

Subject: CX-50 HYBRID SERVICE CAUTIONS FOR NEW AND REVISED FEATURES	Service Alert No.: SA-077/24
	Last Issued : 10/23/2024

BULLETIN NOTES

APPLICABLE MODEL(S)/VINS

2025 CX-50 HYBRID

DESCRIPTION

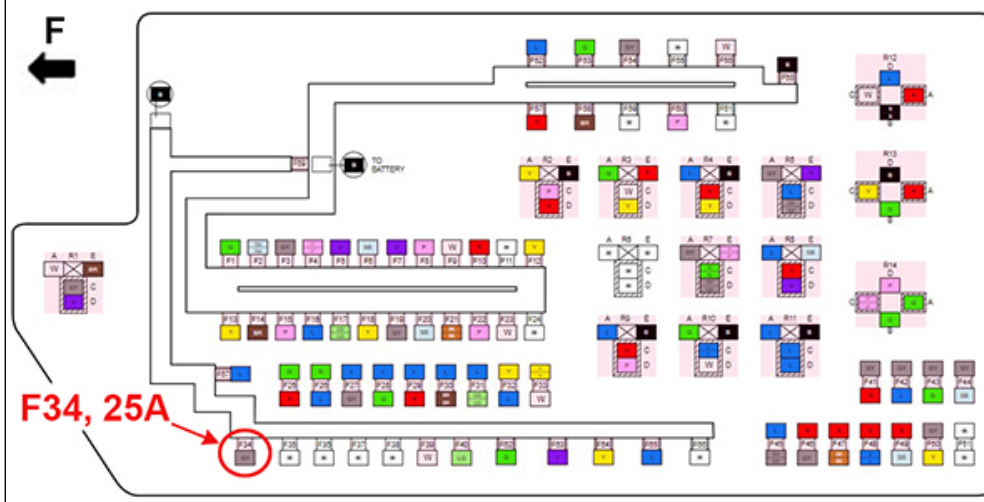
The CX-50 Hybrid has new and revised features that are different from previous models, and may be difficult to understand. This Service Alert provides valuable information to support potential dealer and customer concerns.

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Item	Service Information
PDI Fuse Fuse F34 (25A) is removed from the engine compartment fuse block and is stored on the engine compartment fuse block lid. Insert the fuse during PDI.	RELAY AND FUSE BLOCK [00F-1]

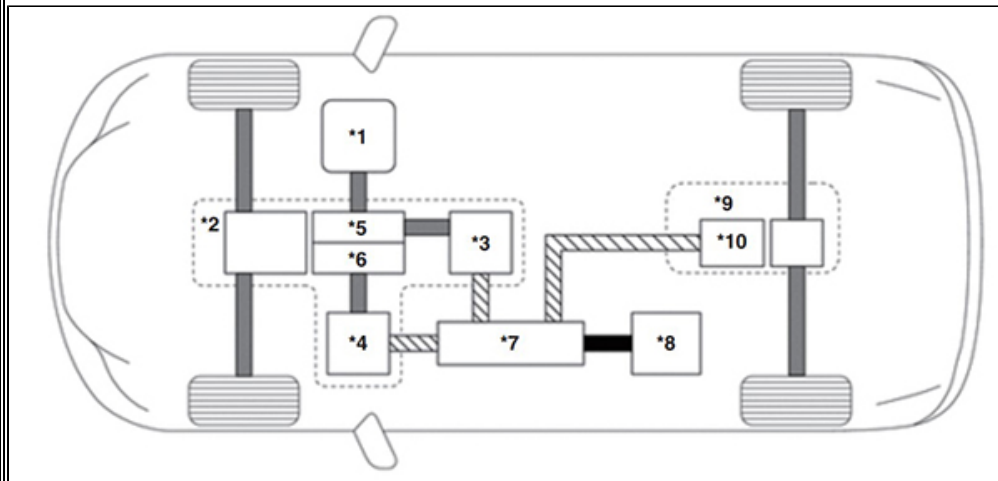
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Hybrid System Outline

- Hybrid vehicles use a combination of 2 kinds of power sources, such as an engine and high voltage battery, to take advantage of the benefits provided by each power source while compensating for each other's shortcomings. As a result, efficient operation is achieved with higher gas mileage than a gas engine only.
- Hybrid vehicles do not need their batteries to be charged by plugging in, unlike existing electric-only vehicles. They are charged from regenerative braking and the gas engine.
- Technical development of power sources (such as engines and fuel cells) is advancing in various fields. The hybrid system is a flexible system that uses a high-efficiency power unit and electric motors.
- Hybrid vehicles have high-voltage electrical circuits and have been developed with consideration given to the protection of drivers and technicians against electrocution.
- This hybrid vehicle uses THS-II to drive the front wheels and adds the e-AWD system to drive the rear wheels.

HYBRID SYSTEM
OUTLINE



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- *1 Engine
- *2 Hybrid transaxle
- *3 Motor generator No.1 (MG1)
- *4 Motor generator No.2 (MG2)
- *5 Power split planetary gear unit (compound gear unit)
- *6 Motor speed reduction gear unit (compound gear unit)
- *7 Inverter with converter assembly
- *8 High voltage battery
- *9 Rear drive unit (rear traction motor with transaxle assembly)
- *10 Rear motor (MGR)

Electrical power path (DC) 

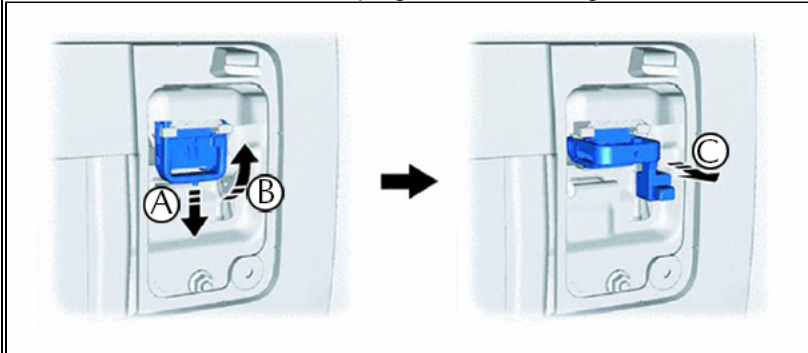
Electrical power path (AC) 

Mechanical power path 

Shutdown of High Voltage before High Voltage Service

Service Plug Removal

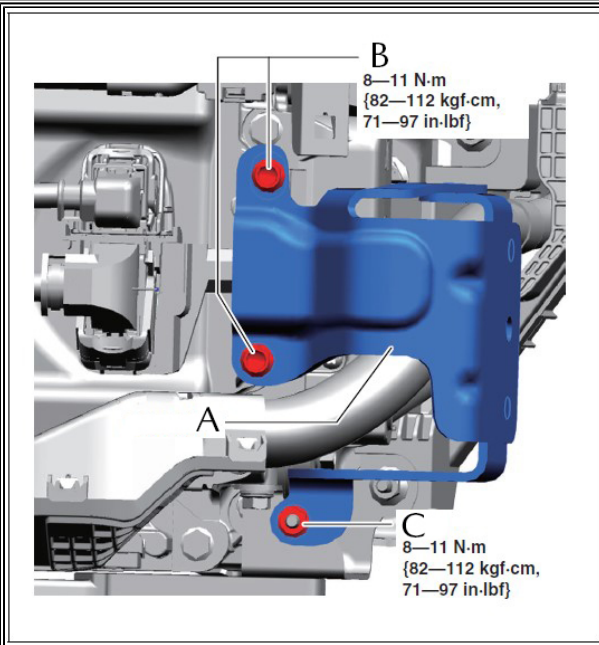
1. Verify that the READY indicator on the instrument cluster is not illuminated. If the READY indicator is turned on, switch the main power OFF.
2. Disconnect the negative lead-acid battery terminal. Go to MGSS [[NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION](#)].
3. Remove the rear seat lower trim grille. Go to MGSS [[REAR SEAT LOWER TRIM GRILLE REMOVAL/INSTALLATION](#)].
4. Wear insulating gloves and remove the service plug using the following procedure.
 - a. Remove the service plug shown in the figure.



- 1) Pull out the lever in the downward direction.
 - 2) Rotate the lever 90° in the direction of the arrow and press the lever until it stops rotating.
 - 3) Remove the service plug.
- b. Verify that the service plug is removed.
 - c. Verify that the main power is switched OFF.
 - d. Leave the vehicle for 10 minutes.
- NOTE:** When the power supply is cut off, the electrical charge remaining in the condenser is automatically discharged.
- e. Remove the bracket (AWD).

HIGH VOLTAGE
SERVICE CAUTIONS

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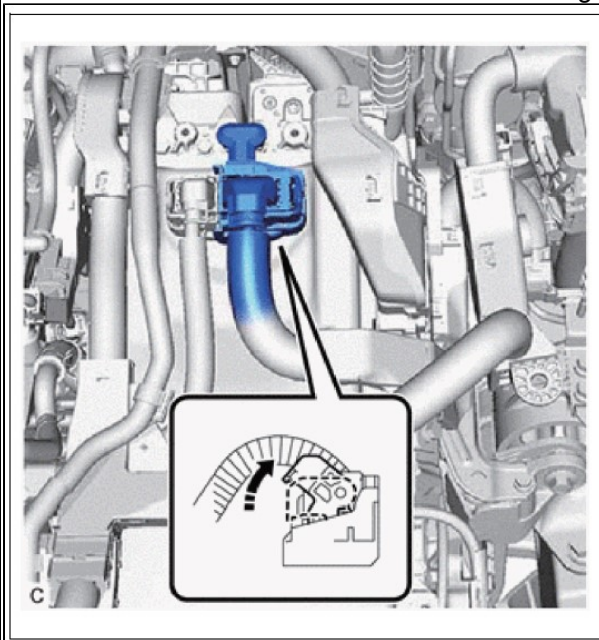


A: Bracket

B: Bolts

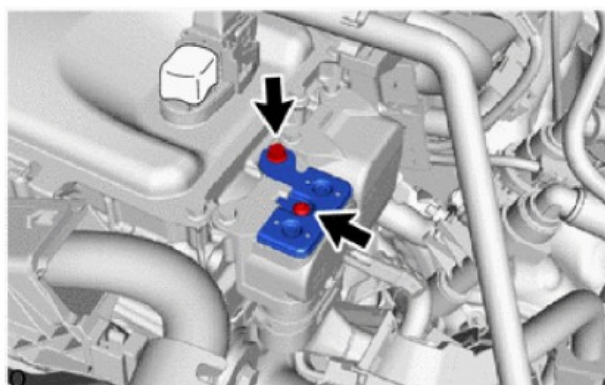
C: Nut

f. Move the lock lever as shown in the image and disconnect the PCU connector.



g. Remove the cover.

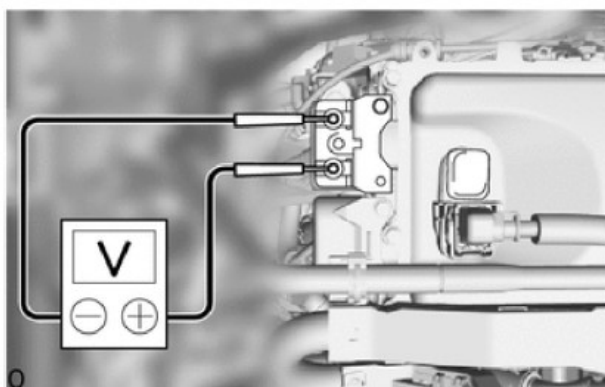
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h. Measure the voltage between terminals P and N using a high voltage tester.

Standard Voltage: 0 V

NOTE: The tester display may not be 0 V depending on the measurement accuracy or variations in the tester used.



i. Install the cover.

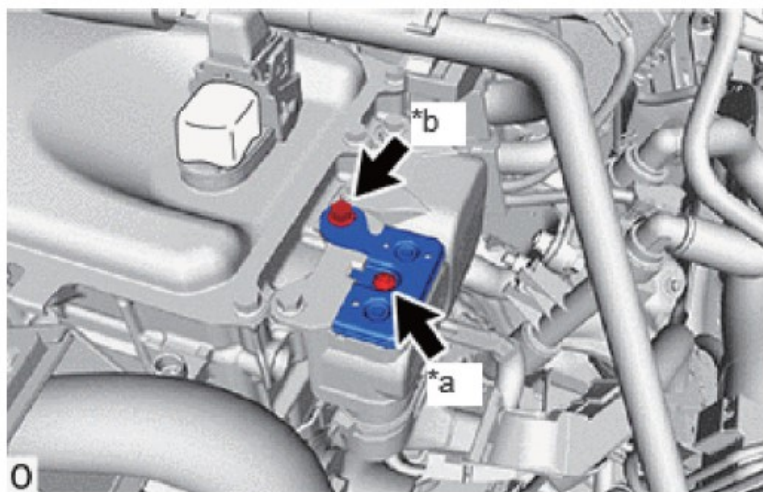
1) Install bolt "A" (*a)

Torque: 32-47 in·lbf (3.6-4 N·m, 37-55 kgf·cm)

2) Install bolt "B" (*b)

Torque: 57-84 in·lbf (6.4-9.6 N·m, 66-97 kgf·cm)

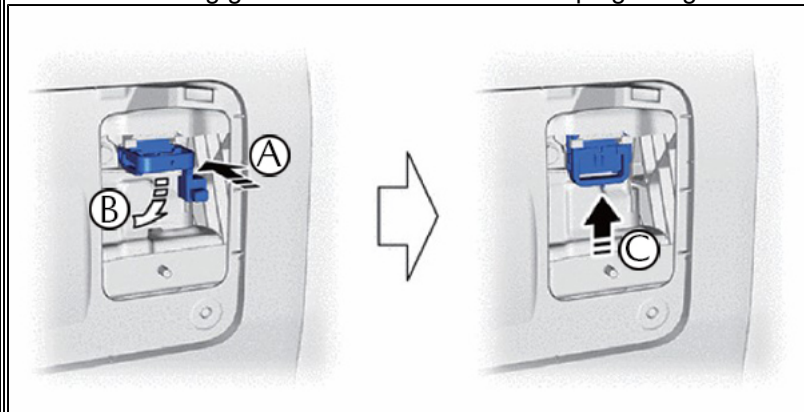
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Service Plug Installation

CAUTION: Before connecting the service plug, check the tightness of the high voltage terminals and the connection status of the connectors.

1. Wear insulating gloves and install the service plug using the following procedure.

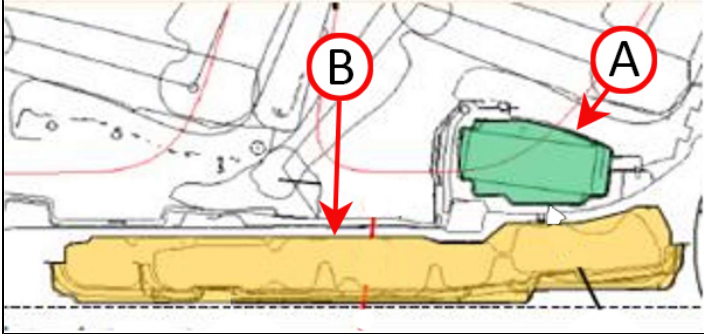


- a. Install the service plug straight into the socket with the lever in the upright position.
 - b. Rotate the lever 90° in the direction of the arrow and press the lever until it stops rotating.
 - c. Press the lever in the direction of the arrow until it locks.
2. Install rear seat lower trim grille. Go to MGSS [[REAR SEAT LOWER TRIM GRILLE REMOVAL/INSTALLATION](#)].
 3. Connect the negative lead-acid battery terminal. Go to MGSS [NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION](#)

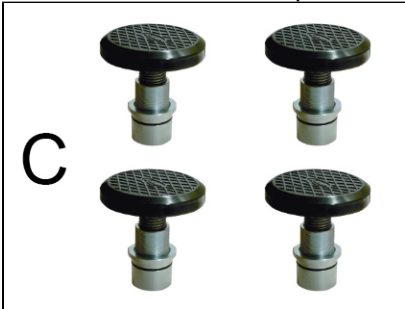
Fuel Tank Interference with Flat Lift

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Ni-Hydride Battery (Ni-MH Battery Pack (A): 245 volts, named High Voltage Battery) is laid out under the rear seat, and then the fuel tank (B) is laid out under the Battery.

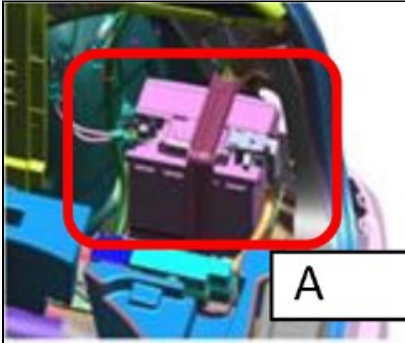


When trying to use a flat lift, there is a concern for deformation or breakage at the fuel tank due to interference with the plate of the lift. Make sure to use an attachment of 120 mm height such as Round Rubber Adapter for 3-stage arm lifts (39-FJ6202) (C) when using the lift. Refer to the Workshop Manual on MGSS for detailed procedures.



12V Lead-Acid Battery with Port Plug

The 12V lead-acid battery (A) is located in the trunk room as shown in the image and has a port plug (Ventilation Type Calcium Battery).



(View from Center to Right side of Cargo Room.)

The required specifications are EN (European Norm) LN2(STD) with Port Plug 12v-55Ah/ 20HR, CCA 345A or more.

Compressor Oil (POE) for Electric A/C Compressor

This hybrid model has an electric A/C compressor that requires Polyolester ND-11 (POE) Oil due to the electrical insulation performance. Polyalkyleneglycol (PAG) Oil (such as E 1 Y0-

A/C COMPRESSOR
REMOVAL/
INSTALLATION

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61-K39) cannot be used in this electric A/C compressor.

Use only Mazda Genuine POE Oil (B4YL-61-K39 : DENSO ND-OIL 11) for the electric A/C compressor.

CAUTION: Using any POE Oil other than the Mazda Genuine POE Oil may cause electric leakage, deteriorated A/C performance, or damages on A/C components. KRYP-61-K39 of RBI00EV-01 ENEOS (JXTG) for CX-90 and CX-70 PHEV model cannot be used in this hybrid model.

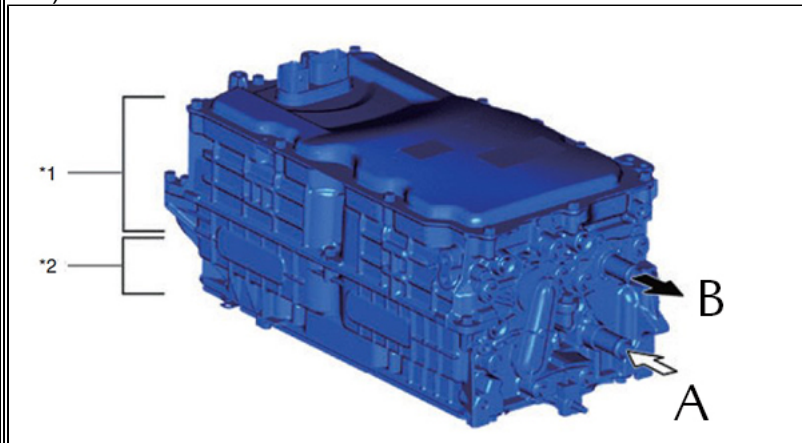
NOTE: A properly adjusted amount of fluorescent agents is used during vehicle production. Never add fluorescent agent into the refrigerant system, otherwise the insulation performance may deteriorate. Never use A/C refrigerant gas containing A/C compressor oil and fluorescent agent, or A/C compressor oil with fluorescent agent.

Refer to the Workshop Manual on MGSS for the detailed procedure.

NOTE: Removing the A/C compressor requires shutdown of the High Voltage as shown in [Shutdown of High Voltage before High Voltage Service](#).

PCU (Power Control Unit) Assembly

The PCU consists of the Motor Generator ECU (Electric Control Unit), Booster Converter, Inverter, DC-DC Converter, which needs to be replaced by an assembly (PCU Assembly: 30-310)



A: Coolant IN

B: Coolant OUT

*1: Boost Converter / Inverter

*2 DC-DC Converter / Reactor

The PCU Assembly is cooled by coolant (FL22) in the Low Temperature (LT) line separately from the High Temperature (HT) line which is cooling the engine (CW) also by coolant (FL22).

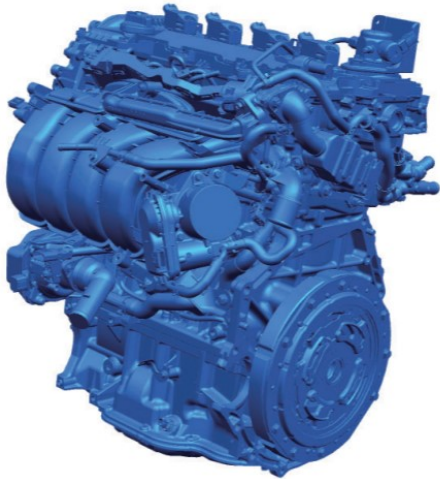
Implement the initialization for the resolver (rotation angle sensor to control the motor) when replacing the PCU using M-MDS. Refer to the Workshop Manual on MGSS for more details.

PCU (POWER
CONTROL UNIT)
REMOVAL/
INSTALLATION

New 2.5L Engine (CW)

MECHANICAL

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1) Use Mazda Genuine Engine Oil 0W-16 (ILSAC GF-6B) for the hybrid system available at Mazda Authorized Dealers due to the certification.

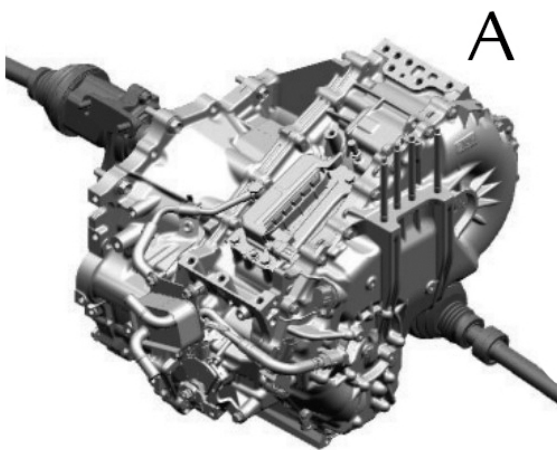
NOTE: 0W-16, GF-6B is usable as alternative in addition to the above setting of Genuine Oil at Dealers.

2) The following Tools and Equipment are required: Engine Hanger and Engine Lift Table with attachments such as PLA-15 to avoid damaging the engine oil pan.

3) Use Mazda Genuine Spark Plugs (CWA 1-18-110 equals FC16HR-Q8/DENSO).

New Front Transaxle Assembly (TPVA-E)

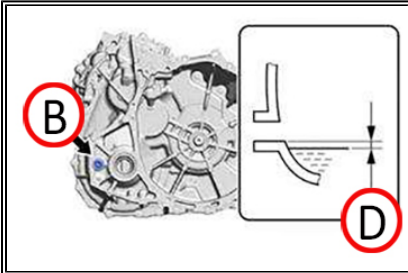
A newly developed Front Transaxle Assembly unit (A) is installed in this model, which includes two Motor Generators (MG1 for charging Ni-MH Battery and supplying electrical power to drive the front wheels and MG2 to assist engine output), and an ATF oil cooler cooled by water (Low Temperature (LT) line).



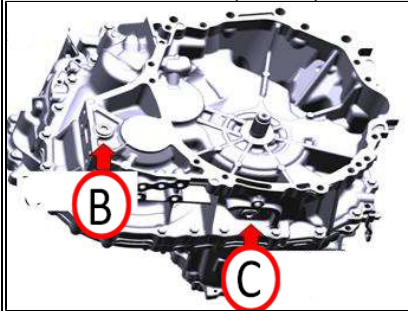
COMPOUND GEAR
UNIT [TPVA-E]

Use only genuine ATF WS JWS3324 Automatic Transaxle Fluid (full level is approximately 4.1 quarts (3.9L) as shown).

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B: Filler Plug
D: 0 - 0.4 in (10mm)

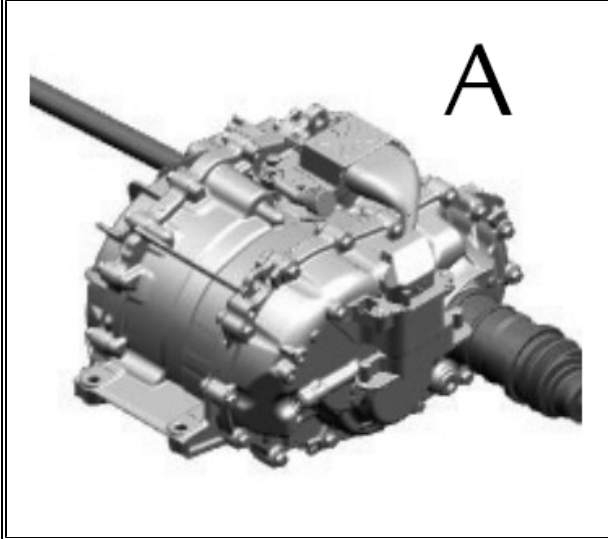


B: Filler Plug
C: Drain Plug

This new Front Transaxle Assembly unit needs to be replaced as a complete unit (19-090). Implement the initialization for the resolver (rotation angle sensor to control the motor) using M-MDS when replacing the Front Transaxle Assembly. Refer to the Workshop Manual on MGSS or this SA for Tire, Oil, Battery and Lubricant Information.

New Rear Transaxle Assembly

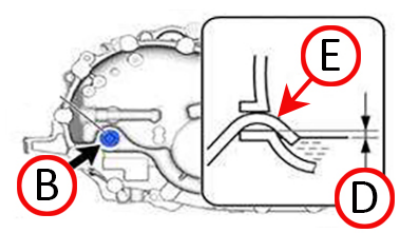
A newly developed Rear Transaxle Assembly (A) unit is installed in this model, which includes a MGR (Motor Generator Rear) to drive the rear wheels and is cooled by air.



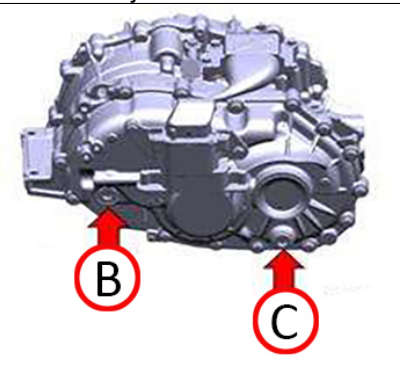
REAR DRIVE UNIT

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Use only genuine ATF WS JWS3324 Automatic Transaxle Fluid, which is same as the Front Transaxle Fluid (full level is approximately 1.8 quarts (1.7L) as shown.



B: Filler Plug
D: 0 - 0.2 in (5mm)
E: Injection Nozzle



B: Filler Plug
C: Drain Plug

This new Rear Transaxle Assy (A) unit needs to be replaced as a complete unit (27-100). Implement the initialization for the resolver (rotation angle sensor to control the motor) using M-MDS when replacing the Rear Transaxle Assembly.
CAUTION: DO NOT use a hydraulic jack on this unit - use a jack at the side sills instead. This new Front Transaxle Assembly unit needs to be replaced as a complete unit (19-090). Refer to the Workshop Manual on MGSS or this SA for Tire, Oil, Battery and Lubricant Information.

Closed Fuel Tank

Lower the pressure in the closed fuel tank using the fuel lid opener switch. The lid can be opened after lowering the pressure (about 10 seconds) before service.
Refer to the Workshop Manual on MGSS for further details.

FUEL-FILLER LID LOCK ACTUATOR

Brake By Wire System

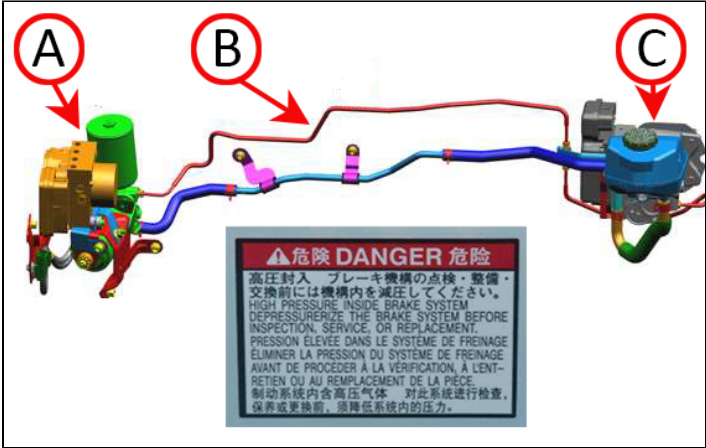
The Brake system is an Accumulator-Based Brake-by-Wire System which has complex hydraulic circuit. Because of this complexity, there is potential the system cannot be emptying air from the hydraulic circuit by pedal-pumping and valve activation, and a special repair method is required. Refer to the instructions on MGSS when servicing brake component parts.
CAUTION: Only use the Brake Fluids listed below for Brake by Wire (Electronically controlled brake unit (A)) equipped on this hybrid model. This is to prevent damage to rubber parts.
B060 DOT3 (CCI): equal to Mazda Genuine Brake Fluid B7
Equivalent Brake Fluids:

BRAKE SYSTEM

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- GC325M/GC325 DOT3 (CCI)
- SH-H DOT3 (Fuji Kako)

NOTE: Safe Brake 16M/9M DOT4 (Clariant) cannot be used.
Applying general standards such as FMVSS, DOT3/DOT4 is NOT sufficient to use.
Always make sure to depressurize the brake system (the red pipe (B) has high pressure of approx.10 Mpa even at IG OFF as shown in the figure) before inspection, service, or replacement for safety.

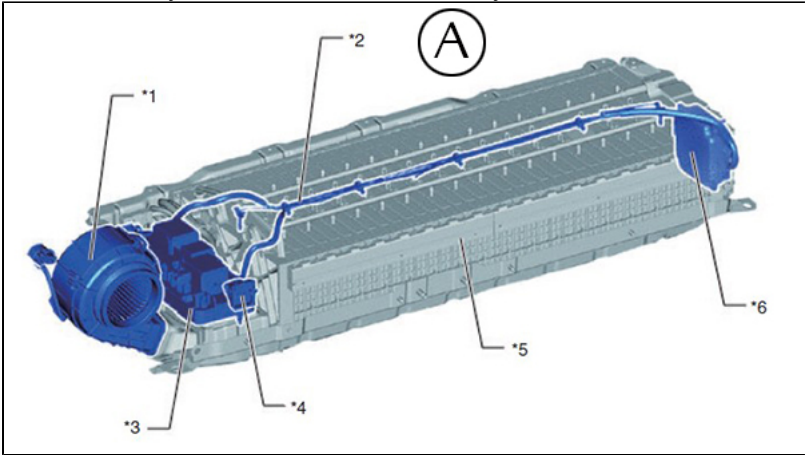


- A: Booster Pump Assembly
B: High Pressure Pipe Line
C: Electronically Controlled Brake Unit

Refer to the Workshop Manual on MGSS for detailed procedures.

High Voltage Battery

A Ni-Hydride Battery (A) (Ni-MH Battery Pack: 245 volts, named High Voltage Battery) is used on this hybrid model and is cooled by air.



- *1 Battery Cooling Blower Assembly
*2 HV Battery Thermistor
*3 Hybrid Battery Junction Block Assembly
*4 Service Plug Grip

HV BATTERY
HV BATTERY COOLING SYSTEM

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*5 HV Battery Modules

*6 Battery Smart Unit (Battery Voltage Sensor)

Storage of new High Voltage Battery (Ni-MH)

In addition to the following, verify the laws and ordinances of each country.

Avoid direct sunlight and store High Voltage Battery (Ni-MH) in a dark and dry place at 23 to 86 degrees F (-5 to 30 degrees C).

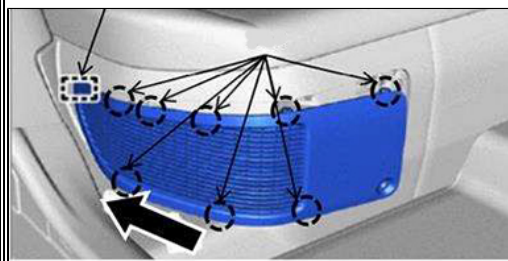
Air Filter User Maintenance for New Ni-MH Battery

Perform cleaning immediately with a soft brush on a vacuum hose (or tapping on the ground if vacuum cleaner is not available) when a message is displayed on the multi-information display. If filter is excessively dirty, replace the filter.

WARNING: DO NOT clean with water or liquids. If the high voltage battery gets wet, it may cause a malfunction or vehicle fire.

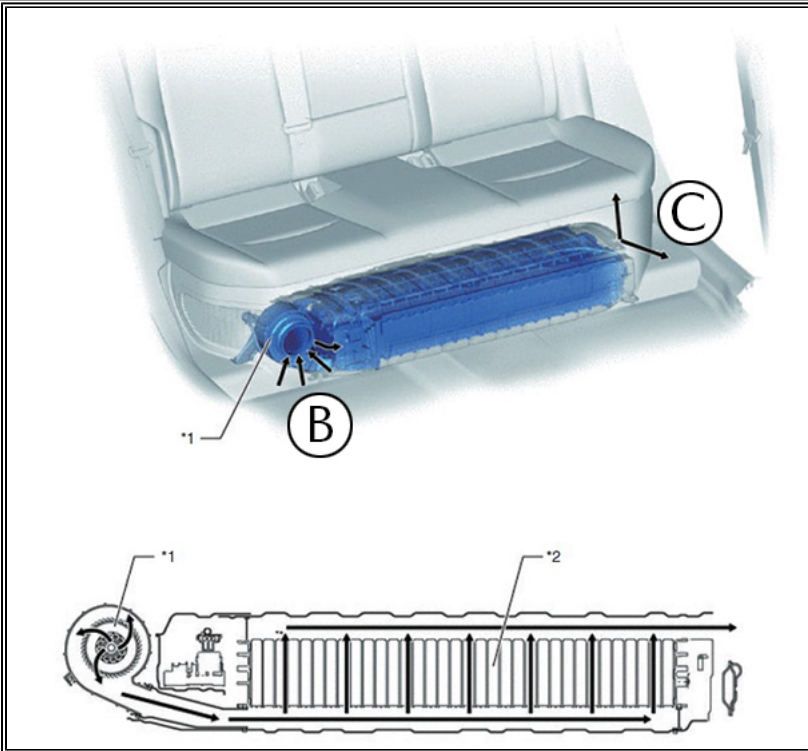
CAUTION:

- If you continue driving while the message is displayed, the high voltage battery may be damaged.
- DO NOT use an air blower for cleaning. Otherwise, dust could be forced in which could decrease the high voltage battery output or damage it.



Rear Seat

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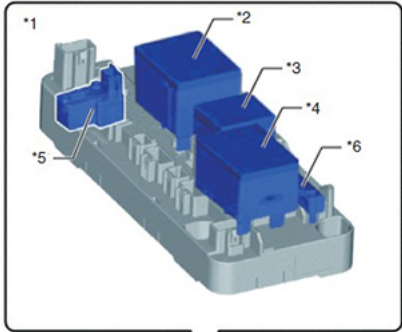
- B: Air Inlet
C: Air Outlet
*1: Battery Cooling Blower Assembly
*2: Hybrid Battery Module

NOTE: After cleaning, the vehicle may need to be driven for about 20 minutes for the message displayed on the multi-information display to go away. Refer to the Owner's Manual and the Workshop Manual on MGSS for more details.

Inner Service of High Voltage Battery (Ni-MH Battery Pack: 245 volts)

NO Modules can be replaced for the Ni-MH Battery Pack. Only some sensors and relays inside of the Ni-MH Battery Pack can be replaced as shown

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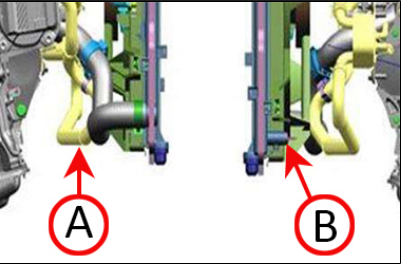


- *1 Hybrid Battery Junction Block
- *2 SMRB
- *3 SMRP
- *4 SMRG
- *5 Battery Current Sensor
- *6 Precharge Resistor

Coolant Drain and Replacement

The PCU (Power Control Unit) and oil (ATF) cooler uses the cooling system (Low Temperature (LT) line) with an electric water pump. The High Temperature (HT) line is for cooling the Engine, and uses another electric water pump. Each line has a scheduled maintenance interval.

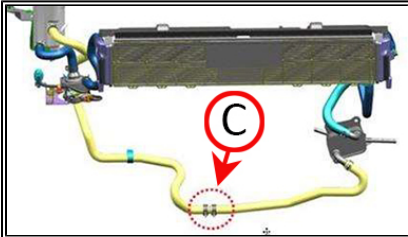
NOTE: LT line does not have a drain plug, therefore, always make sure to remove a joint in the middle of hose to drain the coolant as shown in the figure below. The HT line has a drain plug at the radiator.



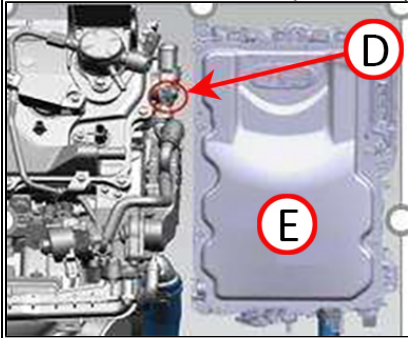
- A: Joint Low Temperature (LT)
- B: Drain Plug High Temperature (HT)

COOLING SYSTEM

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C: Joint Low Temperature (LT)



D: Water Sensor High Temperature (HT)

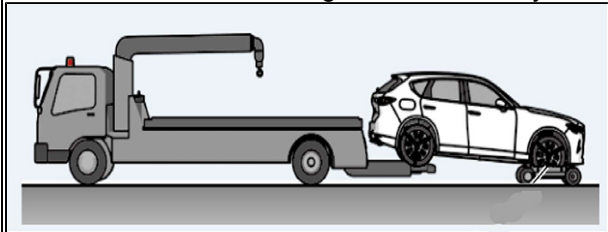
E: Power Control Unit (PCU)

Perform the air drainage process according to the Workshop Manual on MGSS after the coolant (FL22 type) is drained and replaced.

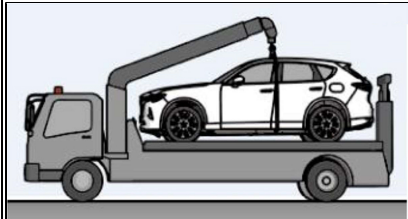
NOTE: There are both methods to operate the electric water pump (with and without Mazda Modular Diagnostic System (M-MDS)). Refer to the Workshop Manual on MGSS for more details.

Towing

CAUTION: When towed, all 4 wheels must be off the ground as shown in the figures, otherwise the MOTOR will generate electricity and may cause system damage.



or



Refer to the Owner's Manual and Rescue Manual on MGSS for more details.

No Jump Start Function

CAUTION: DO NOT Jump Start other vehicles with a dead battery because the PCU of this

TOWING

SERVICE CAUTIONS
WHEN LEAD-ACID

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hybrid model does not have the sufficient specification for it, and may cause a dead 12 volts lead-acid battery. This hybrid model can be jump started from other vehicles. In this case, the plus clip needs to be installed at the terminal in the main fuse box (engine room) as shown in the figure because the 12 volts lead-acid battery is located in the trunk.

BATTERY IS
DISCHARGED



*a - Booster Terminal

*b - Auxiliary battery of rescue vehicle

1 - Booster terminal of stalled vehicle

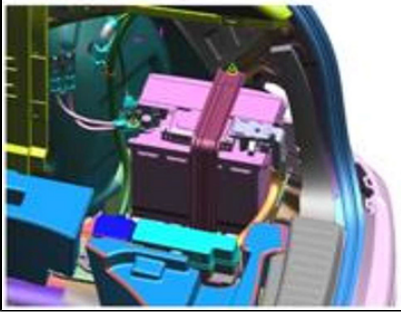
2 - Positive (+) auxiliary battery terminal of rescue vehicle

3 - Negative (-) auxiliary battery terminal of rescue vehicle

4 - Position shown in the illustration on stalled vehicle

Main fuse box (engine room)

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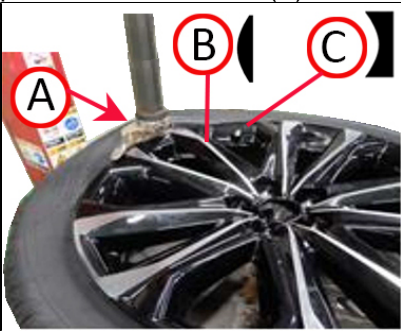


12V battery located in the trunk.
Refer to the Owner's Manual for more details.

Tire Changing of Mazda Genuine Aluminum Wheel (with rim steps approx. 2mm)

CAUTION: Always make sure to place the Mount Head (A) of the tire changer at the higher (convex) (B) rim area as shown in the figure, otherwise the wheel might be damaged when removing the tire.

DO NOT place the Mount Head at lower (concave) (C) rim area, in which you can easily place the Mount Head (A).



- A: Mount Head
- B: Convex
- C: Concave

Refer to the Workshop Manual on MGSS for further detailed procedures.

STEPPED RIM
VERIFICATION AND
CAUTIONARY NOTES

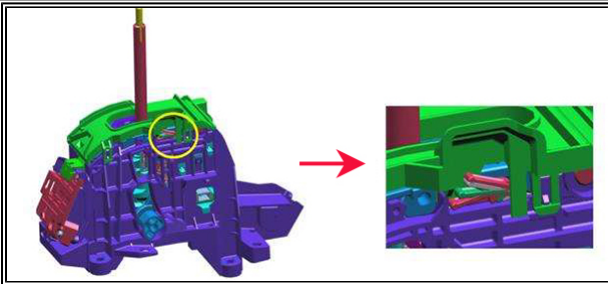
Shift Mechanism

Only adjust the shift cable at the Neutral position on this hybrid model, and not at the Park position like on the non-hybrid CX-50. Insert the cable from the engine room on the hybrid model, not from the cabin as like on the non-hybrid CX-50.

To unlock the Parking lock, always make sure to open the console and operate the unlock lever as shown in the figure below for this hybrid model (dealer service), not by unlock bottom at the console like the non-hybrid CX-50 (user service).

SELECTOR CABLE
ADJUSTMENT

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Maintenance Notification

The maintenance notification function alerts drivers of maintenance needs by turning on the wrench indicator light

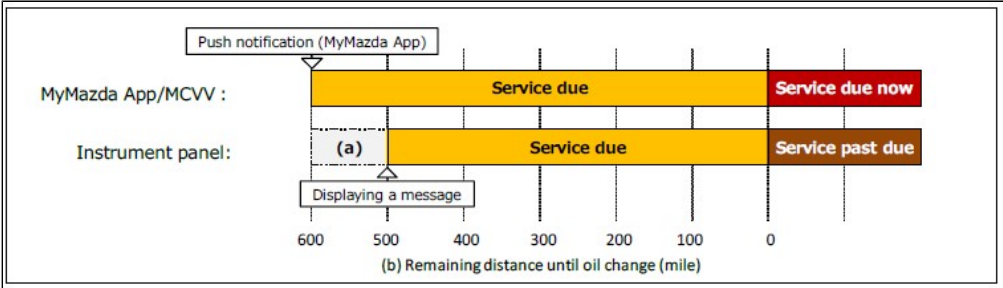


and displaying a message in the instrument panel. The followings are the normal operation of notification:

(a) : When the unit of distance setting is selected “mile”
Although a push notification on MyMazda App at 600 miles of remaining distance until oil change, no message is displayed in the instrument panel due to ECM specification (THS-II hybrid system). Displaying a message in the instrument panel will be at 500 miles of remaining distance until oil change.

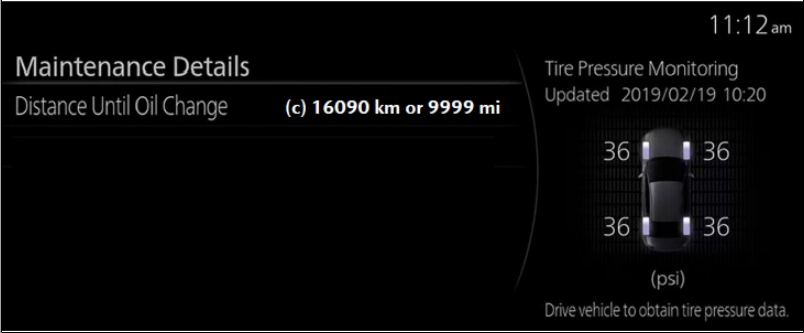
NOTE: When the unit of distance setting is selected “km”, a push notification (MyMazda App) and message (instrument panel) appear at 1,000km of remaining distance until oil change.
(b) : The remaining distance until oil change may display “--- mile or km” in the Mazda Connect (vehicle status monitor screen) and MyMazda App/MCVV if the ECM (THS-II hybrid system) has not completed the calculation of engine oil deterioration.

INSTRUMENT
CLUSTER



(c) : The maximum interval of remaining distance until oil change may display “16,090 km” or “9,999 mi” in the center display after performing engine oil data reset due to ECM specification (THS-II hybrid system).

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