3. Body Repair

3.1. Body Panel information and Repair

3.1.1. Description and Operation

Vanderhall Vehicles body panels are made of a lightweight 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. Body Repair Instructions

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.

3.1.3. Paint Repair

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 over 140 Fahrenheit degrees as they will deform.

3.2. Exterior Body Panels

3.2.1. Description and Operation

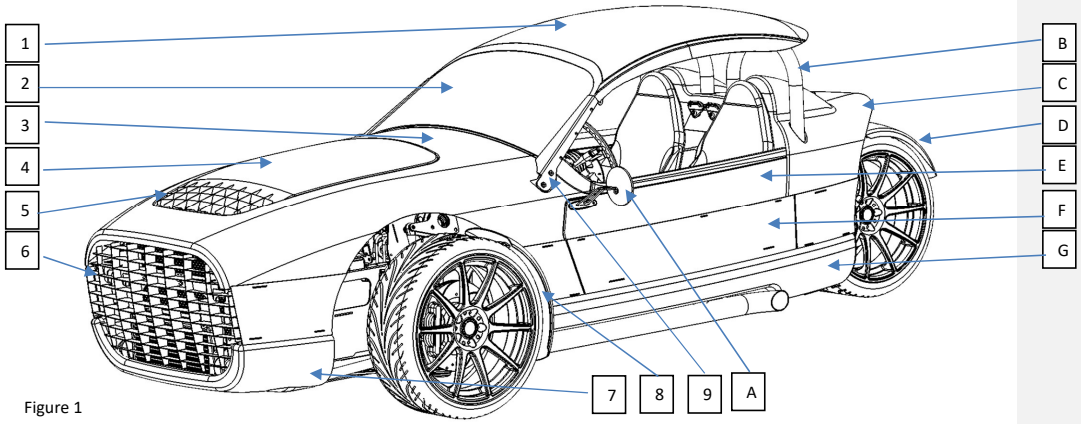

Figure 1

1 – Capshade
2 – Windshield
3 –Outer Hood ~~lid~~
4 – Inner Hood
5 – Hood Grille
6 – Front Grille
7 – Front Valance
8 – Front Wheel Fender
9 – Windshield Post

A – Mirror Assembly
B – Style Bars
C – Tail
D – Rear Wheel Fender
E – Door Panel
F – Door
G- Body Rocker Panel

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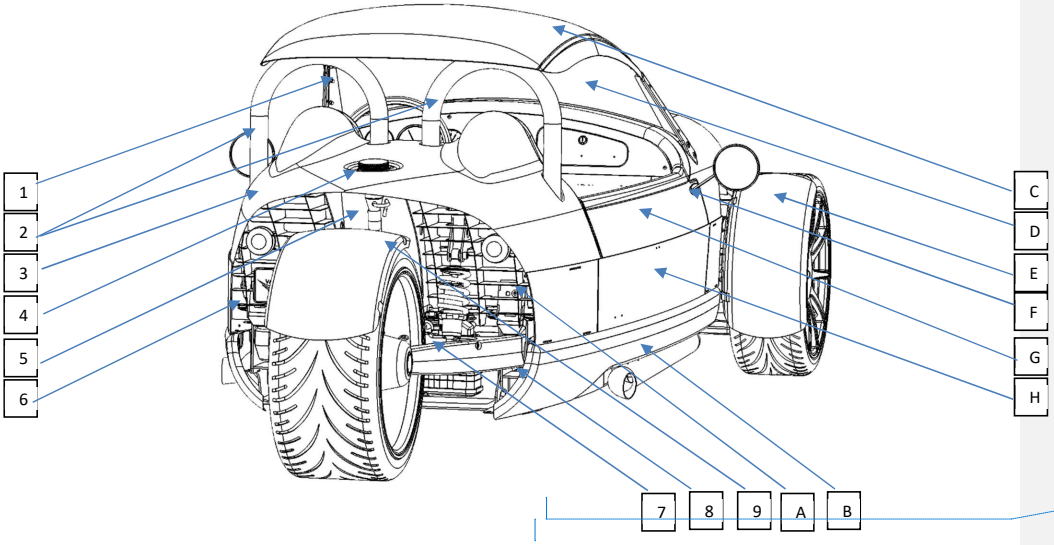
Body Repair



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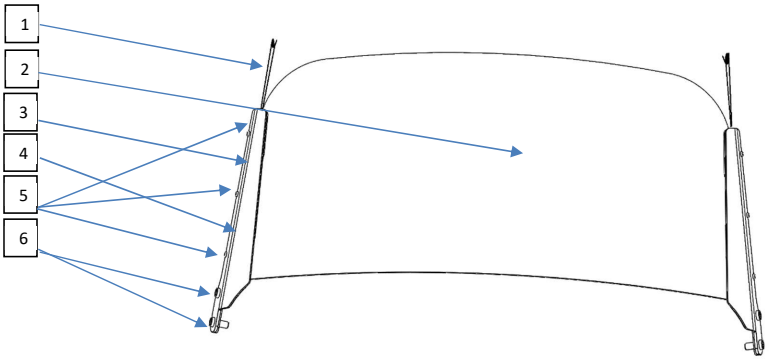
1 – Windshield Post
2 – Style Bars
4 – Fuel Cap ring
3 – Tail
5 – Rear Wheel Splash Guard
6 – Left Rear Grill
7 – Rear Hub Cover
8 – Battery Cover
9 – Rear Wheel Fender

A – Right Rear Grill
B – Body Rocker Panel
C – Capshade
D – Windshield
E – Front Wheel Fender
F – Mirror Assembly
G – Door Panel
H – Door

3.2.2. Repair instructions

3.2.2.1. Windshield (Glass only)



1. Capshade Receiving post	4. Windshield Bracket
2. Windshield	5. M6 x 25mm hex button bolts and M6 cup nuts
3. Windshield Post	6. M16 windshield post bolts and cup nuts

3.2.2.1.1. Fastener Specifications

Application	Specifications
Glass Setting Tape	3/64" thickness Glass setting tape example (Ever Seal 3/64)
M12 x 35mm Low Profile Hex Bolt	50 ft-lb 68 Nm
M6 x 25mm Hex Button bolt	16 lb. ft. 22 Nm

3.2.2.1.2. Tools

4mm Hex allen key
10mm Wrench
10" Plastic Clamp (optional)

3.2.2.1.3. 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 be dangerous. 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 Capshade (See owner's manual for more details)
- Using the 10mm Wrench, remove the six (6x) M6 cup nuts located inside the Windshield post bracket
- Remove the Capshade Receiving posts
- Using the 4mm Hex allen key remove the six (6x) M6 hex button bolts.
- Carefully remove the Windshield post brackets (Pull the bracket gently to unstick the Windshield bracket from the windshield)
- Remove the Windshield Glass

3.2.2.1.4. Installation Procedures

- Remove the old Glass Setting Tape
- Clean the mounting surfaces (Windshield Post, and Windshield Bracket)
- Cut 4 pieces of 13-inch (150 mm) lengths of Glass setting tape
- Cut the Glass setting tape pieces to follow the contour of the Windshield Post
- Place a piece of glass setting tape on each of the Windshield posts
- Use a plastic clamp to hold the windshield with the bracket in the right position on one side, while you hold the glass on position over the other side.
- Place a piece of glass setting tape on the windshield lower corners
- Make sure the windshield is not touching any section of the dashboard cover
- Put the Windshield bracket in position by aligning the 3 holes for the M6 button bolts
- Using the 4mm hex allen key, tighten down the 3 button bolts on each windshield bracket to the right torque specification
- Place the Capshade receiving post in its position, then use the M6 acorn nuts to tighten to the specified torque.
- Reinstall the Capshade if desired.

3.2.2.2. Windshield (Assembly)

Some procedures require the removal of the windshield to be able to perform other jobs, in this case We recommend removing the windshield as an assembly.

3.2.2.2.1. Fastener Specifications

Application	Specifications
M12 x 35mm Low Profile Hex Bolt	50 ft-lb
M6 x 25mm Hex Button bolt	16 lb. ft.

3.2.2.2.2. Tools

10 mm hex allen key

3.2.2.2.3. Removal

- Remove the Capshade (See owner's manual for more details)
- Using the 10mm Hex allen key remove the four (4) M12 low profile bolts holding the windshield post
  - Get assistance when removing the screws, as the windshield may become free.
- Remove the windshield Assembly
  - Use special caution to avoid damages over the windshield glass.
  - Be careful when removing the posts to prevent possible scratches over the Inner Hood

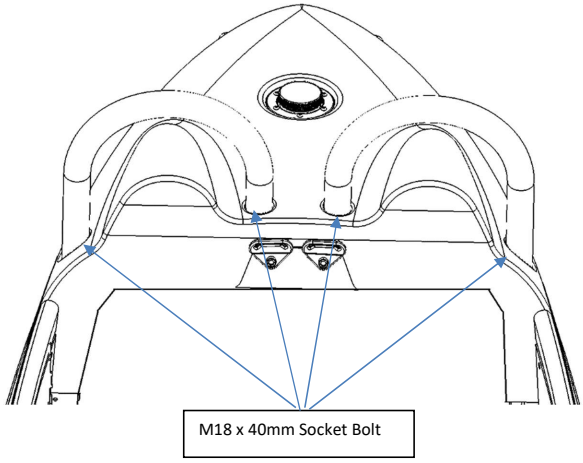
3.2.2.2.4. Installation (Windshield Assembly)

- Place the windshield assembly in position.
  - Get assistance to avoid any damages.
- Using the 10mm Hex allen key, screw in the four (4x) M12 low profile bolts to hold the windshield post in position
- Holding the Windshield assembly on the desired position, Tight down the bolts to the specified torque

3.2.2.2.5. Installation (Windshield not pre-assembled)

- Using the 10mm Hex allen key, screw in the two (2x) M12 low profile bolts to place both of the windshield posts into the right position, (keep them loose for the moment)
- Follow the procedure described on the section ***Repair Instructions →Windshield (Glass only) → Installation Procedure*** of this chapter
- Tighten down the M12 low profile hex bolts to the specified torque

3.2.2.3. Style Bars



3.2.2.3.1. Fastener Specifications

Application	Specifications	
	Metric	English
M18 X 40mm hex Bolts	47 Nm	35lb. ft.

3.2.2.3.2. Tools

19 mm Hex allen key
Ratchet

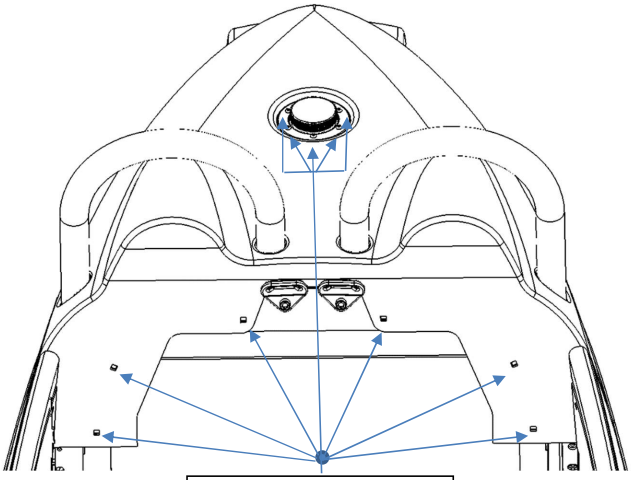
3.2.2.3.3. Removal

- 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 into the receiver tube
- Screw in the M18 x 40mm Hex bolts thru the holes underneath the receiver tubes
- Adjust the bolts to the right torque

3.2.2.4. Tail



M6 x 20mm Socket Button Bolt

3.2.2.4.1. Fastener Specifications

Application	Specifications	
	Metric	English
M6 x 20mm Button Bolt	22 Nm	16 lb. ft.

3.2.2.4.2. Tools

4 mm Hex allen key
Ratchet

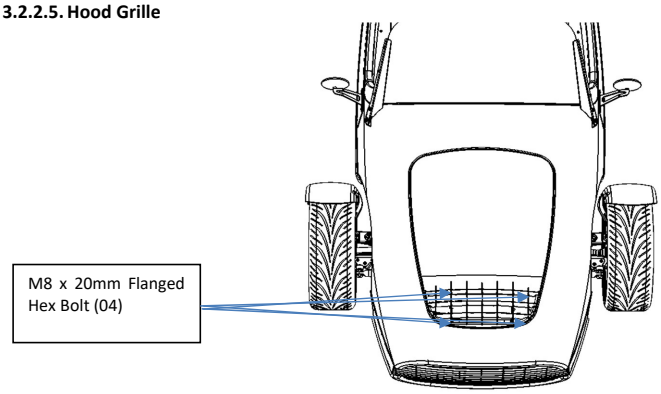
3.2.2.4.3. Removal

- Slide Seats Forward
- Remove the Style Bars, Refer to *Style Bars→Removal* procedure in this section
- Remove the Fuel Cap
  - To avoid any contaminants going inside the gas tank is a good idea keep the fuel fill hole covered
- Remove the six (06) M6x20mm socket button bolt holding the Fuel Cap ring
- Remove the six (06) M6x20mm socket button bolt located over the Tail behind the seats
- Remove the Fuel Cap ring and pull up the Tail to remove it.

3.2.2.4.4. Installation

- Slide Seats Forward
- Place the Tail on its position over the rear end of the vehicle
- Make sure the Tail flanges are placed in the right position inside the groove at the end of the chassis sides
- Open and close the doors to make sure there is not interference with the Tail and the gap between doors and Tail are correct
- Screw in the six (6x) M6x20mm socket button bolt located over the Tail behind the seats
- Place the Fuel Cap ring in the correct position
- Screw in the six (x6) M6x20mm socket button bolts to secure the Fuel Cap ring
- Replace the Fuel Cap
- Install the Style Bars, Refer to *Style Bars→Installation* procedure in this section

3.2.2.5. Hood Grille



3.2.2.5.1. Fastener Specifications

Application	Specifications	
	Metric	English
M8 x 20mm Flanged hex bolt	30 Nm	22 lb. ft.

3.2.2.5.2. Tools

- 13mm Socket
- Ratchet

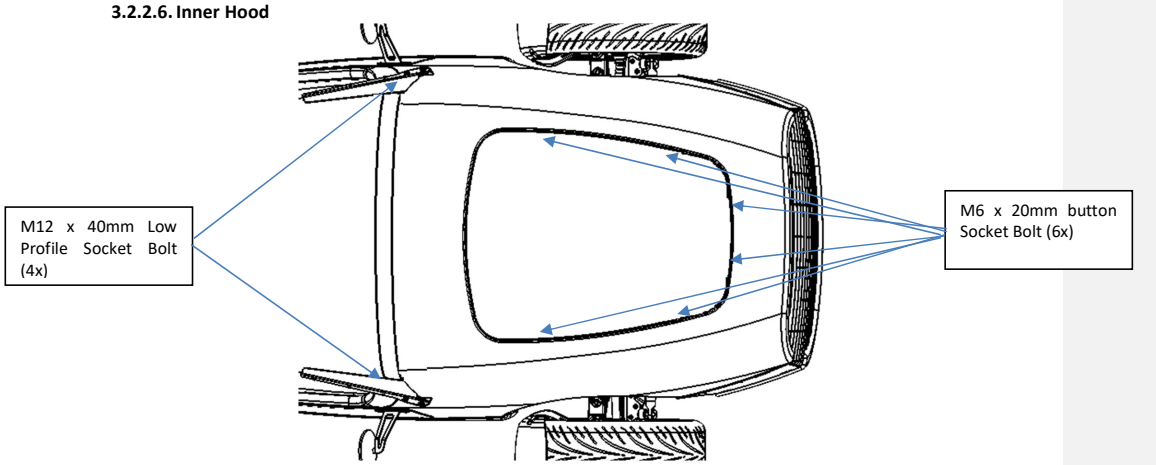
3.2.2.5.3. Removal

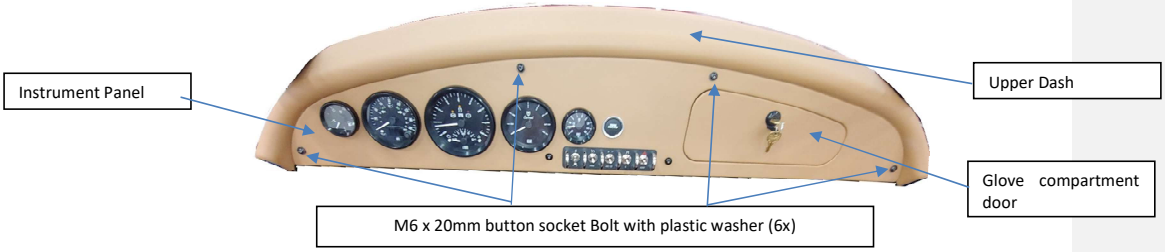
- Open the hood and secure it in vertical position
- Using the 13mm socket and ratchet, remove the four (04) M8 x 20mm bolts holding the hood grille
- Pull up the hood grille with care to avoid damages over the hood or Inner Hood
    - It is recommended to place a piece of foam or cardboard between the hood Grille and the Inner Hood to avoid damages

3.2.2.5.4. Installation

- Open the hood and secure it in vertical position
- Place the hood grille in the correct position on the Inner Hood when the holes on grille and align with the holes on the inner hood.
- Using the 13mm socket and ratchet, screw in the four (04) M8 x 20mm bolts holding the hood grille
- Tighten the bolts down to the specified torque

3.2.2.6. Inner Hood





3.2.2.6.1. Fastener Specifications

Application	Specifications	
	Metric	English
M6 x 20mm Flanged hex bolt	22 Nm	16 lb. ft.
M12 x 35mm Low Profile Hex Bolt	68 Nm	50 lb. ft.
M6 x 20mm socket bolt with plastic washer	22 Nm	16 lb. ft.

3.2.2.6.2. Tools

- 4mm hex allen key
- 10mm hex allen key

3.2.2.6.3. Removal

- Open the inner hood and secure it in vertical position
- Remove the hood grille following the procedure *Hood Grille → Removal* found in this section
- Remove the Windshield Assembly following the procedure *Windshield (Assembly) → Removal* found in this section
- Remove the six (06) M6 x 20mm flanged hex bolt located inside the Inner Hood
- Unscrew the upper four (04) out of the six (06) M6 x 30mm socket button bolt with plastic washer
- Remove the Upper Dash
  - Keep the glove compartment door open during this procedure
- Lift the Outer Hood, then twist it 30 degrees to clear the inner hood, then lift it completely over the Inner hood.
  - *It is strongly recommended to get some help to complete this last task.*

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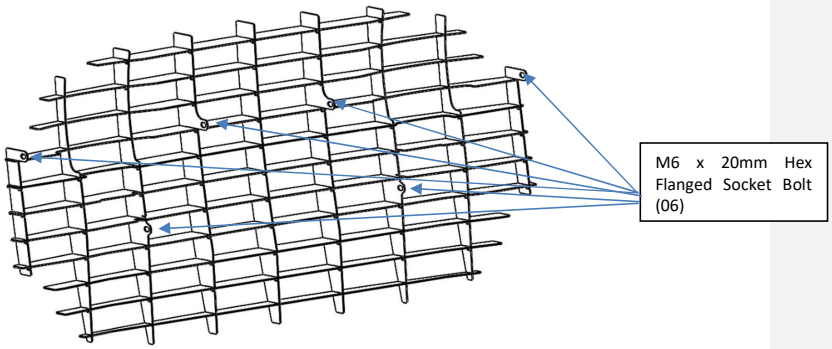
3.2.2.6.4. Installation

- Open the Inner hood and secure it in vertical position
- Lift the Inner Hood completely over the open hood, then twist it 30 degrees to clear up the hood, then put the Inner Hood down until it rests in its natural position
    - *Is strongly recommended to get some help to complete this last task.*
- Install the Upper Dash, hiding the bottom edge behind the dashboard.
- Screw in the upper four (04) out of the six (06) M6 x 30mm socket button bolt with plastic washer
- Screw in the six (06) M6 x 20mm flanged hex bolt located inside the Outer Hood
- Install the Windshield Assembly following the procedure *Windshield (Assembly) → Installation* found in this section
- Install the hood grille following the procedure *Hood Grille → Installation* found in this section

3.2.2.7. Front Grill



3.2.2.7.1. Fastener Specifications

Application	Specifications	
	Metric	English
M6 x 20mm Flanged hex bolt	22 Nm	16 lb. ft.

3.2.2.7.2. Tools

- 10mm socket
- Ratchet

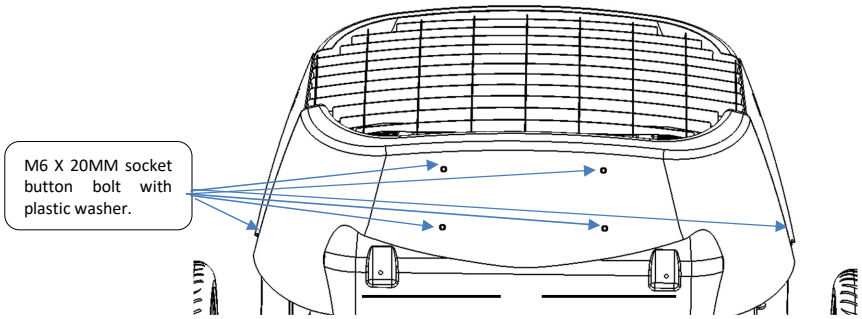
3.2.2.7.3. Removal

- Using the 10mm Socket and ratchet, unscrew the six (6x) M6 x 20mm hex bolts holding the Front Grille
- Pull out the Front Grille

3.2.2.7.4. Installation

- Push in the Front Grille to the right position
    - Check the alignment
- Screw in the six (6x) M6 x 20mm hex bolts holding the Front Grille

3.2.2.8. Front Valance



3.2.2.8.1. Fastener Specifications

Call Out	Component Name	Qty	Specifications
1	M6 X 20MM socket button bolt with plastic washer	6	22Nm (16 ft. lb)

3.2.2.8.2. Tools

- 4mm hex allen key

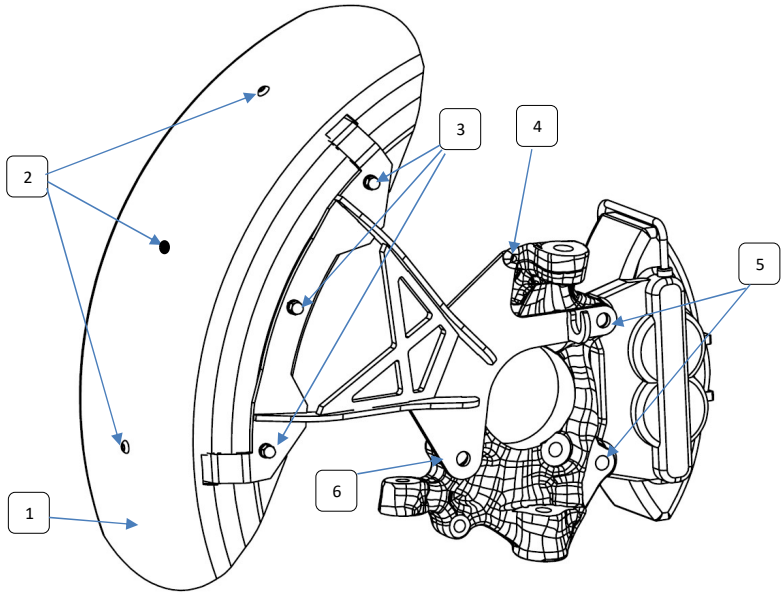
3.2.2.8.3. Removal

- Lift the car using the procedure described in the owner's manual
- Place two (02) Stand Jacks to prevent any accident.
- Using the 4mm hex allen key remove the six (06) M6 x 20mm button bolts holding the front valance

3.2.2.8.4. Installation

- Install and hold the new valance in place
- Using the 4mm hex allen key screw in the six (06) M6 x 20mm button bolts holding the front valance
- Align the front valance with the chassis and Front Grille
- Tighten down the M6 x 20mm socket button bolt with the appropriate torque

3.2.2.9. Wheel Fenders



3.2.2.9.1. Fastener Specifications

Call Out	Component Name	Qty	Specifications
1	Front Fender	1	
2	Fender outer ¼" -20 x ½" Button socket screw	3	22Nm (16 ft. lb)
3	Fender Mounting M6 cup Nut	3	34 Nm (25ft. lb.)
4	Front Fender Bracket M6 x 20mm Flanged hex upper bolt	1	34 Nm (25ft. lb.)
5	Brake Caliper M12 X 50MM Bolts	2	115 Nm (85 ft. lb.)
6	Front Fender Bracket M8 x 30mm Flanged hex lower bolt	1	34 Nm (25ft. lb.)

3.2.2.9.2. Tools

- 4mm hex allen key
- 10mm hex allen key
- 17mm socket