

1990 Mazda MX-5 Workshop Manual

FORWARD

This workshop manual is intended for use by service technicians of Authorised Mazda Dealers to help them service Mazda vehicles. It can also be useful to owners and operators of Mazda vehicles in diagnosing some problems and performing limited repair and maintenance on Mazda vehicles.

For proper repair and maintenance a thorough familiarisation with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawing and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Authorised Mazda dealers. This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

**Mazda Motor Corporation
HIROSHIMA, JAPAN**

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1 NA351 * L0 100001 ~

JM1 NA352 * L0 100001 ~

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IMPORTANT INFORMATION**BASIC ASSUMPTIONS**

This workshop manual assumes that you have certain special tools that are necessary for the safe and efficient performance of service operations on Mazda vehicles and that you know how to use them properly. It also assumes that you are familiar with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

SAFETY RISK

This manual contains certain notes, warnings, and other precautionary information that you should carefully read and follow to reduce the risk of personal injury to yourself or others and the risk of improper service that may damage the vehicle or render it unsafe. If there is no such information in regard to any specific service method, this does not mean there is no possibility that personal safety or vehicle safety will be jeopardized by the use of incorrect methods or tools.

POSSIBLE LOSS OF WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

WARNING ON LUBRICANTS AND GREASES

Avoid all prolonged and repeated contact with mineral oils, especially used oils. Used oils contaminated during service (e.g., engine sump oils) are more irritating and more likely to cause serious effects, including skin cancer, in the event of gross and prolonged skin contact.

Wash skin thoroughly after work involving oil.

Protective hand cleaners may be of value provided they can be removed from the skin with water. Do not use gasoline, paraffin, or other solvents to remove oil from the skin.

Lubricants and greases may be slightly irritating to the eyes.

Repeated or prolonged skin contact should be avoided by wearing protective clothing. Particular care should be taken with used oils and greases containing lead. Do not allow work clothing to be contaminated with oil. Dry clean or launder such clothing at regular intervals.

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HOW TO USE THIS MANUAL

PREPARATION

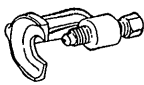
PREPARATION points out the needed **Special Service Tool (SST)** for the service operation that it proceeds. Gather all necessary **SST** before beginning work.

Example:

N TIE-ROD END BOOT AND STEERING GEAR BOOT

TIE-ROD END BOOT AND STEERING GEAR BOOT

PREPARATION

49 0118 850C Puller, ball joint 	49 H028 301 Installer, boot 
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SST NUMBER

49 H028 301

Installer, boot

SST NAME

SST ILLUSTRATION

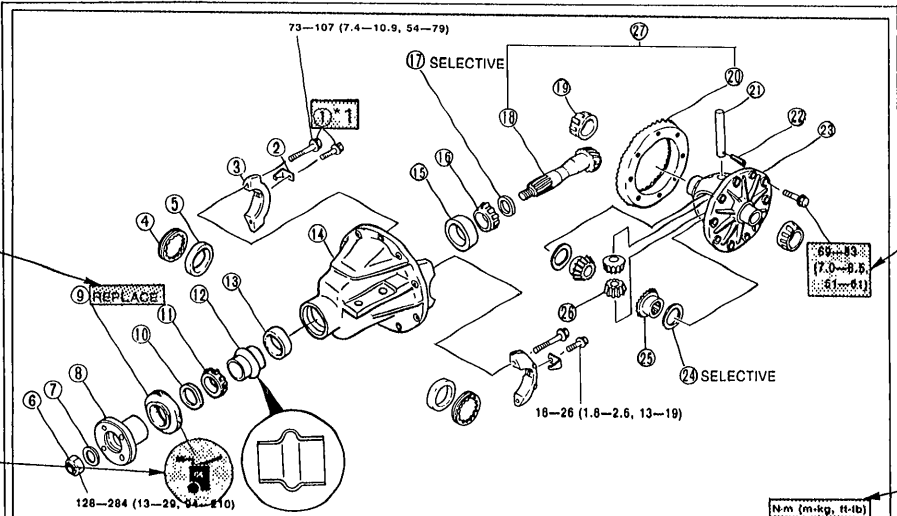


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REPAIR PROCEDURE

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual parts inspections. If a damaged or worn part is found, repair or replace it as necessary.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration.
3. Pages related to service procedures are shown under the illustration. Refer to this information when servicing the related part.

Example:



EXPENDABLE PARTS

APPLICATION POINT OF OIL, ETC. (See page GI-4)

TIGHTENING TORQUE SPECIFICATION *2

TIGHTENING TORQUE UNIT

RELATED PAGE FOR SERVICE

VISUAL INSPECTION INFORMATION

1. Bolt 2. Lock plate 3. Bearing cup 4. Adjusting screw 5. Bearing outer race 6. Locknut 7. Washer 8. Companion flange Removal..... page M-21 Inspect splines and teeth for wear or damage..... page M-22	16. Bearing inner race Removal..... page M-22 Inspect for damage or rough rotation..... page M-24 Installation..... page M-24 17. Spacer 18. Drive pinion Removal..... page M-21 Inspect splines and teeth for wear or damage..... page M-22 Adjustment of height..... page M-22 Adjustment..... page M-24
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*1: The numbers (① ex.) refer to parts identification and where necessary servicing procedure.

*2: Units are in N·m (m·kg, ft·lb) unless otherwise specified.

SYMBOLS

There are six symbols indicating oil, grease, and sealant. These symbols show the points of applying such materials during service.

Symbol	Meaning	Kind
	Apply oil	New engine oil or gear oil as appropriate
	Apply brake fluid	Only brake fluid
	Apply automatic transmission fluid	Only ATF
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly

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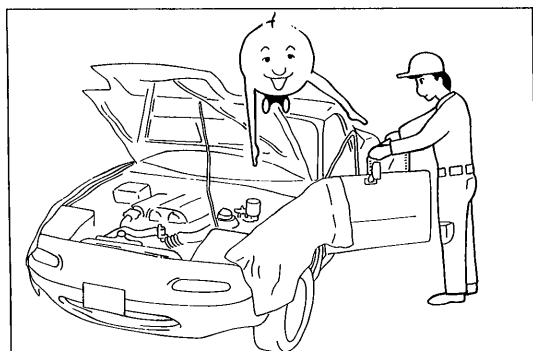
Note

- When special oil or grease is needed, this is shown in the illustration.

NOTES, CAUTIONS, AND WARNINGS

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. **NOTES** give you **added information** that will help you to complete a particular procedure. **CAUTIONS** are given to prevent you from making an error that could **damage the vehicle**. **WARNINGS** remind you to be especially careful in those areas where carelessness can cause **personal injury**. The following list contains some general WARNINGS you should follow when you work on a vehicle.

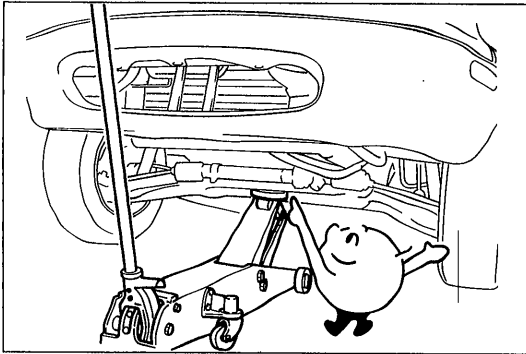
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05UGIX-006

FUNDAMENTAL PROCEDURES**PROTECTION OF VEHICLE**

Always be sure to cover fenders, seats, and floor areas before starting work.



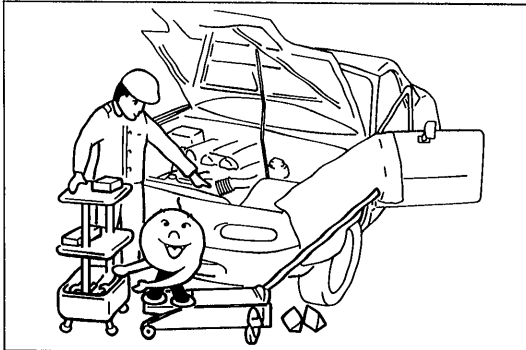
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A WORD ABOUT SAFETY

The following precautions must be followed when jacking up the vehicle.

1. Block the wheels.
2. Use only the specified jacking positions.
3. Support the vehicle with safety stands.

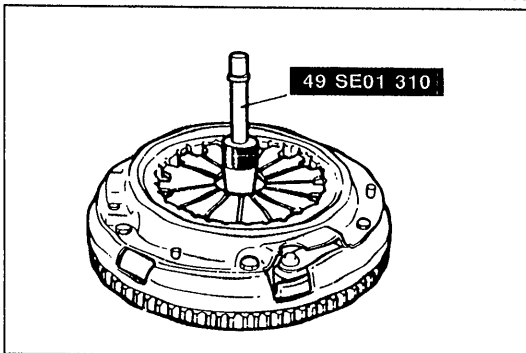
Start the engine only after making certain the engine compartment is clear of tools and people.



9MUGIX-038

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

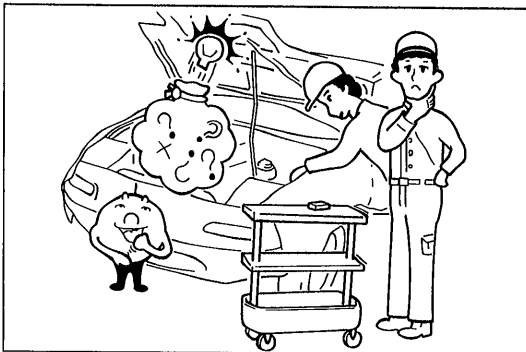
Be sure that all necessary tools and measuring equipment are available before starting any work.



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SPECIAL TOOLS

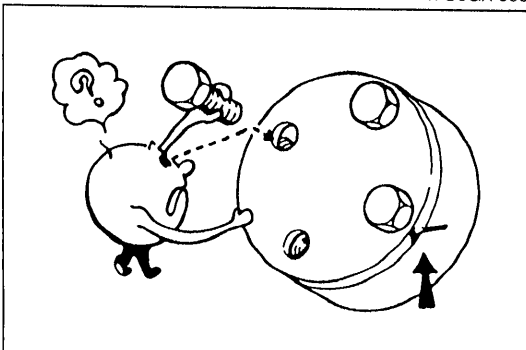
Use special tools when they are required.



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REMOVAL OF PARTS

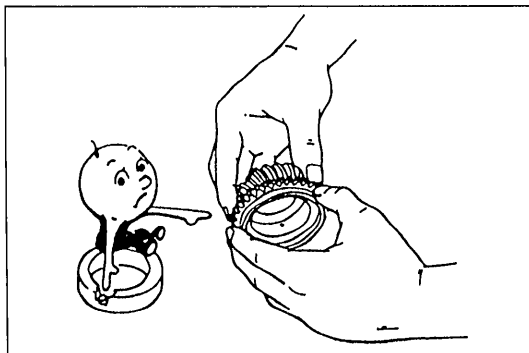
While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair.



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DISASSEMBLY

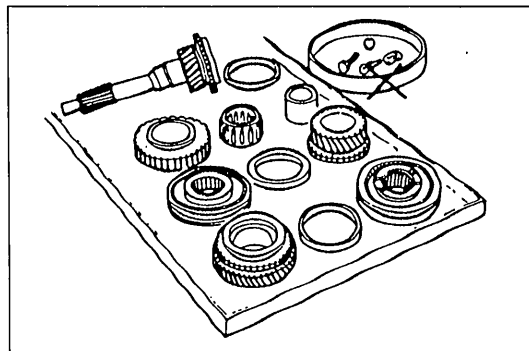
If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



9MUGIX-040

1. Inspection of parts

When removed, each part should be carefully inspected for malfunctioning, deformation, damage, and other problems.

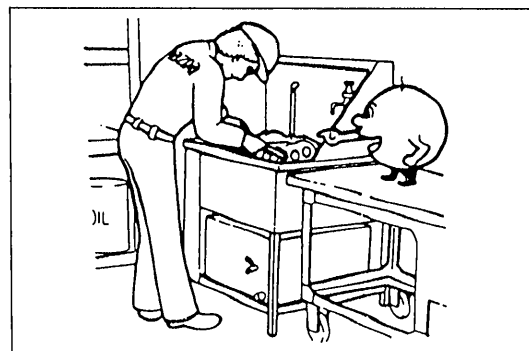


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2. Arrangement of parts

All disassembled parts should be carefully arranged for re-assembly.

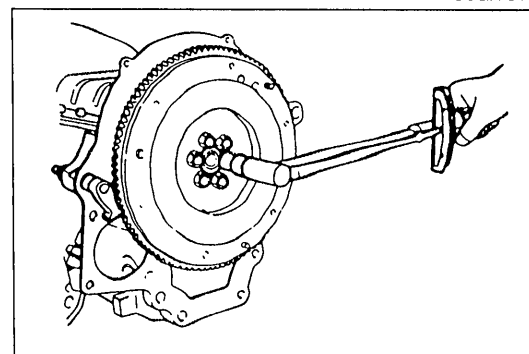
Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



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3. Cleaning parts for reuse

All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.



9MUGIX-004

REASSEMBLY

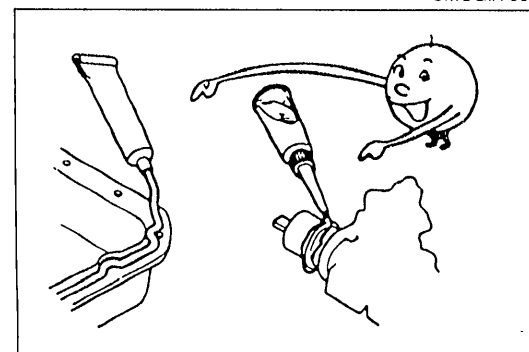
Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts. Refer to STANDARD BOLT AND NUT TIGHTENING TORQUE in Section TD for tightening torques not mentioned in the main text.

If removed, these parts should be replaced with new ones:

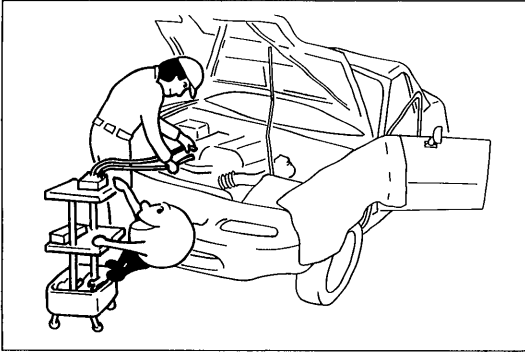
- | | |
|----------------|-----------------|
| 1. Oil seals | 2. Gaskets |
| 3. O-rings | 4. Lock washers |
| 5. Cotter pins | 6. Nylon nuts |

Depending on location:

1. Sealant should be applied to gaskets.
2. Oil should be applied to the moving components of parts.
3. Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



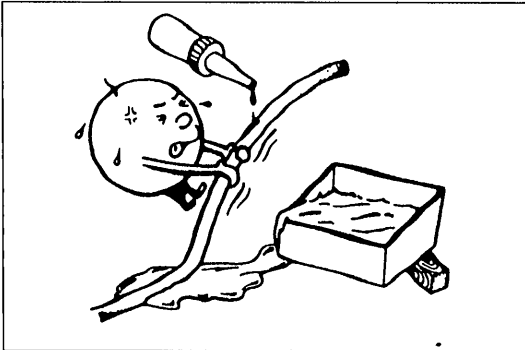
9MUGIX-042



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ADJUSTMENTS

Use suitable gauges and/or testers when making adjustments.



9MUGIX-005

RUBBER PARTS AND TUBING

Prevent gasoline or oil from getting on rubber parts or tubing.

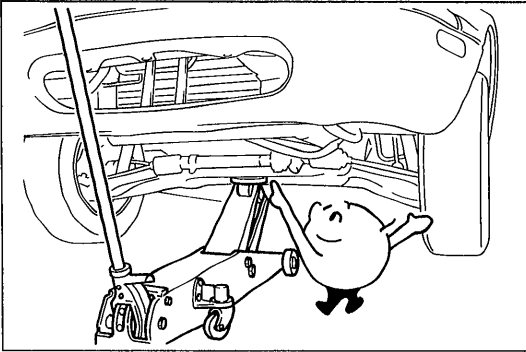
GI JACK AND SAFETY STAND POSITIONS, VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

JACK AND SAFETY STAND POSITIONS

FRONT

Jack position:

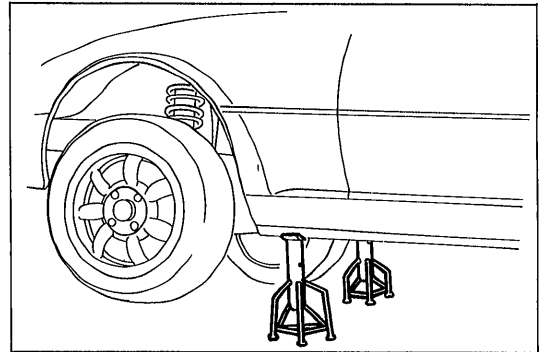
At center of crossmember



05UGIX-007

Safety stand positions:

Side sills

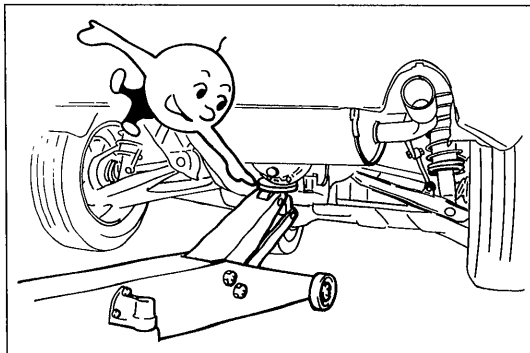


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REAR

Jack position:

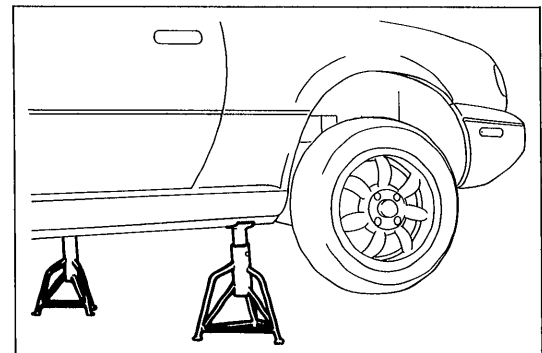
At center of differential



05UGIX-008

Safety stand positions:

Side sills



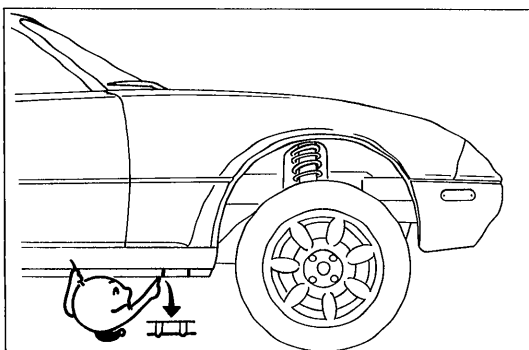
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VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

FRONT

Frame

Side sills

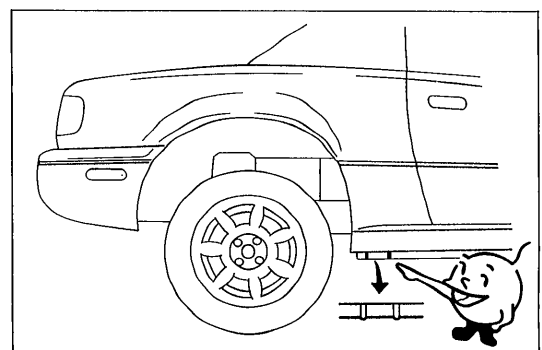


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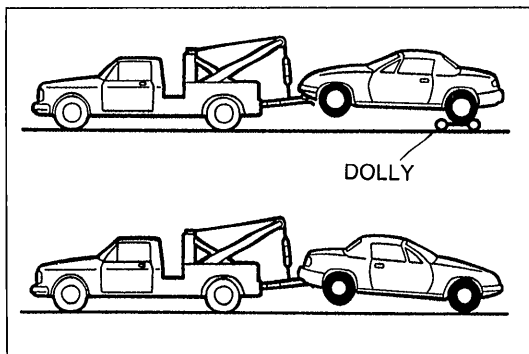
REAR

Frame

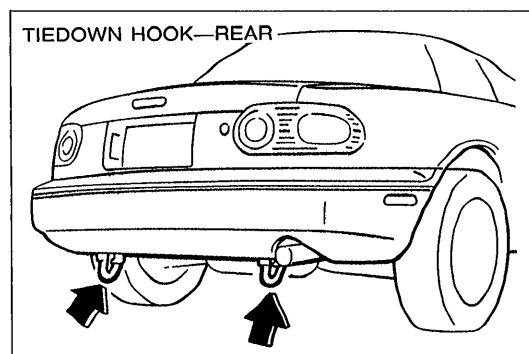
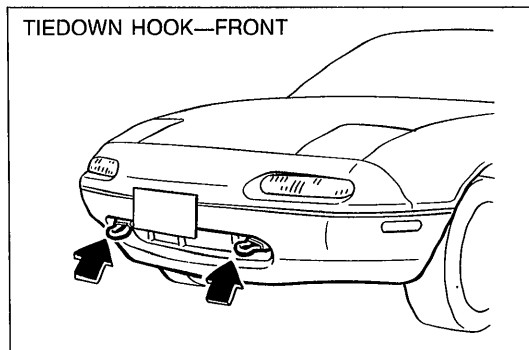
Side sills



05UGIX-010



05UGIX-011



TOWING

Proper towing equipment is necessary to prevent damage to the vehicle during any towing operation.

Laws and regulations applicable to vehicles in tow must always be observed.

Release the parking brake, place the shift lever in neutral, and set the ignition switch in the ACC position. As a rule, towed vehicles should be pulled with the driving wheels off the ground.

WITH MANUAL TRANSMISSION

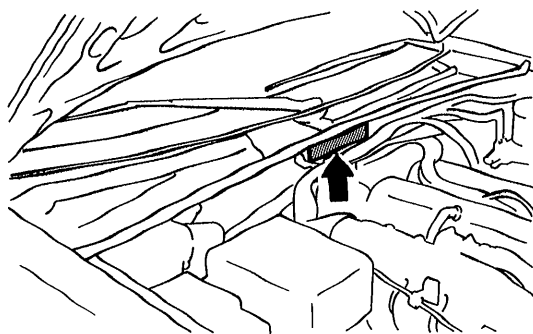
If the transmission, rear axle, and steering system are not damaged, the vehicle may be towed on all four wheels. If any of these components is damaged, use a towing dolly.

CAUTION

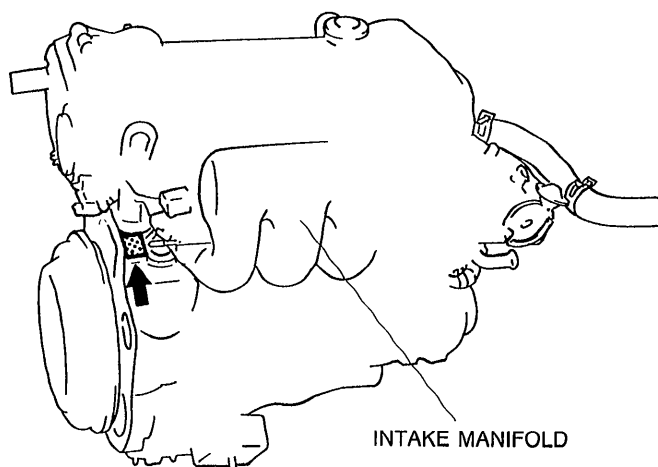
- The power assists for the brakes and steering are inoperable while the engine is off.
- Do not use the tiedown hooks of the vehicle for towing. These hooks are designed **ONLY** for transport tiedown. If the tiedown hooks are used for towing, the front or rear skirt and bumper will be damaged.

IDENTIFICATION NUMBER LOCATIONS

VEHICLE IDENTIFICATION NUMBER (VIN)



ENGINE MODEL AND NUMBER



UNITS

N-m (m-kg or cm-kg, ft-lb or in-lb).....	Torque
rpm.....	Revolutions per minute
A.....	Ampere(s)
V.....	Volt(s)
Ω	Ohm(s) (resistance)
kPa (kg/cm ² , psi).....	Pressure (usually positive)
mmHg (inHg)	Pressure (usually negative)
W.....	Watt
liters (US qt, Imp qt)	Volume
mm (in).....	Length

89U0GX-006

ABBREVIATIONS

ABDC	After bottom dead center
A/C	Air conditioner
ACC.....	Accessories
ATDC.....	After top dead center
BBDC	Before bottom dead center
BTDC.....	Before top dead center
DRL	Daytime running light
ECU.....	Engine control unit
EGI	Electronic gasoline injection
E/L.....	Electrical load
EX.....	Exhaust
IC.....	Integrated circuit
IN.....	Intake
INT.....	Intermittent
ISC.....	Idle-speed control
LH.....	Left hand
LSD.....	Limited slip differential
M.....	Motor, electric
MIL	Malfunction indicator lamp
M/T	Manual transmission
OFF	Switch off
ON.....	Switch on
PCV	Positive crankcase ventilation
PPF.....	Power plant frame
PRC	Pressure regulator control
P/S.....	Power steering
P/W.....	Power window
RH	Right hand
SST	Special service tool
TDC	Top dead center
VRIS.....	Variable resonance induction system

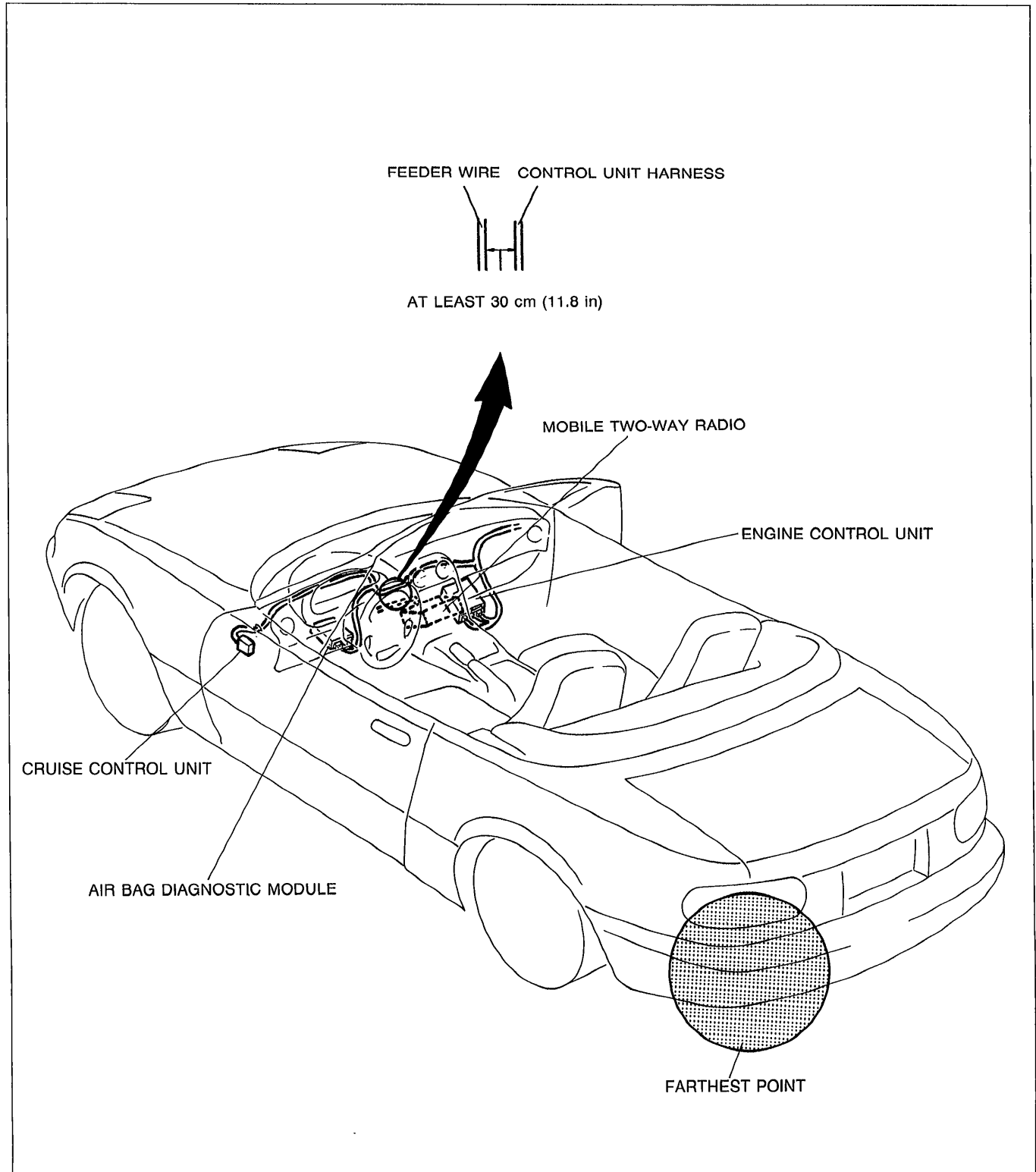
05UGIX-012

CAUTION**INSTALLATION OF MOBILE TWO-WAY RADIO SYSTEM**

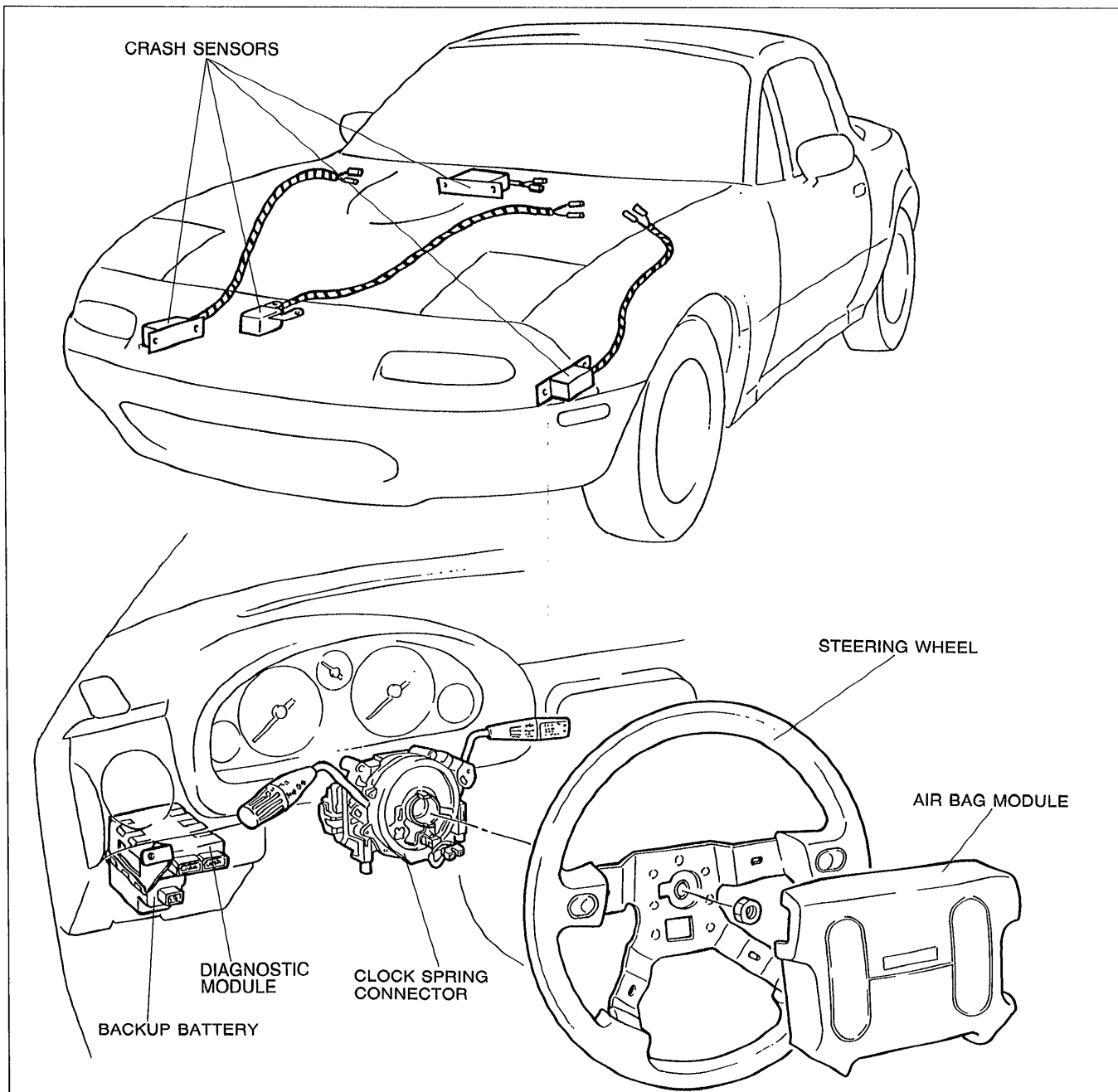
If a mobile two-way radio system is installed improperly or if a high-powered type is used, the EGI system and other systems may be affected.

When the vehicle is to be equipped with a mobile two-way radio, observe the following precautions:

1. Install the antenna at the farthest point from control units.
2. Install the antenna feeder as far as possible from the control unit harnesses (**at least 30 cm [11.8 in]**).
3. Ensure that the antenna and feeder are properly adjusted.
4. Do not install a high-powered mobile two-way radio system.



SERVICE PRECAUTIONS CONCERNING AIR BAG SYSTEM



05UGIX-014

Before Replacing any Components

Before replacing of any air bag system components, or before disconnecting any connectors of the system, first disconnect the negative battery cable. Then remove the air bag module from the vehicle even if it has not failed.

Prohibition of Component Disassembly and Wiring Harness Repair

The components of the air bag system are not intended to be disassembled for service.

If a component failure is indicated by the diagnostic module, replace the suspected component after verifying the condition of the connections and the wire harness. **Do not disassemble any components.**

If an open circuit is found by a continuity test, replace the wire harness. **Do not attempt to repair the wiring.**

Handling of Air Bag Module

1. Do not use an ohmmeter for inspection of the air bag module; it may cause an accidental deployment.
2. When carrying a live air bag module, make sure the trim cover is pointed away from your body to prevent injury in the event of an accidental deployment.