


TN-14-16-004 R4 December 15, 2021		Tesla, Inc. Technical Note
<b>Model:</b>	<b>Vehicle System:</b>	<b>Region:</b>
Model S Model X	16 - Battery System	All


## Inspect the Model S and Model X HV Battery for Underside Damage

*Tech Notes are announcements that help to communicate and track new information about Tesla Service concerns. Such concerns may or may not be VIN specific. These instructions assume knowledge of motor vehicle and high voltage electricity repairs, and should only be executed by trained professionals. Tesla assumes no liability for injury or property damage due to a failure to properly follow these instructions or for repairs attempted by unqualified individuals.*

*This Tech Note supersedes TN-14-16-004 R3, dated 12-Jun-20. Each content change is marked by a vertical line in the left margin. Discard the previous version and replace it with this one.*

Whenever the vehicle is raised, or if the customer has indicated possible damage, the underside of the vehicle, including the High Voltage (HV) battery, should be visually inspected for damage. HV battery damage may include:

- Dents, holes, cracks, or tears
- Corrosion or moisture accumulation
- Evidence of a previous thermal event, such as smoke residue, discoloration, deformation, melted seals, metallic platter, or abnormal odor
- Rupture or disassembly
- Coolant or electrolyte leakage

 **NOTE:** If a vehicle is brought into a Body Shop with visible damage to the bottom of the HV battery, the Body Shop should contact Tesla:

- **In Europe, Middle East, and Africa:** Contact [EMEABodyRepair@Tesla.com](mailto:EMEABodyRepair@Tesla.com).
- **All other regions:** Contact your local Tesla Service Center.

The Body Shop should not try to repair the HV battery damage. Only Tesla Service Centers should try to repair the damaged HV battery.

**⚠ WARNING:** If the HV battery enclosure is compromised with a **visible open hole, crack, or tear** (Figures 1 – 6), the Service Center should not perform any additional inspections, and recommend the customer replace the HV battery. No further diagnosis is needed as Tesla recommends an HV battery replacement for any visible open hole, crack, or tear to meet Tesla’s standards of quality and safety.



Figure 1 – Visible open hole

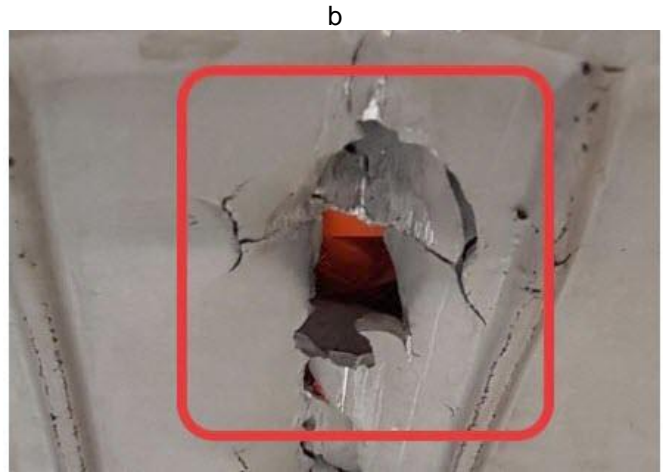


Figure 2 – Visible open hole



Figure 3 – Visible open crack

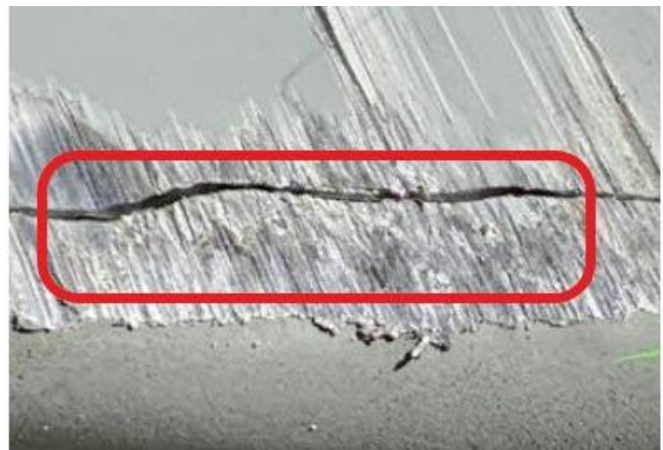



Figure 4 – Visible open crack





Figure 5 – Visible open crack





Figure 6 – Visible open crack


 **NOTE:** If at any point during the inspection the damage requires a HV battery, advise the customer that the HV battery requires replacement to meet Tesla's standards of quality and safety. Tesla does not recommend driving the vehicle until the HV battery is replaced. Since the new HV battery replacement is not covered under the vehicle warranty, the Service Center should recommend that the customer replace the HV battery and provide the customer a price quote for the HV battery replacement. The warranty does not cover the HV battery damage because it was caused by an external impact.

 **NOTE:** If a replacement HV battery is recommended for any out of warranty repair and the customer declines the repair, refer to [Article 6101300](#) for the appropriate next actions.

 **WARNING:** Failure to follow all HV safety precautions, including the use of personal protective equipment, when working on or around HV components may result in serious injury or property damage. Only technicians who have completed Tesla's Mechanical, Electrical, and Trim training course should diagnose, repair, or replace HV components. In addition, all repair and operating instructions should be reviewed and understood before working on Tesla vehicles or associated repair equipment.

 **WARNING:** An HV battery poses a significant high voltage and electrocution risk if the outer enclosure or safety circuits have been compromised or have been significantly damaged. Proper personal protective equipment (PPE) and insulating HV gloves with a minimum rating of class 0 (1000V) must be worn any time a high voltage component is handled. Refer to Technical Note [TN-15-92-003](#), "High Voltage Awareness Care Points" for additional safety information.

 **WARNING:** If the HV battery or vehicle displays signs of escaping gases, smoke, flames, excessive heat, sparks, or arcing, contact the local emergency department and refer to the Emergency Response Guide, available at <http://www.tesla.com/firstresponders> and/or [TN-13-16-007](#), "Lithium-Ion Battery Emergency Response Guide, Model S, X, 3, and Y". Gases or smoke exiting a lithium-ion HV battery are likely flammable and could ignite at any time.

 **WARNING:** Avoid contact with gases escaping from the HV battery. Vented gases might irritate the eyes, skin, and throat. Vent gas temperatures can exceed 600°C (1,110°F). Contact with hot gases can cause burns.

 **WARNING:**

- Inspect or repair a vehicle that has an unstable HV battery outdoors or within easy access to the outdoors.
- If an HV battery has been determined to have a coolant leak, do not pressurize the cooling system.
- Store damaged HV batteries at least 15 m (50 ft) away from flammable materials, structures, other vehicles, and other HV batteries.
- Do not store standalone HV batteries below -20°C (-4°F).
- Do not store standalone HV batteries for over 10 days above 35°C (95°F).
- Do not charge or discharge a standalone HV battery below 0°C (32°F).
- Do not store standalone HV batteries for over 30 days at full state of charge (SOC) or completely discharged.
- Do not charge a damaged or potentially unstable HV battery.
- Do not weld near HV batteries.

# HV Battery Assembly Underside

The underside of the HV battery assembly has several key components, as shown in Figure 7.

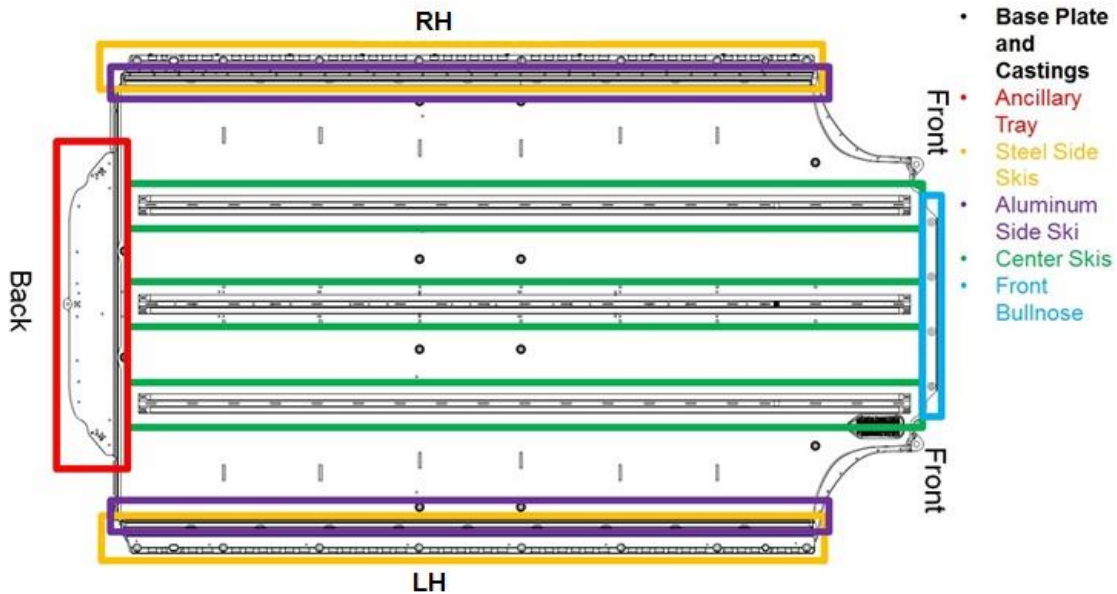


Figure 7 – HV Battery Assembly Components

If there is noticeable damage to the bottom of the HV battery assembly:

1. Create a Toolbox session with [Article 5047](#) marked as an issue
2. Add the comment “@NACompromisedBattery”, “@EUCompromisedBattery”, or “@APACCompromisedBattery”, depending on your region,” to add HV battery inspection engineers as watchers.
3. Collect the following information and upload it to the session:
  - a. Several pictures of the damage, taken with a high-resolution camera: If there isn't a visible open hole, crack, or tear, measure the depth of the HV battery enclosure damage (Figure 8) **while wearing proper PPE**. If the damage is not obvious, take an overall picture of the HV battery assembly, with pointers to the damaged area or areas.

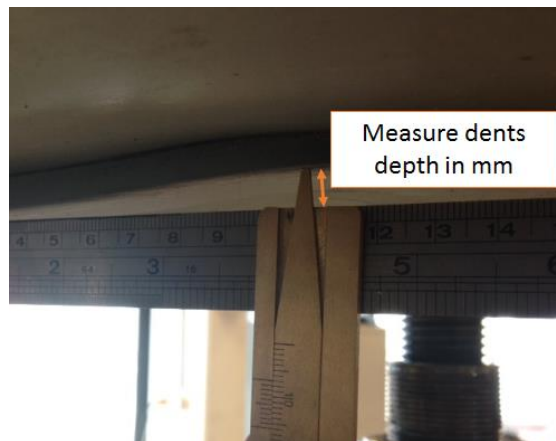


Figure 8 – Measuring the depth of enclosure damage

- b. Information from the customer about the incident that may have caused the damage, if available.

- c. The location of the damage, according to the corresponding zone below.

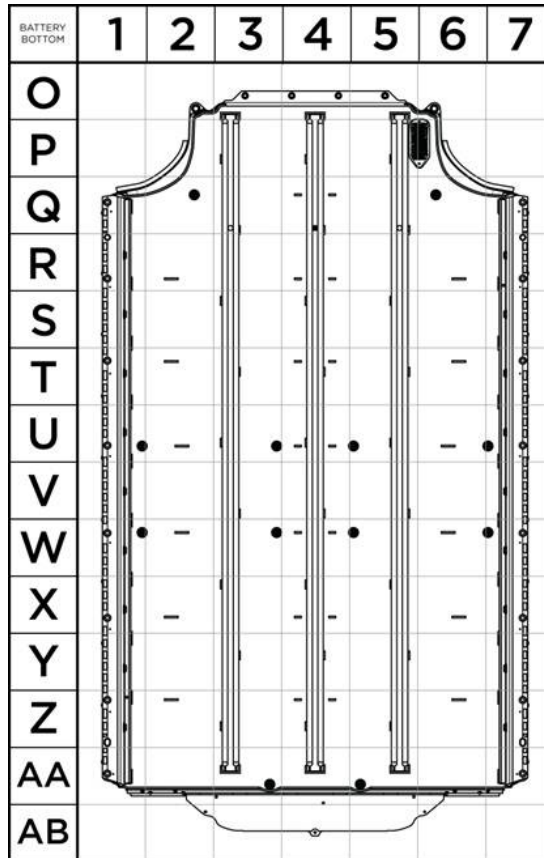


Figure 9

4. Perform the appropriate repair according to the corresponding zone below.

**If a repair is not necessary for any section below:**

1. Use Isopropyl Alcohol (IPA) and a nylon mesh sanding pad to thoroughly clean the area.

**⚠ CAUTION:** Do not use anything other than IPA to clean the HV battery enclosure. Using other chemicals, such as brake cleaner, might corrode the coating on the HV battery enclosure.

2. Apply multiple coats of SEM self-etching primer (aerosol TPN 1028556-00-A or liquid TPN 1111025-00-A).

**📄 NOTE:** In EMEA, use Mavom self-etching primer, PN 9992205\_QTS1.

## Front Bullnose

The front bullnose is a hollow extrusion with 4 fasteners that is welded onto the front of the HV battery.

### Suggest repair to customer:

- Recommend the replacement of the fastener if a fastener attaching the bullnose is damaged or stripped.
- Re-tap fastener hole if a fastener hole is damaged and the fastener cannot withstand full torque.

## Center Skis

The center skis are welded along the bottom of the HV battery.

### Suggest repair to customer:

- Deburr the area with a hand deburring tool to remove the sharp edges if sharp edges are found.
- Recommend HV battery replacement if:
  - The ski is detached or the HV battery is breached.
  - The HV battery enclosure fails leak test due to impact.
  - The HV battery enclosure has low isolation due to impact.

## Ancillary Tray

The ancillary tray is the curved section at the rear of the HV battery.

### Suggest repair to customer:

- Deburr the area with a hand deburring tool to remove the sharp edges if sharp edges are found.
- Recommend HV battery replacement if:
  - The section is breached.
  - The HV battery enclosure fails leak test due to impact.
  - The HV battery enclosure has low isolation due to impact.

## Steel Side Skis

The steel side skis are the removable steel rails on the long sides of the HV battery.

### Suggest repair to customer:

- Deburr the area with a hand deburring tool to remove the sharp edges if sharp edges are found.
- Recommend replacement of the fastener if a fastener attaching the ski is damaged or stripped.
- Re-tap the fastener hole if a fastener hole is damaged and the fastener cannot withstand full torque.
- Recommend steel side ski replacement if
  - The ski, or part of the ski, is detached from the HV battery and an umbrella valve is exposed.
  - The ski is touching an umbrella valve.
- Recommend HV battery replacement if:
  - The HV battery enclosure fails leak test due to impact.
  - The HV battery enclosure has low isolation due to impact.

## Aluminum Side Skis

The aluminum side skis are welded onto the long side of the HV battery.

### Suggest repair to customer:

- Deburr the area with a hand deburring tool to remove the sharp edges if sharp edges are found.
- Recommend aluminum side ski replacement if the ski, or part of the ski, is detached from the HV battery assembly.
- Recommend replacement of the fastener if a fastener is damaged.
- Re-tap the fastener hole if a fastener hole is damaged and the fastener cannot withstand full torque.
- Recommend HV battery replacement if:
  - The HV battery enclosure fails leak test due to impact.
  - The HV battery enclosure has low isolation due to impact.

## Base Plate and Castings

The base plate and castings are part of the HV battery that is not the front bullnose, ancillary tray, steel side skis, aluminum side skis, or center skis.

### Suggest repair to customer:

- Deburr the area with a hand deburring tool to remove the sharp edges if sharp edges are found.
- Recommend HV battery replacement if:
  - A dent is **6 mm** or more in depth.
  - If the HV battery enclosure fails leak test due to impact.
  - If the HV battery enclosure has low isolation due to impact.

For feedback on the accuracy of this document, email [ServiceBulletinFeedback@tesla.com](mailto:ServiceBulletinFeedback@tesla.com).