

2010

MAZDA3 *MAZDASPEED3* Workshop Manual

FOREWORD

This manual contains on-vehicle service and/or diagnosis procedures for the Mazda3/Mazdaspeed3.

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), and related materials shown on the following page.

CONTENTS

Title	Section
GENERAL INFORMATION	00
ENGINE	01
SUSPENSION	02
DRIVELINE/AXLE	03
BRAKES	04
TRANSMISSION/TRANSAXLE	05
STEERING	06
HEATER, VENTILATION & AIR CONDITIONING (HVAC)	07
RESTRAINTS	08
BODY & ACCESSORIES	09
ALPHABETICAL INDEX	AI

© 2009 Mazda Motor Corporation
PRINTED IN U.S.A., APRIL 2009
Form No. 1930-1U-09D
Part No. 9999-95-017B-10

VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1 BL1H3*A# 100001—
JM1 BL1H4*A# 100001—
JM1 BL1H5*A# 100001—
JM1 BL1H6*A# 100001—
JM1 BL1HF*A# 100001—
JM1 BL1S5*A# 100001—
JM1 BL1S6*A# 100001—
JM1 BL1SF*A# 100001—
JM1 BL1SG*A# 100001—

RELATED MATERIALS

Material Name	MNAO Part No.	Mazda Material No.
2010 Mazda3/Mazdaspeed3 Service Highlights	9999-95-064F-10	3455-1U-09D
Engine Workshop Manual L3 WITH TC	9999-95-0L3T-06	1833-1U-05H
Engine Workshop Manual L5	9999-95-00L5-09	1924-1U-08F
Engine Workshop Manual LF L3	9999-95-LFL3-08	1972-1U-08K
Manual Transmission Workshop Manual G35M-R	9999-95-0G35-03	1756-1U-02I
Manual Transaxle and Transfer Workshop Manual A26M-R A26MX-R	9999-95-A26M-07	1898-1U-06G
Manual Transmission Workshop Manual G66M-R	9999-95-G66M-09	1929-1U-08F
Automatic Transaxle Workshop Manual FS5A-EL	9999-95-FS5A-06	1859-1U-05F
2010 Mazda3/Mazdaspeed3 Bodyshop Manual	9999-95-036F-10	3454-1U-09D
2010 Mazda3/Mazdaspeed3 Wiring Diagram	9999-95-019G-10	5766-1U-09D

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

GENERAL INFORMATION

00
SECTION

00-00

GENERAL INFORMATION 00-00

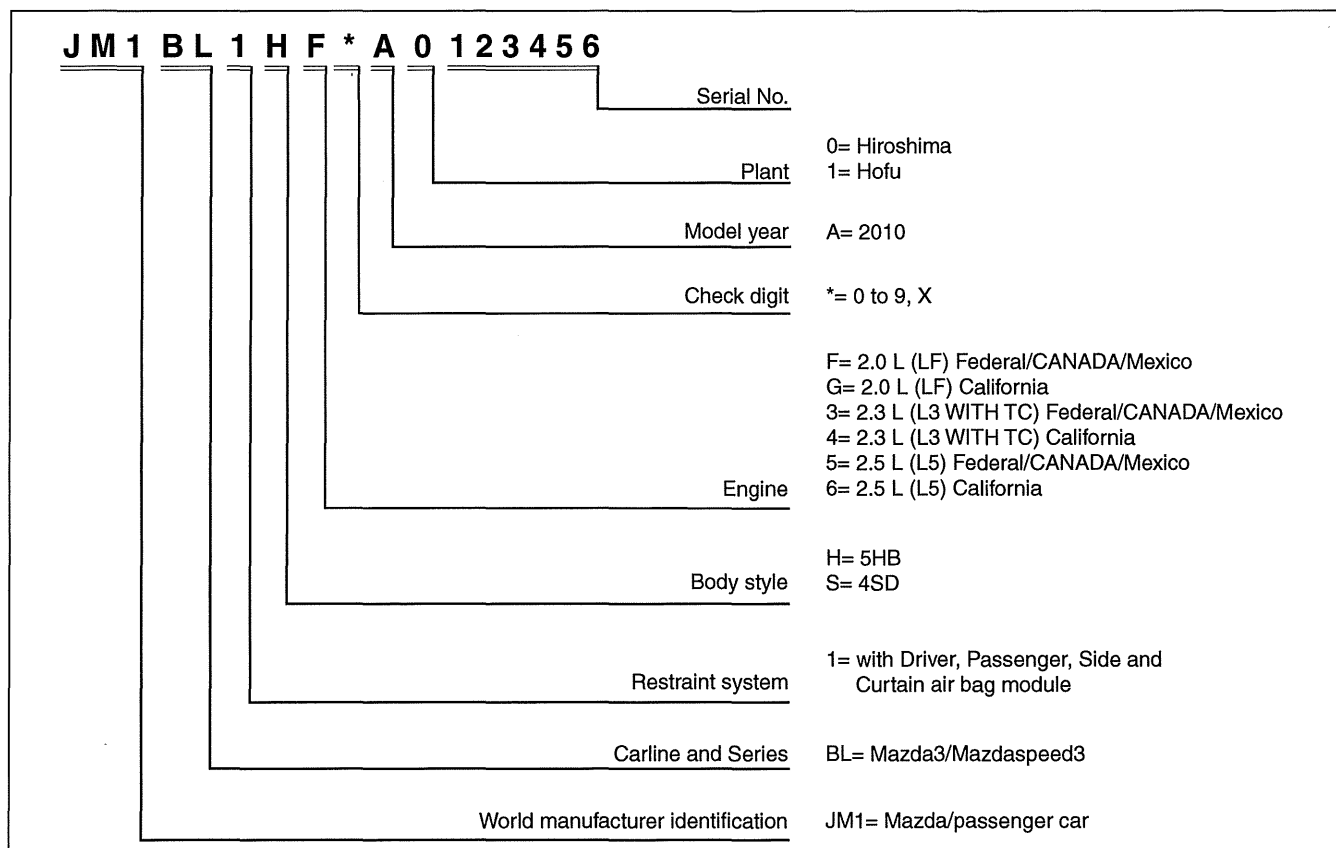
00-00 GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER	
(VIN) CODE	00-00-2
VEHICLE IDENTIFICATION NUMBER	
(VIN)	00-00-2
HOW TO USE THIS MANUAL	00-00-3
Range of Topics	00-00-3
Service Procedure	00-00-3
Symbols	00-00-5
Advisory Messages	00-00-5
Troubleshooting Procedure	00-00-6
Procedures for Use	00-00-7
UNITS	00-00-12
Conversion to SI Units	
(Système International d'Unités)	00-00-12
Rounding Off	00-00-12
Upper and Lower Limits	00-00-12
SERVICE CAUTIONS	00-00-13
Injury/damage Prevention	
Precautions	00-00-13
Protection of the Vehicle	00-00-13
Preparation of Tools and	
Measuring Equipment	00-00-13
Special Service Tools	00-00-13
Malfunction Diagnosis System	00-00-13
Negative Battery Cable Disconnection/ Connection	00-00-14
Oil Leakage Inspection	00-00-14
Removal of Parts	00-00-15
Disassembly	00-00-15
Inspection During Removal, Disassembly	00-00-15
Arrangement of Parts	00-00-15
Cleaning of Parts	00-00-16
Reassembly	00-00-16
Adjustment	00-00-16
Rubber Parts and Tubing	00-00-17
Hose Clamps	00-00-17
Torque Formulas	00-00-17
Vise	00-00-17
Dynamometer	00-00-18
SST	00-00-18
ELECTRICAL SYSTEM	00-00-19
Electrical Parts	00-00-19
Wiring Harness	00-00-19
Connectors	00-00-19
Terminals	00-00-21
Sensors, Switches, and Relays	00-00-21
Wiring Harness	00-00-21
Fuse	00-00-22
Direction of View for Connector	00-00-22
Electrical Troubleshooting Tools	00-00-23
Precautions Before Welding	00-00-24
INSTALLATION OF RADIO SYSTEM	00-00-25
JACKING POSITIONS, VEHICLE LIFT	
(2 SUPPORTS) AND SAFETY STAND	
(RIGID RACK) POSITIONS	00-00-26
Jacking Positions	00-00-26
Vehicle Lift Positions, Safety Stand Positions	00-00-27
TOWING	00-00-28
Vehicle Securing Position	00-00-29
IDENTIFICATION NUMBER	
LOCATIONS	00-00-30
Vehicle Identification Number (VIN)	00-00-30
Engine Identification Number	00-00-30
SAE STANDARDS	00-00-31
ABBREVIATIONS	00-00-32
PRE-DELIVERY INSPECTION	00-00-33
Pre-Delivery Inspection Table	00-00-33
SCHEDULED MAINTENANCE	00-00-34
Scheduled Maintenance Table for U.S.A., CANADA and Puerto Rico	00-00-34
Scheduled Maintenance Table for Mexico	00-00-37

GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER (VIN) CODE

id000000100200



am3uuw0000624

VEHICLE IDENTIFICATION NUMBER (VIN)

id000000100300

JM1 BL1H3*A# 100001—
 JM1 BL1H4*A# 100001—
 JM1 BL1H5*A# 100001—
 JM1 BL1H6*A# 100001—
 JM1 BL1HF*A# 100001—
 JM1 BL1S5*A# 100001—
 JM1 BL1S6*A# 100001—
 JM1 BL1SF*A# 100001—
 JM1 BL1SG*A# 100001—

GENERAL INFORMATION

HOW TO USE THIS MANUAL

id000000800100

Range of Topics

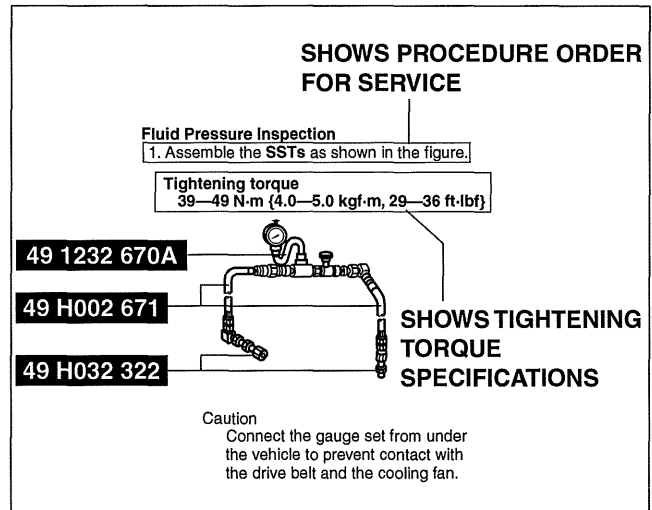
- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
 - Removal/Installation
 - Disassembly/Assembly
 - Replacement
 - Inspection
 - Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

00-00

Service Procedure

Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



am6xuw0000155

GENERAL INFORMATION

Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.

Procedure

↓

①

"Removal/Installation" Portion

②

"Inspection After Installation" Portion

↑

INSTALL THE PARTS BY PERFORMING STEPS 1—3 IN REVERSE ORDER

SHOWS SERVICE ITEM (S)

LOWER TRAILING LINK, UPPER TRAILING LINK REMOVAL/INSTALLATION

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the undercover. (See 01-10-4 Undercover Removal)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Inspect the rear wheel alignment and adjust it if necessary.

INDICATES RELEVANT REFERENCES THAT NEED TO BE FOLLOWED DURING INSTALLATION

SHOWS SPECIAL SERVICE TOOL (SST) FOR SERVICE OPERATION

SHOWS APPLICATION POINTS OF GREASE, ETC.

SHOWS EXPENDABLE PARTS

SHOWS TIGHTENING TORQUE SPECIFICATIONS

SHOWS DETAILS

SHOWS TIGHTENING TORQUE UNITS

N·m (kgf·m, ft·lb)

SHOWS REFERRAL NOTES FOR SERVICE

1	Split pin	7	Split pin
2	Nut	8	Nut
3	Lower trailing link ball joint (See 02-14-5 Lower Trailing Link Ball Joint Removal Note)	9	Upper trailing link ball joint (See 02-14-5 Upper Trailing Link Ball Joint Removal Note)
4	Bolt	10	Nut
5	Lower trailing link	11	Upper trailing link
6	Dust boot (lower trailing link)	12	Dust boot (upper trailing link)

SHOWS REFERRAL NOTES FOR SERVICE

Lower Trailing Link Ball Joint, Upper Trailing Link Ball Joint Removal Note

- Remove the ball joint using the SSTs.

SHOWS SPECIAL SERVICE TOOL (SST) NO.

49 T028 304 UPPER TRAILING LINK
49 T028 305 LOWER TRAILING LINK

49 T028 303









KNUCKLE

am6xuw0000155

GENERAL INFORMATION

Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/ transmission fluid	New appropriate automatic transaxle/ transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

00-00

Advisory Messages

- You will find several **Warnings, Cautions, Notes, Specifications** and **Upper and Lower Limits** in this manual.

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

Specification

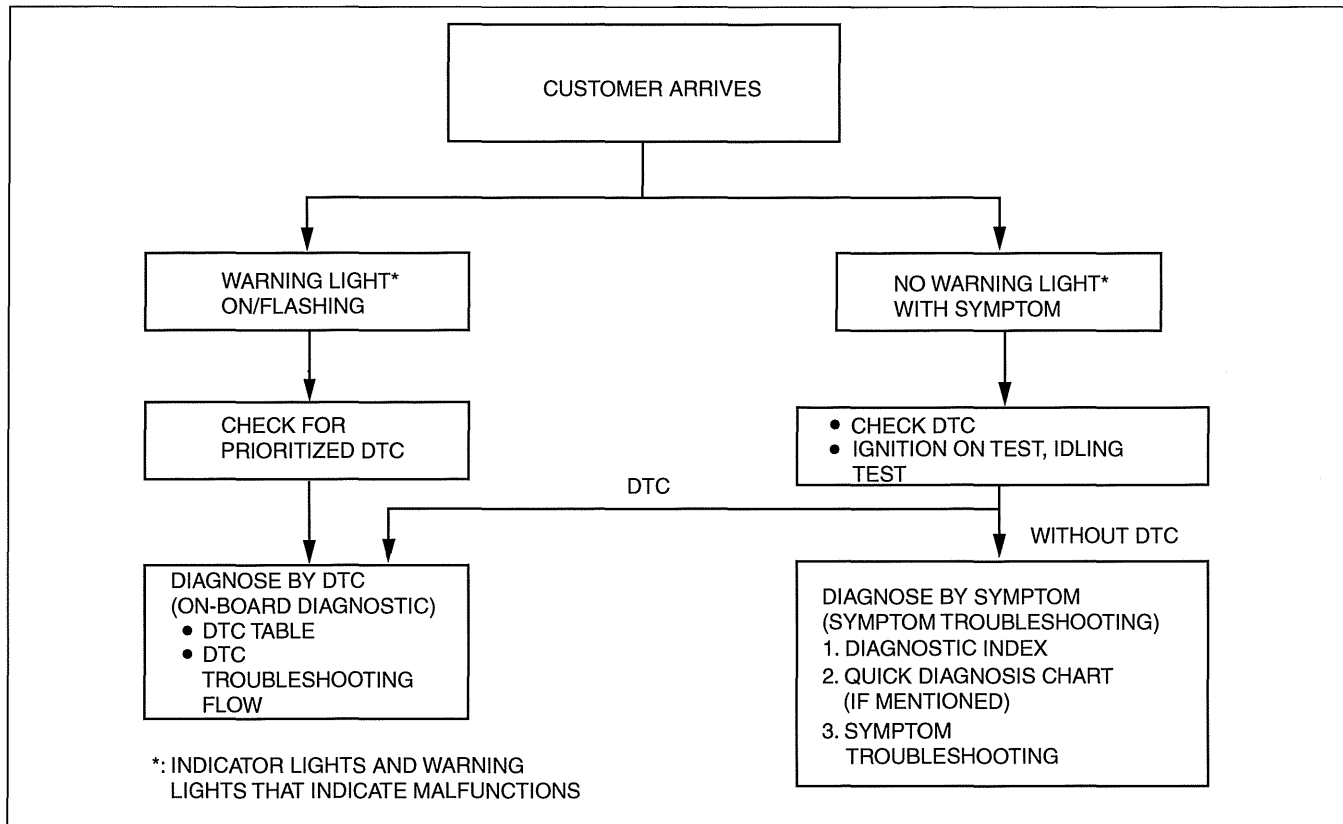
- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

GENERAL INFORMATION

Troubleshooting Procedure Basic flow of troubleshooting



acxuuw00000444

DTC troubleshooting flow (on-board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on-board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on-board diagnostic function.

Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

GENERAL INFORMATION

Procedures for Use

Using the basic inspection (section 05)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.
- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the action column.

00-00

	SHOWS INSPECTION ORDER	SHOWS ITEM NAMES FOR DETAILED PROCEDURES	SHOW POINTS REQUIRING ATTENTION BASED ON INSPECTION RESULTS				
	BASIC INSPECTION						
	STEP	INSPECTION	ACTION				
	1	Perform the mechanical system test. (See 05-13-3 MECHANICAL SYSTEM TEST.) Is mechanical system normal?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any malfunctioning parts according to the inspection result.</td> </tr> </table>	Yes	Go to the next step.	No	Repair or replace any malfunctioning parts according to the inspection result.
Yes	Go to the next step.						
No	Repair or replace any malfunctioning parts according to the inspection result.						
	2	Turn the ignition switch to the ON position. When the selector lever is moved, does the selector illumination indicate synchronized position to the lever location? Also, when other ranges are selected from N or P during idling, does the vehicle move within 1—2 s?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-14-5 SELECTOR LEVER INSPECTION.) (See 05-13-10 TRANSMISSION RANGE (TR) SWITCH INSPECTION.) If the selector lever and TR switch are normal, go to the next step.</td> </tr> </table>	Yes	Go to the next step.	No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-14-5 SELECTOR LEVER INSPECTION.) (See 05-13-10 TRANSMISSION RANGE (TR) SWITCH INSPECTION.) If the selector lever and TR switch are normal, go to the next step.
Yes	Go to the next step.						
No	Inspect the selector lever and TR switch. Repair or replace malfunctioning parts. (See 05-14-5 SELECTOR LEVER INSPECTION.) (See 05-13-10 TRANSMISSION RANGE (TR) SWITCH INSPECTION.) If the selector lever and TR switch are normal, go to the next step.						
	3	Inspect the ATF color condition. (See 05-13-8 AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION.) Are ATF color and odor normal?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any malfunctioning parts according to the inspection result. Flush ATX and cooler line as necessary.</td> </tr> </table>	Yes	Go to the next step.	No	Repair or replace any malfunctioning parts according to the inspection result. Flush ATX and cooler line as necessary.
Yes	Go to the next step.						
No	Repair or replace any malfunctioning parts according to the inspection result. Flush ATX and cooler line as necessary.						
	4	Perform the line pressure test. (See 05-13-3 Line Pressure Test.) Is the line pressure normal?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any malfunctioning parts according to the inspection result.</td> </tr> </table>	Yes	Go to the next step.	No	Repair or replace any malfunctioning parts according to the inspection result.
Yes	Go to the next step.						
No	Repair or replace any malfunctioning parts according to the inspection result.						
	5	Perform the stall test. (See 05-13-4 Stall Speed Test.) Is the stall speed normal?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any malfunctioning parts according to the inspection result.</td> </tr> </table>	Yes	Go to the next step.	No	Repair or replace any malfunctioning parts according to the inspection result.
Yes	Go to the next step.						
No	Repair or replace any malfunctioning parts according to the inspection result.						
REFERENCE COLUMN		Inspect the voltage at the following TCM terminals. (See 05-13-29 TCM INSPECTION.) <ul style="list-style-type: none"> • Terminal 2J (TFT sensor) • Terminals 1D, 2B, 2C, 2E (TR switch) • Terminal 2G (turbine sensor) • Terminal 2D (down switch) • Terminal 2I (up switch) • Terminal 1E (M range switch) • Terminal 1W (steering shift switch) Is the voltage normal?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">Yes</td> <td>Go to the next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any malfunctioning parts according to the inspection result.</td> </tr> </table>	Yes	Go to the next step.	No	Repair or replace any malfunctioning parts according to the inspection result.
Yes	Go to the next step.						
No	Repair or replace any malfunctioning parts according to the inspection result.						

am6xuw0000155

GENERAL INFORMATION

Using the DTC troubleshooting flow

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

· TROUBLE CONDITION

DTC P0103

DETECTION CONDITION
describes the condition under which the DTC is detected.

DTC P0103	<p>MAF circuit high input</p> <p>PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 68 is above 8.25 V, PCM determines that TP circuit has malfunction.</p>	
DETECTION CONDITION	<p>Diagnostic support note</p> <ul style="list-style-type: none"> This is a continuous monitor (CCM). MIL illuminates if PCM detects the above malfunction during first drive cycle. Therefore, PENDING CODE is not available. FREEZE FRAME DATE is available. DTC is stored in the PCM memory. 	
POSSIBLE CAUSE	<ul style="list-style-type: none"> MAF sensor malfunction Connector or terminal malfunction Open circuit in wiring between MAF sensor terminal D and PCM terminal 36 Open circuit in MAF sensor ground circuit 	

POSSIBLE CAUSE
describes possible point(s) of malfunction

FROM MAIN RELAY TERMINAL D

MAF SENSOR HARNESS SIDE CONNECTOR

PCM HARNESS SIDE CONNECTOR

Indicates the inspection step No. to be performed (01 and 05 section)

Indicates the circuit to be inspected (01 and 05 section)

STEP shows the order of troubleshooting

Indicates the connector related to the inspection

Diagnostic procedure			
STEP	INSPECTION		ACTION
1	<p>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</p> <ul style="list-style-type: none"> Has FREEZE FRAME DATA been recorded? 	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<p>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</p> <ul style="list-style-type: none"> Are related Service Bulletins and/or on-line repair information available? 	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	<p>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</p> <ul style="list-style-type: none"> Connect diagnostic tool to DLC-2. Start engine. Access MAF V PID using diagnostic tool. Is MAF V PID within 0.2 - 8.3 V? 	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-33 INTERMITTENT CONCERN TROUBLESHOOTING)
		No	Go to next step.
4	<p>INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR</p> <ul style="list-style-type: none"> Turn ignition key to OFF. Disconnect MAF sensor connector. Check for poor connection (damaged, pulled-out terminals, corrosion etc.). Are there any malfunctions? 	Yes	Repair or replace terminals, then go to Step 8.

INSPECTION
describes the method to quickly determine the malfunctioning part(s).

ACTION
describes the appropriate action to be taken according to the result (Yes/No) of the INSPECTION.

Reference item(s) to perform ACTION.

am6xuw0000155

00-00-8

GENERAL INFORMATION

Using the diagnostic index

- Malfunction symptoms are listed in the diagnostic index under symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	Page
1	Melting of main or other fuses	—	(See 01-03-6 MELT NO.1 MAIN OR OTHER FUSE)
2	MIL comes on	MIL is illuminated incorrectly.	(See 01-03-7 NO.2 MIL COMES ON)
3	Will not crank	Starter does not work.	(See 01-03-8 NO. 3 WILL NOT CRANK)
4	Hard start/long crank/erratic start/erratic crank	Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01-03-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK)
5	Engine stalls. After start/at idle	Engine stops unexpectedly at idle and/or after start.	(See 01-03-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE)
6	Cranks normally but will not start	Starter cranks engine at normal speed but engine will not run.	(See 01-03-15 NO.6 CRANKS NORMALLY BUT WILL NOT START)
7	Slow return to idle	Engine takes more time than normal to return to idle speed.	(See 01-03-19 NO. 7 SLOW RERUN TO IDLE)
8	Engine runs rough/rotling	Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01-03-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE)
9	Fast idle/runs on	Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	(See 01-03-23 NO. 9 FAST IDLE/RUNS ON)
10	Low idle/stalls during deceleration	Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	(See 01-03-24 NO. 10 LOW IDLE/ STALLS DURING DECELERATION)

00-00

acxuuw00000447

GENERAL INFORMATION

Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. It also specifies a range of common causes when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to a malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

SYMPTOM QUICK DIAGNOSTIC CHART		② PARTS WHICH MAY BE THE CAUSE OF PROBLEMS																				
		Starter motor malfunction (Mechanical or electrical)	Starter circuit, including ignition switch open	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel seized	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture improperly	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts improperly installed	Cooling fan or condenser fan seat improperly	Accelerator cable free play mis-adjustment	Fuel quality
Troubleshooting item																						
1	Melts of main or other fuse																					
2	MIL comes on																					
3	Will not crank	x	x		x	x			x				x									
4	Hard to start/long crank/erratic start/erratic crank																					x
5	Engine stalls After start/at idle									x	x	x										x
6	Cranks normally but will not start									x	x	x										x
7	Slow return to idle																	x				
8	Engine runs rough/rolling idle									x	x											x
9	Fast idle/runs on																					x
10	Low idle/stalls during deceleration																					
11	Engine stalls/quits Acceleration/cruise										x	x										x
	Engine runs rough Acceleration/cruise										x	x										x
	Misses Acceleration/cruise										x	x										x
	Buck/jerk Acceleration/cruise/deceleration										x	x										x
	Hesitation/stumble Acceleration										x	x										x
Surges Acceleration/cruise										x	x											x
12	Lack/loss of power Acceleration/cruise										x	x										x
13	Knocking/pinging Acceleration/cruise										x											x
14	Poor fuel economy									x	x											x
15	Emissions compliance									x	x											
16	High oil consumption/leakage											x	x	x								
17	Cooling system concerns Overheating													x	x	x						
18	Cooling system concerns Runs cold																	x		x		
19	Exhaust smoke																					
20	Fuel odor (in engine compartment)																					
21	Engine noise												x									
22	Vibration concerns (engine)													x								
23	A/C does not work sufficiently																					
24	A/C always on/ A/C compressor runs continuously																					
25	A/C does not cut off under wide open throttle conditions																					
26	Exhaust sulphur smell																					x
27	Fuel refill concerns																					
28	Fuel filling shut off issues																					
29	Intermittent concerns																					
30	Constant voltage																					
31	Spark plug condition																					x
32	Automatic transaxle concerns Upshift/downshift/engagement																					
		(See 05-01 AUTOMATIC TRANSAXLE SYMPTOM TROUBLESHOOTING)																				

am6xuw0000155

GENERAL INFORMATION

00-00

Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to be taken for each trouble symptom.

	DESCRIPTION describes what kind of TROUBLE SYMPTOM	TROUBLE SYMPTOM				
14		Engine flares up or slips when upshifting or down shifting				
DESCRIPTION		<ul style="list-style-type: none"> • When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly. • When accelerator is depressed while driving, engine speed increases but vehicle not. 				
POSSIBLE CAUSE describes possible point of malfunction		<ul style="list-style-type: none"> • There is clutch slip because clutch is stuck or line pressure is low. <ul style="list-style-type: none"> — Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) <ul style="list-style-type: none"> • Line pressure low • Malfunction or mis-adjustment of TP sensor • Malfunction of VSS • Malfunction of input/turbine speed sensor • Malfunction of sensor ground • Malfunction of shift solenoid A, B or C • Malfunction of TCC solenoid valve • Malfunction of body ground • Malfunction of throttle cable • Malfunction of throttle valve body — Poor operating of mechanical pressure <ul style="list-style-type: none"> • Selector lever position disparity • TR switch position disparity 				
STEP shows the order of troubleshooting.		<p>Note</p> <ul style="list-style-type: none"> • Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted. 				
Reference item(s) for additional information to perform INSPECTION.	INSPECTION describes the method to quickly determine the malfunctioning part(s).	ACTION describes the appropriate action to be taken according to the result (Yes/No) of the INSPECTION. How to perform ACTION is described in the relative material shown. Reference item(s) to perform ACTION.				
Diagnostic procedure						
STEP	INSPECTION	ACTION				
1	<ul style="list-style-type: none"> • Is line pressure okay? 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 5%;">Yes</td> <td>Go to next step.</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Repair or replace any defective parts according to inspection results.</td> </tr> </table>	Yes	Go to next step.	No	Repair or replace any defective parts according to inspection results.
Yes	Go to next step.					
No	Repair or replace any defective parts according to inspection results.					
2	<ul style="list-style-type: none"> • Is shift point okay? (See 05-17-5 ROAD TEST) 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 5%;">Yes</td> <td>Go to next step</td> </tr> <tr> <td style="text-align: center;">No</td> <td>Go to symptom troubleshooting No.9 "Abnormal shift".</td> </tr> </table>	Yes	Go to next step	No	Go to symptom troubleshooting No.9 "Abnormal shift".
Yes	Go to next step					
No	Go to symptom troubleshooting No.9 "Abnormal shift".					
3	<ul style="list-style-type: none"> • Stop engine and turn ignition switch on. • Connect diagnostic tool to DLC-2. • Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. • Is operating sound of shift solenoids heard? 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 5%;">Yes</td> <td> <ul style="list-style-type: none"> • Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F)) • If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATION) </td> </tr> <tr> <td style="text-align: center;">No</td> <td> <ul style="list-style-type: none"> • Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation) • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C. </td> </tr> </table>	Yes	<ul style="list-style-type: none"> • Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F)) • If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATION) 	No	<ul style="list-style-type: none"> • Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation) • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.
Yes	<ul style="list-style-type: none"> • Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F)) • If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATION) 					
No	<ul style="list-style-type: none"> • Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX. • Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation) • If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C. 					
4	<ul style="list-style-type: none"> • Verify test results. <ul style="list-style-type: none"> — If okay, return to diagnostic index to service any additional symptoms. — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. — If vehicle is repaired, troubleshooting completed. — If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM. 					

am6xuw000156

GENERAL INFORMATION

id000000801600

UNITS

Electric current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm ² (kilogram force per square centimeter)
	psi (pounds per square inch)
Number of revolutions	rpm (revolutions per minute)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm² in the following specifications:

210—260 kPa {2.1—2.7 kgf/cm², 30—38 psi}

270—310 kPa {2.7—3.2 kgf/cm², 39—45 psi}

- The actual converted values for 2.7 kgf/cm² are 264 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

GENERAL INFORMATION

SERVICE CAUTIONS

id000000800200

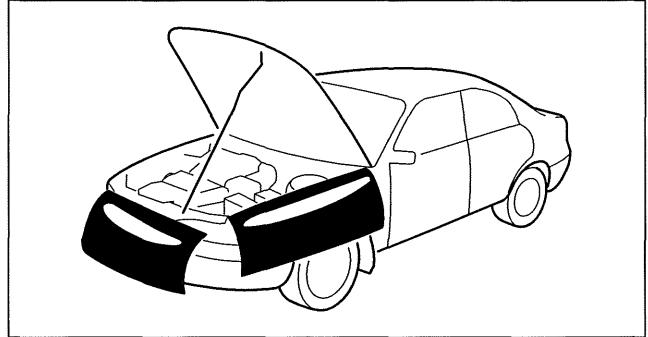
Injury/damage Prevention Precautions

- Depending on the vehicle, the cooling fan may operate suddenly even when the ignition is switched to off. Therefore, keep hands and tools away from the cooling fan even if the cooling fan is not operating to prevent injury to personnel or damage to the cooling fan. Always disconnect the negative battery cable when servicing the cooling fan or parts near the cooling fan.

00-00

Protection of the Vehicle

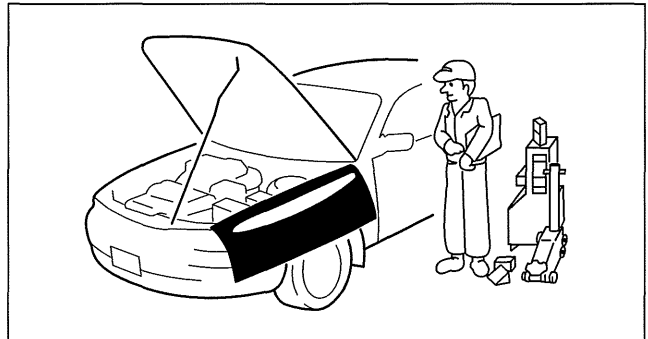
- Always be sure to cover fenders, seats and floor areas before starting work.



am3uuw0000191

Preparation of Tools and Measuring Equipment

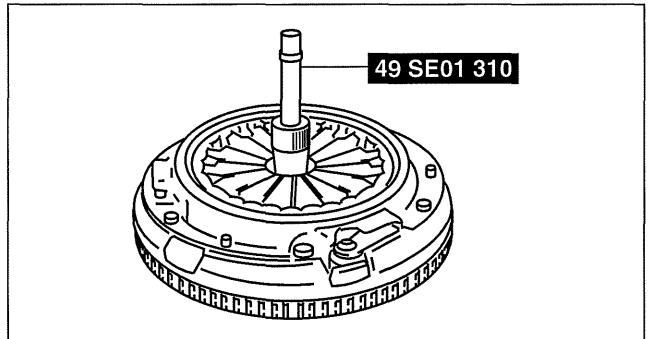
- Be sure that all necessary tools and measuring equipment are available before starting any work.



am3uuw0000192

Special Service Tools

- Use special service tools or equivalent when they are required.



am3uuw0000193

Malfunction Diagnosis System

- Use the Mazda modular diagnostic system (M-MDS) or equivalent for malfunction diagnosis.

GENERAL INFORMATION

Negative Battery Cable Disconnection/Connection

- Perform the following system initialization after disconnecting the negative battery cable.

SYSTEM	PAGE
Steering angle sensor	(See 09-18-20 STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.)
Power window system	(See 09-12-17 POWER WINDOW INITIALIZATION PROCEDURE.)

Required procedure following negative battery cable disconnection

SAS control module Disconnect the negative battery cable and wait for 1 min. or more to allow the back-up power supply to deplete its stored power.
Clock and audio The clock and audio memory settings will be erased, therefore record the clock and audio settings prior to disconnecting, and reset them after reconnecting.
Audio The DTC memory will be erased, therefore record the DTC content prior to disconnecting.

Oil Leakage Inspection

- Use either of the following procedures to identify the type of oil that is leaking:

Using UV light (black light)

1. Remove any oil on the engine or transaxle/transmission.

Note

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle/transmission oil).

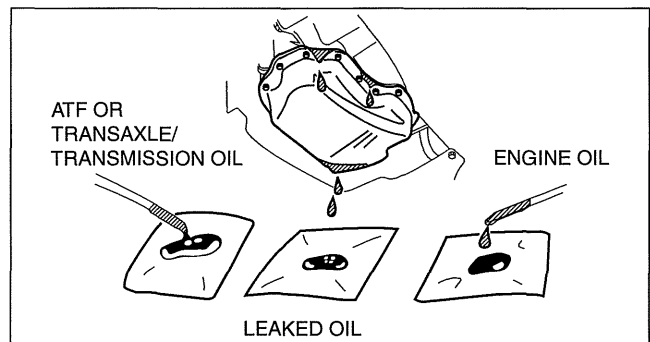
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle/transmission oil).
3. Allow the engine to run for 30 min.
4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.
5. If no dye leakage is found, allow the engine to run for another 30 min. or drive the vehicle then reinspect.
6. Find where the oil is leaking from, then make necessary repairs.

Note

- To determine whether it is necessary to replace the oil after adding the fluorescent dye, refer to the fluorescent dye instruction manual.

Not using UV light (black light)

1. Gather some of the leaking oil using an absorbent white tissue.
2. Take samples of engine oil and ATF (or transaxle/transmission oil), both from the dipstick, and place them next to the leaked oil already gathered on the tissue.
3. Compare the appearance and smell, and identify the type of oil that is leaking.
4. Remove any oil on the engine or transaxle/transmission.
5. Allow the engine to run for 30 min.
6. Check the area where the oil is leaking, then make necessary repairs.

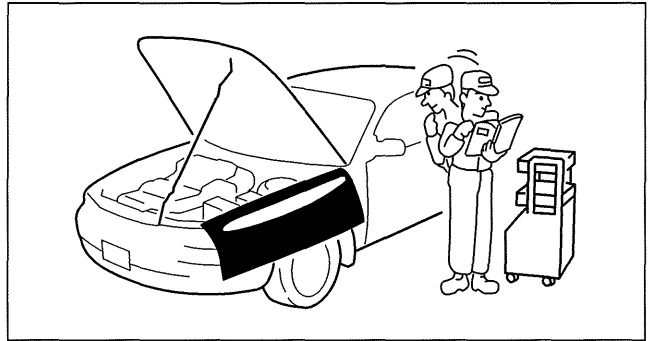


am3uuw000192

GENERAL INFORMATION

Removal of Parts

- While correcting a problem, also try to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.

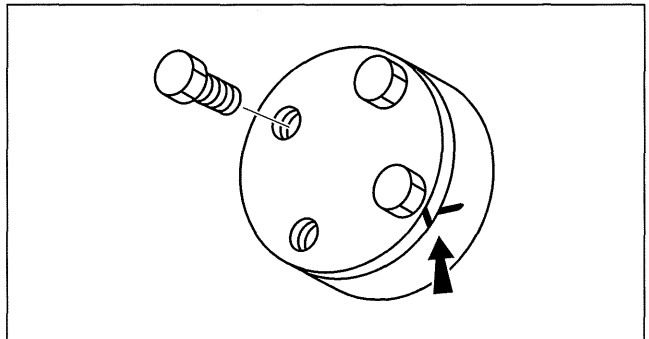


am3uuw0000192

00-00

Disassembly

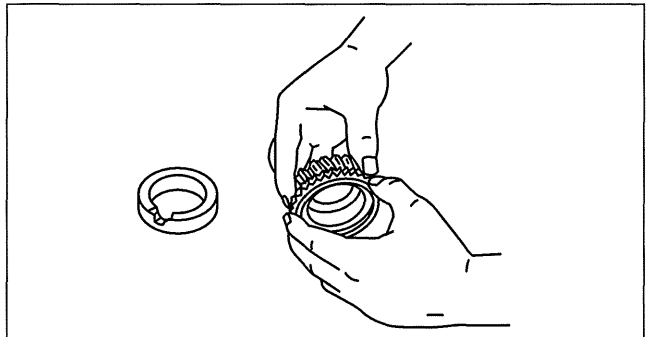
- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



am3uuw0000192

Inspection During Removal, Disassembly

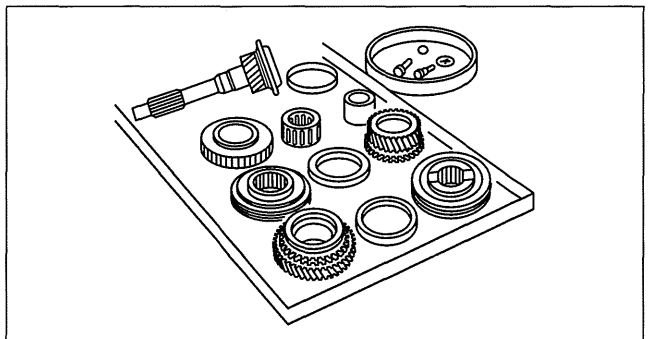
- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



am3uuw0000192

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.



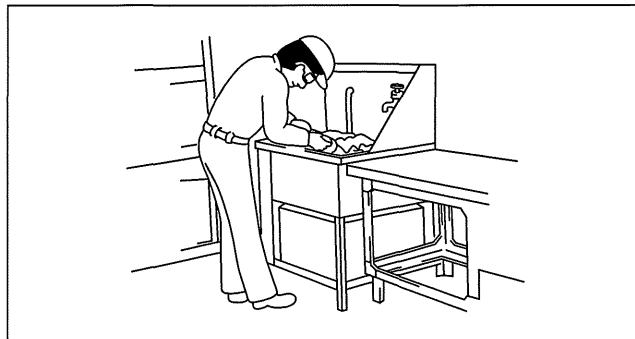
am3uuw0000192

Cleaning of Parts

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

Warning

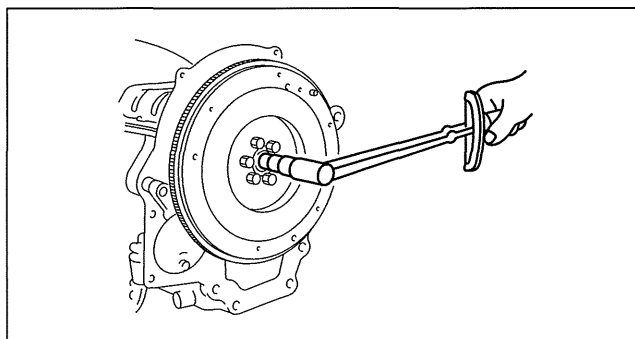
- **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



am3uuw0000192

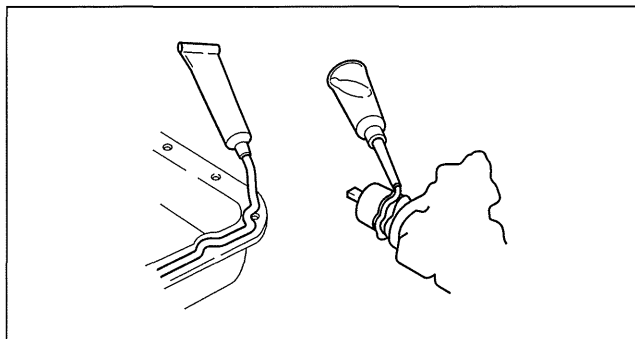
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, the following parts should be replaced with new ones:
 - Oil seals
 - Gaskets
 - O-rings
 - Lock washers
 - Cotter pins
 - Nylon nuts



am3uuw0000192

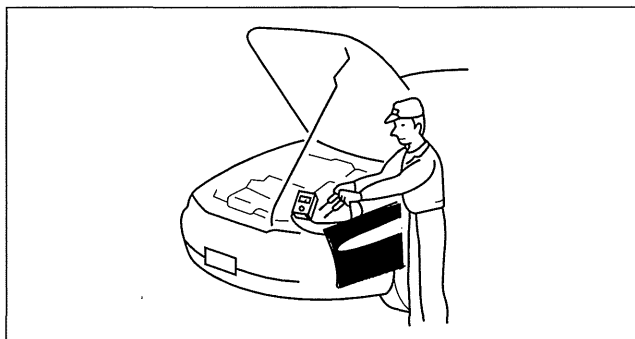
- Depending on location:
 - Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
 - Oil should be applied to the moving components of parts.
 - Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



amxzzw0000006

Adjustment

- Use suitable gauges and testers when making adjustments.



am3uuw0000193