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2018 Clarity Plug-in Hybrid: New Model Body Repair Information

DISCLAIMER: This publication contains a summary of new body and vehicle technology that may affect collision and other body repairs. Always refer to the service information manual and Body Repair Manual for complete repair information. A subscription may be purchased at: techinfo.honda.com

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OVERVIEW OF BODY FEATURES



- Body construction using 52% lightweight materials, including aluminum and ultra-high-strength steel (UHSS - 980 MPa and higher).
- World's first Glass Fiber Reinforced Polymer/Plastic (GFRP) rear bumper beam.
- Bolt-on resin composite front bulkhead assembly.
- Clarity Plug-in Hybrid is equipped with Honda Sensing®, which includes these advanced safety and driver-assistive technologies: Adaptive Cruise Control with Low Speed Follow, Lane Keeping Assist System, Road Departure Mitigation, and Collision Mitigation Braking System™ with pedestrian sensing capability.

WARNING

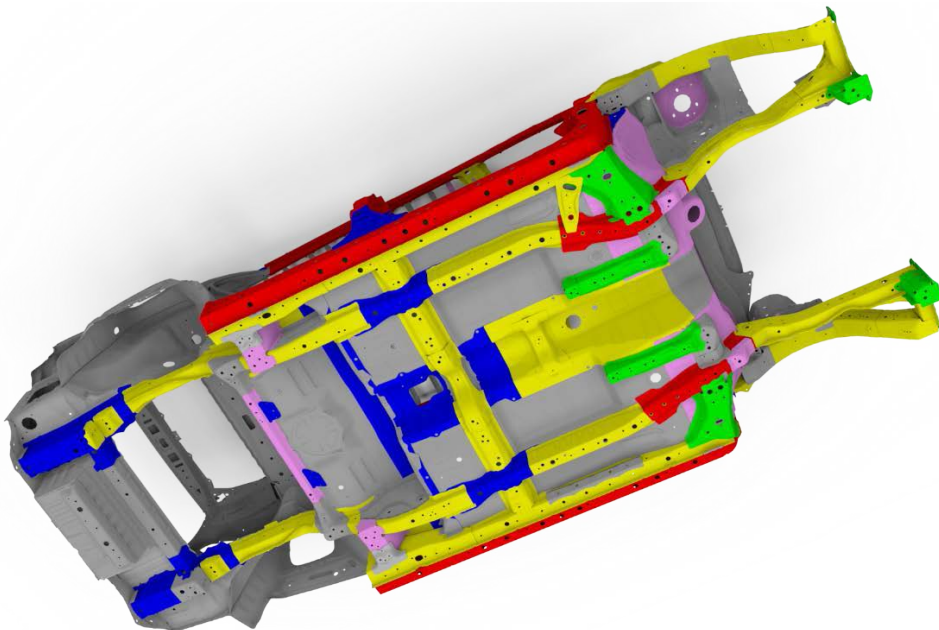
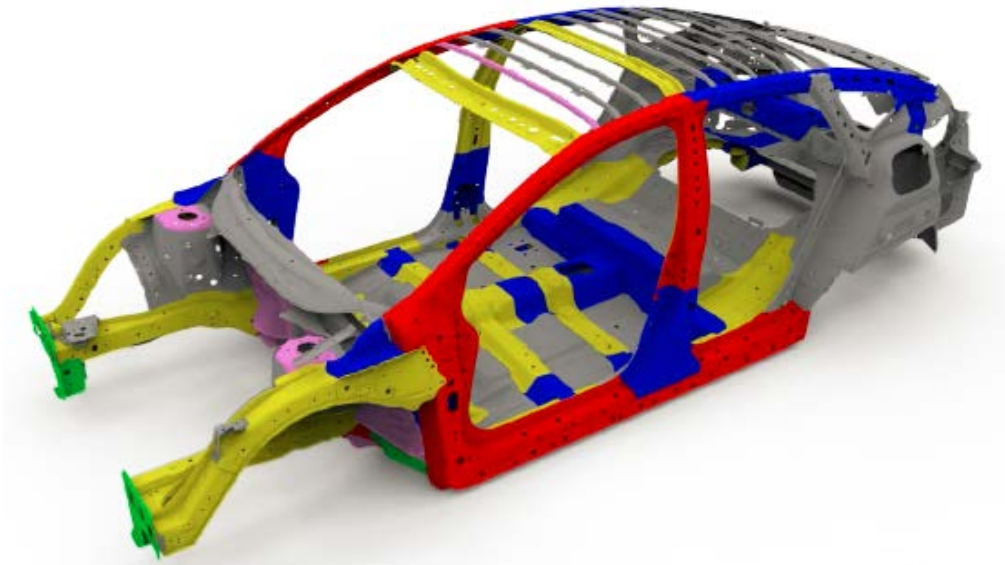
- Keep heat, sparks, and flames away. In addition, keep electronic devices that can emit static discharge away.
- Always have a fire extinguisher (dry powder type or carbon dioxide gas type) at the work location at all times.
- Only properly trained technicians should inspect and repair the Clarity's high-voltage systems.

NEW MODEL BODY TECHNOLOGY

Body Construction and High-Strength Steel Content

- Steel parts are color coded based on their tensile strength in Megapascals (MPa).
- High-strength steel (HSS) is defined as any steel with a tensile strength of 340 MPa or higher.
- Ultra-high-strength steel (UHSS) is defined as any steel with a tensile strength of 980 MPa or higher.
- Steel repair and welding procedures vary, depending on the tensile strength of the parts involved.

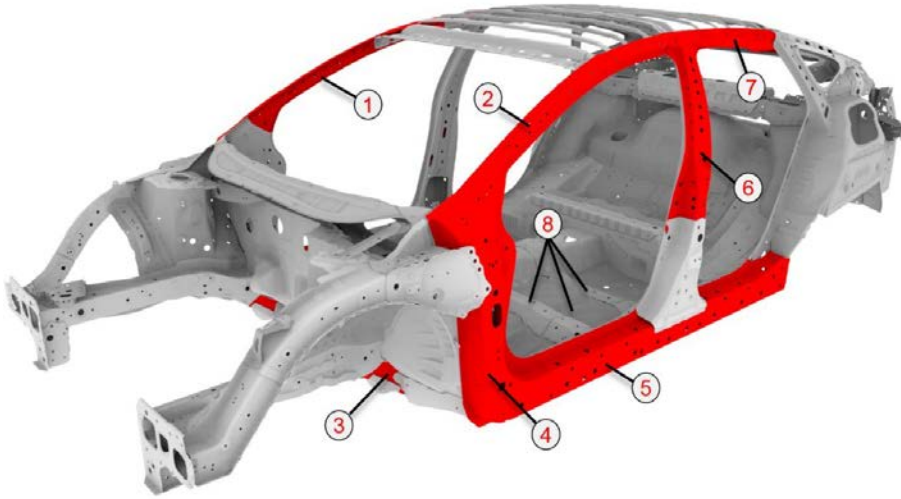
NOTE: The following illustrations are for general reference only. Some body parts are made from multiple layers of different tensile strength steels. Refer to the Body Construction section of the body repair manual for specific steel tensile strengths.



1.500 MPa (Hot Stamp) Steel Locations

1,500 MPa steel is stronger than ordinary steel, so it can help protect vehicle occupants while reducing overall vehicle weight to improve fuel efficiency.

The numbered parts in the illustration below are made of 1,500 MPa steel.



| | | | |
|---|------------------------------|---|-------------------------------|
| 1 | Front Inner Upper Panel | 5 | Side Sill Reinforcement |
| 2 | Front Pillar Upper Stiffener | 6 | Center Pillar Upper Stiffener |
| 3 | Front Side Frame Extension | 7 | Roof Side Stiffener |
| 4 | Front Pillar Lower Stiffener | 8 | Floor Cross member Stiffener |

NOTE: 1,500 MPa Stiffeners are located inside the front floor frame, front floor cross member, and front floor rear cross member.

Resin Composite (Plastic) Front Bulkhead Assembly

The Clarity has a front bulkhead assembly made from resin composite material.

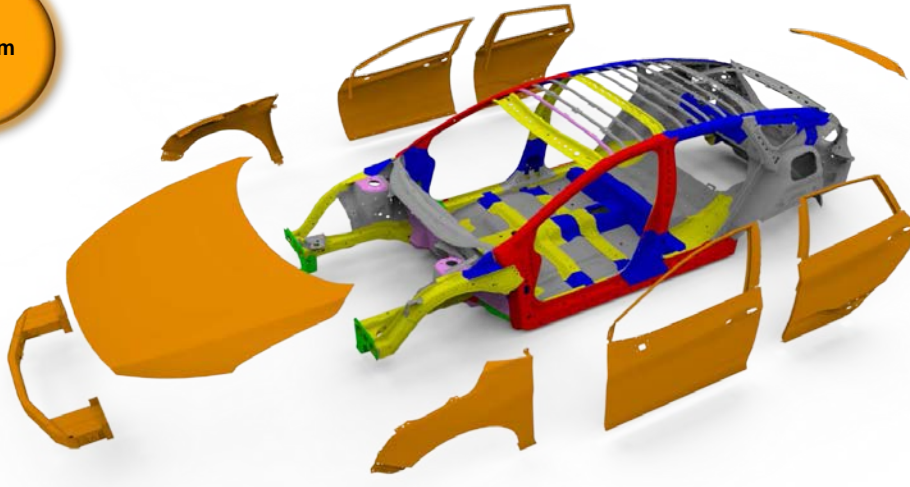
- The bulkhead design improves engine compartment access during factory assembly and service.
- The front bulkhead is attached with multiple bolts and is sold and replaced only as a complete assembly.
- The cooling fans, radiator, A/C condenser, hood lock, outside air temperature sensor, and related piping/components are attached to the front bulkhead using molded-in M6/M8 threaded inserts.
- Over torqueing or using power tools may break these inserts loose, requiring front bulkhead replacement.
- A damaged bulkhead must be replaced, not repaired.
- For more information, refer to “Front Bulkhead Replacement” in the body repair manual.



Aluminum Parts and Reparability

The following parts are made from aluminum alloy:

| | |
|----------------------|-------------------------------------|
| Front Bumper Beam | Rear Shelf Panels |
| Hood Panel | Trunk Lid |
| Front Fenders | Front and Rear Subframe (Not shown) |
| Front and Rear Doors | |



Laser-Brazed Roof Attachment

The factory-installed roof panel is attached using a laser-brazed joint to the outer side panels.

- Laser-brazed joints cannot be duplicated during roof panel replacement.
- The original roof panel must be cut off near the laser-brazed joint and the remaining flange removed separately.
- The service roof panel is attached using service replacement bolted clamp-type brackets (five per side) and panel bonding adhesive.
- The roof panel, service brackets, and bolts must be ordered separately. Refer to the online parts catalog.
- Refer to “Roof Panel Replacement” in the body repair manual.



Service Replacement Roof Panel (Underside View)

BODY REPAIR INFORMATION

NOTE: The following content is intended only to highlight new/special concerns. No body repairs should be attempted without first referencing the applicable body repair manual.

Use of Heat During Body Straightening and Repair

When you are doing body straightening and repair procedures, follow these guidelines:

- **Do not** apply heat to any body part during straightening. This may compromise the internal structure and strength of high-strength steel parts.
- Any part that has heat applied to it during straightening must be replaced with new parts.
- Ignoring these instructions may significantly reduce occupant protection in any subsequent collision.

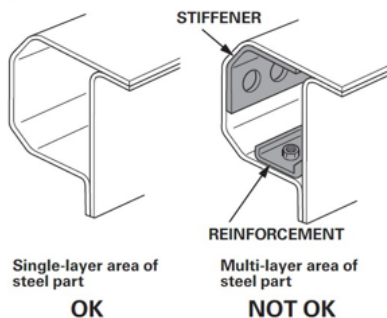


Sectioning (Cut and Joint) Guidelines

Various high-strength and ultra-high-strength steel materials with different sheet thicknesses and strengths are applied in many places that vary with body design in order to increase collision safety performance, body stiffness, and weight reduction. Stiffening members are also applied inside some steel parts (patches, reinforcements, stiffeners, etc.)

Follow these guidelines to avoid an unsafe repair:

- Outer body and floor panels may be sectioned as necessary. Specific sectioning procedures are not provided in the body repair manual.
- Depending on the type of vehicle damage, steel parts with a tensile strength of 780 MPa or less may be sectioned, as long as all three of the following conditions are met:
 - Sectioning must be done in a single-layer area of the part.
 - Multi-layer internal steel reinforcements and stiffeners must not be cut.
 - Sectioning must be done in load bearing areas such as engine, transmission, or suspension mounting points.



Sectioning Area Examples

- If any of the above sectioning conditions cannot be met, replace those body structural components (stiffeners, reinforcements, and other multi-layered steel parts) as assemblies that match the replacement parts configuration.
- Approved welding methods are shown in the table at below.
- Refer to the body repair manual for complete procedures.
- MAG plug welding is now allowed on 1,500 MPa (hot stamp) steel parts in select locations only as specified in the body repair manual.

Welding Method for Steel Parts

O = Approved

X = Not Approved

O* = Approved only if specified in BRM

| Steep Part Tensile Strength | Welding Method | | |
|--------------------------------|----------------|----------|------|
| | Spot Welding | MAG Weld | |
| | | Plug | Butt |
| <590 | O | O | O |
| 590 | O | O | O |
| 780 | O | O | O |
| 980 | O | O | X |
| 1,500 | O | O* | X |

NOTE: Welding instructions must be followed exactly as specified to ensure adequate weld strength.

WELDING PRECAUTIONS AND INFORMATION

Repairing 1, 500 MPa Steel Parts

Observe these precautions when repairing 1,500 MPa steel parts:

- Never attempt to straighten damaged 1,500 MPa steel parts; they may crack.
- 1,500 MPa steel parts must be replaced at factory seams using only approved repair methods. Do not section these parts.
- MIG-brazed joints should be used only in locations not accessible by a spot welder.
- To ensure adequate weld tensile strength, always manually set the spot welder to the specifications provided in the body repair manual.
- Unapproved MAG welding procedures on 1,500 MPa steel may generate heat levels that will significantly reduce the strength and structural integrity of 1,500 MPa steel parts.
- The photo below shows a tensile strength test results of an improperly MAG welded 1,500 MPa steel part. The 1,500 MPa side fractured first because excessive welding heat reduced its strength.
- For more details, refer to “Basic Welding Information” the Body section of the service information.

Important Information

Parts made of Ultra-High-Strength Steel (UHSS/1,500MPa/USIBOR) must be installed as a complete part. No sectioning is allowed. Ultra-High-Strength Steel requires special welding equipment, procedures, and settings. See the welding section of the body repair manual. Failure to use the proper equipment or follow the proper procedures can result in an unsafe repair.

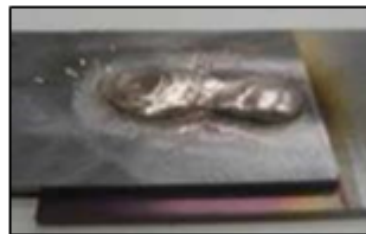
MIG Brazing Guidelines for 1,500 MPa Steel Parts

NOTE: Refer to the body repair manual for complete procedures.

- MIG-brazed joint locations are specified in the body repair manual.
- A single- or double-hole MIG braze may be specified, depending on the tensile strength of the parts being joined.
- The size and number of holes are critical to achieving adequate joint strength.
- A MIG welder with pulse control must be used. Refer to the equipment manufacturer's instructions for welder voltage and current setup.
- The photos below show the difference in results between pulsed and non-pulsed MIG brazing.



Pulsed MIG (OK)



w/o Pulsed MIG (NG)

MAG Welding Specifications for 590–980 MPa High-Strength Steel Parts

NOTE: In this publication and the body repair manual, gas metal arc welding (GMAW) is referred to by its subtypes depending on requirements as follows:

- MIG Welding/Brazing = This refers to metal inert gas welding or brazing where 100% argon (Ar) shielding gas is used. Argon is inert and does not react with the molten weld pool or brazing operation.
- MAG Welding = This refers to metal active gas welding where the shielding gas being used contains a mixture of 80% argon (Ar) and 20% carbon dioxide (CO₂). It is considered active because the CO₂ undergoes a limited reaction with the molten weld pool.
- For MAG welding, 80/20 shielding gas (C20) is preferred. However, 75/25 (C25) is acceptable.

Important Information

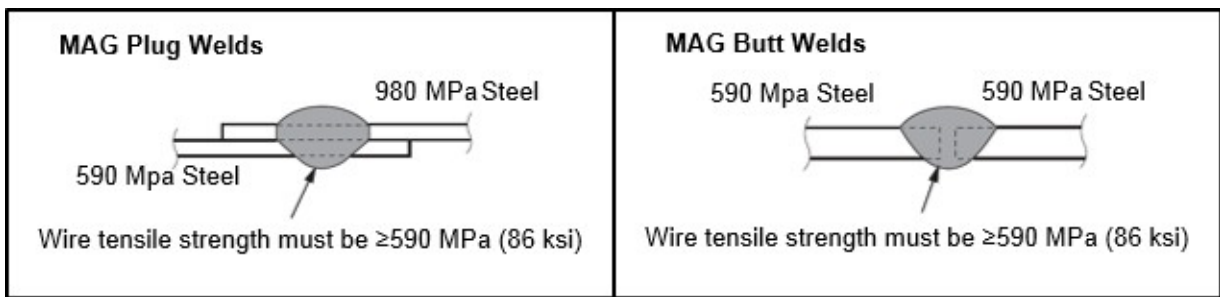
Parts made of high-strength steel (590-980 MPa) must often be installed as a complete part. Section only according to published repair information and guidelines. This high-strength steel requires special welding equipment, procedures, and settings. See the Welding section of the body repair manual. Failure to use the proper equipment or follow

- The welding wire used must have a tensile strength equal to or greater than the lowest tensile strength of the parts being welded. The conversion chart below shows the relationship of steel tensile strength (MPa) to the minimum welding wire tensile strength (in kilopond per square inch [ksi]).

| Steel Tensile (MPa) | Wire Tensile (ksi) |
|---------------------|--------------------|
| 590 | ≥86 |
| 780 | ≥113 |
| 980 | ≥142 |

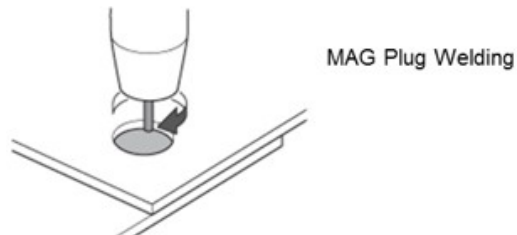
(1,000 psi = 1 ksi)

- Typical ER70S-6 MIG wire has a minimum tensile strength of 70 ksi (483 MPa). It can be used when welding up to 440 MPa steel parts. Refer to the diagrams below:



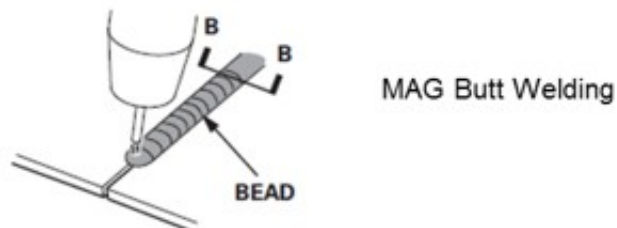
MAG Plug Welding Guidelines

- MAG plug welding may be done when joining body components to 590–980 MPa steel parts.
- MAG plug may also be used on 1,500 MPa steel parts only as specified in the body repair manual.
- Follow the recommendations described in the body repair manual.



MAG Butt Welding Guidelines

- MAG butt welding may be done only on steel parts with a tensile strength of 780 MPa and lower.
- Welding speed is critical to achieve the correct weld strength and minimize the heat affected zone (HAZ).
- Follow the recommendations described in the body repair manual.



BEFORE STARTING COLLISION REPAIRS

With any collision repairs, always refer to and follow the information outlined in the Generation Information section of the body repair manual. The following information outlines special consideration when repairing a Honda Clarity.

IPU (Intelligent Power Unit) Leak Test After Airbag Deployment

An IPU leak test must be done on any Clarity Plug-In Hybrid involved in a collision severe enough to deploy the airbags. The test consists of pressurizing the IPU with shop air to check for any leaks. If the IPU does not pass leak check, it must be replaced. Contact Techline for further information.

High-Voltage System Components

If you are doing any repairs that require the removal of high-voltage system components, the vehicle must be taken to an authorized Honda dealer. Authorized Honda dealers have the training and equipment needed to remove and install high-voltage components.

Refer to the Electrical Powertrain Component Location Index in the service information for a complete list of high-voltage system components.

DURING COLLISION REPAIRS

With any collision repairs, always refer to and follow the information outlined in the General Information section of the body repair manual. The following information outlines special consideration when repairing a Honda Clarity.

Precautions When Using a Heated Paint Booth

| System | Precautions |
|---------------------|--|
| SRS | <ul style="list-style-type: none">Do not apply heat greater than 212°F (100°C) when drying painted surfaces anywhere around the SRS components. |
| Electric Powertrain | <ul style="list-style-type: none">High temperature may damage the battery module. When drying paint in a heated paint booth, make sure the temperature does not exceed 149°F (65°C). |

AFTER COLLISION REPAIRS

Collision Shut-off History Clear Command

When the battery condition monitor module receives a collision detection signal (CDS) from the SRS unit, it updates the collision shut-off history and stores it in the module's non-volatile memory. The battery condition monitor module stops supplying power to the high-voltage circuits disrupting the control signal to be sent to the high-voltage contactor inside the battery module the next time the system is being turned on.

Aiming Driving Support Systems

The Honda Clarity is equipped with advanced safety driving support systems to help warn drivers and mitigate hazards. It is very important that the components making up this system are properly aimed after a collision repair.

Use the following table to determine what component requires aiming.

| Component | When to Aim |
|-----------------------|--|
| Multipurpose Camera | <ul style="list-style-type: none">• Whenever the multipurpose camera unit is removed or replaced |
| Millimeter Wave Radar | <ul style="list-style-type: none">• Whenever the millimeter wave radar unit is removed or replaced• After any front-end collision repairs |
| LaneWatch™ Camera | <ul style="list-style-type: none">• Whenever the LaneWatch™ camera, right-side power mirror or right-front door is removed or replaced• Whenever the right-front door is adjusted• Whenever the right-front door is repaired |

If aiming is required, take the vehicle to an authorized Honda dealer.

AUTHORIZED HONDA CLARITY DEALERS

The Clarity Plug-In Hybrid can only be taken to the authorized Honda dealer for service and repairs. To locate an authorized Honda dealer, contact Honda Customer Relations at 1-888-946-6329.