SERVICE CAUTIONS

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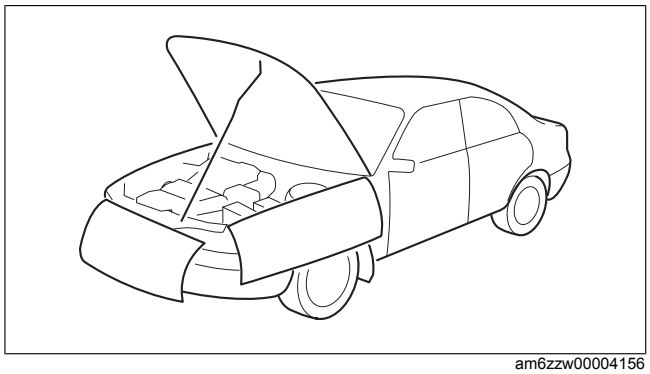
Injury/damage Prevention Precautions

- Depending on the vehicle, the cooling fan may operate suddenly even when the ignition is switched OFF (LOCK). 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.

Protection of the Vehicle

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



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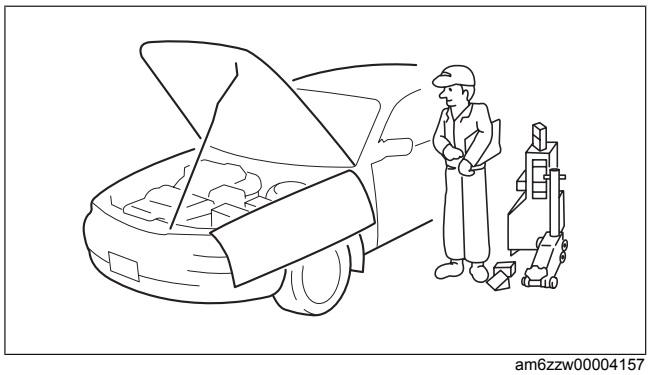
Preparation of Tools and Measuring Equipment

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



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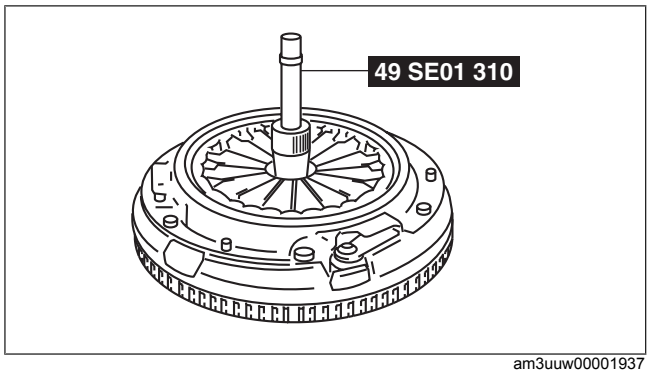
Special Service Tools

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



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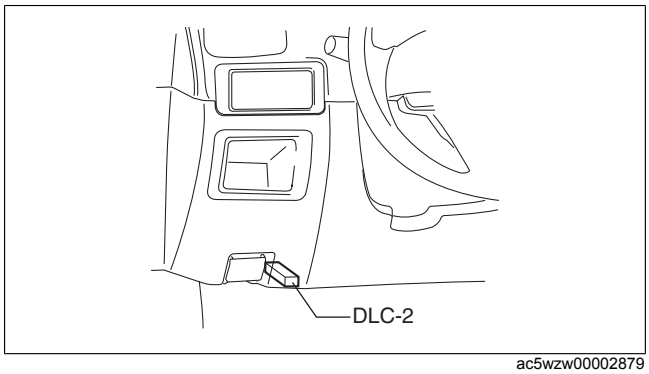
Malfunction Diagnosis System

- Use the Mazda Modular Diagnostic System (M-MDS) for malfunction diagnosis.

Connection to malfunction diagnosis system

- With the ignition switched off, connect the malfunction diagnosis system to the DLC-2 connector shown in the figure.



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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 transmission/transaxle.

Note

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

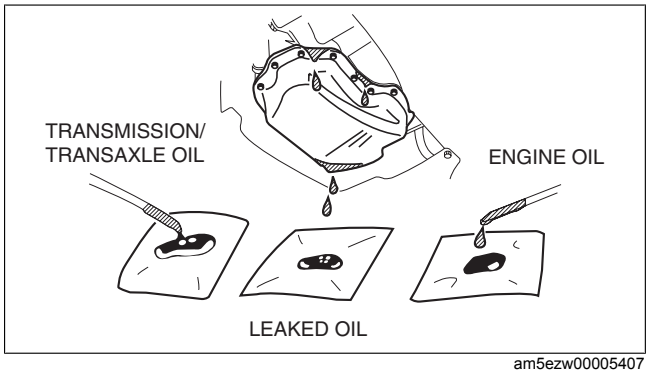
2. Pour the fluorescent dye into the engine oil or transmission/transaxle oil.
3. Allow the engine to run for **30 min**.
4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.
5. If no dye leakage is found, allow the engine to run for another **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 sample of the leaking oil using an absorbent white tissue.
2. Then gather some sample of engine and transmission/transaxle oil onto a white cloth or piece of paper.
   - MT vehicles: Transmission/transaxle oil
   - AT vehicles: ATF
   - CVT vehicles: CVT fluid
3. Compare the appearance and smell, and identify the type of oil that is leaking.
4. Remove any oil on the engine or transmission/ transaxle.
5. Allow the engine to run for **30 min**.
6. Check the area where the oil is leaking, then make necessary repairs.



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Negative Battery Cable Disconnection/Connection

Warning

- Before removing the SRS air bag system-related parts, always disconnect the negative battery cable and wait for 1 min. or more to allow the back-up power supply to deplete its stored power. (See AIR BAG SYSTEM SERVICE WARNINGS.)

Required procedure after negative battery cable disconnection/connection

System name	Conditions after disconnecting the negative battery cable	Required procedure		Reference
		Before disconnecting negative battery cable	After connecting negative battery cable	
Power window system	Reset to initial setting and auto-function is disabled.	—	Perform the power window system initial setting.	(See POWER WINDOW SYSTEM INITIALIZATION PROCEDURE.)
Sunroof system	Reset to initial setting and function is disabled.	—	Perform the sunroof system initial setting.	(See SUNROOF SYSTEM INITIALIZATION PROCEDURE.)
Clock and audio	Clock display and audio system memory are reset.	Verify the setting content.	Set the verified content before disconnecting negative battery cable.	—
i-stop system	Specified information in the PCM cleared and the i-stop does not operate normaly.	Verify PID “BATT_SOC” value and record. *1	Perform battery condition initial setting (i-stop setting). *2	(See BATTERY CONDITION INITIALIZATION SETTING (i-stop SETTING) [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See BATTERY CONDITION INITIALIZATION SETTING (i-stop SETTING) [SKYACTIV-D 2.2].)
Tire pressure monitoring system (TPMS)	The tire pressure monitoring system detection accuracy decreases.	—	Perform the tire pressure monitoring system initialization.	(See TIRE PRESSURE MONITORING SYSTEM INITIALIZATION PROCEDURE.)

*1 : Because the “BATT_SOC” value before disconnecting the negative battery cable is required for the battery condition initial setting (i-stop setting), record the “BATT_SOC” value before disconnecting the negative battery cable.
*2 : For vehicles with i-stop, if the negative battery cable is disconnected and re-connected, battery condition initial setting (i-stop setting) must be performed.

Switch The Power Supply Using The Push Button Start And Start The Engine

- The power supply switch using the push button start is performed by depressing the clutch pedal (MTX), depressing the brake pedal (ATX), and then pressing the push button start.

MTX

PUSH BUTTON START PRESSED WITHOUT DEPRESSING THE CLUTCH PEDAL

POWER SUPPLY	ENGINE STATE	SHIFT POSITION
		ALL
OFF	–	
ACC	–	
ON	ENGINE OFF	
	ENGINE ON	

ATX

PUSH BUTTON START PRESSED WITHOUT DEPRESSING THE BRAKE PEDAL

POWER SUPPLY	ENGINE STATE	SHIFT POSITION		
		P	N	OTHER THAN P, N
OFF	–			
ACC	–			
ON	ENGINE OFF			
	ENGINE ON			

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- For engine starting using the push button start, depress the clutch pedal (MTX), depress the brake pedal (ATX), and then press the push button start.

MTX

PUSH BUTTON START PRESSED WITH THE CLUTCH PEDAL DEPRESSED

POWER SUPPLY	ENGINE STATE	SHIFT POSITION
		ALL
OFF	–	
ACC	–	
ON	ENGINE OFF	
	ENGINE ON	

ATX

PUSH BUTTON START PRESSED WITH THE BRAKE PEDAL DEPRESSED

POWER SUPPLY	ENGINE STATE	SHIFT POSITION		
		P	N	OTHER THAN P, N
OFF	–			
ACC	–			
ON	ENGINE OFF			
	ENGINE ON			

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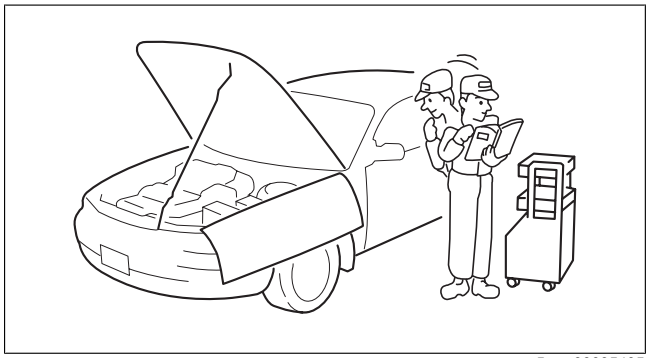
Removal of Parts

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



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Control Unit Configuration (Initial Setting) Procedure Using M-MDS

- If the control unit is replaced, it is necessary to write the vehicle specification data to a new control unit using the M-MDS. This procedure is called configuration (initial setting).
- There are the following two methods of the configuration procedure for the control unit:
  - — Configuration by reading/writing data of vehicle information: Reads the vehicle information from the control unit prior to replacement, and writes the vehicle information to a new control unit.
  - — Configuration by As-Built data: Obtains the vehicle specification data when the vehicle is shipped from the factory, and writes the data to a new control unit.

Caution

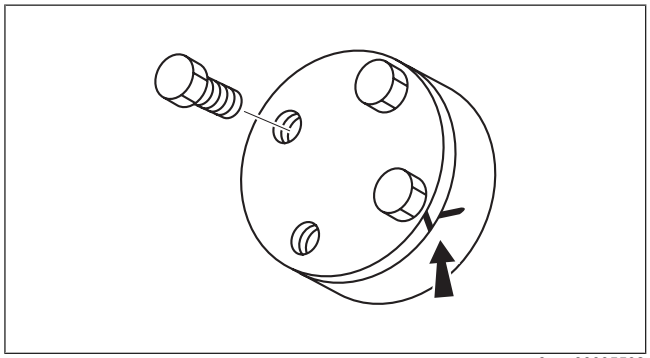
- **Normally perform the configuration using reading/writing function of vehicle information.**
- **The configuration using As-Built data is used if the vehicle information cannot be read due to a damaged control unit which is to be replaced, or if a DTC such as a configuration malfunction is detected.**
- **If a control unit having a personalization function is configured using As-Built data, the settings customized by the customer are initialized (to factory settings). In this case, verify the setting values made by the customer and change the customized setting values using the "Programmable Parameters" from the M-MDS menu.**
- **If the module programming menu of the M-MDS (Programmable Module Installation, As-Built, Programmable Parameters) is performed, perform the procedure while the battery monitor icon of the M-MDS is green or gray.**

Note

- For reading the vehicle information, the procedure is automatically performed during the procedure for the M-MDS vehicle identification and network test, and the vehicle specification information is temporarily stored in the M-MDS during vehicle identification.

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.



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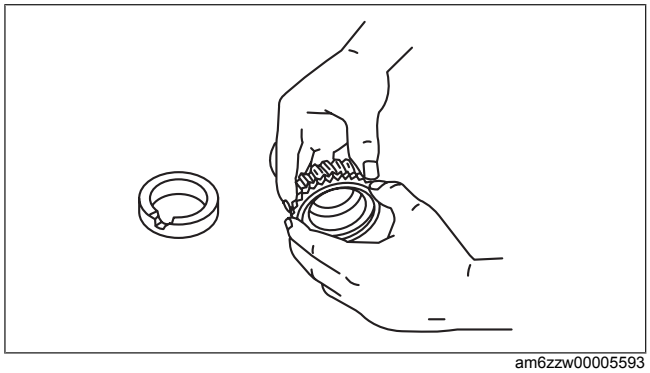
Inspection During Removal, Disassembly

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



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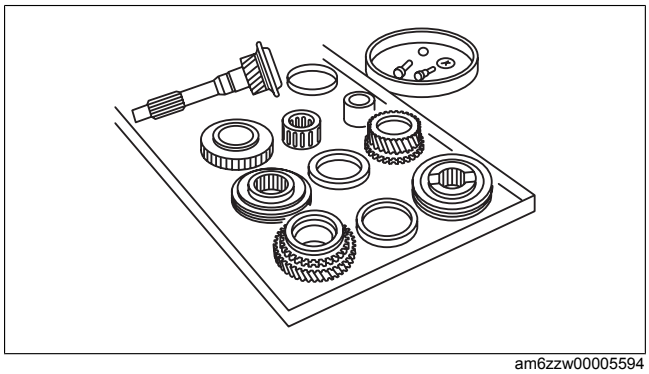
Arrangement of Parts

- 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.



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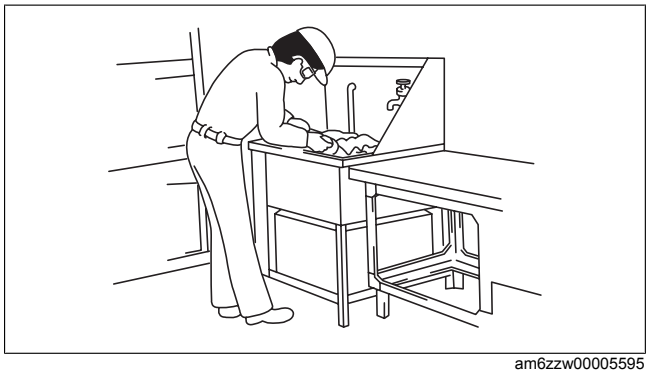
Cleaning of Parts

- 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.**



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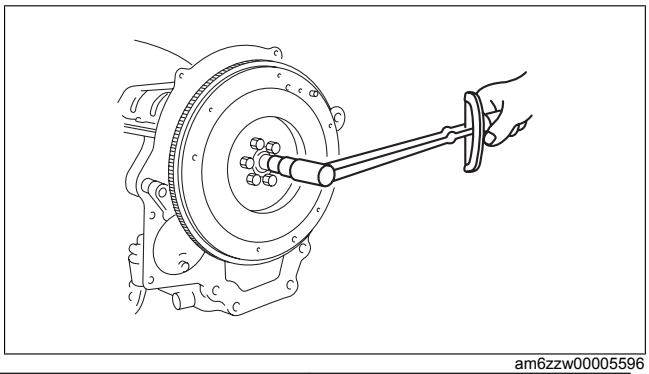
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, these parts should be replaced with new ones:



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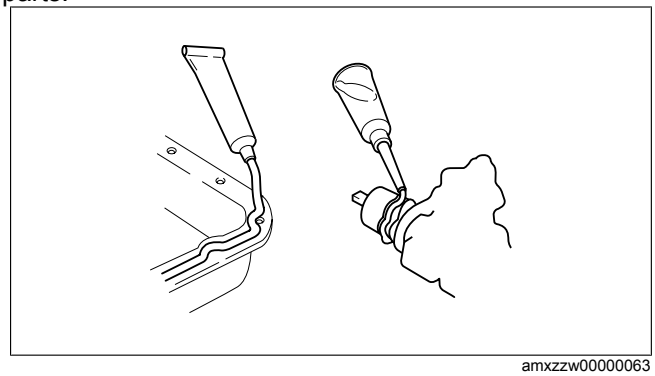
Oil seals	Cotter pins
Gaskets	Locknuts (Nylon nuts)
O-rings	Spring pins
Lock washers	—

- 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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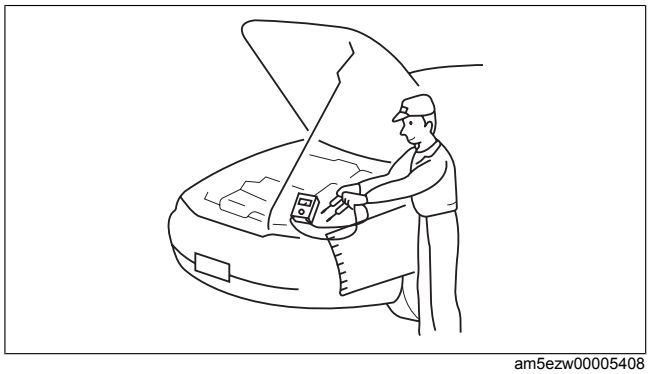
Adjustment

- Use suitable gauges and testers when making adjustments.



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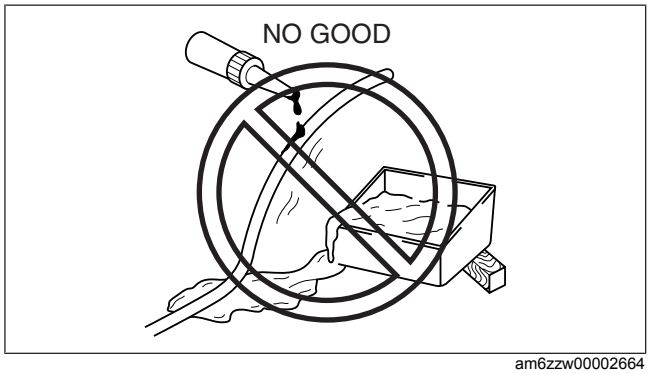
Rubber Parts and Tubing

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



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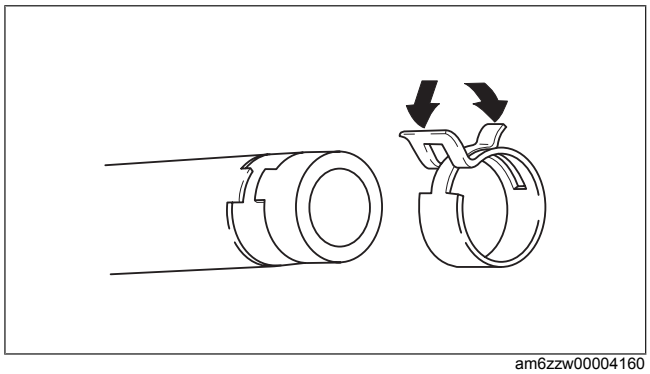
Hose Clamps

- 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.

  Note
  - Follow the description in each section because the clamps which are used with the fuel-related system differ from the one indicated above.



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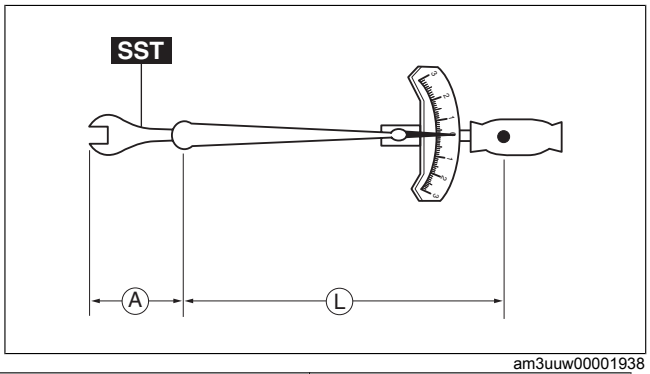
Torque Formulas

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



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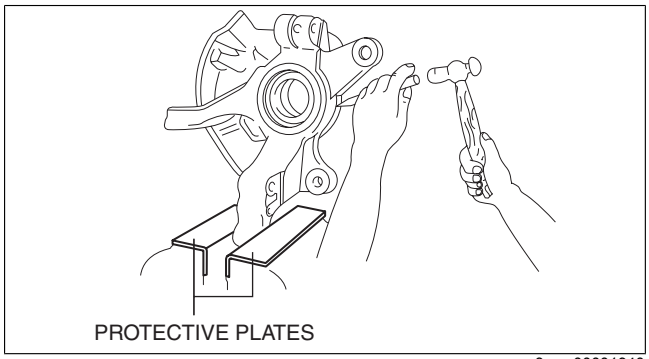
Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]

Torque Unit	Formula
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]

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

Vise

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



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Dynamometer

- When inspecting and servicing the power train on the dynamometer or speedometer 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.
  - — Keep the rear bumper cool by placing a cooling fan near the exhaust pipe so that the rear bumper does not get deformed by the heat from the exhaust.
  - — Keep the area around the vehicle uncluttered so that heat does not build up.
  - — Watch the water temperature gauge and do not overheat the engine.
  - — Avoid added load to the engine and maintain normal driving conditions as much as possible.

Note

- When only the front or rear wheels are rotated on a chassis dynamometer or equivalent, the DSC HU/CM determines that there is a malfunction in the DSC and illuminates the following lights:
  - — with DSC
    - ABS warning light
    - Brake system warning light
    - TCS/DSC indicator light
- If the above lights are illuminated, dismount the vehicle from the chassis dynamometer and switch the ignition OFF (LOCK). Then, switch the ignition ON, run the vehicle at **10 km/h or more** and verify that the warning lights go out. In this case, a DTC will be stored in the memory. Clear the DTC from the memory by following the memory clearing procedure [DSC] in the on-board diagnostic system. (See ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].)
- If the engine cannot be stopped using the push button start, perform an emergency engine stop operation. (See Torque Formulas.)

Emergency Engine Stop Operation

- While performing an inspection by rotating the wheels using a dynamometer, if the ABS HU/CM (with ABS system) or DSC HU/CM (with DSC system) detects a vehicle speed signal error, the engine cannot be stopped using the push button start. If the engine cannot be stopped using the push button start, perform an emergency stop using the following procedure.

1. Press and hold the bush button start for **approx. 3 s** or more, or press it three times or more successively within **approx. 1.5 s**.
2. The engine stops (position is ACC).
3. Press the push button start to switch the ignition OFF.

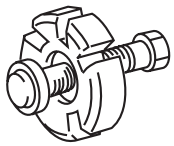
SST

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

Example (SST List)

1: 49 UN30 3009
2: 303-009

Crankshaft damper remover



1: Mazda **SST** number
2: Global **SST** number

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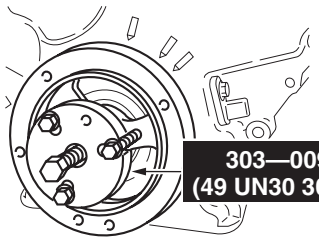
Example (In text)



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