7.4 (0.45 – 0.75, 3.3 – 5.4) | | |
| | 8 | 9.8 – 17.7 (1.00 – 1.80, 7.2 – 13.0) | 17.7 – 31.4 (1.80 – 3.20, 13.0 – 23.1) | 23.5 – 39.2 (2.40 – 4.00, 17.4 – 28.9) |
| | 10 | 22.6 – 36.3 (2.30 – 3.70, 16.6 – 26.8) | 37.3 – 66.7 (3.80 – 6.80, 27.5 – 49.2) | 48.1 – 83.4 (4.90 – 8.50, 35.4 – 61.5) |
| | 12 | 39.2 – 64.7 (4.00 – 6.60, 28.9 – 47.7) | 68.6 – 117.7 (7.00 – 12.00, 50.6 – 86.8) | 88.3 – 147.1 (9.00 – 15.00, 65.1 – 108.5) |

**The mark is embossed on the bolt head as follows:**

**4T —— 4** **9T —— 9**
**5T —— 5** **10T —— 10**
**7T —— 7**

# Lifting, Towing and Tie-down Points

**Be sure to lift, tow and tie-down the vehicle at the designated positions.**

## 1. Garage Jack

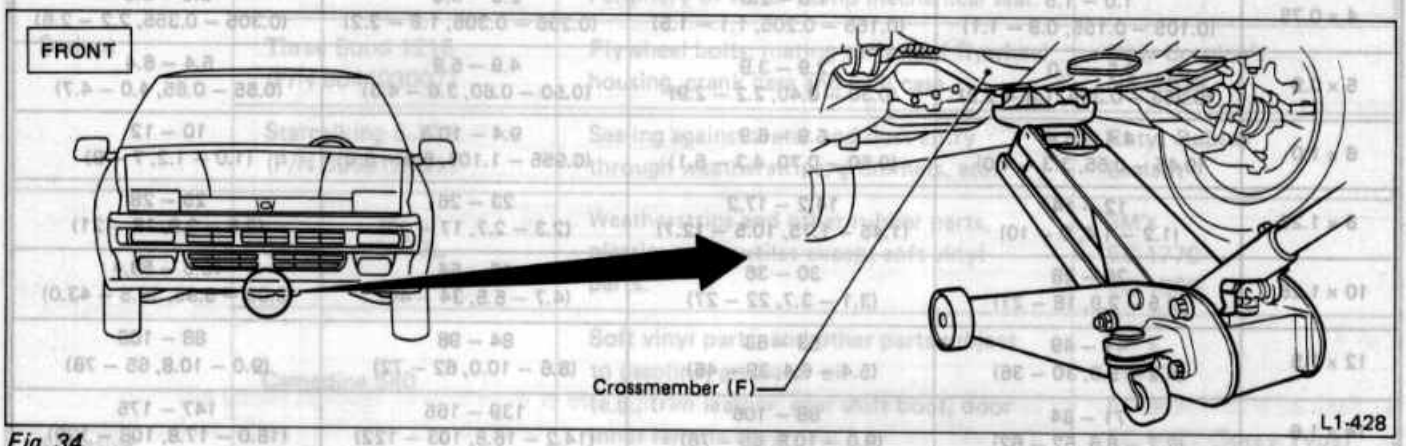



*Fig. 34*

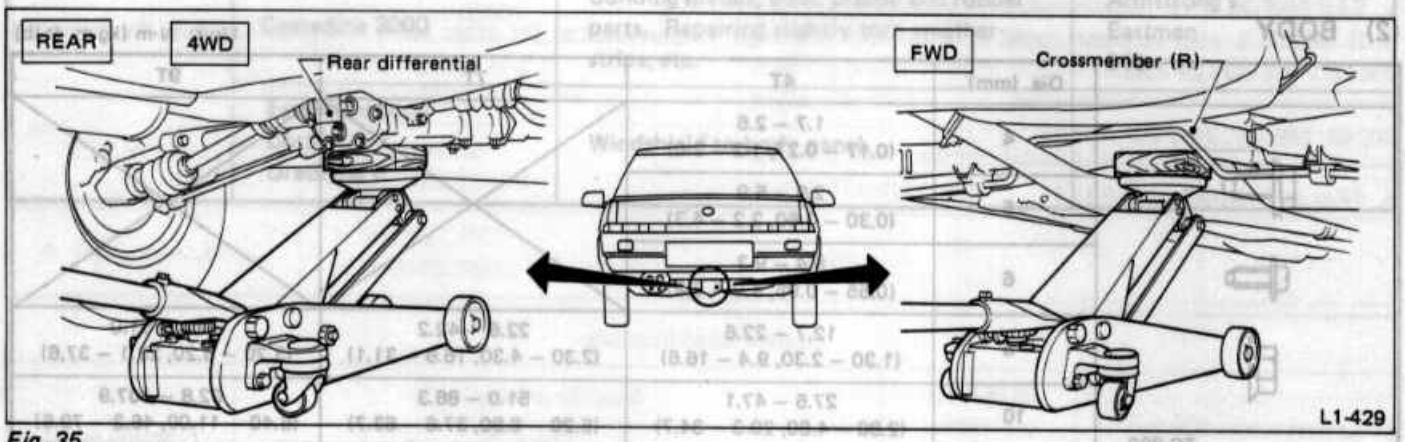



*Fig. 35*

**a. When jacking up the vehicle, place chocks to hold wheels.**
**b. After jacking up the vehicle with garage jack, be sure to support the vehicle with safety stands for safety.**

## 2. Pantograph Jack

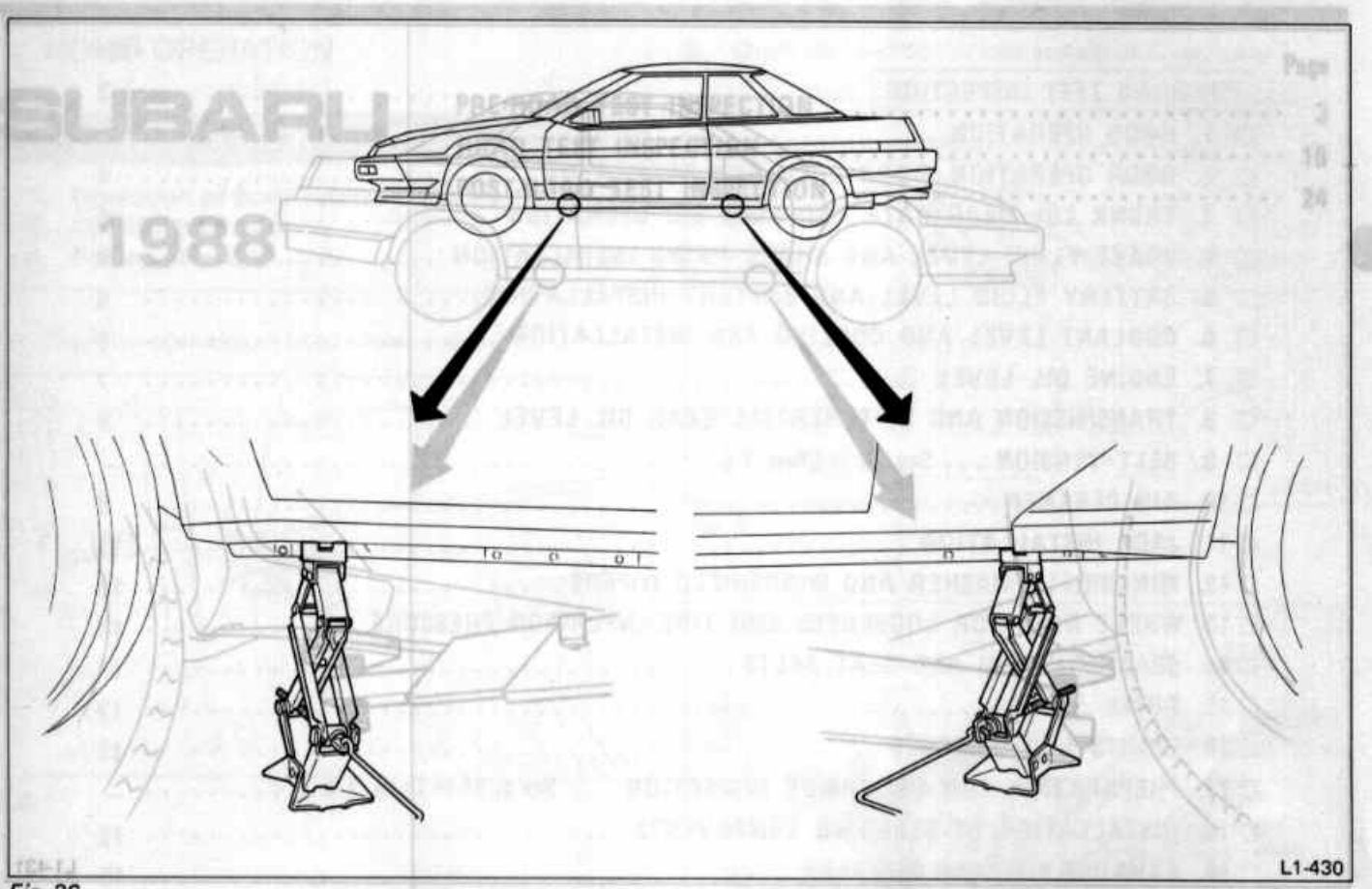
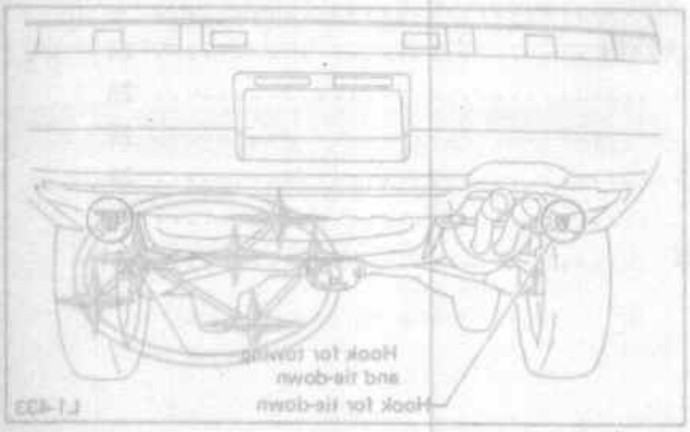



*Fig. 36*

**a. Never get under the vehicle while it is supported only by the jack. Always use safety stands to support body when you have to get under the car.**
**b. Block the wheels diagonally using wheel chocks.**
**c. Make sure the jack is set at the correct position on the flange of side sill.**
**d. Be careful not to set the jack at the air flap portion.**



## 3. Safety Stand

**Be sure to lift vehicle at the same four positions as those of pantograph jack.**

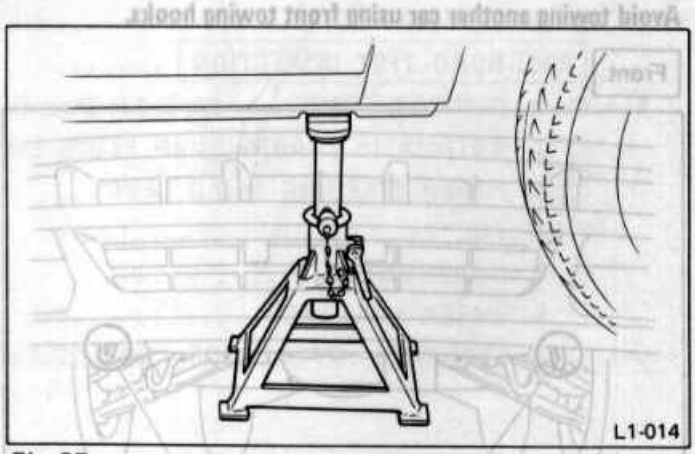



*Fig. 37*

## 4. Lift

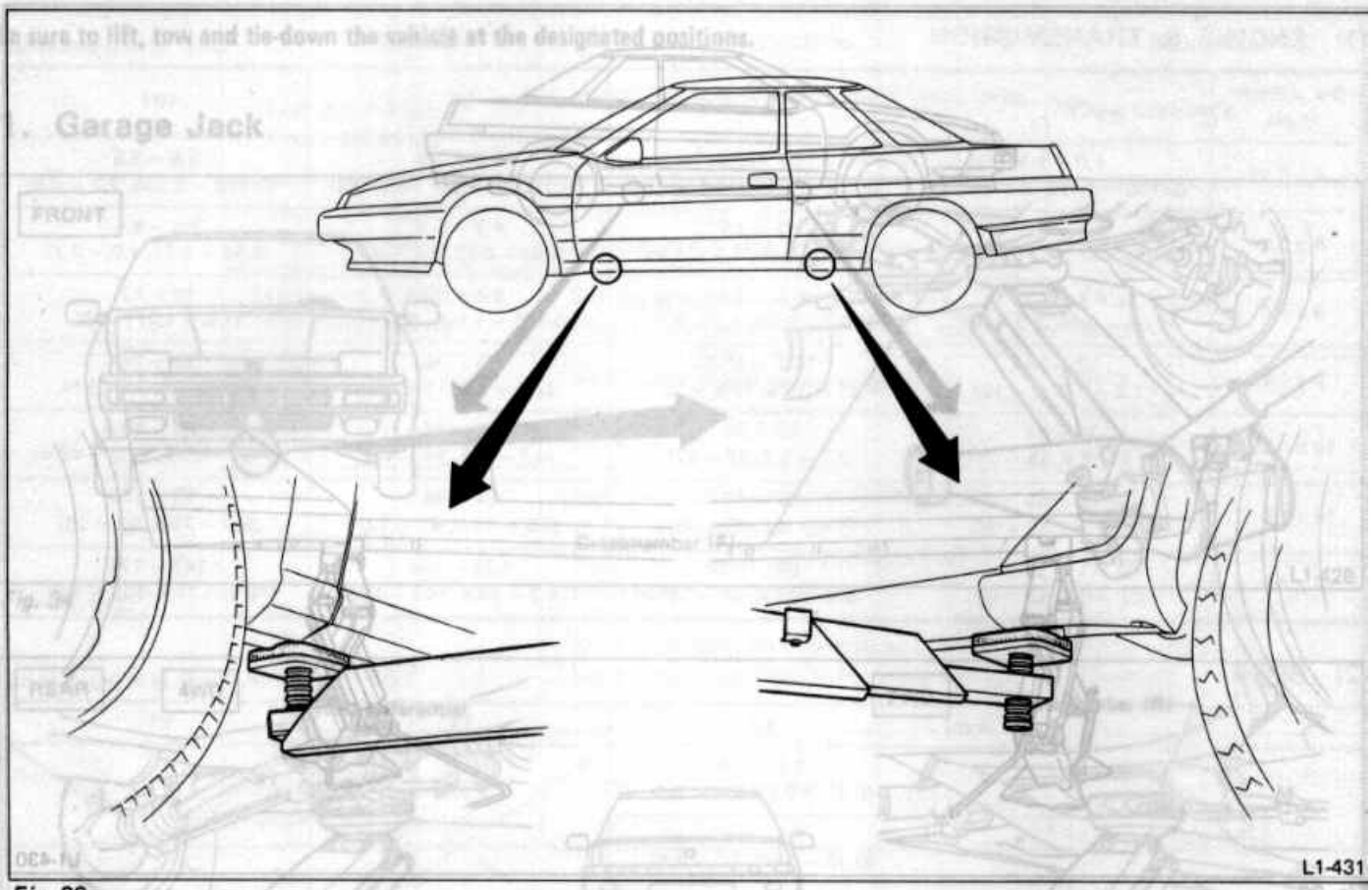



*Fig. 38*

**a. Be sure to lift vehicle at the same four positions as those of pantograph jack.**
**b. Be careful not to set the lift at the air flap portion.**

## 5. Towing and Tie-down Hooks

**Avoid towing another car using front towing hooks.**

Front

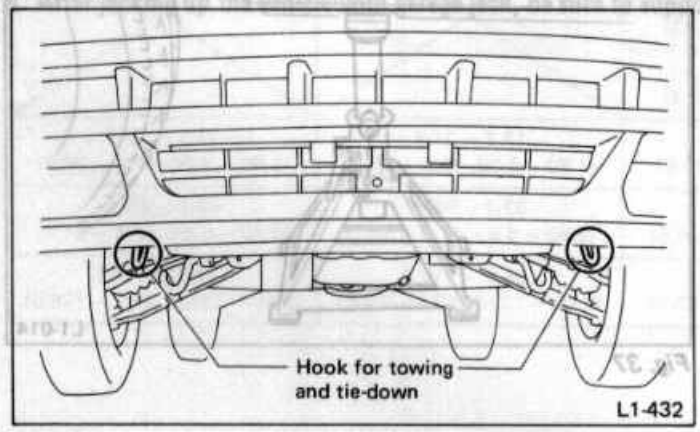



*Fig. 39*

Rear

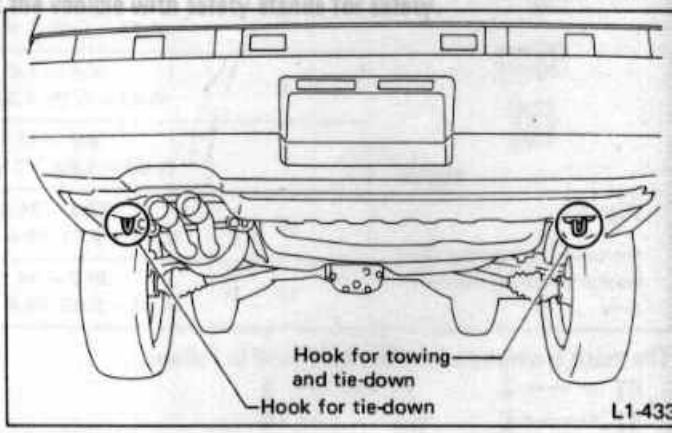



*Fig. 40*