3. Body Repair

3.1. Body Panel information and Repair

3.1.1. Description and Operation

Vanderhall Venice body panels are made of a light weight ABS Plastic substrate with both a color film and a UV resistant clear film. This material gives the appearance of a base coat/ clear coat paint finish. These panels can be repaired with common polyurethane paint systems. Undamaged body panels should not experience any degradation from sun or water exposure. Body panels are not structural, and may be removed for refinishing.

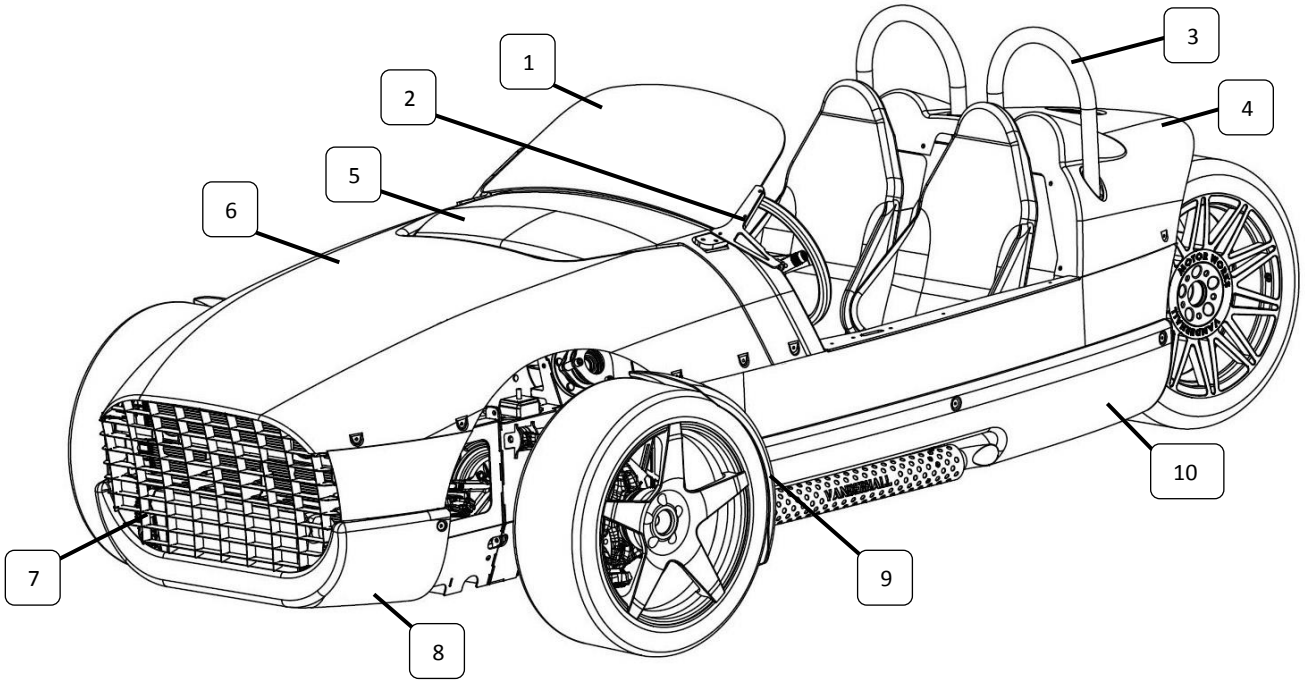
3.1.2. Repair Instructions

Venice body panels are built to be lightweight and damage resistant. Small imperfections such as scratches, chipping, and paint delamination may be repaired. Damage to the panel substrate, however, may not be repaired. Any panel that is cracked or perforated must be replaced.

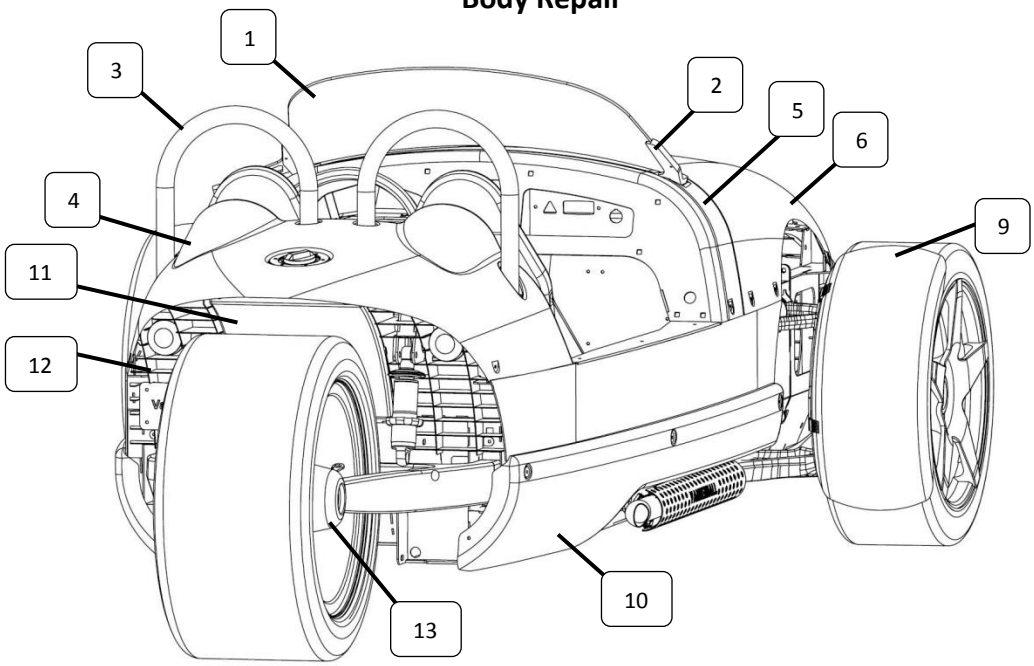
For paint repairs:
Any paint damage or delamination may be repaired using polyurethane paint systems. When repairing a damaged panel sand the affected area lightly. In cases of paint delamination, the panel substrate may be scuffed with Scotch-Brite Very Fine (red) pads or equivalent, and then treated with a plastic adhesion promoter. Parts may then be refinished according to the paint manufacturer's instructions. Panels must not be baked as they will deform

3.2. Exterior Body Panels

3.2.1. Description and Operation



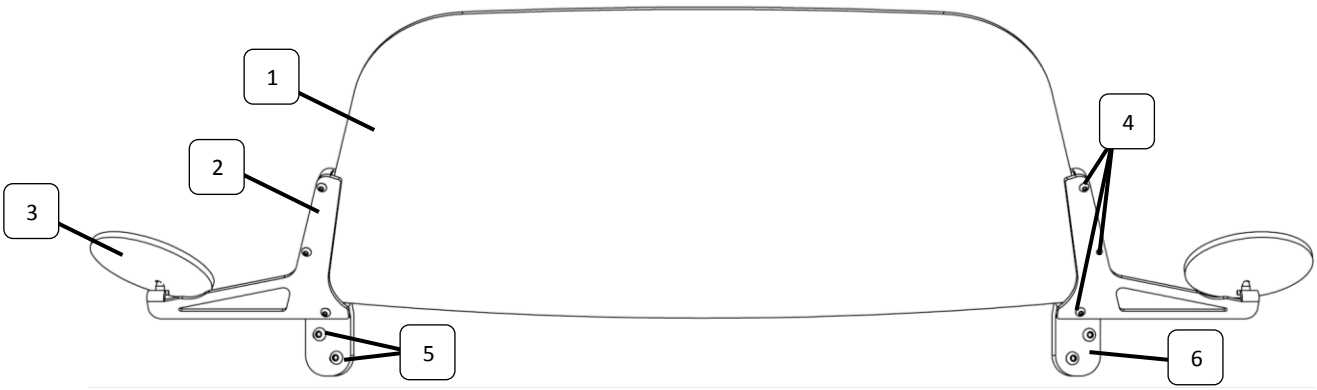
1 – Windshield
2 – Windshield support / Mirror post
3 - Style Bars
4 - Tail
5 - Cowl
6 - Hood
7 – Front Grill
8 – Front Valance
9 – Front Wheel Fender
10- Body Rocker Panel



1 – Windshield
2 – Windshield support / Mirror post
3 – Style Bars
4 - Tail
5 – Cowl
6 - Hood
9 – Front Fender
10 – Body Rocker Panel
11 – Rear Wheel Splash Guard
12 – Rear Grill
13 – Rear Hub Cover

3.2.2. Repair instructions

3.2.2.1. Windshield



1. Windshield	4. Mirror Post to Windshield Support Screw
2. Mirror Post	5. Windshield Support
3. Mirror	6. Windshield Support to Chassis Screw

3.2.2.1.1. Fastener Specifications

Application	Specifications
Glass Setting Tape	3/64 thickness Glass setting tape example (Ever Seal 3/64)

3.2.2.1.2. Removal Procedures

Caution:
The windshield is constructed from two layers of glass with a clear film in-between. Should the glass break the film will hold many of the pieces together. However it is possible for glass pieces to become dislodged. These pieces can cut you Wear Safety Glasses and work gloves when working with broken glass to prevent injury

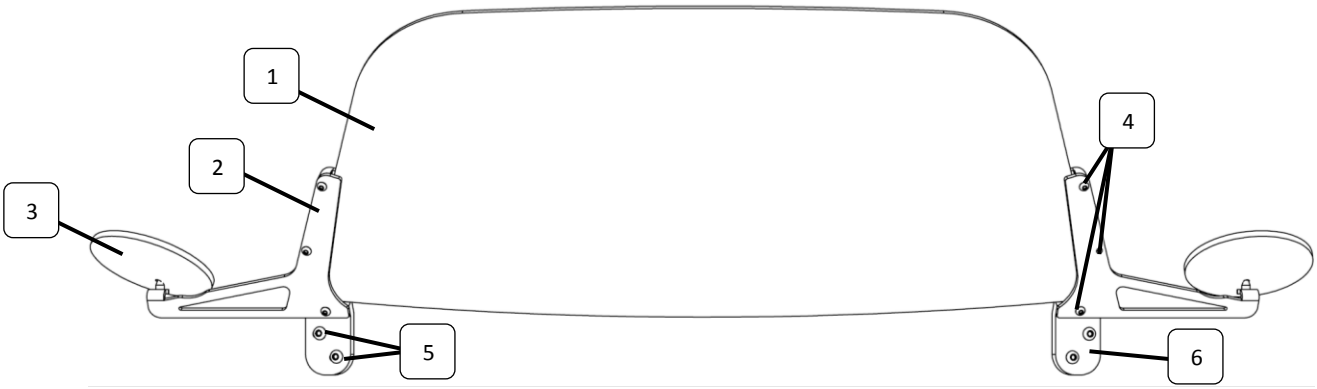
Note:
To prevent future injury When removing a broken windshield, It is good practice to place drop cloths over the carpet and seats Additionally after the glass has been removed the dash, sills and surrounding areas should be vacuumed clean

- Remove the Mirror Posts **REFER TO WINDSHIELD SUPPORT/ MIRROR POST IN THIS SECTION**
- Remove the Windshield Glass

3.2.2.1.3. Installation Procedures

- If reinstalling the windshield, remove the old tape
- Clean the mounting surfaces (Windshield, Mirror Post, and Windshield Support) to remove grease and dirt
- Loosely (~5 turns of mounting screw) install the mirror posts on to the Windshield Support
- Loosen the Windshield Support screws until the windshield support can be moved easly
- Cut 2 6 inch (150 mm) lengths of Glass setting tape
- Wrap a single layer of glass setting tape around the left and right edges of the glass starting on the bottom edge
- Insert the windshield between the Mirror Mounting Post and the Windshield Support
- Tighten the Mirror Mounting Post **REFER TO WINDSHIELD SUPPORT/ MIRROR POST IN THIS SECTION**
- Tighten the Windshield Support Screws, **REFER TO WINDSHIELD SUPPORT/ MIRROR POST IN THIS SECTION**

3.2.2.2. Windshield support / Mirror post



1. Windshield	4. Mirror Post to Windshield Support Screw
2. Mirror Post	5. Windshield Support
3. Mirror	6. Windshield Support to Chassis Screw

3.2.2.2.1. Fastener Specifications

Application	Specifications	
	Metric	English
Windshield Support to Chassis Screw	22 Nm	16 lb. ft.
Mirror Post to Windshield Support Screw	7.5 Nm	5.5 ft-lb

3.2.2.2.2. Tools

4 mm hex key
5 mm hex key

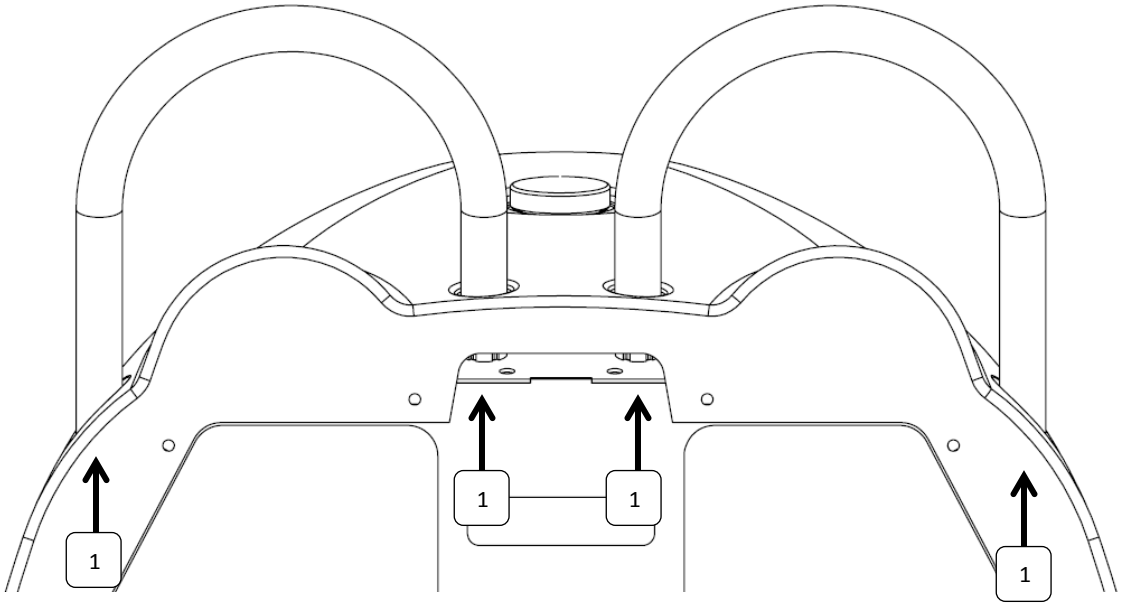
3.2.2.2.3. Removal Procedures

- Remove the 6, Mirror Post to Windshield Support Screws
  - Get assistance when removing the screws, as the windshield may become free.
- Remove the windshield **REFER TO WINDSHIELD IN THIS SECTION**
- Remove the 4 Windshield Support to Chassis Screws

3.2.2.2.4. Installation Procedures

- If the Windshield supports have been removed, install them loosely
  - Otherwise loosen the windshield supports until they can be moved easily
- Loosely (~5 turns of mounting screw) install the mirror posts on to the Windshield Support
- Install the Windshield, **REFER TO WINDSHIELD IN THIS SECTION**
-

3.2.2.3. Style Bars



Venice Style Bars

3.2.2.3.1. Fastener Specifications

Application	Specifications	
	Metric	English
Style Bar Mounting Bolts	47 Nm	35lb. ft.

3.2.2.3.2. Tools

30 mm Socket

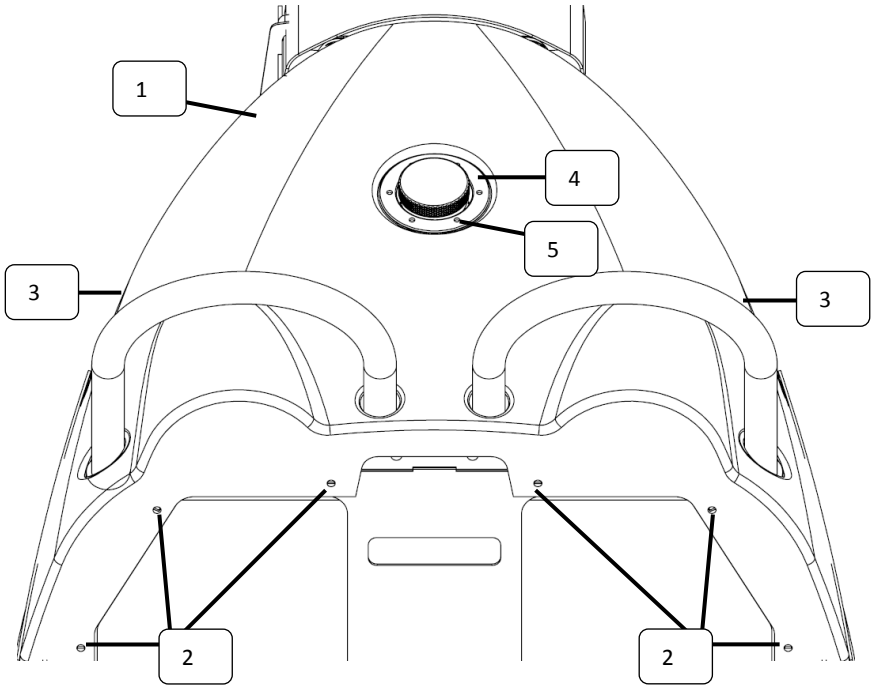
3.2.2.3.3. Removal

- Slide seats forward fully
- Remove the two bolts from each of the style bars (1)
- Pull style bar vertically to extract from the chassis

3.2.2.3.4. Installation

Push the style bars down in to the receiver tube

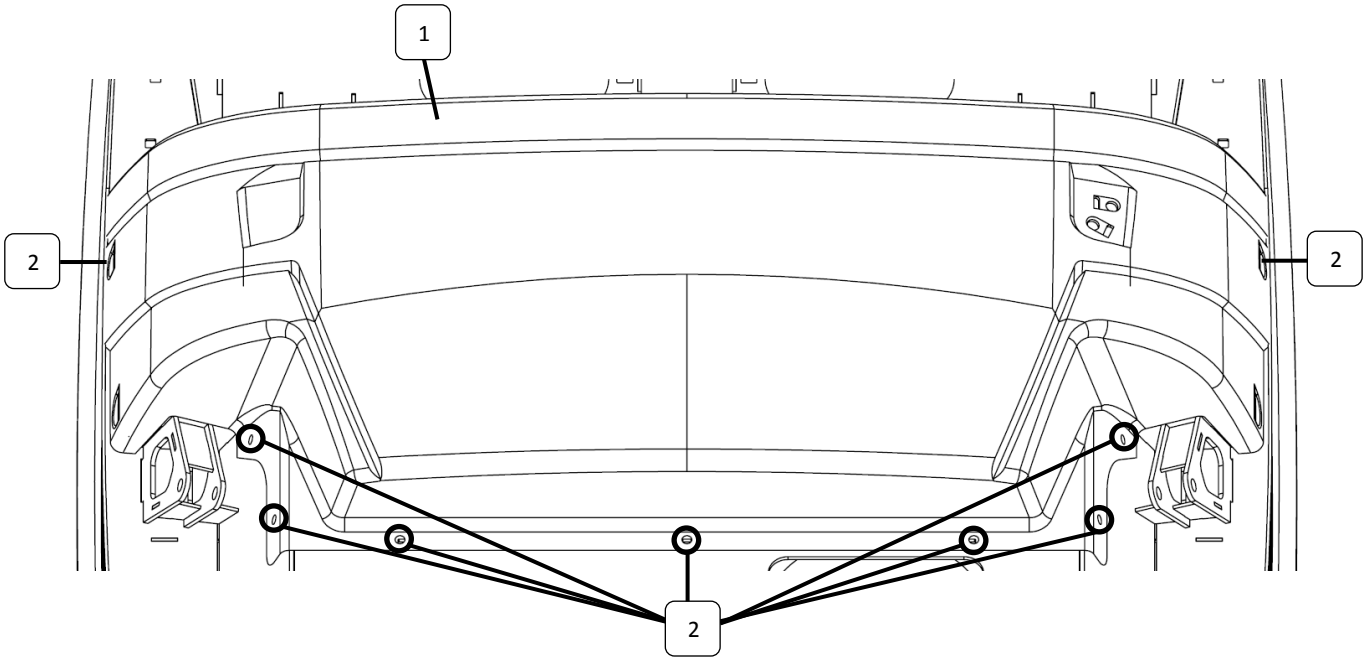
3.2.2.4. Tail



Venice Tail

Call Out	Component Name
Preliminary Procedures 1. Slide Seats Forward 2. Remove the Style Bars, Refer to Style Bars in this section 3. Remove Fuel Cap	
1	Tail
2	Interior Tail Screws Qty: 6 Tighten: 22Nm (16 ft. lb)
3	Exterior Tail Screws Qty: 2 Tighten: 22Nm (16 ft. lb)
4	Fuel Trim Ring
5	Fuel Trim Ring Screws Qty: 6 Tighten: 22Nm (16 ft. lb)

3.2.2.5. Cowl



Venice Cowl

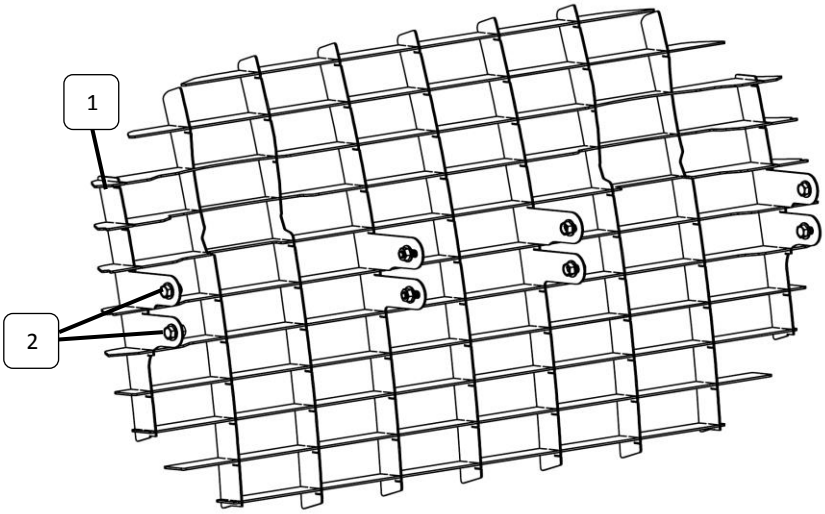
Call Out	Component Name
Preliminary Procedures 1. Remove Hood, Refer to Hood in this section 2. Remove Windshield supports / Mirror Posts, Refer to Windshield supports / Mirror Post in this section	
1	Cowl
2	Cowl Screws Qty: 9 Tighten: 22Nm (16 ft. lb)

3.2.2.6. Hood

Venice Hood

Call Out	Component Name
1	Hood
2	Hood Screws Qty: 8 Tighten: 22Nm (16 ft. lb)

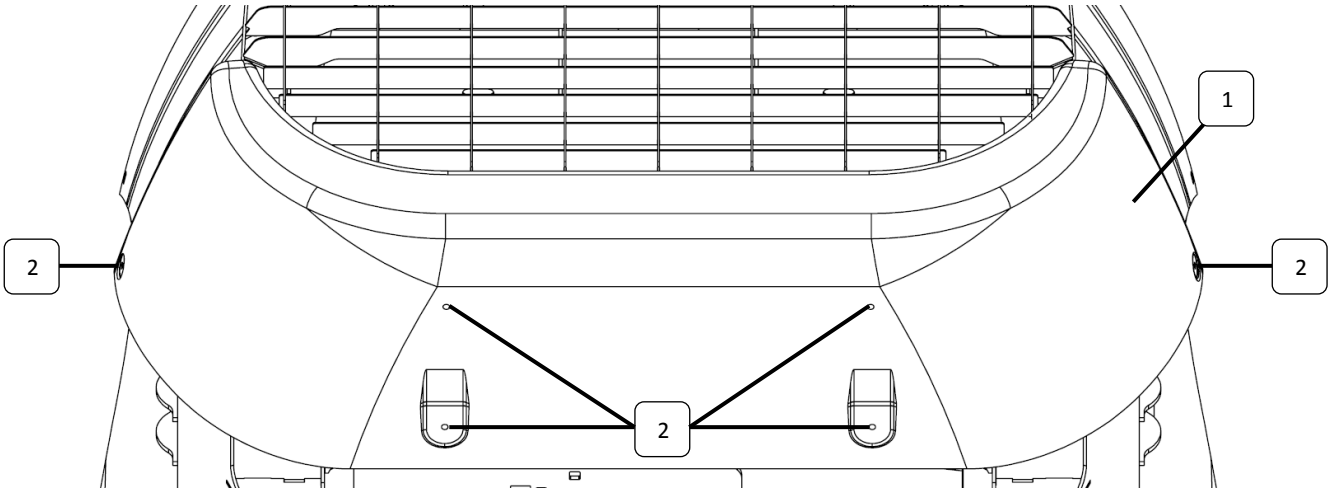
3.2.2.7. Front Grill



Venice Front Grill

Call Out	Component Name
Preliminary Procedures 1. Remove Hood	
1	Front Grill
2	Front Grill Screws Qty: 8 Tighten: 7Nm (60 in. lb.)

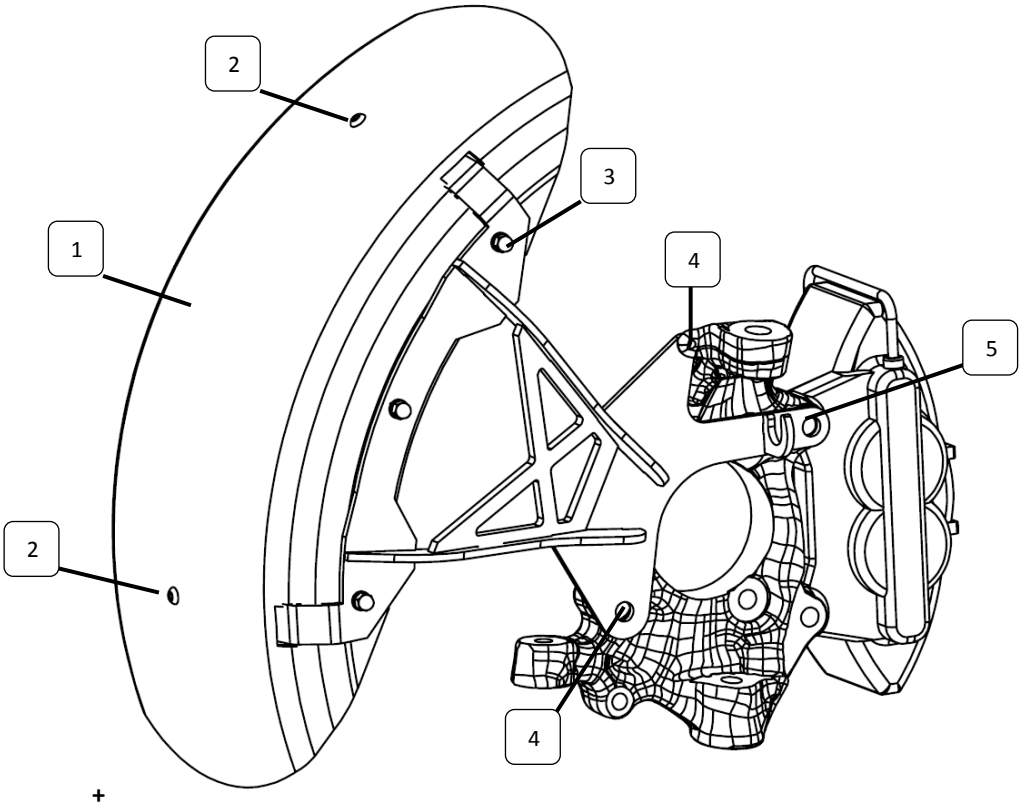
3.2.2.8. Front Valance



Front Valance

Call Out	Component Name
1	Venice Front Valance
2	Valance Screws Qty: 6 Tighten: 22Nm (16 ft. lb)

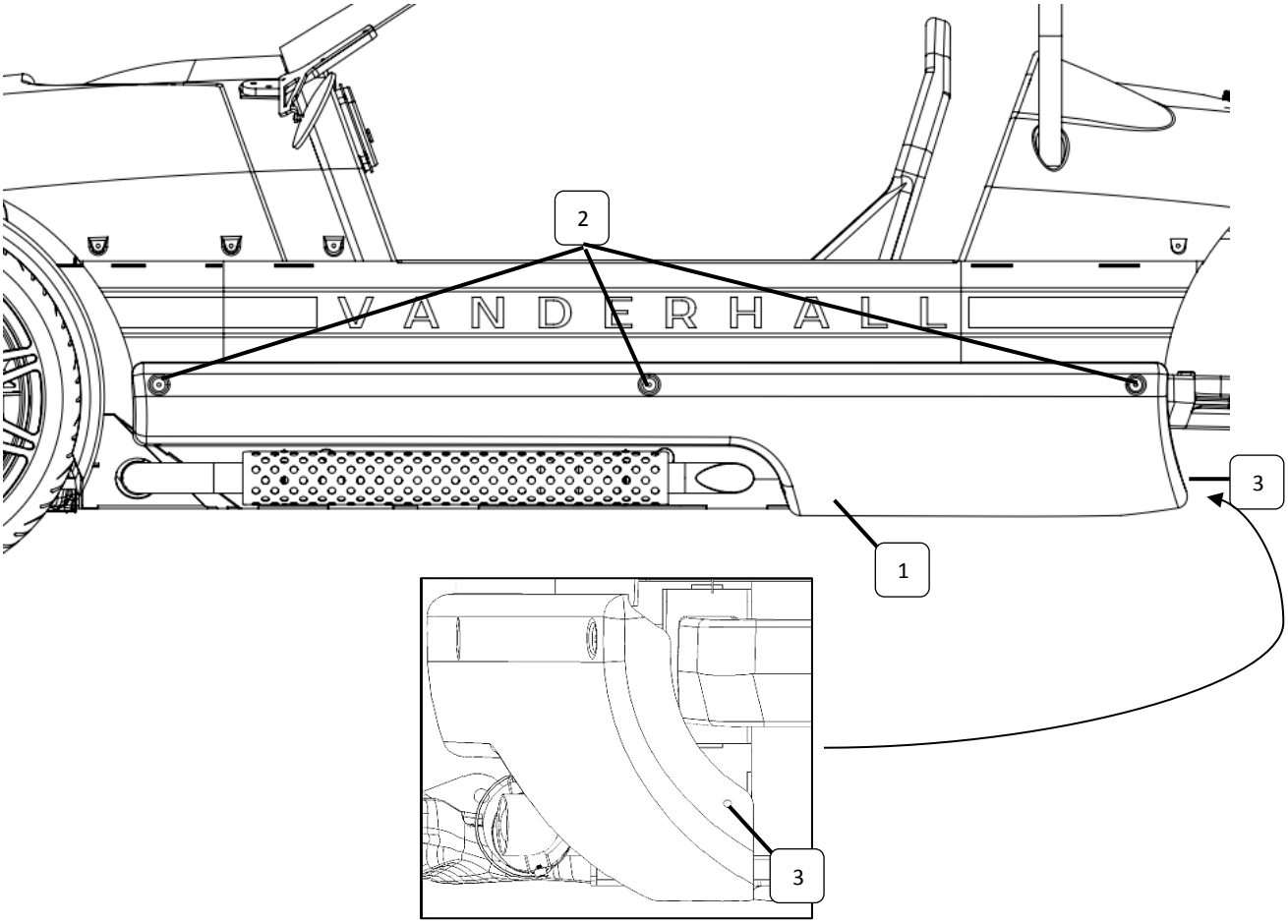
3.2.2.9. Wheel Fenders



3.2.2.10. +

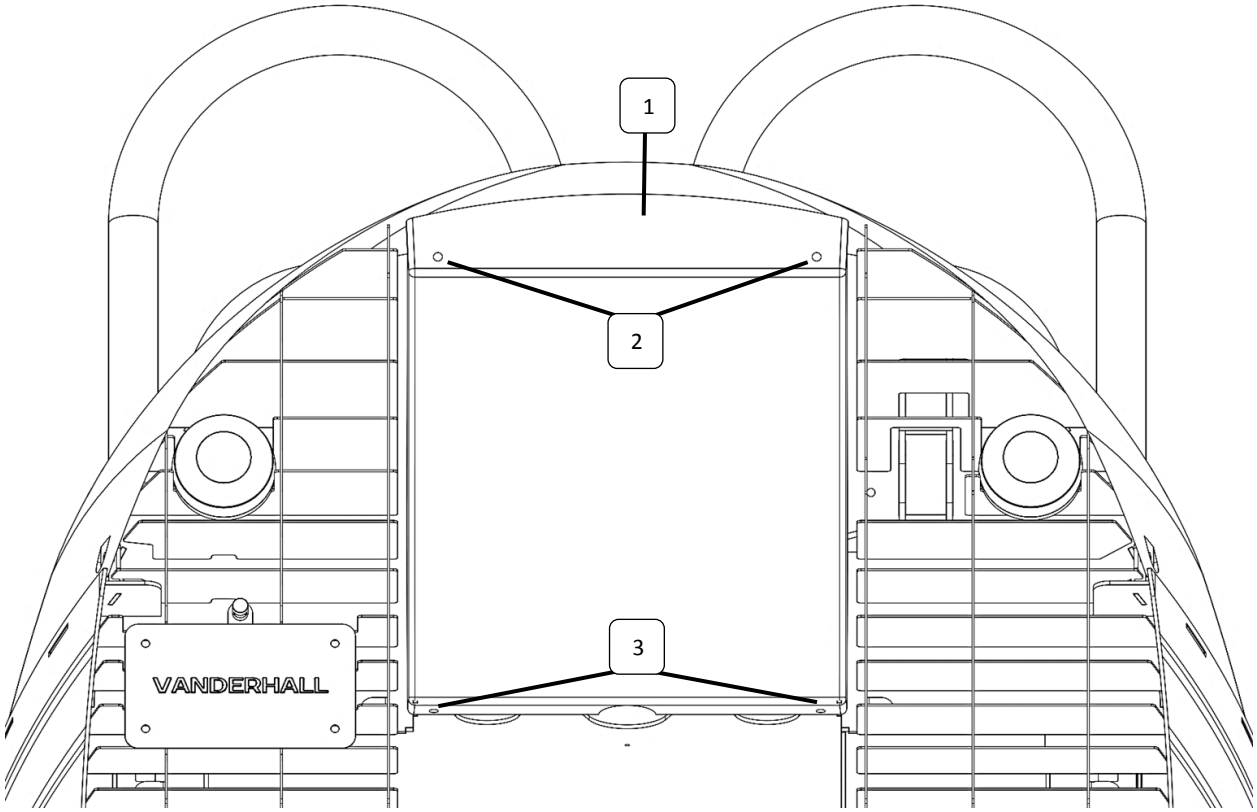
Call Out	Component Name
1	Front Fender
2	Fender outer screw Qty: 2 Tighten: 22Nm (16 ft. lb)
3	Fender Mounting Nut Qty: 3 Tighten: 34 Nm (25ft. lb.)
4	Front Fender Bracket to Steering Knuckle Qty: 2 Tighten: 34 Nm (25ft. lb.)
5	Front Fender Bracket to Brake Caliper Tighten: 115 Nm (85 ft. lb.)

3.2.2.11. Body Rocker Panel



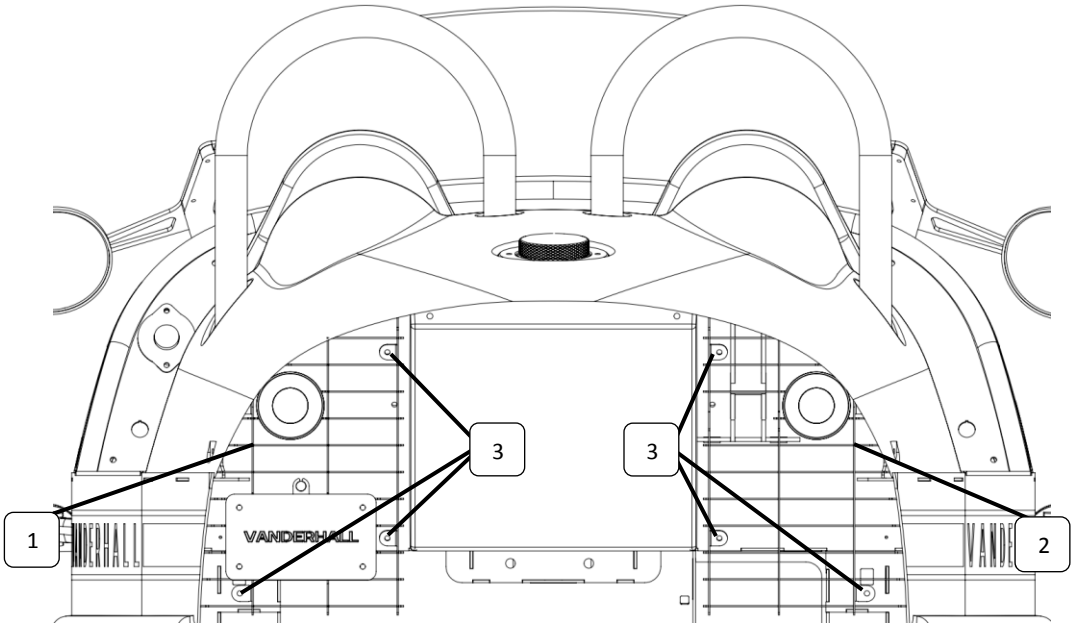
Call Out	Component Name
1	Body Rocker Panel
2	Rocker Panel Mounting Screw Qty: 3 Tighten: 22Nm (16 ft. lb)
3	Rocker Panel Mounting Rear Screw Tighten: 22Nm (16 ft. lb)

3.2.2.12. Rear Wheel Splash Guard



Call Out	Component Name
1	Splash Guard
2	Upper Splash Guard Screw Qty: 2 Tighten: 22Nm (16 ft. lb)
3	Lower Splash Guard Screw Qty: 2 Tighten: 22Nm (16 ft. lb)

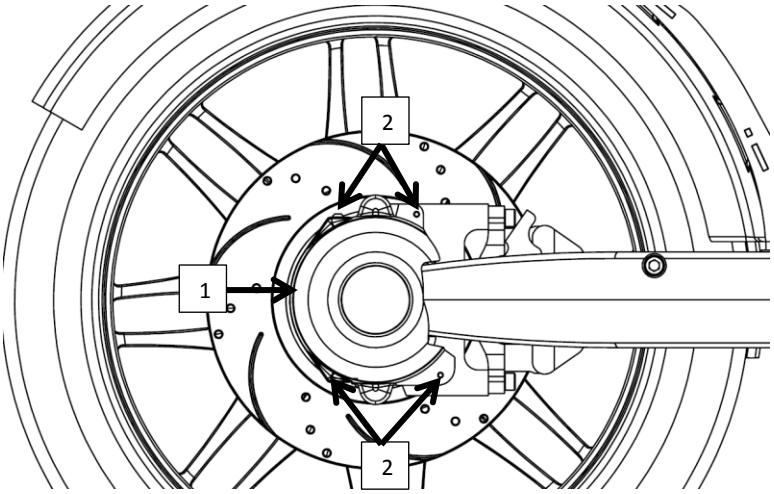
3.2.2.13. Rear Grill



The rear grill is separated in to two pieces a Left and a Right Half these can be removed independently

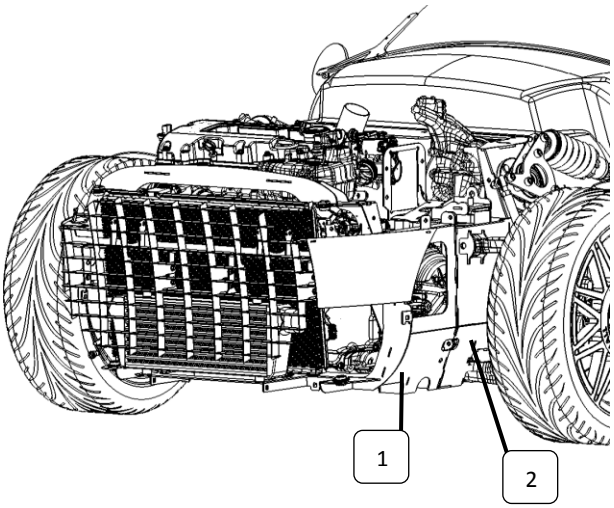
Call Out	Component Name
Preliminary Procedures Right Rear Grill Half Lift and support Vehicle Remove the Rear shock upper connection Refer to Rear Shock Replacement Left Rear Grill Half Remove License Plate	
1	Left Rear Grill Half Note: During removal Pull Grill away from chassis far enough to access the tail light and license plate connectors. Disconnect tail light connector Disconnect license plate connector
2	Right Rear Grill Half Note: During removal Pull Grill away from chassis far enough to access the tail light connector Disconnect tail light connector
3	Grill mounting Screws Qty: 6 (3 on each half) Tighten: 7Nm (60 in. lb.)

3.2.2.14. Rear Hub Cover



Callout	Component Name
1	Rear Hub Cover
2	Rear Hub Cover Bolt (Qty: 4) **Tighten** 3.5 Nm (30 in lb.)

3.3. Frame and Underbody



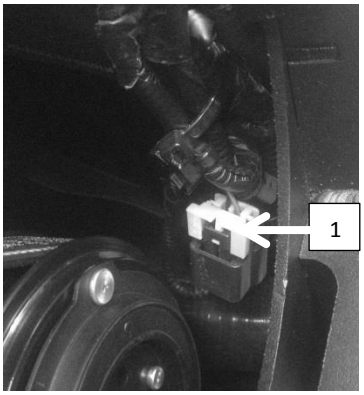
(1) Front Chassis Clip
(2) Chassis

3.3.1. Repair Instructions

3.3.1.1. Front Chassis Clip

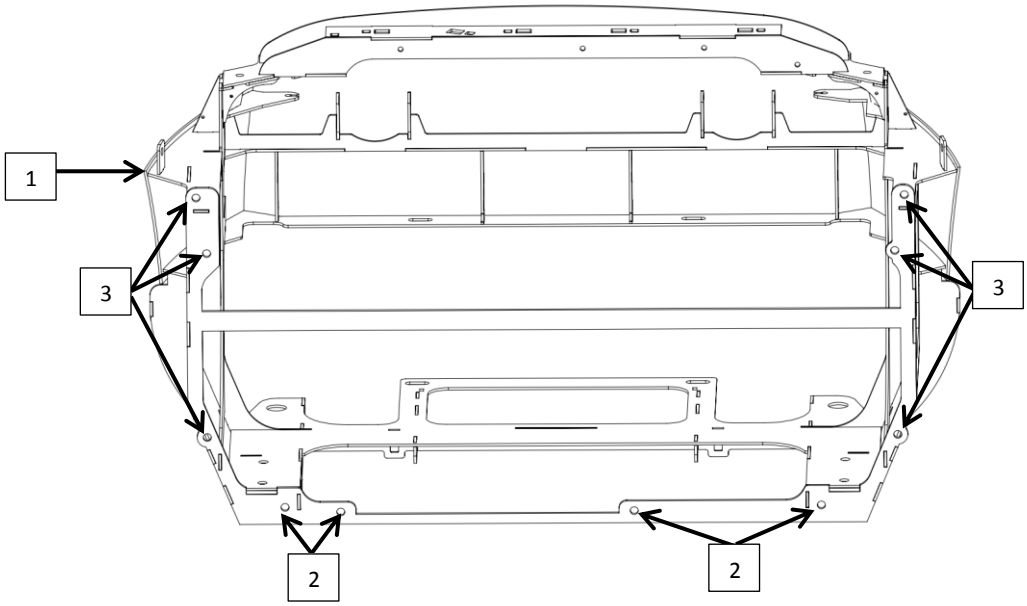
3.3.1.1.1. Removal

1. Disconnect the negative terminal of the battery. Refer to Battery Negative Terminal Replacement.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Remove the Front Valance, Refer to Front Valance
4. Drain the cooling system. Refer to Cooling System Draining and Filling.
5. Remove the Radiator surge Tank, Refer to Radiator surge tank
6. Remove the Engine side of the Radiator inlet hose Refer to Radiator Inlet Hose Replacement
7. Remove the Engine side of the Radiator outlet hose Refer to Radiator outlet Hose Replacement
8. Remove the Throttle body side of the Air Charge Outlet Hose Refer to Air Charge Outlet Hose Replacement
9. Remove the Turbo charger side of the Charge air Cooler Inlet hose Refer to Charge air Cooler Inlet hose Replacement
10. Disconnect the Sway bar from the Anti-sway bar end links Refer to Anti-sway bar
11. Disconnect the Engine Coolant Temperature Sensor Electrical harness from the Radiator, Refer to Engine Coolant Temperature Sensor Replacement – Radiator
12. Remove the transmission cooler lines. Refer to Fluid Cooler Inlet Hose Replacement and Fluid Cooler Outlet Hose Replacement.



13. Disconnect the 5 electrical connections bundled together On the Right side of the Front Chassis Clip

14. Disconnect the electrical connection to near the center of the front clip harness above the radiator fan
15. Follow the Front Clip harness and disconnect the 5 electrical connections on the left side of the Front Chassis Clip
16. Disconnect the electrical connection on Intake Air Pressure and Temperature Sensor refer to Air Pressure and Temperature Sensor Replacement
17. Remove the Junction Block, Refer to Junction block Replacement

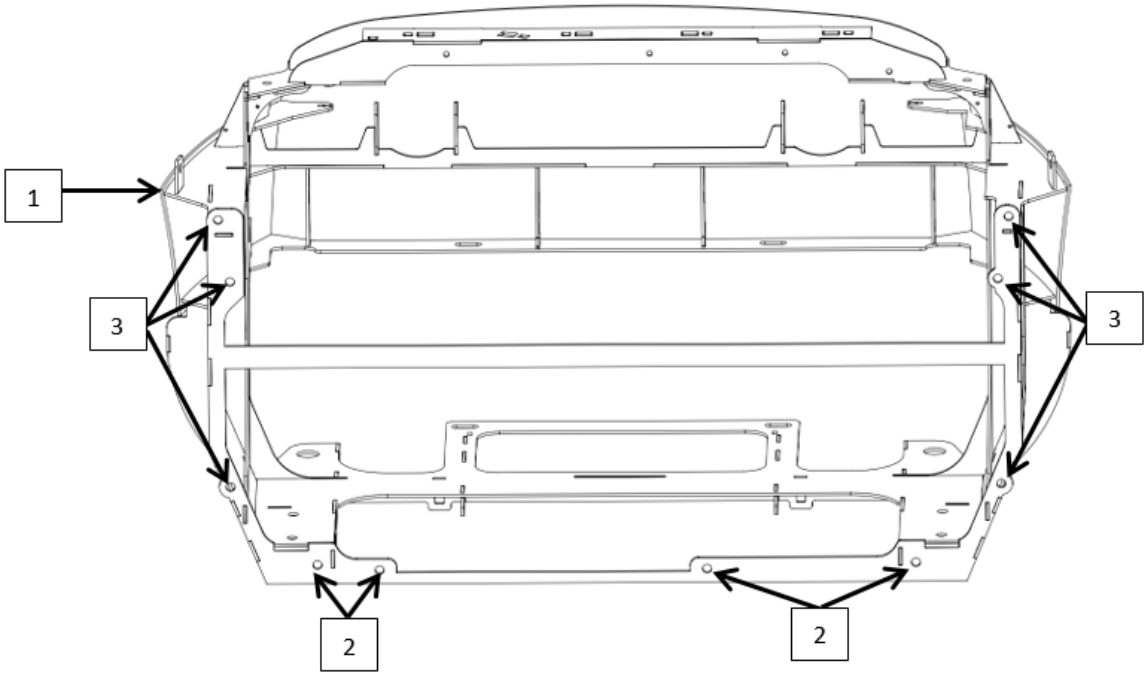


Note:
The Image above shows only the front Clip Frame assembly and does not include heat exchanger or other accessories

Caution:
The Front Chassis Clip Assembly is heavy about 30kg (65 lb) • Support the Front Chassis Clip with Jack Stands or a floor jack prior to removing Fasteners • Have an assistant help with the Removal of the Front Clip

18. Remove the 4 nuts and bolts under the Front Chassis Clip (2)
19. Remove the 6 upper Bolts from the Front Chassis Clip (3)
20. Remove the Front Chassis Clip and accessories (1)

3.3.1.1.2. Installation

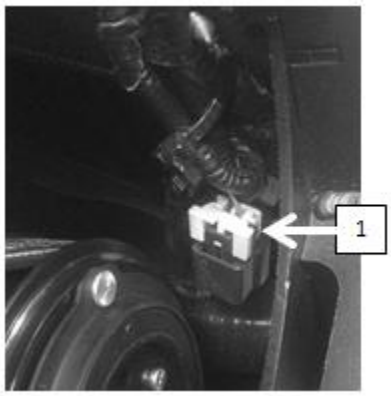


Note:
The Image above shows only the front Clip Frame assembly and does not include heat exchanger or other accessories

Caution:
The Front Chassis Clip Assembly is heavy about 30kg (65 lb) • Support the Front Chassis Clip with Jack Stands or a floor jack prior to removing Fasteners • Have an assistant help with the Removal of the Front Clip

1. Position the Front Chassis Clip (1) against the Main chassis and support it with Jack Stands or a Floor Jack
2. Install the 4 upper Bolts from the Front Chassis Clip (3) Tighten to 40Nm (30 lb ft)
3. Install the 4 nuts and bolts under the Front Chassis Clip (2) Tighten to 40Nm (30 lb ft)
4. Install the Junction Block, Refer to Junction block Replacement
5. Connect the 5 electrical connections on the left side of the Front Chassis Clip

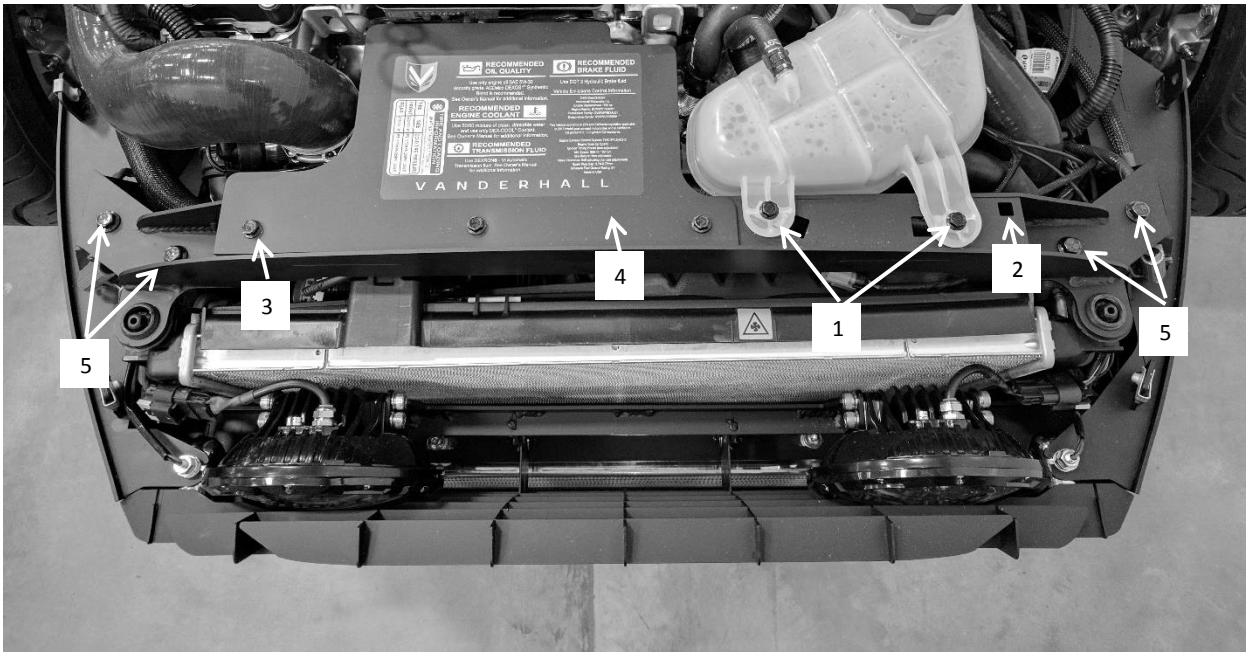
6. the electrical connection to near the center of the front clip harness above the radiator fan



7. Connect the 5 electrical connections bundled together On the Right side of the Front Chassis Clip
8. Connect the electrical connection on Intake Air Pressure and Temperature Sensor refer to Air Pressure and Temperature Sensor Replacement
9. Install the transmission cooler lines. Refer to Fluid Cooler Inlet Hose Replacement and Fluid Cooler Outlet Hose Replacement.
10. Install the Engine Coolant Temperature Sensor Electrical harness to the Radiator, Refer to Engine Coolant Temperature Sensor Replacement – Radiator
11. Connect the Sway bar from the Anti-sway bar end links Refer to Anti-sway bar
12. Connect the Turbo charger side of the Charge air Cooler Inlet hose Refer to Charge air Cooler Inlet hose Replacement
13. Connect the Throttle body side of the Air Charge Outlet Hose Refer to Air Charge Outlet Hose Replacement
14. Connect the Engine side of the Radiator outlet hose Refer to Radiator outlet Hose Replacement
15. Connect the Engine side of the Radiator inlet hose Refer to Radiator Inlet Hose Replacement
16. Install the Radiator surge Tank, Refer to Radiator surge tank.
17. Fill the cooling system. Refer to Cooling System Draining and Filling.
18. Install the Front Valance, Refer to Front Valance
19. Lower the Vehicle
20. Connect the negative terminal of the battery. Refer to Battery Negative Terminal Replacement
21. Check the Transmission Fluid level and refill as necessary

3.3.1.2. Radiator Support Cross Brace

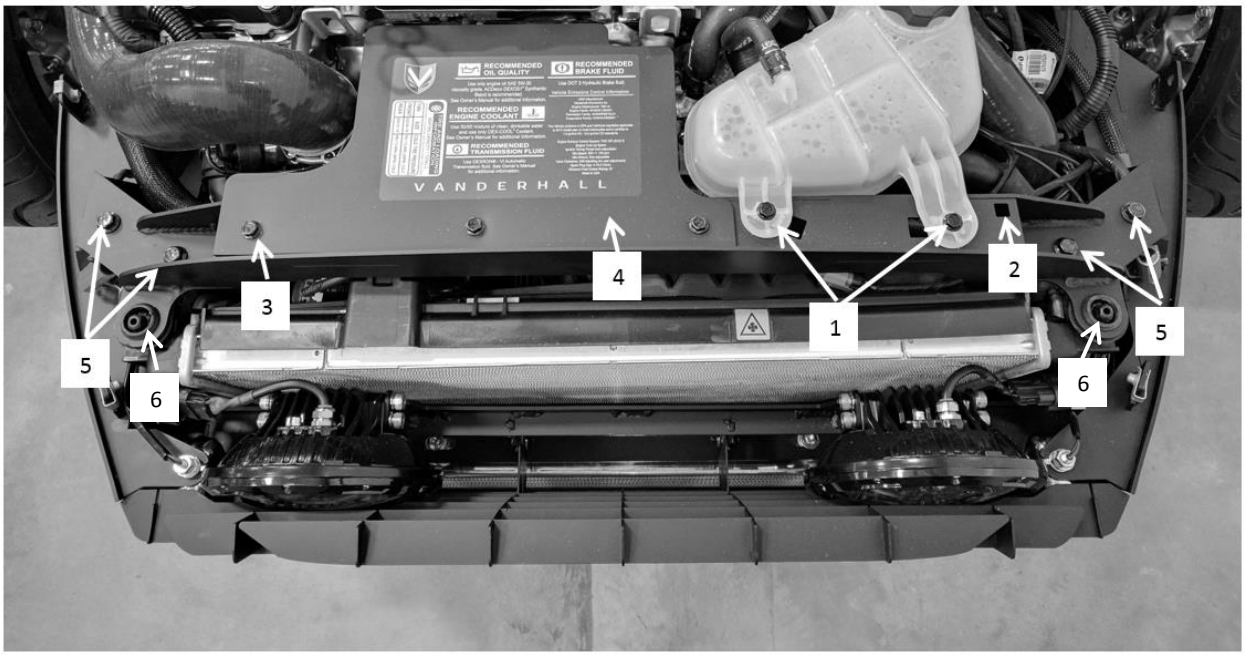
3.3.1.2.1. Removal Procedure



Note:
The above Image shows the Front Fenders Removed, this is not necessary for the Replacement of the Radiator Support Cross Brace

1. Without draining remove the Radiator Surge tank (1) and position out of the way, Refer to Radiator surge tank Replacement
2. Remove the cooling Fan relay (if equipped) (2) and position out of the way, Refer to Cooling Fan Relay
3. Remove the 4 Bolts holding the Radiator Cross Brace to the Front Chassis Clip (3)
4. Remove the 3 bolts (3) holding the heat shield (4) to the cross brace
5. Remove the Radiator Support Cross Brace
6. Swap Components over as necessary

3.3.1.2.2. Installation Procedure



1. Insert the Radiator in to the bushings of the Radiator Support Cross Brace (6)
2. Install the 4 Bolts in to the Radiator Cross Brace and the Front Chassis Clip (5), tighten to 27Nm (20 ft lb)
3. Install the 3 bolts (3) to secure the heatshield to the Radiator Cross Brace (4) , tighten to 27Nm (20 ft lb)
4. Install the cooling Fan relay (2) Refer to Cooling Fan Relay
5. Install the Radiator Surge tank (1) Refer to Radiator surge tank Replacement