

# **BACKUP**

# **Service Manual**

# **LASER TALON**

## **1991**

### **Volume-1 Engine, Chassis & Body**

### **FOREWORD**

This Service Manual has been prepared with the latest service information available at the time of publication. It is subdivided into various group categories and each section contains diagnosis, disassembly, repair, and installation procedures along with complete specifications and tightening references. Use of this manual will aid in properly performing any servicing necessary to maintain or restore the high levels of performance and reliability designed into these outstanding vehicles.

This BACKUP DSM manual is to be used ONLY as a BACKUP. Please DO NOT REDISTRIBUTE WHOLE SECTIONS. This BACKUP was sold to you under the fact that you do indeed OWN a GENUINE DSM MANUAL. It CANNOT BE considered a REPLACEMENT (Unless your original manual was lost or destroyed.)

Please See README.TXT or README.HTML for additional information

Thank you. Gimmiemymanual@hotmail.com



## **CHRYSLER CORPORATION**

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**NOTE:** For Electrical, refer to Volume-2 "Electrical".

## HOW TO USE THIS MANUAL

N00BAAZ

### CONTENTS

The preceding page contains GROUP INDEX which lists the group title and group number.

### PAGE NUMBERS

All page numbers consist of two sets of digits separated by a dash. The digits preceding the dash identify the number of the group. The digits following the dash represent the consecutive page number within the group. The page numbers can be found on the top left or right of each page.

### TEXT

Unless otherwise specified, each service procedure covers all models. Procedures covering specific models are identified by the model codes, or similar designation (engine type, transaxle type, etc.). A description of these designations is covered in this unit under "VEHICLE IDENTIFICATION".

### TROUBLESHOOTING

Troubleshootings are classified into master troubleshooting and group troubleshooting and located as follows:

The master troubleshooting is prepared when the trouble symptom relates to two or more groups and given in MASTER TROUBLESHOOTING.

The group troubleshooting guide is prepared for causes of problems related to that individual group only; a troubleshooting guide is prepared for each appropriate group.

### SERVICE PROCEDURES

The service steps are arranged in numerical order and attentions to be paid in performing vehicle service are described in detail in SERVICE POINTS.

### DEFINITION OF TERMS

#### STANDARD VALUE

Indicates the value used as the standard for judging the quality of a part or assembly on inspection or the value to which the part or assembly is corrected and adjusted. It is given by tolerance.

#### LIMIT

Shows the standard for judging the quality of a part or assembly on inspection and means the maximum or minimum value within which the part or assembly must be kept functionally or in strength. It is a value established outside the range of standard value.

Indicates tightening torque.

Repair kit or set parts are shown. (Only very frequently used parts are shown.)

Removal steps : The numbers before part name correspond to numbers in the illustration, and indicate the order of removal.

Disassembly steps : The numbers before part name correspond to numbers in the illustration, and indicate the order of disassembly.

Installation steps : This is provided if installation cannot be made in the reverse order of "Removal steps"; omitted if installation in the reverse order of "Removal steps" is possible.

Reassembly steps : This is provided if reassembly cannot be made in the reverse order of "Disassembly steps"; omitted if reassembly in the reverse order of "Disassembly steps" is possible.

#### Classification of SERVICE POINTS

- ◀▶ : Removal
- 4 : Installation
- ▶◀ : Disassembly
- ◆◆ : Reassembly

### MODEL INDICATIONS

The following abbreviations are used in this manual for classification of model types.

M/T: Indicates the manual transaxle, or models equipped with the manual transaxle.

A/T: Indicates the automatic transaxle, or models equipped with the automatic transaxle.

MPI: Indicates the multi-point injection, or engines equipped with the multi-point injection.

SOHC: Indicates an engine with the single overhead camshaft, or a model equipped with such an engine.

DOHC: Indicates an engine with the double overhead camshaft, or a model equipped with such an engine.

Turbo: Indicates an engine with turbocharger, or a model equipped with such an engine.

Non-Turbo: Indicates an engine without turbocharger, or a model equipped with such an engine.

FWD: Indicates the front wheel drive vehicles.

AWD: Indicates the all wheel drive vehicles.

ABS: Indicates the anti-lock braking system or models equipped with the anti-lock braking system.



Page number

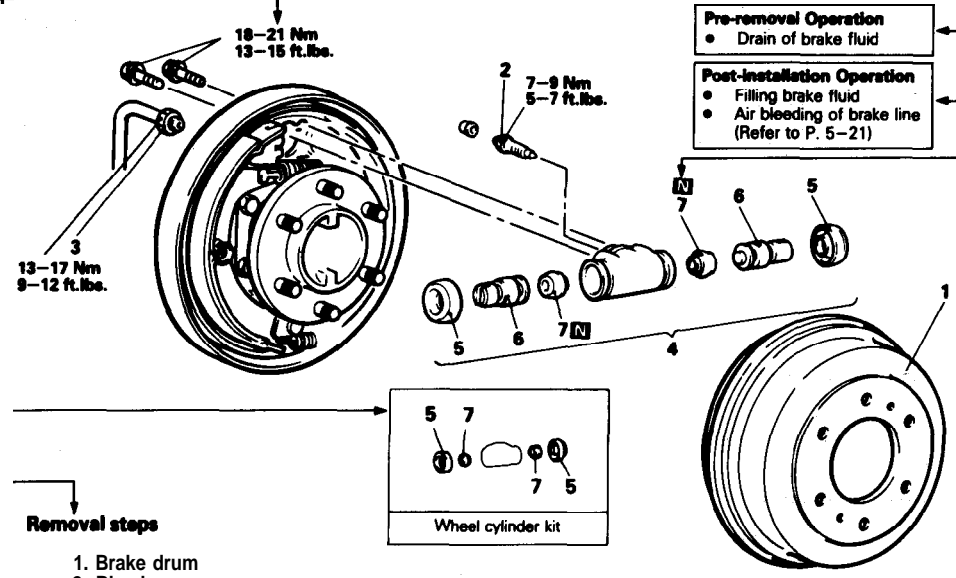
Group title

Section title

Indicates the incidental operation to be performed before removal or after installation

**5-44** **BRAKES—Rear Brake Wheel Cylinder**

**REAR BRAKE WHEEL CYLINDER  
REMOVAL AND INSTALLATION**



**Removal steps**

1. Brake drum
2. Bleeder screw
3. Brake tube connection
- \* 4. Wheel cylinder assembly
- e 5. Wheel cylinder boot
- + 6. Piston assembly
- 7. Piston cup

**NOTE**

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) • \*: Refer to "Service Points of Installation".

**SERVICE POINTS REMOVAL**

**-7. REMOVAL OF PISTON CUP**

Using a screwdriver, remove the piston cup from the piston.

**INSPECTION**

Check the following points, and if there is any abnormality, replace the entire wheel cylinder assembly.

- (1) Check piston and wheel cylinder walls for rust or damage.
- (2) Check clearance between the cylinder and the piston.  
Measure in two perpendicular directions to figure the clearance between the wheel cylinder inner diameter (max.value) and the piston outer diameter (min.value).

**Limit** : 0.15 mm (.0059 in.)

**NOTE**

If the difference is more than the limit, replace the piston and wheel cylinder as an assembly.

Indicates non-reusable part.

This number corresponds to the number in "Removal steps", "Disassembly steps", "Installation steps" or "Reassembly steps".

An explanation of procedures, notes, etc. regarding removal, installation, disassembly and reassembly.

EXPLANATION OF THE TROUBLESHOOTING GUIDE

**3. Checking the passenger compartment-temperature sensor, outside-air sensor, air-thermostat sensor and refrigerant-temperature sensor circuits**

**Operation description**  
 A negative-characteristic thermistor is employed for each sensor in order to convert the ambient temperature of the sensor part to resistance. The sensor power-supply (25V) of the air-conditioner unit is applied to the terminals (16), (15), (17) (5) divided by the resistance R.

**Troubleshooting hints**  
 Diagnosis  
 No. 11: The passenger compartment-temperature sensor input signal is held to 25°C (77°F).  
 No. 12: The outside-air sensor input signal is held to 15°C (59°F).  
 No. 13: The air-thermostat sensor input signal is held to 4°C (39°F).

**Air conditioner control unit terminal voltage**

Terminal No	Signal	Conditions	Terminal voltage
5	Outside-air sensor	Sensor part temperature 25°C (77°F): 4 kΩ	1.0-1.6V
10	Sensor power supply	At all times	2.45-2.55V
15	Refrigerant-temperature sensor	Sensor part temperature 25°C (77°F) when air conditioner is OFF: 80 Ω	0.15V
16	Passenger compartment-temperature sensor	Sensor part temperature 25°C (77°F): 4 kΩ	1.0-1.6V
17	Air-thermostat sensor	Sensor part temperature 25°C (77°F) when air conditioner is OFF: 4 kΩ	1.0-1.6V

**Indicates connector's terminal number.**

**Indicates the circuit diagram for checking (including the interface of the air conditioner control unit).**

**Indicates the connector number. Numbers are used in the operation descriptions only as necessary, and these numbers correspond to the numbers used in harness and component layout diagrams.**

**Provides the description of circuit operation for basic understanding.**

**Indicates the check to be made.**

**Provides hints (including judgement) when troubleshooting procedures are followed.**

**Indicates the diagnosis output code No. and the system conditions during output.**

**Indicates the terminals to be checked.**

**Indicates the conditions under which the check should be made.**

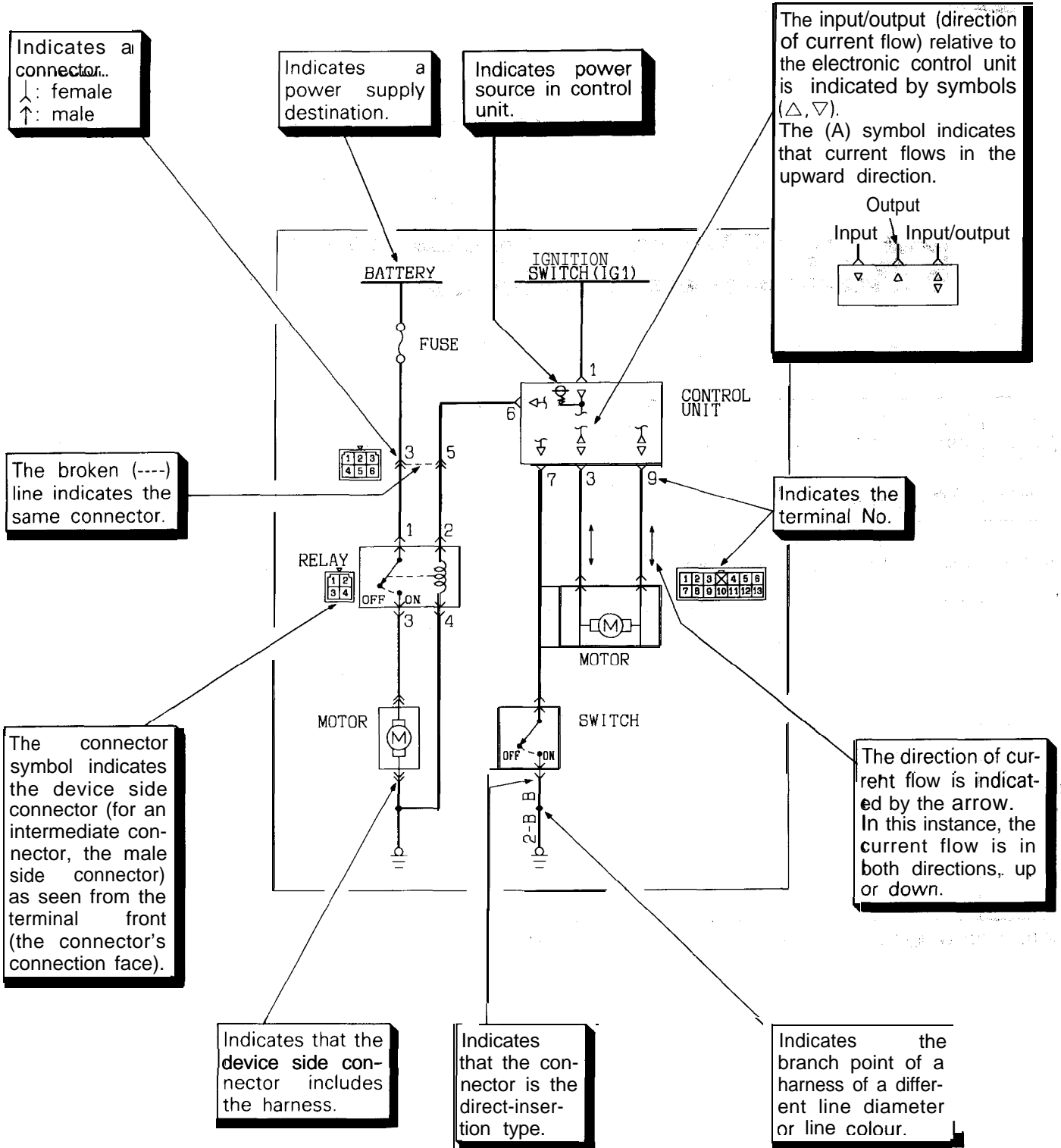
**Indicates the specification to be used for judgement of the check results. If there is no particular mention of conditions in the "Conditions" column, the column shows the specification under normal conditions.**

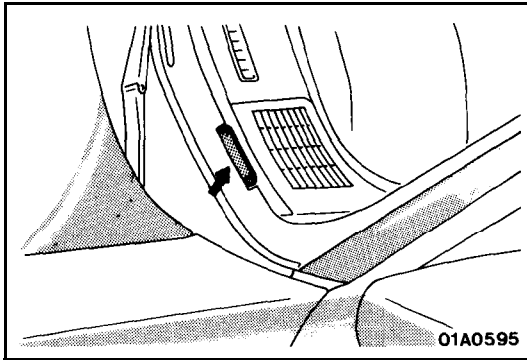
**EXPLANATION OF CIRCUIT DIAGRAMS**

The symbols used in circuit diagrams are used as described below.

**NOTE**

For detailed information concerning the reading of circuit diagrams, refer to GROUP 8—Wiring Harness.





## VEHICLE IDENTIFICATION

NOCCA--

### VEHICLE IDENTIFICATION NUMBER LOCATION

The vehicle identification number (V.I.N.) is located on a plate attached to the left top side of the instrument panel.

### VEHICLE IDENTIFICATION CODE CHART **PLATE**

NOCCB--

All vehicle identification numbers contain 17 digits. The vehicle number is a code which tells country, make, vehicle type, etc.



1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit	6th Digit	7th Digit	8th Digit	9th Digit	10th Digit	11th Digit	12th to 17th Digits
Country	Make	Vehicle type	Others	Line	Price class	Body	Engine	*Check digits	Model year	Plant	Serial number
4- USA	E- Eagle P- Plymouth	3- Passenger Car	B- Manual Seat Belt C- Automatic Seat Belt	S- Laser or Talon T- Talon AWD	3- Medium 4- High 5- Premium 6- Special	4- 3 door Hatchback	T- 1.8 liter (107 cu.in.) [SOHC-MPI] R- 2.0 liters (122 cu.in.) [DOHC-MPI] U- 2.0 liters (122 cu.in.) [DOHC-MPI-Turbo]	1 2 3 . . . 9 x	M- 1991 Year	E- DSM	000001 to 999999

NOTE \* "Check digit" means a single number or letter x used to verify the accuracy of transcription of vehicle identification number.

**VEHICLE IDENTIFICATION NUMBER LIST**

NOCC-

➤ **VEHICLES FOR FEDERAL**

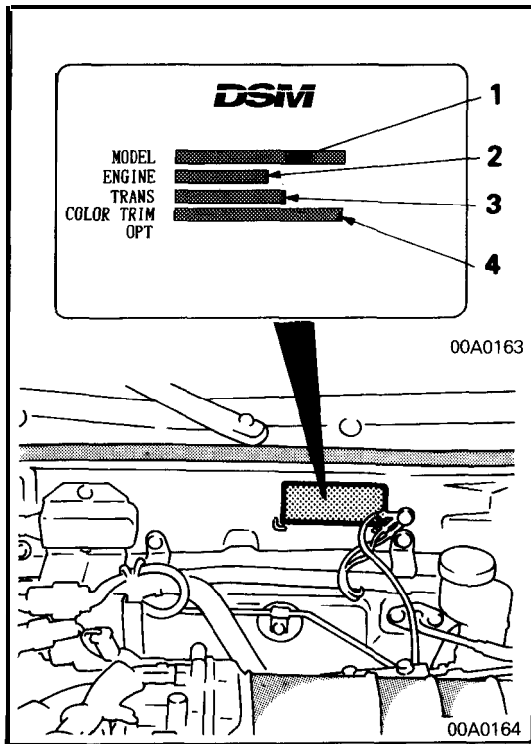
V.I.N. (except sequence number)	Brand	Engine Displacement	Models Code
4P3CS34T□ME	Plymouth Laser	1.8 liter (107 cu.in.) [SOHC-MPI]	D21AMNJEL4P/RJEL4P
4P3CS44T□ME			D21AMNHEL4P/RHEL4P
4P3CS44R□ME		2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML4P/RHML4P
4P3CS44U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNHFL4P/RHFL4P
4E3CS44R□ME	Eagle Talon <FWD>	2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML4E/RHML4E
4E3CS54U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNPFL4E/PPFL4E
4E3CT64U□ME	Eagle Talon <AWD>		D27AMNGFL4E/RGFL4E

**VEHICLES FOR CALIFORNIA**

V.I.N. (except sequence number)	Brand	Engine Displacement	Models Code
4P3CS34T□ME	Plymouth Laser	1.8 liter (107 cu.in.) [SOHC-MPI]	D21AMNJEL9P/RJEL9P
4P3CS44T□ME			D21AMNHEL9P/RHEL9P
4P3CS44R□ME		2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML9P/RHML9P
4P3CS44U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNHFL9P/RHFL9P
4E3CS44R□ME	Eagle Talon <FWD>	2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML9E/RHML9E
4E3CS54U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNPFL9E/PPFL9E
4E3CT64U□ME	Eagle Talon <AWD>		D27AMNGFL9E/RGFL9E

**VEHICLES FOR CANADA**

V.I.N. (except sequence number)	Brand	Engine Displacement	Models Code
4P3BS34T□ME	Plymouth Laser	1.8 liter (107 cu.in.) [SOHC-MPI]	D21AMNJEL5P/RJEL5P
4P3BS44T□ME			D21AMNHEL5P/RHEL5P
4P3BS44R□ME		2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML5P/RHML5P
4P3BS44U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNHFL5P/RHFL5P
4E3BS44R□ME	Eagle Talon <FWD>	2.0 liter (122 cu.in.) [DOHC-MPI]	D22AMNHML5E/RHML5E
4E3BS54U□ME		2.0 liter (122 cu.in.) [DOHC-MPI-Turbo]	D22AMNPFL5E/PPFL5E
4E3BT64U□ME	Eagle Talon <AWD>		D27AMNGFL5E/RGFL5E



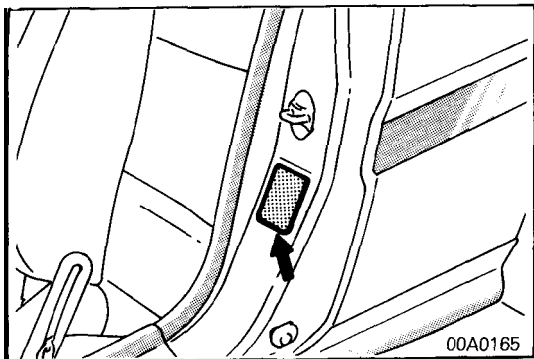
**VEHICLE INFORMATION CODE PLATE**

N00CD--

Vehicle information code plate is riveted onto the bulkhead in the engine compartment.

The plate shows model code, engine model, transaxle model, and body color code.

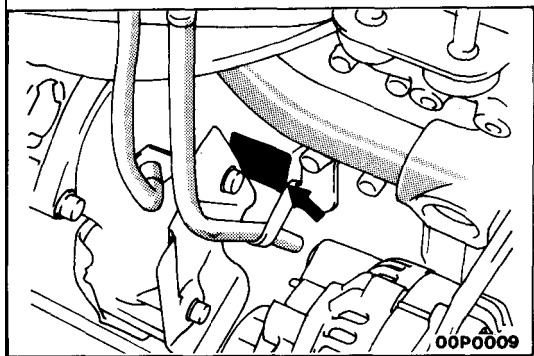
- 1. MODEL **D22AMN HML4P**  
 Model series: **D22AMN**  
 Vehicle model: **HML4P**
- 2. ENGINE **4G63**  
 Engine model: **4G63**
- 3. TRANSAXLE **F5M33**  
 Transaxle model: **F5M33**
- 4. COLOR, TRIM OPT **B14**  
 Monotone exterior color code: **B14**



**VEHICLE SAFETY CERTIFICATION LABEL**

N00CF--

- The vehicle safety certification label is attached to the face
- This label indicates the month and year of manufacture, Gross Vehicle Weight Rating (G.V.W.R.), Gross Axle (G.A.W.R.) front and rear, and Vehicle Identification Number (V.I.N.).



**ENGINE MODEL STAMPING**

N00CG--

- The engine model number is stamped at the front side on following:


Engine model	Engine displacement
4G37	1.8 liter (107 cu.in.) [SOHC-MPI]
4G63	2.0 liter (122 cu.in.) [DOHC-MPI] or [DOHC-MPI-Turbo]

- The engine serial number is stamped near the engine model number, and the serial number cycles, as shown below.

Engine serial number	Number cycling
AA0201 to YY9999	AA0201 ----- → AA9999 AB0001 ----- → AY9999 BA0001 ----- → YY9999


**Theft protection label**

original parts



**DSM** **WSC** **DSM**  
00A0212

For replacement parts



00A0213

**THEFT PROTECTION**

NOCCIAB

In order to protect against theft, a Vehicle Identification Number (VIN) is stamped in, or attached as a label to, the following major parts of the engine and transaxle, as well as main outer panels:

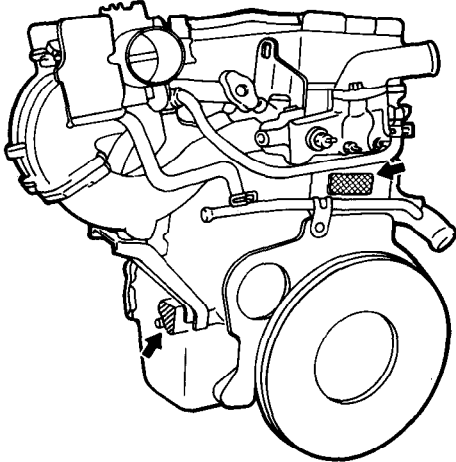
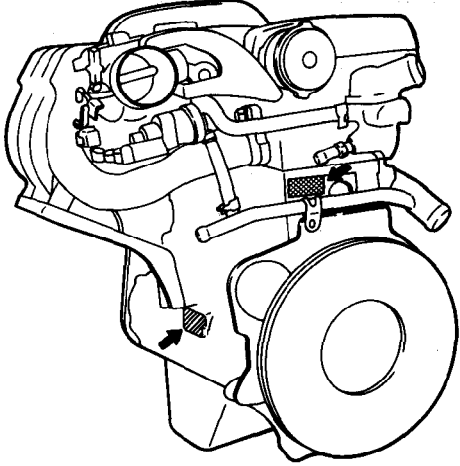
Engine cylinder block, Transaxle housing, Fender, Door, Quarter panel, Hood, Trunk lid, Bumpers



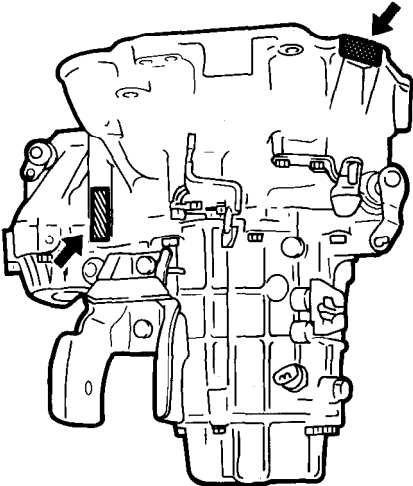
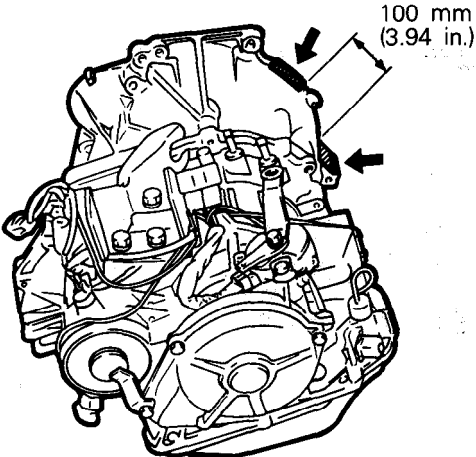
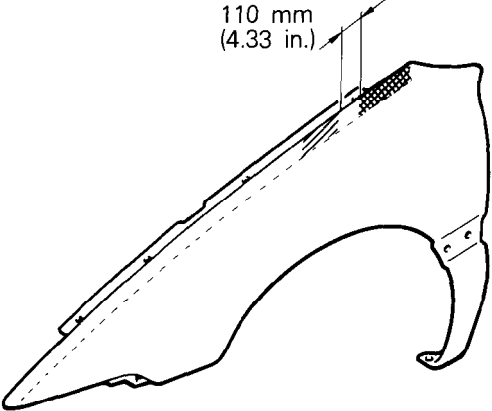
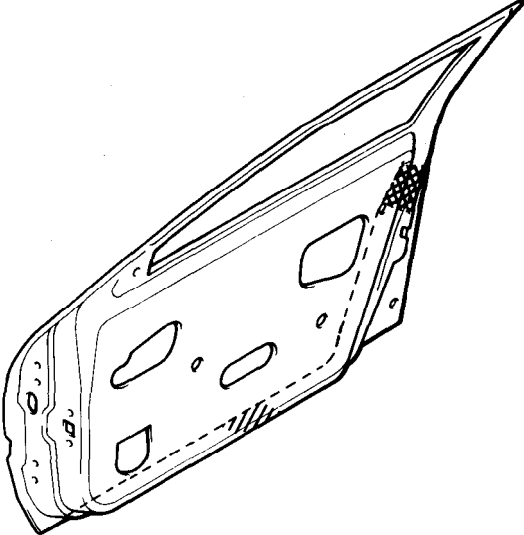
In addition, a theft-protection label is attached to replacement parts for the body outer panel main components, and the same data are stamped into replacement parts for the engine and the transaxle.

**Cautions regarding panel repairs**


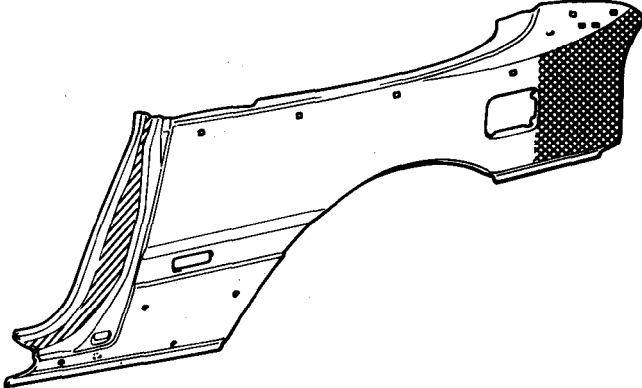
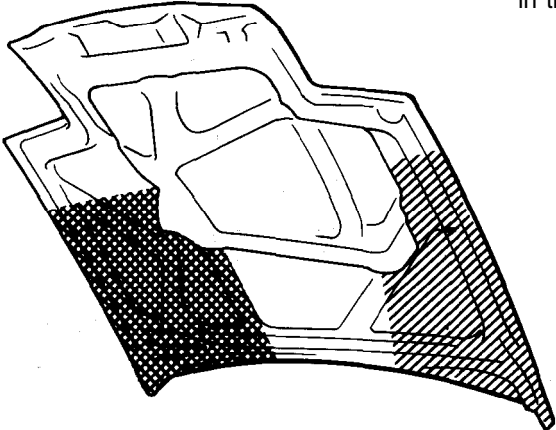
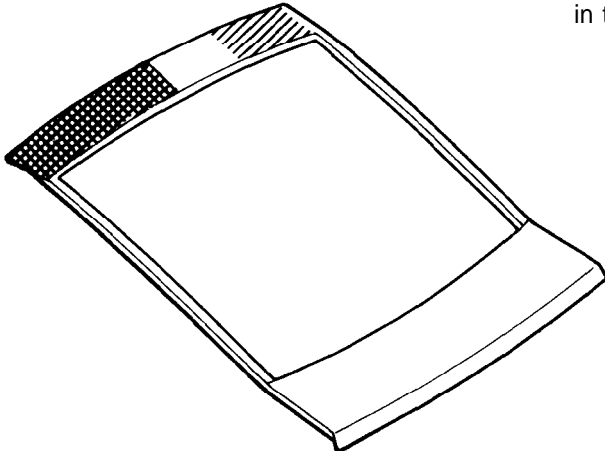
1. When repainting original parts, do so after first masking the theft-protection label, and, after painting, be sure to peel off the masking tape.
2. The theft-protection label for replacement parts is covered by masking tape, so such parts can be painted as is. The masking tape should be removed after painting is finished.
3. The theft-protection label should not be removed from original parts or replacement parts.



**LOCATIONS**

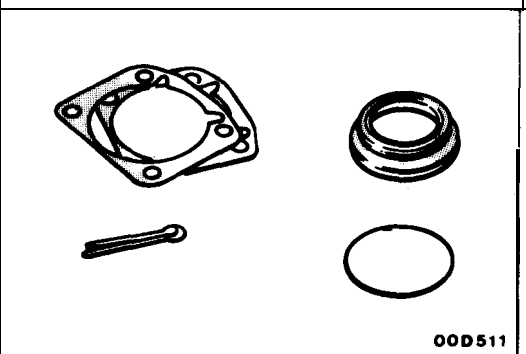
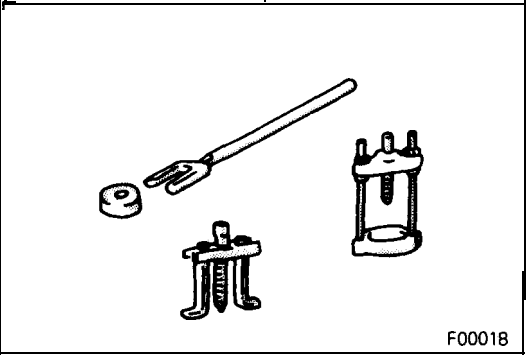
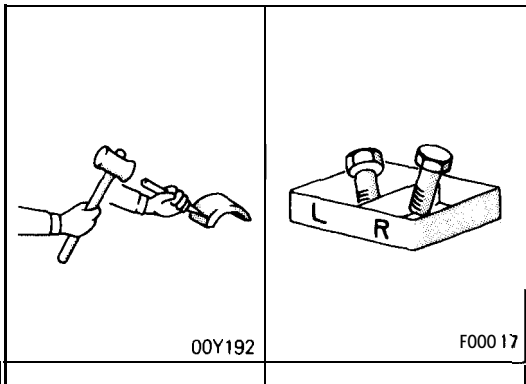
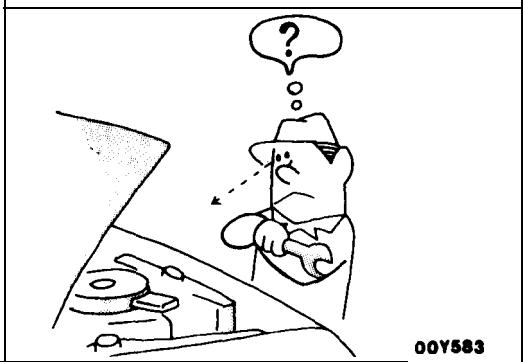
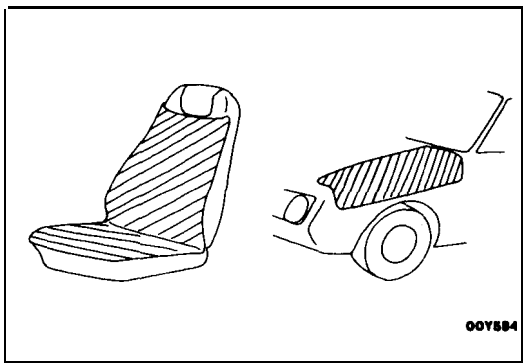
Part	Target area
Engine	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1.8L Engine</p>  <p>00A0057</p> </div> <div style="text-align: center;"> <p>2.0L DOHC Engine</p>  <p>00A0055</p> </div> </div> <div style="margin-top: 10px;"> <p> <span style="display: inline-block; width: 15px; height: 10px; background-color: black; margin-right: 5px;"></span> : for original equipment parts  <span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); margin-right: 5px;"></span> : for replacement parts                 </p> </div>

Part	Target area	 : for original equipment parts  : for replacement parts
Transaxle	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Manual transaxle</p>  <p>00A0061</p> </div> <div style="text-align: center;"> <p>Automatic transaxle</p>  <p>100 mm (3.94 in.)</p> <p>00A0062</p> </div> </div>	
Fender	 <p>110 mm (4.33 in.)</p> <p>The illustration indicates left hand side, outer. Right hand side is symmetrically opposite.</p> <p>31A0259</p>	
Door	 <p>31A0258</p> <p>The illustration indicates right hand side, outer. Left hand side is symmetrically opposite.</p>	



Part	Target area <span style="float: right;">                        : for original equipment parts                      : for replacement parts                 </span>
Quarter panel	<p>The label is attached at the inner side of the parts shown in the figure.</p>  <p>The illustration indicates left hand side, outer. Right hand side is symmetrically opposite.</p> <p style="text-align: right;">31A026E</p>
Hood	<p>The label is attached at the inner side of the parts shown in the figure.</p>  <p style="text-align: right;">31A0256</p>
Tailgate	<p>The label is attached at the inner side of the parts shown in the figure.</p>  <p style="text-align: right;">31A0260</p>

Part	Target area <span style="float: right;">  : for original equipment parts   : for replacement parts                 </span>
Front bumper	<div data-bbox="623 359 1214 695" data-label="Image"> </div> <p data-bbox="505 789 1299 821">The label is attached at the inner side of the parts shown in the figure.</p> <p data-bbox="1377 800 1455 821">31A0332</p>
Rear bumper	<div data-bbox="623 936 1187 1310" data-label="Image"> </div> <p data-bbox="505 1392 1292 1423">The label is attached at the inner side of the parts shown in the figure.</p> <p data-bbox="1377 1402 1455 1423">31A0332</p>



## PRECAUTIONS BEFORE SERVICE N00DAAH

### PROTECTING THE VEHICLE

If there is a likelihood of damaging painted or interior parts during service operations, protect them with suitable covers (such as seat covers, fender covers, etc.).

### REMOVAL AND DISASSEMBLY

When checking a malfunction, find the cause of the problem. If it is determined that removal and/or disassembly is necessary, perform the work by following the procedures contained in this Service Manual.

If punch marks or mating marks are made to avoid error in assembly and to facilitate the assembly work, be sure to make them in locations which will have no detrimental effect on performance and/or appearances.

If an area having many parts, similar parts, and/or parts which are symmetrical right and left is disassembled; be sure to arrange the parts so that they do not become mixed during the assembly process.

1. Arrange the parts removed in the proper order.
2. Determine which parts are to be reused and which are to be replaced.
3. If bolts, nuts, etc., are to be replaced, be sure to use only the exact size specified.

### SPECIAL TOOLS

If other tools are substituted for the special tools to do service or repair work, there is the danger that vehicle parts might be damaged, or the technician might be injured; therefore, be sure to use the special tool whenever doing any work for which the use of one is specified.

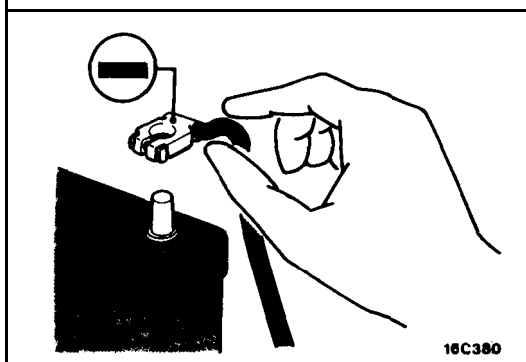
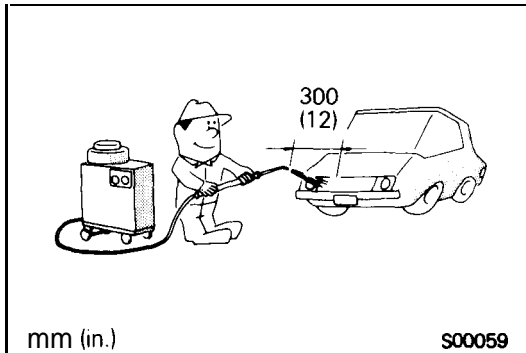
### PARTS TO BE REPLACED

If any of the following parts are removed, they must be replaced with new parts.

1. Oil seals
2. Gaskets (except rocker cover gasket)
3. Packings
4. O-rings
5. Lock washers
6. Cotter pins
7. Self-locking nuts

## PARTS

When replacing parts, use MOPAR genuine parts.



## VEHICLE WASHING

If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to maintain the spray nozzle at a distance of at least 300 mm (12 in.) from any plastic parts and all opening parts (doors, luggage compartment, etc.).

## SERVICING ELECTRICAL SYSTEM

1. Note the following before proceeding with work on the electrical system.  
Note that the following must never be done:  
Unauthorized modifications of any electrical device or wiring, because such modifications might lead to a vehicle malfunction, over-capacity or short-circuit that could result in a fire in the vehicle.
2. When servicing the electrical system, disconnect the negative cable terminal from the battery/.

### Caution

1. Before connecting or disconnecting the negative cable, be sure to turn off the ignition switch and the lighting switch.  
(If this is not done, there is the possibility of semiconductor parts being damaged.)
2. For MPI-equipped models, after completion of the work steps [when the battery's negative (-) terminal is connected], warm up the engine and allow it to idle for approximately five minutes under the conditions described below, in order to stabilize engine control conditions, and then check to be sure that the idling is satisfactory.

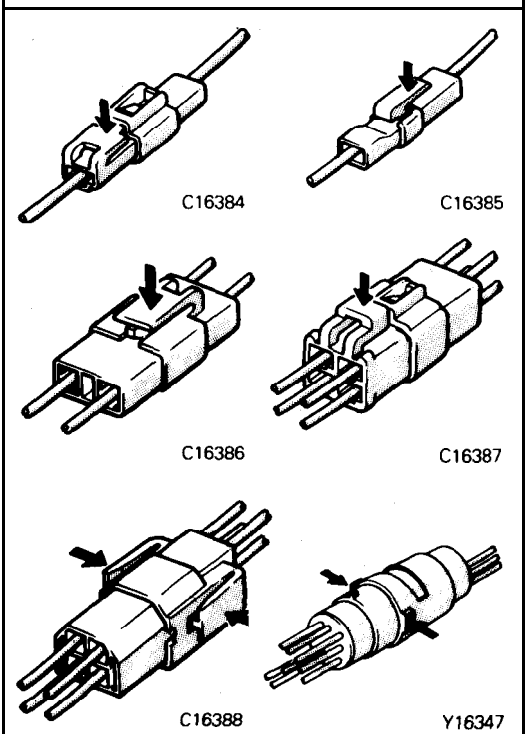
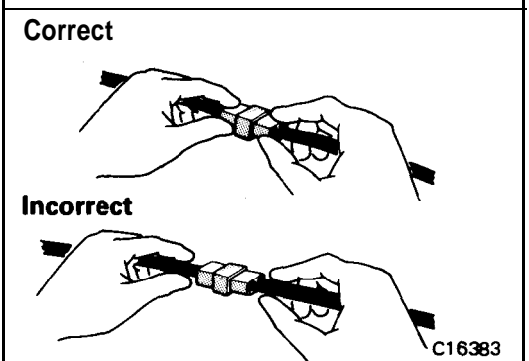
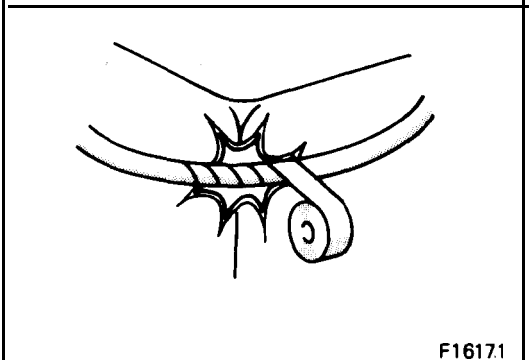
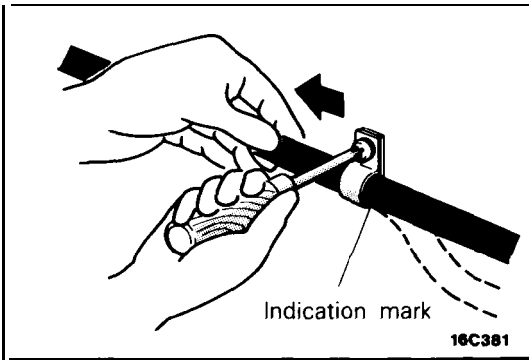
Engine coolant temperature: **85–95°C (185–203°F)**

Lights, electric fans, accessories: **OFF**

Transaxle: **neutral position**

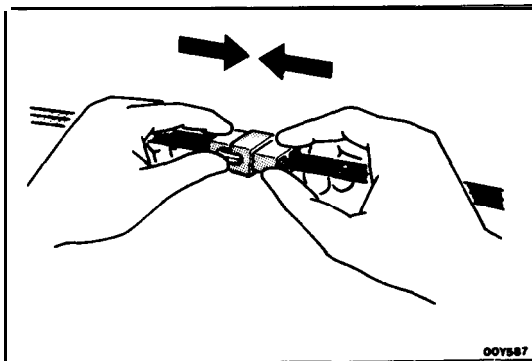
(A/T models: **“N” or “P”**)

Steering wheel: **neutral (center) position**

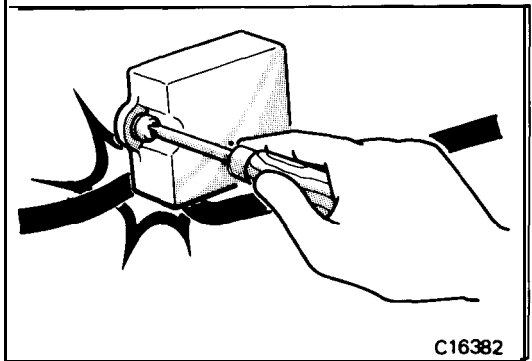


**WIRING HARNESSES**

1. Secure the wiring harnesses by using **clamps**. However, for any harness which passes to the engine or other vibrating parts of the vehicle, allow some slack within a range that does not allow the engine vibrations to cause the harness to come into contact with any of the surrounding parts. Then secure the harness by using a clamp.  
In addition, if a mounting indication mark (yellow tape) is on a harness, secure the indication mark in the specified location.
  
2. If any section of a wiring harness contacts the edge of a part, or a corner, wrap the section of the harness with tape or something similar in order to protect it from damage.
  
3. When disconnecting a connector, be sure to pull only the connector, not the harness.
  
4. Disconnect connectors which have catches by pressing in the direction indicated by the arrows in the illustration.

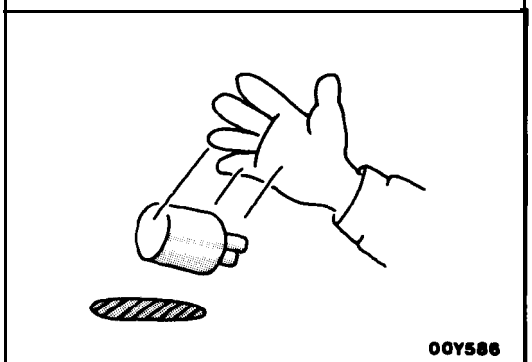


5. Connect connectors which have catches by inserting the connectors until they snap.

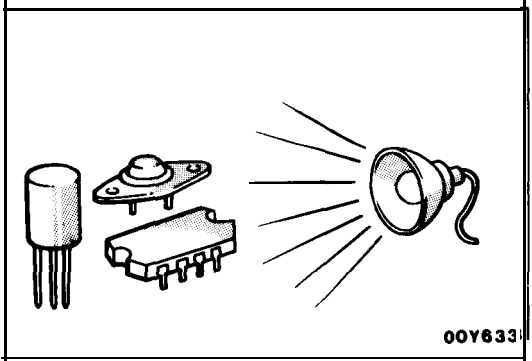


### ELECTRICAL COMPONENTS

1. When installing any of the vehicle parts, be careful not to pinch or damage any of the wiring harnesses.



2. Sensors, relays, etc., are sensitive to strong impacts. Handle them with care so that they are not dropped or mishandled.



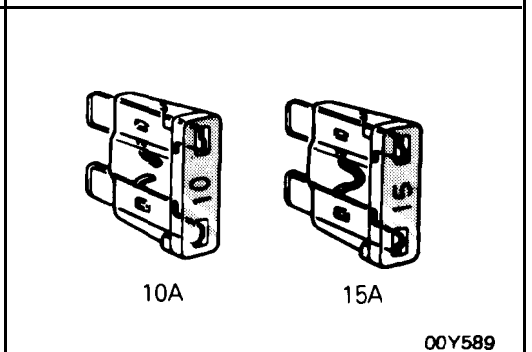
3. The electronic parts used for relays, etc., are sensitive to heat. If any service which causes a temperature of 80°C (176°F) or more is performed, remove the part or parts in question before carrying out the service.

### FUSES AND FUSIBLE LINKS

1. If a blown-out fuse is to be replaced, be sure to use only a fuse of the specified capacity. If a fuse of a capacity larger than that specified is used, parts may be damaged and the circuit may not be protected adequately.

#### Caution

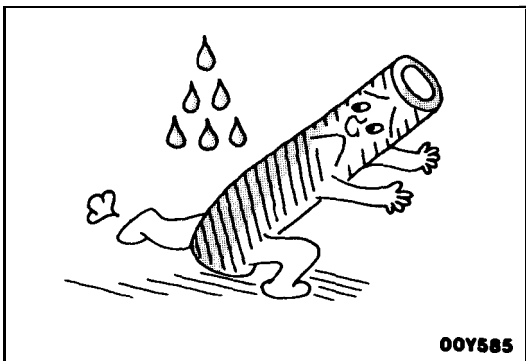
1. If a fuse is blown-out, be sure to eliminate the cause of the problem before installing a new fuse.
2. Check the condition of fuse holders. If rust or dirt is found, clean metal parts with a **fine-grained** sandpaper until proper metal-to-metal contact is **made**. Poor contact of any fuse holder will **often lead to voltage drop or heating in the circuit and could result in improper circuit operation.**



Nominal size	SAE gage No.	Permissible current	
		In engine compartment	Other areas
0.3 mm <sup>2</sup>	AWG 22	~	5A
0.5 mm <sup>2</sup>	AWG 20	7A	13A
0.85 mm <sup>2</sup>	AWG 18	9A	17A
1.25 mm <sup>2</sup>	AWG 16	12A	22A
2.0 mm <sup>2</sup>	AWG 14	16A	30A
3.0 mm <sup>2</sup>	AWG 12	21A	40A
5.0 mm <sup>2</sup>	AWG 10	31A	54A

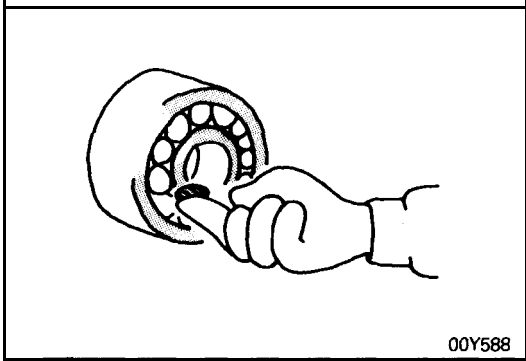
2. If additional optional equipment is **to be installed**, in the vehicle, follow the procedure listed in the appropriate instruction manual; however, be sure to pay careful attention to the following points:

- (1) In order to avoid overloading the wiring, take the electrical current load of the optional equipment into consideration, and determine the appropriate wire size:
- (2) Where possible, route the wiring through the existing harnesses.
- (3) If an ammeter or similar instrument is to be connected to a live-wire circuit, use tape to protect the wire, use a clamp to secure the wire, and make sure that there is no contact with any other parts.
- (4) Be sure to provide a fuse for the load circuit of the optional equipment.



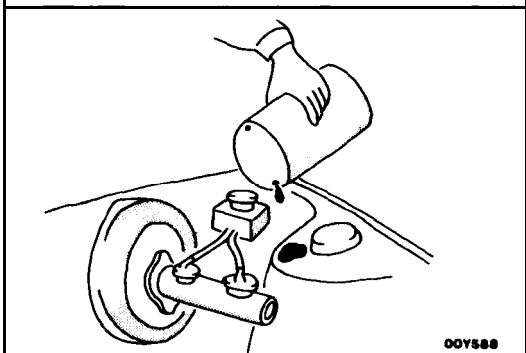
### TUBES AND OTHER RUBBER PARTS

Be careful to avoid spilling any gasoline, oil, etc., or rubber parts, they might be adversely affected.



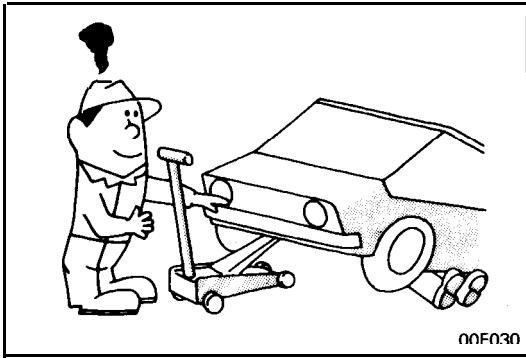
### LUBRICANTS

In accordance with the instructions in this Service Manual, apply the specified lubricants in the specified locations during assembly and installation.



### BRAKE FLUID

Be careful to avoid spilling any brake fluid on painted surfaces, because the paint coat might be discolored or damaged.



## DOING SERVICE WORK IN GROUPS OF TWO OR MORE TECHNICIANS

If the service work is to be done by two or more technicians working together, extra caution must be taken.

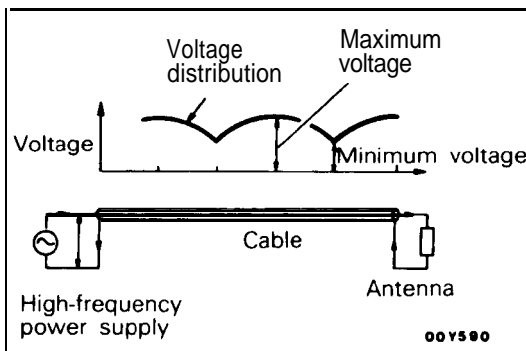
## NOTE ON INSTALLATION OF RADIO EQUIPMENT NO0EA

The computers of the electronic control system has been designed so that external radio waves will not interfere with their operation.

However, if antenna or cable of amateur transceiver etc. is routed near the computers, it may affect the operation of the computers, even if the output of the transceiver is no more than 25W.

To protect each of the computers from interference by transmitter (hum, transceiver, etc.), the following should be observed.

1. Install the antenna on the roof or rear bumper.
2. Because radio waves are emitted from the coaxial cable of the antenna, keep it 200 mm (8 in.) away from the computers and the wiring harness. If the cable must cross the wiring harness, route it so that it runs at right angles to the wiring harness.
3. The antenna and the cable should be well matched, and the standing-wave ratio\* should be kept low.
4. A transmitter having a large output should not be installed in the vehicle.
5. After installation of transmitter, run the engine at idle, emit radio waves from the transmitter and make sure that the engine is not affected.



### “STANDING-WAVE RATIO

If an antenna and a cable having different impedances are connected, the input impedance  $Z_i$  will vary in accordance with the length of the cable and the frequency of the transmitter, and the voltage distribution will also vary in accordance with the location.

The ratio between this maximum voltage and minimum voltage is called the standing-wave ratio. It can also be represented by the ratio between the impedances of the antenna and the cable.

The amount of radio waves emitted from the cable increases as the standing-wave ratio increases, and this increases the possibility of the electronic components being adversely affected.

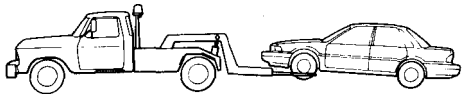


N00GA--

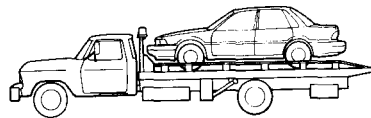
Sling type



Wheel lift type



Flat bed type



00A0049

## TOWING AND HOISTING

### WRECKER TOWING RECOMMENDATION <FWD>

#### FRONT TOWING PICKUP

##### Caution

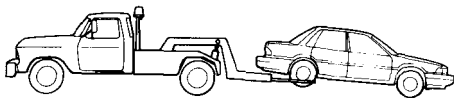
This vehicle cannot be towed by a wrecker using sling-type equipment to prevent the bumper from deformation. If this vehicle is towed, use wheel lift or flat bed equipment.

The vehicle may be towed on its rear wheels for extended distances provided the parking brake is released. It is recommended that vehicles be towed using the front pickup whenever possible.

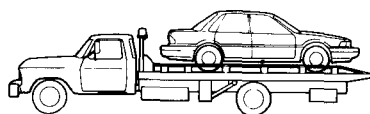
Sling type



Wheel lift type



Flat bed type



00A0048

#### REAR TOWING PICKUP

##### Caution

This vehicle cannot be towed by a wrecker using sling-type equipment to prevent the axle beam from deformation. If this vehicle is towed, use wheel lift or flat bed equipment.

Manual transaxle vehicles may be towed on the front wheels, provided the transaxle is in neutral and the drive-line has not been damaged. The steering wheel must be clamped in the straight-ahead position with a steering wheel clamping device designed for towing service use.

##### Caution

**Do not use steering column lock to secure front wheel position for towing.**

Automatic transaxle vehicle may be towed on the front wheels at speeds not to exceed 50 km/h (30 mph) for a distances not to exceed 30 km (18 miles).

##### Caution

**If these limits cannot be met, the front wheels must be placed on a tow dolly.**

#### TOWING WHEN KEYS ARE NOT AVAILABLE

When a locked vehicle must be towed and keys are not available, the vehicle may be lifted and towed from the front, provided the parking brake is released: If not released, the rear wheels should be placed on a tow dolly.

**SAFETY PRECAUTIONS**

The following precautions should be taken when towing **the** vehicle.

1. DO NOT LIFT OR TOW THE VEHICLE BY ATTACHING **TO** OR WRAPPING AROUND THE BUMPER.
2. Any loose or protruding parts of damaged vehicle such as hoods, doors, fenders, trim, etc., should be secured prior to moving the vehicle.
3. Operator should refrain from going under a vehicle while it is lifted by the towing equipment, unless the vehicle is adequately supported by safety stands.
4. Never allow passengers to ride in a towed vehicle.
5. State and local rules and regulations must be followed when towing a vehicle.

**<AWD>**

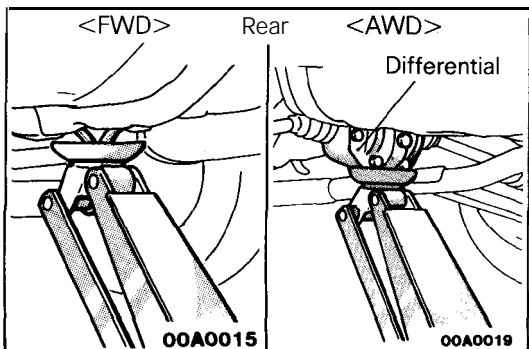
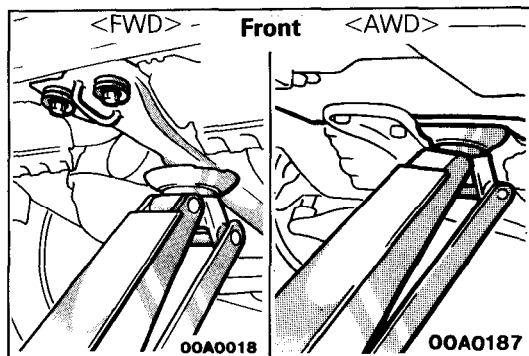
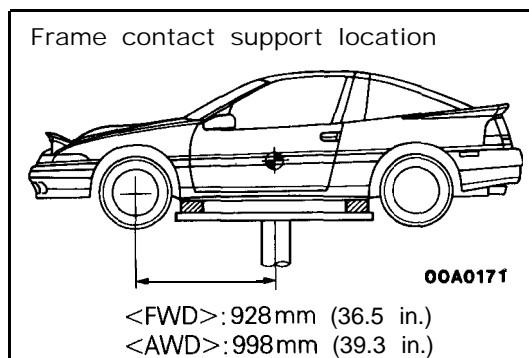
Refer to the section "Special Handling Instructions for AWD Models".

**HOISTING****POST TYPE**

Special care should be taken when raising the vehicle on a frame contact type hoist. The hoist must be equipped with the proper adapters in order to support the vehicle at the proper locations.

**Caution**

When service procedures require removing rear **suspension**, fuel tank, spare tire and lift gate, place **additional weight** on rear end of vehicle or anchor vehicle to hoist to prevent tipping of center of gravity changes.

**FLOOR JACK**

The usual type of floor jack is used at the following locations.

Front:

- <FWD> Under the mid point of centermember
- <AWD> Under the mid point of crossmember

Rear:

- <FWD> Under the jack up bracket of rear floor pan
- <AWD> Under the rear differential

**Cautions**

1. Never use a jack at the lateral rod or rear suspension assembly. **<FWD>**
2. In order to prevent scarring the centermember **<FWD>** or crossmember **<AWD>**, place a piece of cloth on the jack's contact surface (to prevent corrosion caused by damage to the coating).
3. A floor jack must never be used on any part of the underbody.
4. Do not attempt to raise one entire side of the vehicle by placing a jack midway between front and rear wheels. This practice may result in permanent damage to the body.