

Mazda6 Workshop Manual

FOREWORD

This manual contains on-vehicle service and diagnosis for the Mazda6.

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.

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**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.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

U.K. specs.

JMZ GG12820#	100001—
JMZ GG14320#	100001—
JMZ GG14820#	100001—
JMZ GG12F20#	100001—
JMZ GG12F50#	100001—
JMZ GG14F20#	100001—
JMZ GG14F50#	100001—

European (L.H.D.) specs.

JMZ GG1232*#	100001—
JMZ GG1282*#	100001—
JMZ GG1432*#	100001—
JMZ GG1482*#	100001—
JMZ GG12F2*#	100001—
JMZ GG12F5*#	100001—
JMZ GG14F2*#	100001—
JMZ GG14F5*#	100001—

GCC specs.

JM7 GG32F**#	100001—
JM7 GG34F**#	100001—
JM7 GG42F**#	100001—
JM7 GG44F**#	100001—

RELATED MATERIALS

Mazda6 Training Manual (European (L.H.D.), GCC Specs.)	3359-1*-02C
Engine Workshop Manual L8, LF, L3	1731-1*-02C
Manual Transaxle Workshop Manual G35M-R	1732-1*-02C
Automatic Transaxle Workshop Manual FN4A-EL	1623-10-98E
Automatic Transaxle Workshop Manual Supplement FN4A-EL	1746-1*-02C
Mazda6 Wiring Diagram (European (L.H.D.), GCC specs.)	5539-1*-02C
Mazda6 Wirinig Diagram (U.K. specs.)	5540-1*-02C
Mazda6 Bodyshop Manual (European (L.H.D. U.K.), GCC specs.)	3360-1*-02C

* : Indicates the printing location
E: Europe
0: Japan

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

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

RANGE OF TOPICS

A6E20100001W01

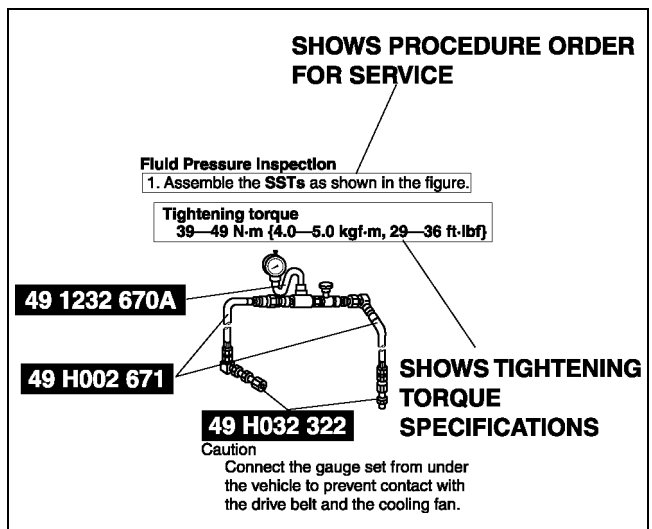
- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
 - Removal/Installation
 - Disassembly/Assembly
 - Replacement
 - Inspection
 - Adjustment
- Simple operations which can be performed easily just by looking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

SERVICE PROCEDURE

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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.



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HOW TO USE THIS MANUAL

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

"Removal/Installation" Portion

"Inspection After Installation" Portion

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

SHOWS SERVICE ITEM(S)

INDICATES ANY RELEVANT REFERENCES WHICH NEED TO BE FOLLOWED DURING INSTALLATION

SHOWS SPECIAL SERVICE TOOL(SST) FOR SERVICE OPERATION

SHOWS APPLICATION POINTS OF GREASE, ETC.

SHOWS EXPENDABLE PARTS

SHOWS DETAILS

SHOWS TIGHTENING TORQUE UNITS

SHOWS TIGHTENING TORQUE SPECIFICATIONS

SHOWS PROCEDURE ORDER FOR SERVICE

SHOWS THERE ARE REFERRAL NOTES FOR SERVICE

LOWER TRAILING LINK, UPPER TRAILING LINK REMOVAL/INSTALLATION

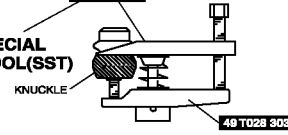
1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the undercover. (See N-5 Undercover Removal)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Inspect the rear wheel alignment and adjust it if necessary.

<ol style="list-style-type: none"> 1 Split pin 2 Nut 3 Lower trailing link ball joint (See R-8 Lower Trailing Link Ball Joint Removal Note) 4 Bolt 5 Lower trailing link 6 Dust boot (lower trailing link) 	<ol style="list-style-type: none"> 7 Split pin 8 Nut 9 Upper trailing link ball joint (See R-8 Upper Trailing Link Ball Joint Removal Note) 10 Nut 11 Upper trailing link 12 Dust boot (upper trailing link)
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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.











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HOW TO USE THIS MANUAL

SYMBOLS

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- There are eight symbols indicating oil, grease, fluids, sealant, and **SST** or equivalent use. 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

ADVISORY MESSAGES

A6E20100001W04

- You'll 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

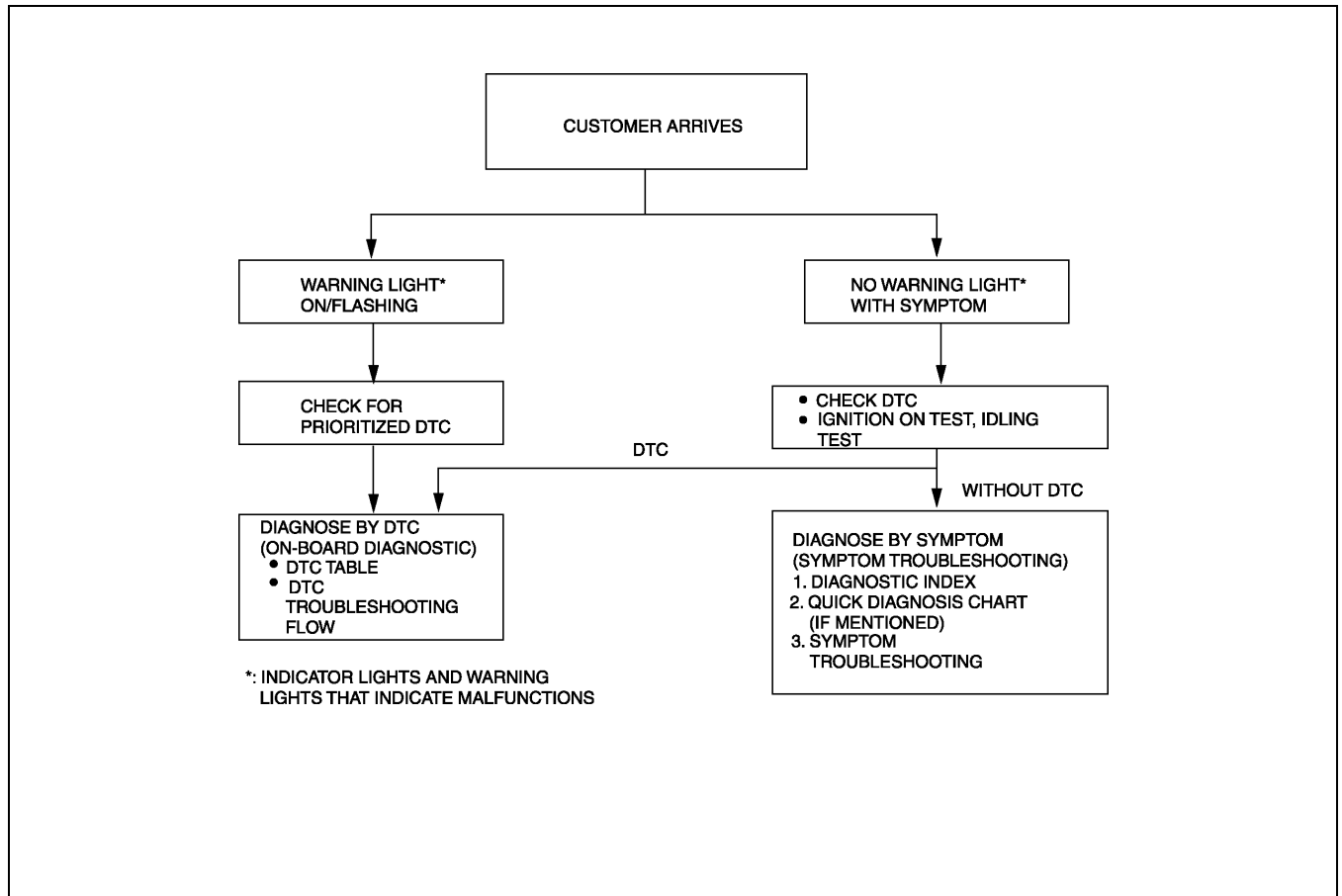
- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

HOW TO USE THIS MANUAL

TROUBLESHOOTING PROCEDURE

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Basic flow of troubleshooting



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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.

HOW TO USE THIS MANUAL

Procedures for Use

Using the basic inspection (section K)

- 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 remarks column.

SHOWS INSPECTION ORDER	SHOWS ITEM NAMES FOR DETAILED PROCEDURES	SHOW POINTS REQUIRING ATTENTION BASED ON INSPECTION RESULTS
AUTOMATIC TRANSAXLE BASIC INSPECTION		
STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> • Turn ignition switch is on. • Does O/D OFF indicator light (illuminate/go out) correspond to O/D OFF switch position (on/off)? 	Yes Go to next step.
		No Perform symptom troubleshooting No.26 "O/D OFF indicator light does not illuminate when O/D OFF switch is turned to on", or No.27 "O/D OFF indicator light illuminates when O/D OFF switch is not turned to on"
2	<ul style="list-style-type: none"> • Turn ignition switch is on. • When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 to 2 seconds? 	Yes Go to next step.
		No Inspect selector lever. Repair or replace defective areas.
3	<ul style="list-style-type: none"> • Inspect the ATF color condition. • Are ATF color and odor normal? 	Yes Go to next step.
		No Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	<ul style="list-style-type: none"> • Perform line pressure test. See K-2 Line Pressure Test • Is line pressure okay? 	Yes Go to next step.
		No Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	<ul style="list-style-type: none"> • Perform stall test. See K-2 Stall Speed Test • Is stall speed is okay? 	Yes Go to next step.
		No Repair or replace defective parts according to inspection result.

REFERENCE COLUMN

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HOW TO USE THIS MANUAL

Using the DTC troubleshooting flow

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

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

TROUBLE CONDITION

DTC PO103

DTC PO103	MAF circuit high input
DETECTION CONDITION	<p>PCM monitors input voltage from TP sensor after Ignition key is turned on. If input voltage at PCM terminal 88 is above 8.25 V, PCM determines that TP circuit has malfunction.</p> <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	<p>POSSIBLE CAUSE</p> <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

Diagnostic procedure			
STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED <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	VERIFY RELATED REPAIR INFORMATION AVAILABILITY <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.
		No	Go to next step.
3	VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT <ul style="list-style-type: none"> Connect NGS tester to DLC-2. Start engine. Access MAF V PID using NGS tester. Is MAF V PID within 0.2 - 8.3 V? 	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. See F1-33 INTERMITTENT CONCERN TROUBLESHOOTING
		No	Go to next step.
4	INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR <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.

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HOW TO USE THIS MANUAL

Using the diagnosis index

- The symptoms of the malfunctions are listed in the diagnostic index for 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 F2-6 MELT NO.1 MAIN OR OTHER FUSE
2	Will not crank	Starter does not work.	See F2-7 NO.2 MIL COMES ON
3	Hard start/long crank/erratic start/erratic crank	Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	See F2-8 NO. 3 WILL NOT CRANK
4	Engine stalls. After start/at idle	Engine stops unexpectedly at idle and/or after start.	See F2-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK
5	Cranks normally but will not start	Starter cranks engine at normal speed but engine will not run.	See F2-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE
6	Slow return to idle	Engine takes more time than normal to return to idle speed.	See F2-15 NO.6 CRANKS NORMALLY BUT WILL NOT START
7	Engine runs rough/rotling	Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	See F2-19 NO. 7 SLOW RERUN TO IDLE
8	Fast idle/runs on	Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	See F2-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE
9	Low idle/stalls during deceleration	Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	See F2-23 NO. 9 FAST IDLE/RUNS ON

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HOW TO USE THIS MANUAL

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 the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

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Possible factor		PARTS WHICH MAY BE THE CAUSE OF PROBLEMS													
		Cooling fan seated improperly	Accelerator cable free play misadjustment	Fuel quality	Engine overheating	Air cleaner element clogged or restriction	Air leakage from intake-air system (Loose tubes, cracks, broken gaskets)	IAC valve improper operation	Throttle body malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial Ignition timing misadjustment (CMP&crankshaft pulley misadjustment)	Spark plug malfunction	High-tension leads malfunction (Cracks, open, low resistance)	CMP sensor damaged (e.g. open or short circuits)
QUICK DIAGNOSIS CHART															
Trouble shooting item															
1	Melting of main or other fuses														
2	Will not crank														
3	Hard to start/long crank/erratic start/erratic crank			x		x	x			x			x	x	x
4	Engine stalls. After start/at idle			x	x	x	x	x		x	x	x	x	x	x
5	Cranks normally but will not start			x	x		x	x		x	x	x	x	x	x
6	Slow return to idle								x						
7	Engine runs rough/rolling idle			x	x		x	x		x		x	x	x	x
8	Fast idle/runs on		x												
9	Low idle/stalls during deceleration						x	x							
10	Engine stalls/quits. Acceleration/cruise			x	x	x	x		x	x			x		x
	Engine runs rough. Acceleration/cruise			x	x	x	x		x	x			x		x
	Misses Acceleration/cruise			x	x	x	x		x	x			x		x
	Buck/jerk Acceleration/cruise/ deceleration			x	x	x	x		x	x			x		x
10	Hesitation/stumble Acceleration			x	x	x	x		x	x			x		x
	Surges Acceleration/cruise			x	x	x	x		x	x			x		x
	Lack/loss of power Acceleration/cruise			x	x	x	x		x				x		x
12	Knocking/pinging Acceleration/cruise				x										
13	Poor fuel economy			x		x							x		x
14	Emissions compliance						x	x		x			x		x
15	High oil consumption/leakage														
16	Cooling system concerns Overheating														
17	Cooling system concerns Runs cold														
18	Exhaust smoke						x						x		x
19	Fuel odor (in engine compartment)														
20	Engine noise									x					
21	Vibration concerns (engine)		x												
22	A/C does not work sufficiently.														
23	A/C is always on or A/C compressor runs continuously.														
24	A/C is not cut off under WOT conditions .														
25	Exhaust sulphur smell			x											
26	Intermittent concerns								x		x	x		x	x
27	Constant voltage														
28	Automatic transmission (AT) concerns Upshift/downshift/ engagement	See Section K TROUBLESHOOTING													

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HOW TO USE THIS MANUAL

Using the symptom troubleshooting

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

DESCRIPTION
describes what kind of TROUBLE SYMPTOM

POSSIBLE CAUSE
describes possible point of malfunction

STEP shows the order of troubleshooting.

Reference item (s) for additional information to perform INSPECTION.

INSPECTION describes the method to quickly determine the failed part.

TROUBLE SYMPTOM

14	<p>DESCRIPTION</p> <p>Engine flares up or slips when upshifting or down shifting</p> <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. <p>POSSIBLE CAUSE</p> <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 <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.
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ACTION describes the appropriate action to take as a result (YES/NO) of 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? 	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 K-5 Road Test Preparation 	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 NGS tester to DLC-2. • Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON. • Is operating sound of shift solenoids heard? 	Yes	<ul style="list-style-type: none"> • Overhaul control valve body and repair or replace any defective parts. See ATX Workshop Manual GF4A-EL (1686-1A-99F)
		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 K-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. 		

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UNITS

UNITS

UNITS

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GI

Electrical current	A (ampere)
Electric power	W (watt)
Electric resistance	Ω (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)
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)
Weight	fl oz (fluid ounce)
	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.

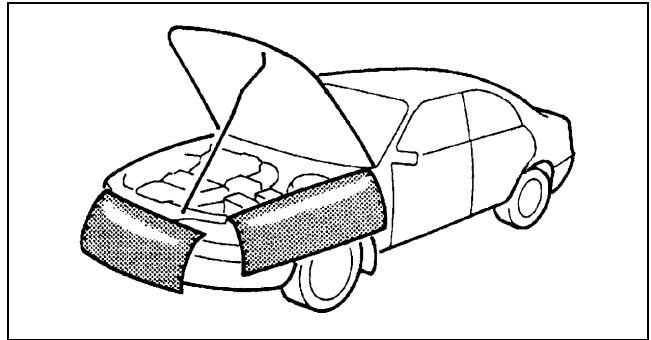
FUNDAMENTAL PROCEDURES

FUNDAMENTAL PROCEDURES

PROTECTION OF VEHICLE

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

A6E20140004W01

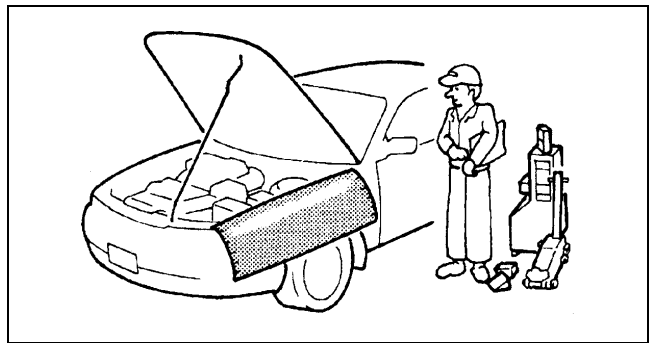


X3U000WAG

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

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

A6E20140004W02

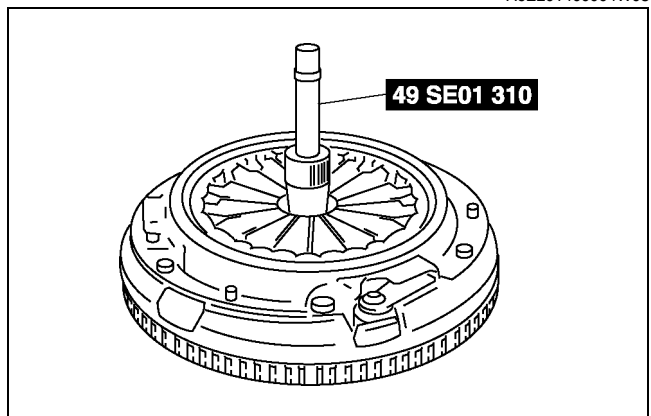


X3U000WAH

SPECIAL SERVICE TOOLS

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

A6E20140004W03



X3U000WAJ

OIL LEAKAGE INSPECTION

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

A6E20140004W04

Using UV Light (Black Light)

1. Remove on the engine or transaxle.

Note

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle oil).
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle oil).
 3. Allow the engine to run for 30 minutes.
 4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.

FUNDAMENTAL PROCEDURES

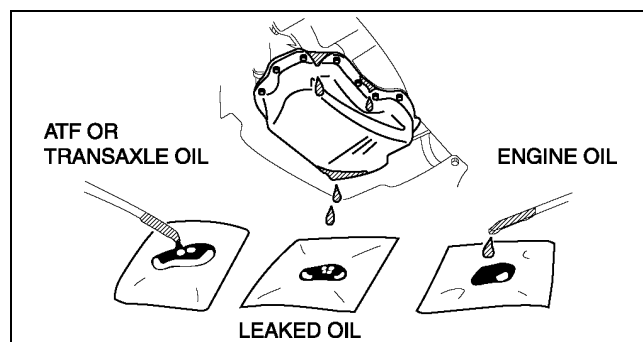
5. If no dye leakage is found, allow the engine to run for another 30 minutes or drive the vehicle then reinspect.
6. Find where the oil is leaking from, then make necessary repairs.

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 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 minutes.
6. Check the area where the oil is leaking, then make necessary repairs.



XME2014003

DISCONNECTION OF THE NEGATIVE BATTERY CABLE

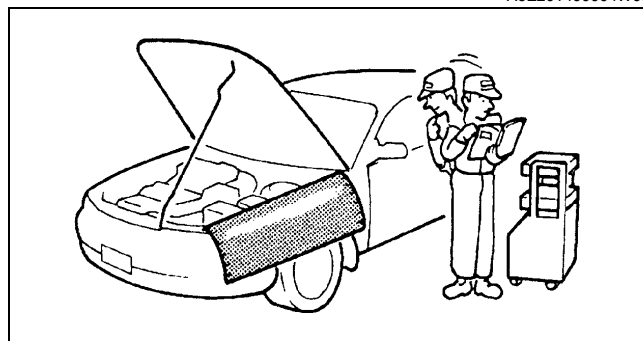
- Before beginning any work, turn the ignition switch to LOCK position, then disconnect the negative battery cable and wait for more than 1 minute to allow the backup power supply of the SAS unit to deplete its stored power. Disconnecting the battery cable will delete the memories of the clock, audio, and DTCs, etc. Therefore, it is necessary to verify those memories before disconnecting the cable.
- If the battery had been disconnected during vehicle maintenance or for other reasons, the window will not fully close automatically. Carry out the power window main switch initial setting. (See [S-23 INITIAL SETTING](#).)

A6E201400004W05

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.

A6E201400004W06

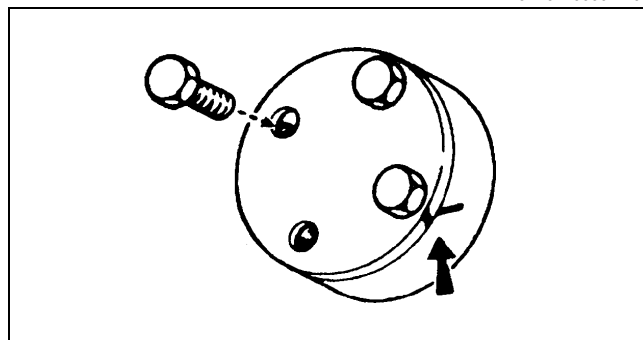


X3U000WAK

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.

A6E201400004W07



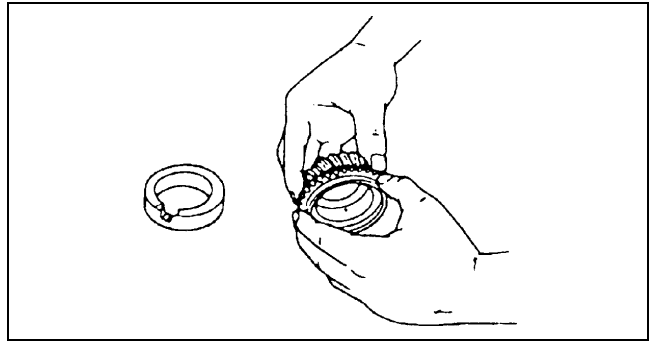
X3U000WAL

FUNDAMENTAL PROCEDURES

INSPECTION DURING REMOVAL, DISASSEMBLY

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

A6E20140004W08

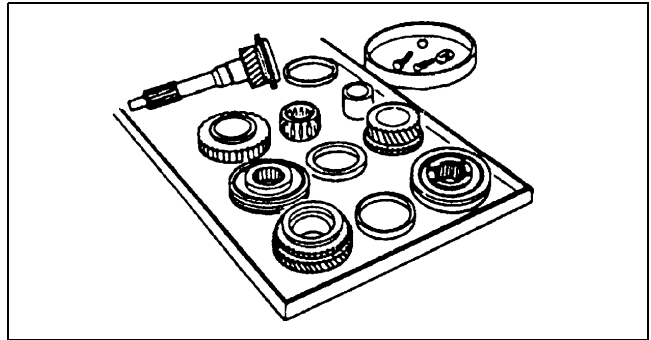


X3U000WAM

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.

A6E20140004W09



X3U000WAN

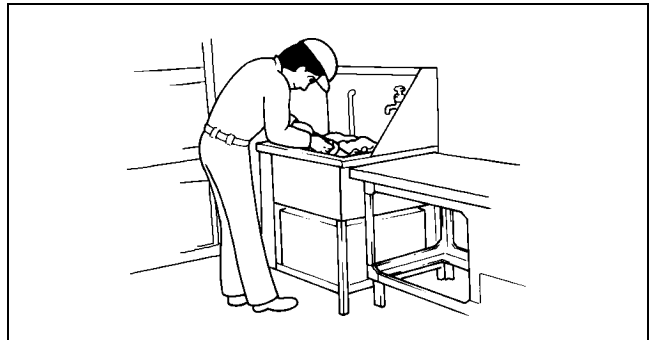
CLEANING OF PARTS

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

A6E20140004W10

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.**

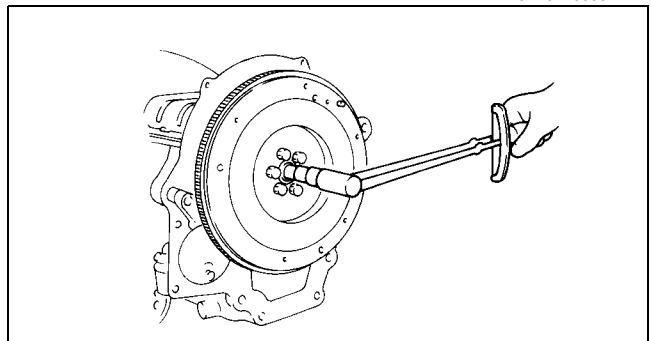


WGIWXX0030J

REASSEMBLY

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.

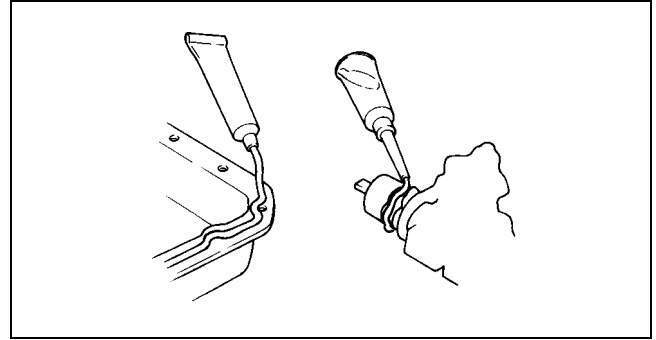
A6E20140004W11



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FUNDAMENTAL PROCEDURES

- If removed, these parts should be replaced with new ones:
 - Oil seals
 - Gaskets
 - O-rings
 - Lockwashers
 - Cotter pins
 - Nylon nuts
- 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.

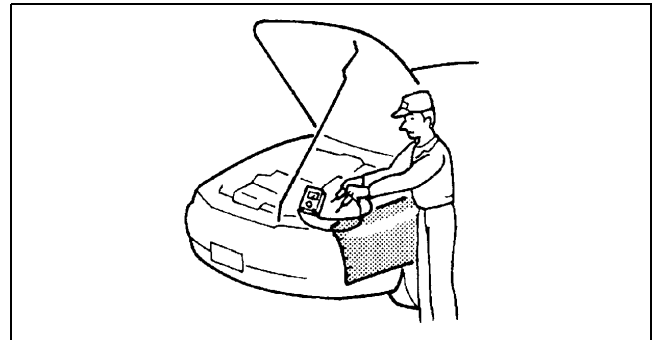


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ADJUSTMENT

- Use suitable gauges and/or testers when making adjustments.

A6E201400004W12

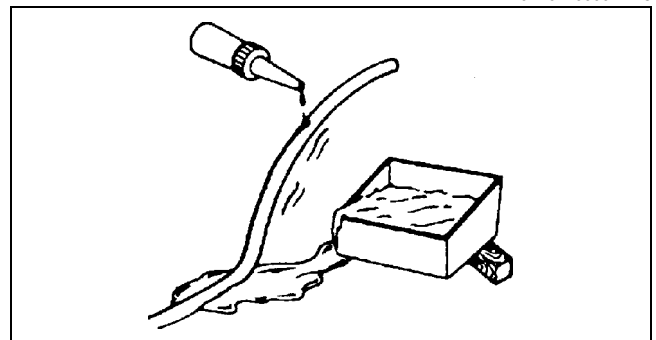


X3U000WAS

RUBBER PARTS AND TUBING

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

A6E201400004W13

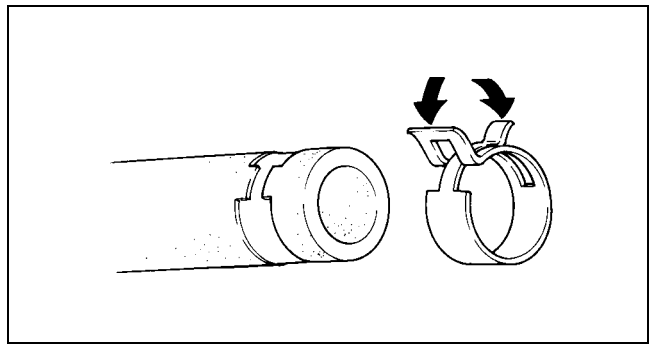


WGIWXX0034E

FUNDAMENTAL PROCEDURES

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.



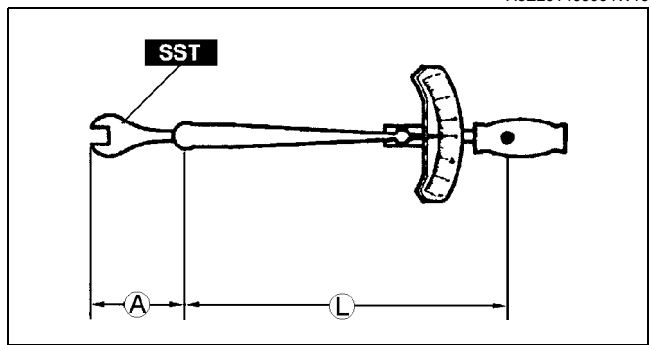
A6E201400004W14

WGIWXX0035J

TORQUE FORMULAS

- When using a torque wrench-SST or equivalent combination, the written torque must be recalculated due to the extra length that the SST or equivalent adds to the torque wrench. Recalculate the torque using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	$N \cdot m \times [L / (L + A)]$
kgf·m	$kgf \cdot m \times [L / (L + A)]$
kgf·cm	$kgf \cdot cm \times [L / (L + A)]$
ft·lbf	$ft \cdot lbf \times [L / (L + A)]$
in·lbf	$in \cdot lbf \times [L / (L + A)]$



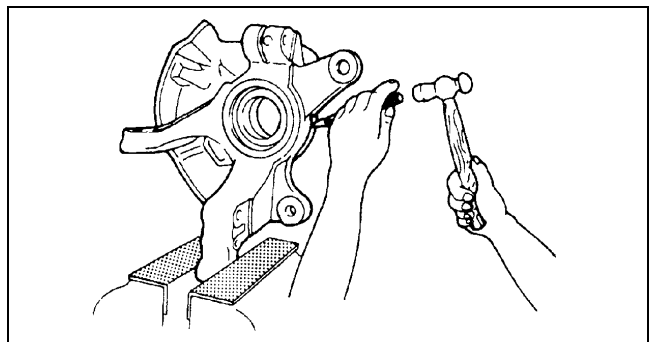
A6E201400004W19

WGIWXX0036E

A : The length of the **SST** past the torque wrench drive
 L : The length of the torque wrench

WISE

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



A6E201400004W16

X3U000WAW

FUNDAMENTAL PROCEDURES, INSTALLATION OF RADIO SYSTEM

DYNAMOMETER

A6E20140004W17

- When inspecting and servicing the power train on the dynamometer or speed meter tester, pay attention to the following:
 - Place a fan, preferably a vehicle-speed proportional type, in front of the vehicle.
 - Make sure the vehicle is in a facility with an exhaust gas ventilation system.
 - Since the rear bumper might deform from the heat, cool the rear with a fan. (Surface of the bumper must be below **70 degrees**.)
 - Keep the area around the vehicle uncluttered so that heat does not build up.
 - Watch the water temperature gauge and don't overheat the engine.
 - Avoid added load to the engine and maintain normal driving conditions as much as possible.

Note

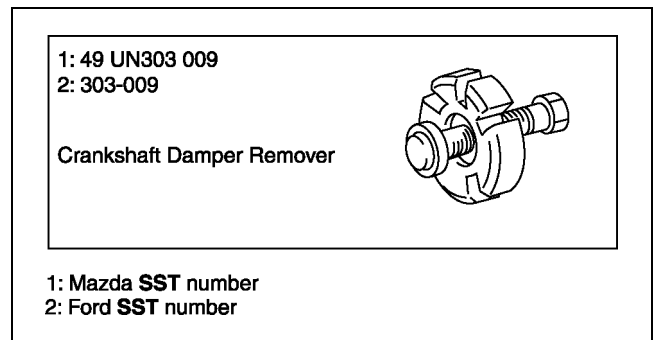
- When only the front wheels are being rotated on the dynamometer, the ABS warning light could illuminate. If the ABS warning light illuminates, turn the ignition switch to the LOCK position, then turn it back to the ON position, run the vehicle at **10km/h** and check that the ABS warning light goes off. (In this case, a DTC will be stored in the memory. To delete this data from the memory, follow the procedure for deleting DTCs (ABS) from memory.) (See **P-6 PRECAUTION (BRAKES)**) to turn off the warning light.)

SST

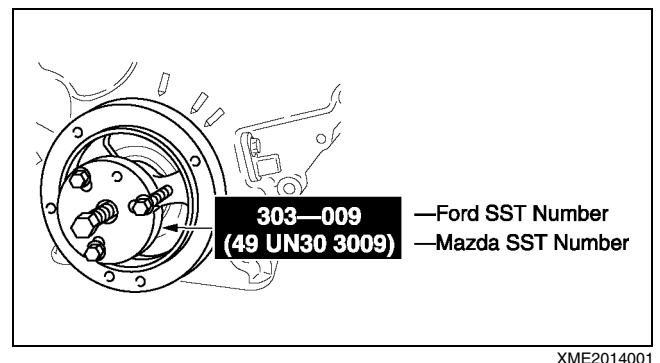
A6E20140004W18

- Some Ford **SST** or equivalent are used as **SSTs** necessary for engine repair. Note that these **SSTs** are marked with Ford **SST** numbers.
- Note that a Ford **SST** number is written together with a corresponding Mazda **SST** number as shown below.

Example (section ST)



Example (except section ST)



INSTALLATION OF RADIO SYSTEM

INSTALLATION OF RADIO SYSTEM

A6E20160005W01

If a radio system is installed improperly or if a high-powered type is used, the CIS and other systems may be affected. When the vehicle is to be equipped with a radio, observe the following precautions:

- Install the antenna at the farthest point from control modules.
- Install the antenna feeder as far as possible from the control module harnesses.
- Ensure that the antenna and feeder are properly adjusted.
- Do not install a high-powered radio system.