

# Service Alert

Mazda North American Operations  
Irvine, CA 92618-2922



<b>Subject:</b> <b>BATTERY MAINTENANCE AT DEALER (12 VOLT LEAD ACID, HIGH VOLTAGE (EV) AND M HYBRID)</b>	<b>Service Alert No.: SA-018/23</b>
	<b>Last Issued : 04/04/2023</b>

## BULLETIN NOTES

This SA supersedes the previously issued bulletin(s) listed below. The changes are noted below in Red.

Previous TSBs:	Date(s) Issued:	Previous TSBs	Date(s) Issued:
SA-018/23	03/28/23	01-004/16	02/15/16
01-006/22	06/22/22	01-017/12	05/23/12
01-006/21	12/12/21, 08/24/21 and 02/08/21	01-003/11	01/12/11
01-001/19	01/02/19	01-009/10	08/24/10, 06/11/10, 02/15/10, and 02/02/10
01-008/18	03/26/18	01-029/06	07/28/06

## APPLICABLE MODEL(S)/VINS

2022-2024 Mazda3	2022-2023 CX-9	2023-2024 CX-50
2022-2024 CX-30	2022-2024 MX-30	2024 CX-90
2022-2024 CX-5	2022-2024 MX-5	

## DESCRIPTION

This service information provides testing and charging procedures in order to promote proper battery maintenance, to deliver new vehicles with fully charged batteries, and to reduce unnecessary battery replacement cost.


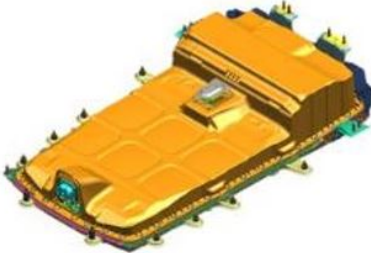
For new vehicles in stock at the dealer, inspect and maintain the batteries periodically according to the repair procedure.

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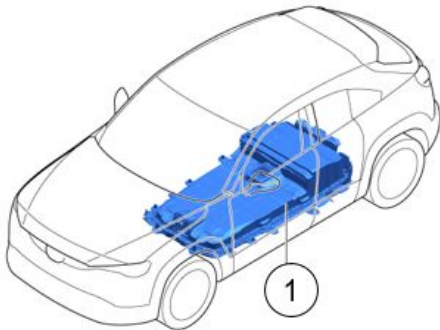
**ADDITIONAL INFORMATION FOR MX-30 EV AND CX-90 PHEV:**

The MX-30 EV and CX-90 PHEV are equipped with 2 batteries:

- A lead-acid battery which feeds the features consuming less power, such as ECU, lights or audio.
- A high-voltage battery which supplies the power for high-voltage systems such as the motor and the inverter.
- The 12V Sub Battery of the CX-90 PHEV is not in the scope of this Service Information as it is maintenance free.

Lead-acid Battery	High-voltage Battery (MX-30 shown)	Lead-acid Battery Specs
		<p style="text-align: center; color: red;">12V 20HR 65 Ah 465 CCA D23 (JIS)</p>

The high-voltage battery (1) is located under the vehicle.



The lead-acid battery is charged by the high-voltage battery when the EV system is activated. If the power is turned ON many times without activating the EV system, the lead-acid battery may discharge completely, making it impossible to turn the ignition ON and to activate the EV system.

The table below describes the situations in which charging the lead-acid battery is necessary.

Showroom vehicles with ignition OFF	
The doors are opened and closed at least 10 times/hour.	Activate the EV system at least 1 hour every morning, after noon and night.
The doors are opened and closed 2 or 3 times/hour.	Activate the EV system at least 1 hour every morning and afternoon.
The doors are opened and closed 2 or 3 times a day.	Activate the EV system at least 1 hour every morning.
Stored vehicles	
The doors are opened and closed 2 or 3 times per month.	Activate the EV system at least 1 hour every month.

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## High-voltage battery

Verify the State-of-charge (SOC) in the instrument cluster.

- **MX-30 EV:** If the SOC is lower than 26%, charge it to 50% (either by normal charging or quick charging).
- **CX-90 PHEV:** If the SOC is lower than 1%, charge it to 10% (either by normal charging, quick charging or engine running).

### NOTE:

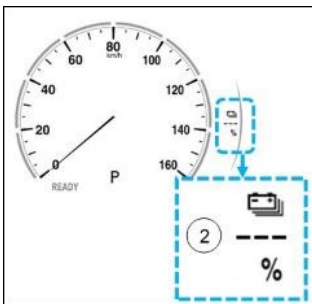
- While explaining the vehicle functionalities to a customer using a showroom vehicle, have the EV system activated.
- The READY indication (1) is displayed in the instrument cluster when the EV system is activated.



- If the vehicle has a value other than 90% set for the maximum charge limit, reset it to 90% on Mazda Connect before handing the vehicle to the customer.

## Prevention of high voltage battery discharging

- Before leaving the vehicle, make sure that the power switch is switched OFF (READY indication is not displayed).
- When the high voltage battery charge display shows “---” (2) in the instrument cluster, charge the battery immediately just after you notice the indication without performing “READY ON” operation. If the vehicle has to be moved, minimize the frequency of “READY ON” operation and record how many times it has been done.





**NOTE:** When the high voltage battery charge display shows “---”, the charge level is 0% or less. If “READY ON” operation is done several times in this situation, the high voltage battery may not keep in a good condition and, in the worst case, it will need to be replaced.

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**ADDITIONAL INFORMATION FOR CX-90 INLINE6 WITH M HYBRID**

The CX-90 INLINE6 is equipped with 2 batteries:

- A lead-acid battery which feeds the features consuming less power, such as ECU, lights or audio.
- A lithium-ion battery (M Hybrid) which supplies power for some systems and recharges the 12 volt lead-acid battery. It is located under the vehicle on the driver's side.

Lead-acid Battery	M Hybrid Battery	Lead-acid Battery Specs
		<p style="text-align: center;">12V 20 HR 65 Ah 520A CCA D23 (JIS) (for START/STOP)</p>

The maintenance procedure is different for a lithium ion battery than a conventional lead-acid battery. The M Hybrid battery has a characteristic that self-discharge occurs gradually if the vehicle is not driven for a long period. Without proper maintenance, the following symptoms may occur during vehicle inventory or after delivering the vehicle to customers.

- i-stop activation becomes less frequent since the performance of the M Hybrid battery degrades due to the electrolyte deterioration.
- The relay located inside the M Hybrid battery is turned off and electricity generation stops. In the worst case, the vehicle will be non-operational. It is caused by the SOC (\*1) level decreasing due to self-discharge (\*2), which is a characteristic of the lithium-ion battery.

\*1 SOC (State of Charge): Charging rate of a battery  
 \*2 Energy is consumed due to chemistry inside a battery.

All Mazda Distributors and Dealers are requested to maintain the M Hybrid battery by driving the vehicle or keeping the engine idling for more than 10 minutes once every 3 months, turning off lights, A/C, etc. in order to recharge at a no load condition. The vehicle should also be stored in a cool place as much as possible since the electrolyte deteriorates as the temperature rises.

**NOTE:**

- It is not possible to recharge the M Hybrid battery using a battery charger.
- A M Hybrid battery replacement due to lack of maintenance is NOT covered under warranty.

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## REPAIR PROCEDURE

### HIGH VOLTAGE BATTERY MAINTENANCE

Verify the State-of-charge (SOC) in the instrument cluster.

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- **CX-90 PHEV:** If the SOC is lower than 1%, charge it to 10% (either by normal charging, quick charging or engine running).

### M HYBRID BATTERY MAINTENANCE

Drive the vehicle or keep the engine idling for more than 10 minutes once every 3 months, turning off lights, A/C, etc. in order to recharge at a no load condition and store the vehicle in a cool place as much as possible since the electrolyte deteriorates as the temperature rises.

#### NOTE:

- It is not possible to recharge the M Hybrid battery using a battery charger.
- A M Hybrid battery replacement due to lack of maintenance is NOT covered under warranty.

### LEAD-ACID BATTERY MAINTENANCE

#### LEAD-ACID BATTERY VISUAL INSPECTION

Visually check battery for the following:

- The surface of the battery should be dry and clean (no dirt). If it is not, wipe away the dirt and moisture with a damp cloth. If a dry cloth is used, static electricity could ignite the battery vapor gas.
- Ensure there is no corrosion (rust) or dirt on the battery terminals and that the connections are tight.
  - If the battery terminals are loose, tighten them.
  - If there is any corrosion (rust), use a wire brush to remove it.
- Check the liquid level (non-sealed battery).
  - Make sure that the liquid level in each cell is between the upper and lower level.
  - If the liquid level is low, remove the cap and fill with distilled water to the upper level.
  - If any other water than distilled is used, it could cause the battery to discharge.
  - Do not overfill the battery. If the battery is overfilled, liquid will leak.
- Verify the battery case is not damaged or deformed. If the battery case is deformed, it is recommended to replace the battery, as the inside of the battery may also be damaged.
- Install the battery securely in the vehicle using the battery clamp.

The following are indications the battery is nearly dead and may need to be replaced soon:

- The battery liquid level requires topping off more often.
- The need to recharge the battery becomes more frequent.
- The engine cranking speed is insufficient to start engine.
- When you press/depress the accelerator pedal, the intensity of the headlight/interior lights changes.
- The electrolyte liquid levels between the cells varies.
- The electrolyte liquid becomes dirty.
- The turn signals blink slower than normal.

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## LEAD-ACID BATTERY INSPECTION AND RECHARGE PROCEDURE

## NOTE:

- Some batteries may be equipped with a "battery eye". The battery eye color simply indicates the battery state-of-charge, not its condition. DO NOT replace a battery based solely on the indication given by the battery eye. Always follow the procedure shown below for proper inspection of the battery condition.
- This procedure should be performed using the Mazda DCA-8000PM battery management system. Refer to TSB [BATTERY TEST PROCEDURE REQUIREMENTS USING THE DCA-8000PM](#).

Step	Inspection	Result	Action
1	Inspect the battery with the DCA-8000PM.	"GOOD BATTERY"	Return vehicle to inventory
		"GOOD-RECHARGE"	Refer to the following "Discharged Lead-Acid Battery Inspection" and "Discharged Lead-Acid Battery Troubleshooting Procedure" and check if there is any problem on vehicle side. If not, perform "Battery Diagnostics" on the battery using the DCA-8000PM.
		"CHARGE AND RETEST"	Refer to the following "Discharged Lead-Acid Battery Inspection" and "Discharged Lead-Acid Battery Troubleshooting Procedure" and check if there is any problem on vehicle side. If not, perform "Battery Diagnostics" on the battery using the DCA-8000PM.
		"REPLACE BATTERY"	Replace battery.

## DISCHARGED LEAD-ACID BATTERY INSPECTION

## Possible Factors

- Battery discharging current is exceeding charging current.
  - Engine idling too long with high electric load (i.e. traffic jam at night or in the rain).
  - Excessive use of electric devices with engine off (generator not working).
  - Generator problem (i.e. loose drive belt, internal failure, damage).
  - Poor or no contact between battery and generator.
  - Generator control problem (i.e. short circuit or contact loss of field coil control circuit / generator output voltage signal circuit).
  - Electric load too high, especially due to aftermarket equipments.

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Too much electric consumption while vehicle is not in use.

- Electric devices left on.
- Excessive use of electric devices with engine off (generator not working).
- Vehicle not in use for long periods of time.
- Excessive parasitic draw, especially due to aftermarket equipments.
- Weak battery.
  - Low electrolyte, electrode plate deterioration.

**DISCHARGED LEAD-ACID BATTERY TROUBLESHOOTING PROCEDURE**

**NOTE:** If needed, use the “Battery Diagnostics” of the Mazda DCA-8000PM to test the charging and starting systems by following the on-screen instructions to enter the appropriate information. Refer to the Mazda DCA-8000PM Quick Start Guide or Midtronics online Instruction Manual for more information.

Step	Inspection	Result	Action
1	Measure the parasitic draw of the vehicle. Refer to MGSS ( BATTERY INSPECTION/Parasitic Draw.) Is it within spec? Note: The following are considered normal parasitic draw values for aftermarket accessories. <ul style="list-style-type: none"> <li>• Remote engine starter - up to 15 mA</li> <li>• Radar detector - up to 15 mA</li> <li>• Anti-theft alarm - up to 15 mA</li> <li>• Navigation system - up to 15 mA</li> <li>• Cell phone charger - 0-60 mA</li> </ul>	YES	Go to next step.
		NO	Repair or replace the malfunctioning part.

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	<ul style="list-style-type: none"> <li>DVD player - up to 5 mA</li> </ul>		
2	<p>Check the connection of harness &amp; connectors between PCM field coil control and generator.</p> <p>Are all items OK?</p> <p>Refer to MGSS (BATTERY INSPECTION/ GENERATOR INSPECTION)</p>	YES	Go to next step.
		NO	Repair or replace the malfunctioning part.
3	<p>Measure the generator voltage.</p> <p>Is it within spec?</p> <p>Refer to MGSS (BATTERY INSPECTION/ GENERATOR INSPECTION)</p>	YES	Go to next step.
		NO	Inspect generator according to MGSS (BATTERY INSPECTION/ GENERATOR INSPECTION). If anything is wrong, repair or replace the malfunctioning part.
4	<p>Ask customer's usage of electric devices and check if any of following conditions apply.</p> <ul style="list-style-type: none"> <li>Engine idling too long with high electric load (i.e. traffic jam at night or in the rain).</li> <li>Excessive use of electric devices with engine off (generator or not working).</li> <li>Electric devices left on.</li> <li>Vehicle not in use for long periods.</li> </ul> <p>Do they apply?</p> <p><b>NOTE:</b> Even if the battery is dead, it may be recovered just with normal driving after a jump start as long as the charging system is working properly.</p>	YES	Advise customer of proper usage of electric devices.
		NO	<p>Refer to the appropriate troubleshooting procedure on MGSS. (It may not be a "dead battery").</p> <p>Refer to MGSS (SYMPTOM TROUBLESHOOTING / NO. 3 WILL NOT CRANK and NO. 4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK).</p>

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## LEAD-ACID BATTERY MAINTENANCE PROCEDURE AND WARRANTY POLICY

**NOTE:**

- Remove the room fuse while the vehicle is in inventory.
- Disconnect the battery negative cable if the vehicle is in inventory for more than 1 month.
- Remember, batteries continue discharging by parasitic draw and self-discharging even though the vehicle is in inventory.
- If the battery discharges for a long period of time and becomes sulfated, the battery may be difficult to recover.
- If the battery is discharged, the battery is hard to recover by road driving.
- In some cases, even if the battery is discharged (less than 12.4 V voltage and 1.22 specific gravity), cranking is still possible. Therefore, do not judge the battery as good/bad by cranking only.
- It is the dealer's responsibility to maintain batteries on inventory vehicles. Failure to provide documentation that proper maintenance was performed may result in denial of battery warranty claims.
- Battery failure due to lack of maintenance is not a warrantable repair. Refer to Mazda Warranty Policies and Procedures 2.5 and 2.6 for details.

## 1. For DEALER INVENTORY vehicles, follow the appropriate procedure below.

- Vehicles Arriving from Port:
  - Battery should be inspected and recharged (if necessary) within 2 days from date of delivery to dealer. Refer to the BATTERY INSPECTION AND RECHARGE PROCEDURE. Recharge and replace battery as necessary.
  - Recharging and replacement for vehicles arriving from ports IS covered by warranty (within 2 days). To be covered by warranty, the following information is required to be completed and submitted with the claim:
    - Properly documented Section 1 of the New Vehicle Inventory Battery Maintenance Record
    - DCA-8000PM Test Result Printout
    - 10 character Warranty code is required in the text field of the claim
- Inventory Vehicles:
  - As PDI step 2 indicates, inspect battery voltage every 10 days for showcase or forefront vehicles and every 30 days for inventory vehicles. Refer to the BATTERY INSPECTION AND RECHARGE PROCEDURE.
  - Make sure to properly document Section 2 of the New Vehicle Inventory Battery Maintenance Record.

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2. For RETAIL vehicles within 90 days of in-service, follow the appropriate procedure below.

- Retail Vehicles (Within Warranty Period):
  - Battery should be inspected and recharged (if necessary). Refer to the BATTERY INSPECTION AND RECHARGE PROCEDURE. Recharge and replace battery as necessary.
  - If battery tests GOOD, diagnose charging and electrical system for problem.
  - Recharging and replacement for customer retail vehicles IS covered by warranty. To be covered by warranty, the following information is required to be completed and submitted with the claim:
    - Authorization approval from the DCSM
    - Properly documented Sections 1, 2, and 3 of the New Vehicle Inventory Battery Maintenance Record attached to the repair order
    - DCA-8000PM Test Result Printout attached to the repair order
    - 10 character Warranty code is required in the text field of the warranty claim

3. For RETAIL vehicles after 90 days of in-service, follow the appropriate procedure below.

- Retail Vehicles (Within Warranty Period):
  - Battery should be inspected and recharged (if necessary). Refer to the BATTERY INSPECTION AND RECHARGE PROCEDURE. Recharge and replace battery as necessary.
  - If battery tests GOOD, diagnose charging and electrical system for problem.
  - Recharging and replacement for customer retail vehicles IS covered by warranty. To be covered by warranty, the following information is required to be completed and submitted with the claim:
    - DCA-8000PM Test Result Printout attached to the repair order
    - 10 character Warranty code is required in the text field of the warranty claim

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