

1993 Mazda RX-7 Workshop Manual

FOREWORD

This workshop manual is intended for use by service technicians of Authorized 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 familiarization 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 drawings 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 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.

All rights reserved. No part of this book may be reproduced or used in any form or by any means, electronic or mechanical—including photocopying and recording and the use of any kind of information storage and retrieval system—without permission in writing.

**Mazda Motor Corporation
HIROSHIMA, JAPAN**

APPLICATION:

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

CONTENTS

Title	Section
General Information	GI
Pre-Delivery Inspection and Scheduled Maintenance Services	A
Engine	C
Lubrication System	D
Cooling System	E
Fuel and Emission Control Systems	F
Engine Electrical System	G
Clutch	H
Manual Transmission	J
Automatic Transmission	K
Electronically-Controlled	L
Propeller Shaft	M
Front and Rear Axles	N
Steering System	F
Braking System	Q
Wheels and Tires	F
Suspension	S
Body	T
Body Electrical System	U
Heater and Air Conditioner Systems	TD
Technical Data	ST
Special Tools	Z
Wiring Diagram (Form No. 5210-10-91H)	

* Refer to the 1993 RX-7 Body Electrical Troubleshooting manual (form N o. 1312-10-91L) for servicing of the body electrical components.

© 1991 Mazda Motor Corporation
PRINTED IN JAPAN, NOV. '91
1292-10-91 I
(9999-95-018B-93)

VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1FD 331*PO 200001 ~

JM1FD 332*PO 200001 ~

GENERAL INFORMATION

IMPORTANT INFORMATION	GI- 2
BASIC ASSUMPTIONS	GI- 2
SAFETY RISK	GI- 2
POSSIBLE LOSS OF WARRANTY	GI- 2
WARNING ON LUBRICANTS AND GREASES	GI- 2
HOW TO USE THIS MANUAL	GI- 3
PREPARATION	GI- 3
REPAIR PROCEDURE	GI- 3
SYMBOLS	GI- 4
NOTES, CAUTIONS, AND WARNINGS	GI- 4
FUNDAMENTAL PROCEDURES	GI- 4
PROTECTION OF VEHICLE	GI- 4
A WORD ABOUT SAFETY	GI- 5
PREPARATION OF TOOLS AND MEASURING EQUIPMENT	GI- 5
SPECIAL TOOLS	GI- 5
REMOVAL OF PARTS	GI- 5
DISASSEMBLY	GI- 5
REASSEMBLY	GI- 6
ADJUSTMENTS	GI- 7
RUBBER PARTS AND TUBING	GI- 7
JACK AND SAFETY STAND POSITIONS	GI- 8
VEHICLE LIFT (2-SUPPORT TYPE)	
POSITIONS	GI- 8
TOWING	GI- 9
WITH MANUAL TRANSMISSION	GI- 9
WITH AUTOMATIC TRANSMISSION	GI- 9
IDENTIFICATION NUMBER LOCATIONS	GI-10
UNITS	GI-10
ABBREVIATIONS	GI-10
CAUTION	GI-11
INSTALLATION OF MOBILE TWO-WAY RADIO SYSTEM	GI-11
REMOVAL OF IGNITION KEY ON AUTOMATIC TRANSMISSION MODEL	GI-11
SERVICE PRECAUTIONS CONCERNING AIR BAG SYSTEM	GI-12
ELECTRICAL TROUBLESHOOTING TOOLS	GI-14
CAUTION WITH ELECTRICAL PARTS	GI-15

07UGIX-001

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 if necessary. 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.

9MUGIX-002

HOW TO USE THIS MANUAL

PREPARATION



PREPARATION points out the needed **SST** for the service operation that follows. It is best to gather all necessary **SST** before beginning work.

Example:


N ENGINE SPEED SENSING POWER STEERING

ENGINE SPEED SENSING POWER STEERING

PREPARATION

<p>49 0118 850C Puller, ball joint</p> 	<p>49 H028 301 Installer, boot</p> 
--	--

9MAJ0NX-030




SST NUMBER

49 H028 301

SST NAME

Installer, boot

SST ILLUSTRATION



9MUGIX-033

REPAIR PROCEDURE

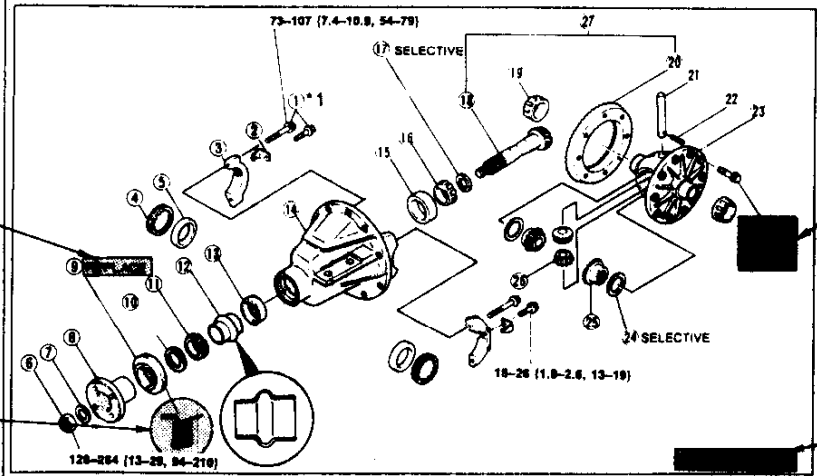
1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual parts inspections. If a damaged or worn part is found, repair or replace it as necessary.
2. Expendable parts, tightening torques, and symbols for oil, grease, 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:

SHOWS EXPENDABLE PARTS

SHOWS APPLICATION POINT OF OIL, ETC.

SHOWS RELATED PAGE FOR SERVICE



<p>1. Bolt</p> <p>2. Lock plate</p> <p>3. Bearing cup</p> <p>4. Adjusting screw</p> <p>5. Bearing outer race</p> <p>6. Locknut</p> <p>7. Washer</p> <p>8. Companion flange</p>	<p>16. Bearing inner race</p> <p>Removal..... page M-22</p> <p>Installation..... page M-24</p> <p>17. Spacer</p> <p>18. Drive pinion</p> <p>Removal..... page M-21</p> <p>Inspect splines and teeth for wear or damage..... page M-22</p> <p>Adjustment of height..... page M-22</p> <p>Adjustment..... page M-24</p>
--	---

SHOWS TIGHTENING TORQUE SPECIFICATION *2







SHOWS TIGHTENING TORQUE UNIT

SHOWS VISUAL INSPECTION INFORMATION

* 1: The numbers (① ex.) refer to parts identification and where necessary servicing procedure.
 * 2: Units are in N·m {kgf·m, 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 servicing.

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	Petroleum jelly

07UGIX-002

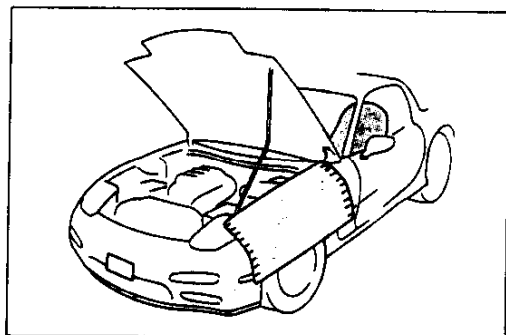
Note

- When specific 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.

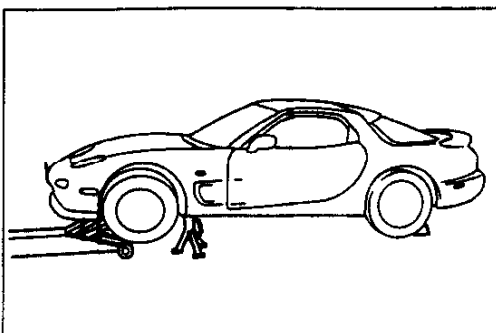
9MUGIX-036



9MUGIX-037

FUNDAMENTAL PROCEDURES**PROTECTION OF THE VEHICLE**

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



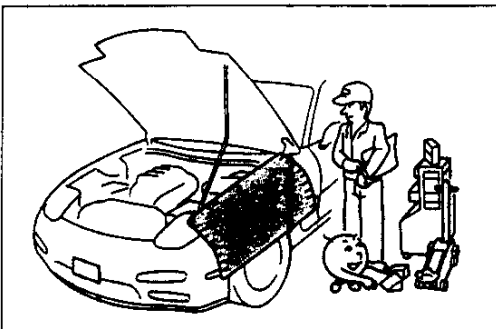
9MUGIX-003

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.

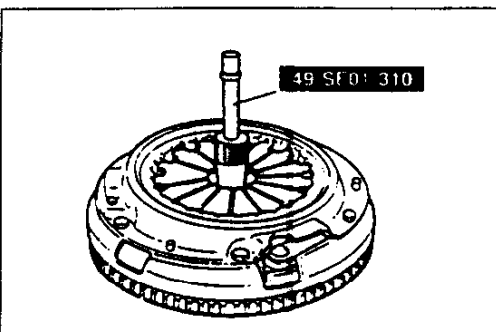
Start the engine only after making certain the engine compartment is clear of tools and people.



9MUGIX-038

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

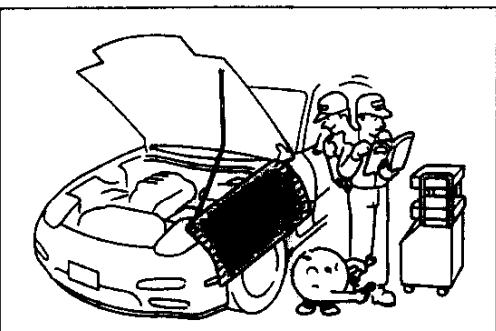
Be sure that all necessary tools and measuring equipment are available before starting any work.



9MUGIX-003

SPECIAL TOOLS

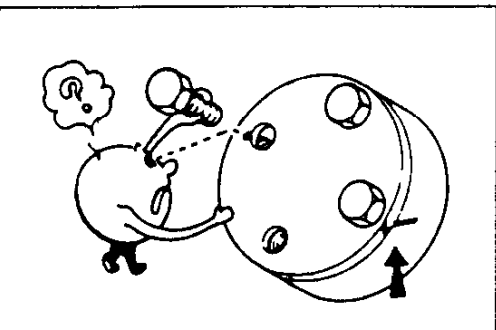
Use Special Service Tools (**SST**) when they are required.



47UGIX-006

REMOVAL OF PARTS

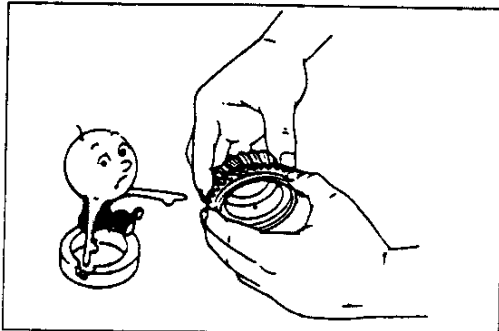
While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair.



9MUGIX-039

DISASSEMBLY

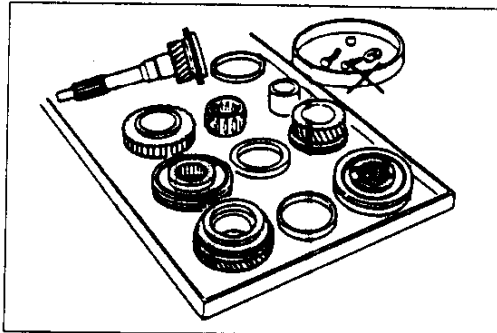
If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



9MUGIX-040

1. Inspection of parts

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

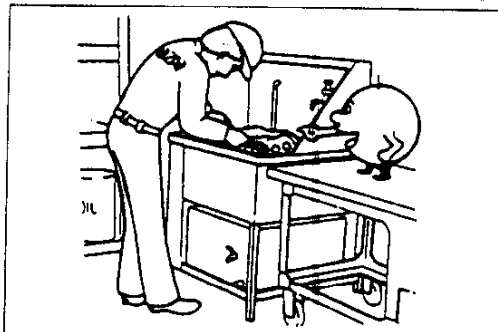


9MUGIX-041

2. Arrangement of parts

All disassembled parts should be carefully arranged for reassembly.

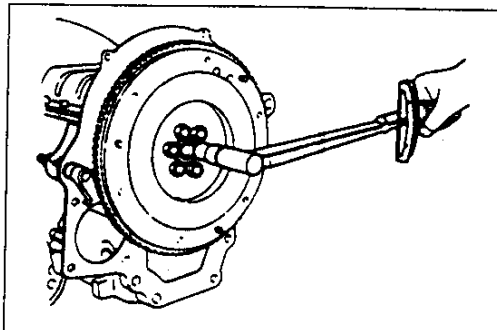
Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



47U0GX-010

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.

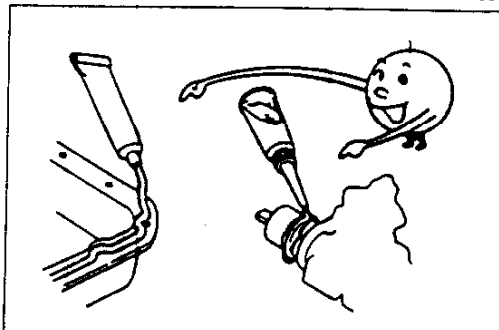
Refer to STANDARD BOLT AND NUT TIGHTENING TORQUE in Section TD for tightening torques not mentioned in the main text.

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

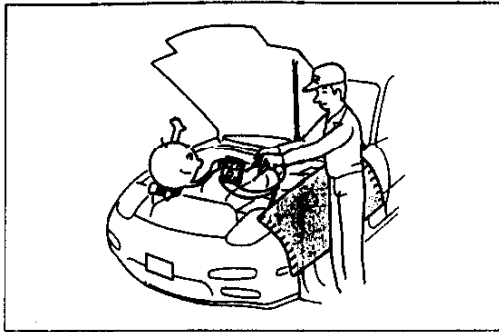
- | | |
|----------------|-----------------|
| 1. Oil seals | 2. Gaskets |
| 3. O-rings | 4. Lock washers |
| 5. Cotter pins | 6. Nylon nuts |

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.



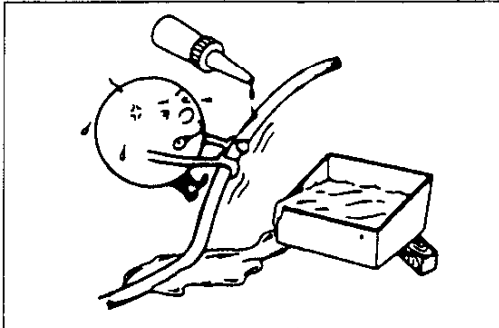
9MUGIX-042



67UGIX-002

ADJUSTMENTS

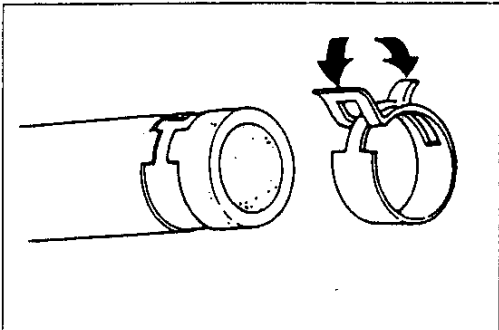
Use suitable gauges and/or testers when making adjustments.



9MUGIX-005

RUBBER PARTS AND TUBING

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



19GGIX-008

HOSE CLAMPS

When reinstalling, position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.

CAUTIONS ON USE OF CHASSIS ROLLER

Observe the following when test-running a vehicle on a dynamometer.

- Place a cooling fan with adequate capacity in front of the vehicle.
(A vehicle speed proportional type is desirable.)
- Connect an exhaust gas ventilation unit.
- Cool around the exhaust pipes with a cooling fan.
Exhaust heat could cause thermal deformation in the rear bumper fascia.
Bumper surface temperature: 70°C {158°F} max.
- Allow adequate space in front and rear of the vehicle.
Do not let heat built up around the vehicle.
- Pay attention to the water temperature gauge readings.
Do not allow the engine to overheat.
- Avoid excessively loaded running.
Run the vehicle at a constant speed.

19GGIX-009

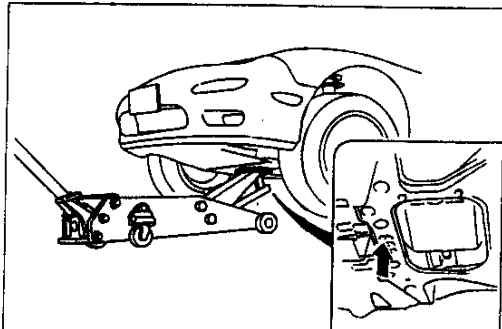
GI JACK AND SAFETY STAND POSITIONS/VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

JACK AND SAFETY STAND POSITIONS

FRONT

Jack position:

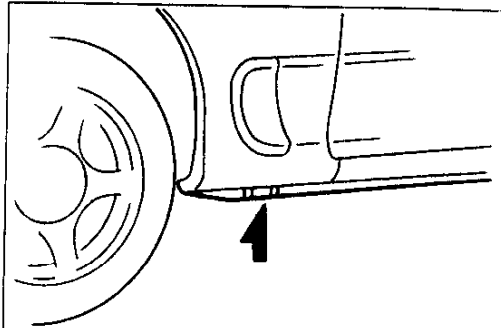
At center of crossmember



07UGIX-004

Safety stand positions:

At both sides of body frame

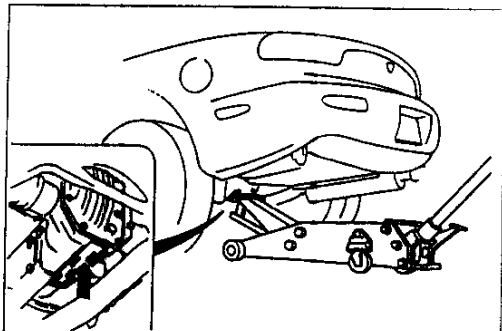


07UGIX-005

REAR

Jack position:

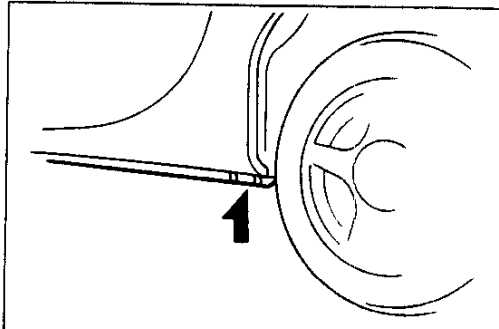
At the center of the differential



07UGIX-006

Safety stand positions:

At both sides of body frame



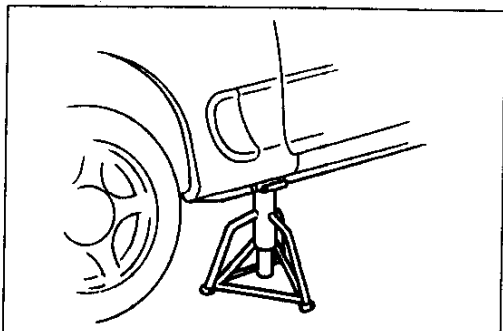
07UGIX-007

VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

FRONT END

Frame

Side sills

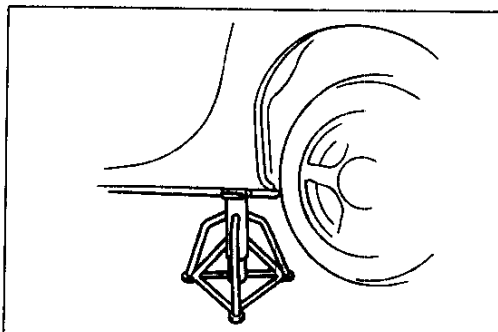


9MUGIX-010

REAR END

Frame

Side sills



9MUGIX-011