

CIRCULAR LETTER

FROM: Maserati TSO

TO: Maserati Network



PERSONAL SERVICE LAB

MASTERS OF CARE

Maserati Hybrid System Info



ATTENTION: This document replaces MAS003003. Please discard any paper copy of the previous bulletin

DATE: DECEMBER 26 2022

This circular letter aims to point out the new contents and the important effects related to the technological evolution achieved in the entire Maserati Hybrid range.

Contact your Regional AfterSales Manager (RAM) or the Technical Support Helpdesk if you have any questions. (Maseratitechsupport@maserati.com)

Thank You for your continued support and cooperation.

Maserati Americas
Aftersales Dept.

General Description Of The Hybrid Range

The technology used is the Mild Hybrid one, or "light hybrid", and the basis is an internal combustion engine (ICE) with the addition of new components to enhance performance and reduce fuel consumption and emissions. Below is a brief description of the new and more interesting components:

- BSG – Belt Starter Generator: An electric machine provides crankshaft power to compensate for losses in belt-driven auxiliaries. It also functions as a 48 V-powered alternator.



- Lithium-ion battery: a device that stores energy produced by the BSG when operating as an alternator and replenishes the energy to the BSG when it operates as an electric engine. It also supplies an electric compressor (called eBooster) to optimize engine response and torque delivery.

Risks linked to 48 V lithium-ion batteries

Lithium-ion batteries present specific chemical risks and fire, as shown in the product fact sheet attached.



See how to manage these risks in accordance with all local health and environmental safety regulations.

Maintenance for 48V lithium-ion batteries

The lithium-ion battery's internal components **are not** subject to maintenance. If there is a malfunction, the batteries are considered "black boxes", meaning units with internal components that cannot be inspected and must be replaced. Visual indications and electronic diagnostic checks provide technicians with guidelines for identifying damaged batteries (there will be a dedicated section on the online technical documentation).

Replacing a 48V lithium-ion battery after a collision

For safety reasons, a collision that causes the airbag to inflate also triggers the pyrotechnic protection fuse in the 12V circuit. This event causes the 48V battery to go into the self-protection state mode, which prevents its further use. Consequently, in the event of a collision that causes an airbag to inflate, the 48V battery will need to be replaced. Internal components of lithium-ion batteries are maintenance-free. If there is a malfunction, the batteries are considered "black boxes", meaning units with internal components that cannot be inspected and must be replaced. Visual indications and electronic diagnostic checks provide technicians with guidelines for identifying damaged batteries (there will be a dedicated section on the online technical documentation).

Battery Logistics and Inventory handling

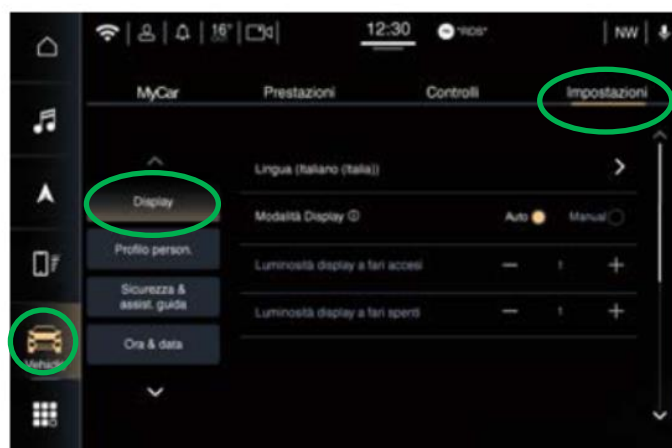
Since it is an electrical energy storage device, the MHEV car lithium-ion battery is subject to self-discharge. If it is discharged (with a charge level below 5%), the battery enters a permanent deactivation state and must be replaced and disposed of. Checking the SOC (State of charge) of the batteries stored in the warehouses and mounted on the cars in stock is mandatory.

Checking the state of charge of the batteries at 3-month intervals is advisable. In the case of batteries stored in stock with SOC below 5%, a PHD ticket must be opened. If the state of charge is less than 50% for batteries installed on vehicles, proceed with the check and recharge procedure, starting the engine and letting it idle until the 48V battery state of charge is equal to or greater than 50%.

Use the Maserati EVO tool to read the SOC value as described by the **MAS002677** communication or the specific indication on the instrument panel:

Grecale:

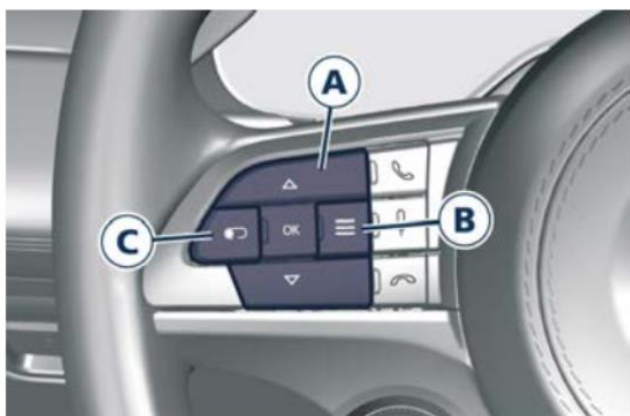
Activate HYBRID INFO



- Click on Vehicle, then Settings, Display, and select Widget List from the list

Widget selection

- Scroll with the button indicated by the letter C until the HYBRID INFO Widget appears on the display:



The battery icon fills up green depending on the SOC level. 50% corresponds to half the complete charge. For more details, consult the technical documentation.

Battery Checking

If replacing the battery, the spare part needs to be checked before its installation, using the diagnostic wiring tool for the BPCM module on MHEV Maserati EVO vehicle 48V batteries and following the dedicated section on the online technical documentation to perform the battery acceptance evaluation. If the rating is negative, the technician must open a BOL ticket before proceeding.

Personal Protective Equipment (PPE)

If the lithium-ion batteries show signs of obvious damage, if they are emitting odors or smoke, wear the appropriate personal protective equipment indicated by the supplier in the product information sheet.

Description	Image	Maserati special tool	Generic equipment	Note
Protective glasses EN166 Application area 349-5 Mechanical resistance B(T)			X	Use only for damaged batteries
Rubber-insulated electrical safety gloves			X	Use only for damaged batteries
Respiratory Mask protection according to EN149			X	Use only for damaged batteries

Images are for illustration purposes only

For normal disconnection, refitting, and replacement, the Battery Pack Control Module (BPCM) is protected against electrostatic discharges. In any case, avoid contact between the battery connectors and conductive objects (hands, tools, etc.). To avoid short circuits, always protect the positive and negative poles of the battery with electrical tape when removing it from the vehicle. For more details, consult the technical documentation. Personal protective equipment is readily available in every local market.

Tools and equipment

Based on local regulations and/or the equipment already available at your workshop, the dealer must evaluate the opportunity to equip himself with the following:

- A safety container, code 900029795, in which to temporarily store a damaged/suspect/removed battery in safety conditions (tool required for the entire Maserati network).



The image is for illustrative purposes

The container is equipped with:

- HF smoke filtering capability
- Warning labels
- Padlock
- Four wheels with two brakes
- Lid support bracket (to prevent the lid from flipping over)

 See how to manage these risks in accordance with all local health and environmental safety regulations.

Refer to the following diagram:

EQUIPMENT	Description	Image	Special tool	Available at Maserati	Generic equipment	Note
	Safety container for batteries - Conservation			X 900029795	X	
	Insulating mat				X	Provides electric insulation for temporary battery conservation
	Diagnostic wiring for the MHEV 48V vehicle BPCM module battery			X 900029797		Wiring for battery diagnostics outside the car

The insulation mat serves to comply with the requirements for storing the battery system on surfaces that offer electrical insulation listed in the Product Information Sheet.

The 4-cylinder hybrid engine on the Levante requires a set of mandatory tools for the maintenance of its mechanical parts. The entire Maserati Network will be invited to purchase the tools highlighted in red in the following summary table:

<u>Code</u>	<u>Short description - name</u>	<u>GRECALE HYBRID</u>
900028207	L4 ENGINE LIFTING BRACKETS	
900029740	STANDOFF MULTI AIR ADAPTER	X
900029741	ADAPTER BRACKETS	X
900029742	GUIDE AND EXTRACTOR KIT FOR FUEL MANIFOLD (*)	X
900029743	INSERTION GUIDE FOR FUEL MANIFOLD PIPE	X
900029744	EXTRACTOR FOR FUEL MANIFOLD PIPE	X
900029745	REAR CRANKSHAFT OIL SEAL GUIDE	X
900029746	OIL PUMP KIT FOR TIMING THE BALANCING SHAFT	X
900029747	MULTIAIR MODULE SPRING COMPRESSION TOOL	X
900029748	DIAL GAUGE SUPPORT	X
900029749	HEXAGONAL FRONT SHOCK ABSORBER SUPPORT	X
900029732	ENGINE SUPPORT PLATE	X
900029730	ENGINE SUPPORT UPDATE	X
900029731	CHAIN TENSIONER LOCKING PIN	
900029768	TRANSMISSION SUPPORT UPDATE	X
900029797	DIAGNOSTIC WIRING FOR THE MHEV 48V VEHICLE BPCM MODULE BATTERY	X
900030609	UPGRADE FOR ENGINE SUPPORT LUG	
900030608	FLEX PLATE LOCKING TOOL	X
900030610	ENGINE-TRANSMISSION REMOVAL TOOL UPGRADE	X
900030611	REAR AXLE REMOVAL TOOL UPGRADE	X
900030612	TRANSMISSION OIL FILLER CAP TOOL	X
900030613	BRAKE PAD SPRING ASSEMBLY TOOL	X
900030614	L4 ENGINE LIFTING BRACKETS	X
900030807	M182 CARBENCH TEMPLATE KIT	X
900030806	M182 GLOBALJIG TEMPLATE KIT	X
900030741	CHAIN TENSIONER PIN	X

(*) Kit consisting of 900029743+900029744

Storing 48 V lithium-ion batteries

The batteries must be stored in the warehouse following the technical and safety requirements indicated in the attached Product Information Sheet.

Some of the relevant requirements are:

- The room where the batteries are stored must be accessible only to authorized personnel.
- The room where the batteries are stored must be dry and ventilated.
- The battery system must be kept on surfaces that offer electrical insulation.
- avoid temperatures above 65°C.



Verify how to manage these risks in accordance with all local health and environmental safety regulations.

Battery Warranty Claims

Lithium-ion batteries are not considered subject to wear (like traditional lead acid or AGM batteries), so they have the same warranty conditions that apply to the entire vehicle. Battery-related warranty claims must be managed in the vehicle configuration update tab in the dedicated ModisCS+ ►Service Entry section, illustrated below. When filing a claim, the operator must enter the serial number and code of the new battery.

Vehicle Information Campaign Warranty BOL Vehicle Configuration Update Service Entry Customer Data

▼ Input

Part Number Description Serial Number

We recommend you to enclose the explanatory notes

Add Go To Non-genuine part/accessory

Part Number	Description	Serial Number	Note
Records not found			

1 / 1

The code and serial number are shown on the label located on the top of the battery:



The battery is not covered by the warranty if the state of charge has reached the critical threshold due to self-discharge. A specific paragraph in the use and maintenance manual warns customers about the actions to be taken if the vehicle is not used for a long time. This section is shown below:

Vehicle Stored for Long Periods

If the vehicle is going to be stored for long period of time, you need to check first the 12 V battery charge status and that of the 48 V battery on the **MHEV models** (see "Functions of Electric Vehicle Menu on MIA" in section "Dashboard Instruments and Controls", or check the status on the "Hybrid Info" widget on the left digital dial). If the charge status of the 48 V battery is below 50% (value represented in picture), avoid stopping the engine in this condition, but keeping it running at idle in order to recharge the 48 V battery at least up to 50%, in the case of stops within 3 months, or 100% for longer stops.



Grecale Hybrid Handbook excerpt

Safety Precautions (WARNINGS)

Lithium-ion batteries pose a fire and chemical hazard. Referring to the product information sheet, check the regulations and standards requirements in force locally regarding the management of risks inherent in the safe handling, storage, and disposal of lithium-ion batteries. Before storing or handling a lithium-ion battery, consult the Online Technical Documentation to classify the battery.

Classifying the battery's state of efficiency

The classification allows you to assess whether the battery condition is considered critical, suspicious, or safe. The classification can be performed on spare batteries or with the battery mounted on the vehicle. For details of the assessment, please refer to the technical documentation.

Disposal of 48 V lithium-ion batteries

In the event of a breakdown or accident, the batteries must be disposed of in accordance with the various waste management regulations and regulations in force in the respective countries.