Section 5 Body

Torque Specifications

Description	Nm	Lb-Ft	Lb-In
B-pillar bolts	102-150	76-110	
B-pillar trim screws	20-30	15-22	
Ball club washer bracket bolts	23-33	17-24	
Ball club washer screws	0.8-1.2		7-10
Brake pedal pad bolt	24-31	18-22	
Expanded trunk bolts	23-33	17-24	
Fender bolts – front	8		70
Fender bolts – rear	8		70
Floor mat scrivets	9-13		80-115
Frame extender bolts	24-31	18-22	
Frame front upper crossmember bolt	24-31	18-22	
Front fascia bolts	3.3		29
Golf rack bolts	23-33	17-24	
Grab handle bolts	20-30	15-22	
High mount stop lamp screws	9-12		80-106
Hinge Bolt	41-60		
Hinge Bracket Screws	12-16		107-141
Instrument cluster gauge screws	2.7-3.7		24-32
Instrument panel bolts	10		88
Instrument panel bracket bolts	23-33	17-24	88
Lower windshield roof rail bolts	24-31	18-22	

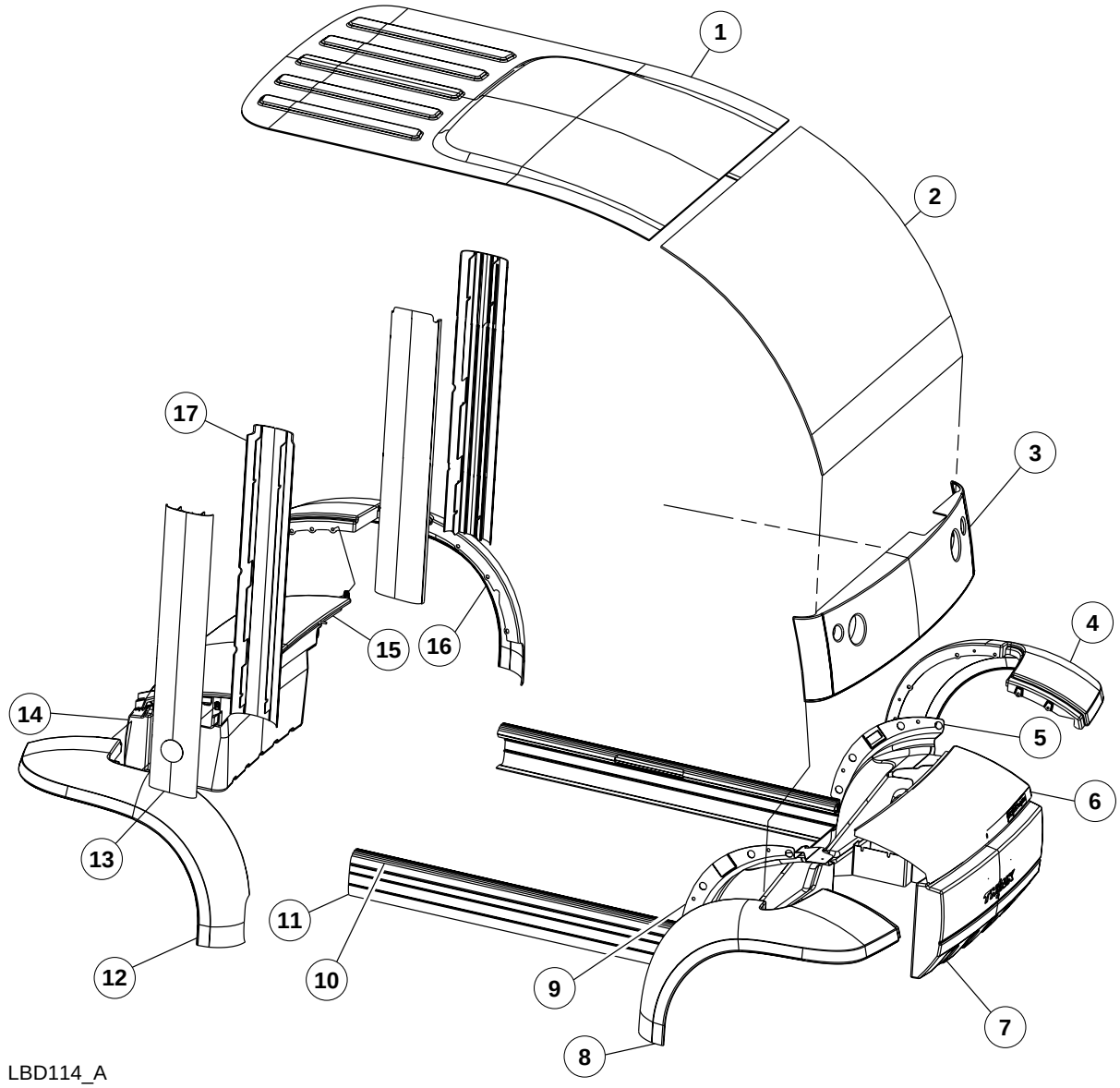
Description	Nm	Lb-Ft	Lb-In
Rear bumper bolts	3.3		29
Roof rail to cowl bracket bolts	24-31	18-22	
Roof rail reinforcement to B-pillar inner bolts	24-31	18-22	
Roof rail reinforcement to B-pillar lower bolts	11-13		98-115
Seat back cover screws – Rear	10		88
Seat back frame bolts – Rear	20-30	15-22	
Seat belt hanger bolt	26-34	19-25	
Seat belt retractor bolt – Front	26-34	19-25	
Seat belt retractor bolt – Rear	26-34	19-25	
Seat belt bolt	26-34	19-25	
Seat belt retractor bracket bolt	20-25	15-18	
Seat belt hanger bracket bolt – lower	9-12		80-106
Seat belt hanger bracket bolt – side	20-25	15-18	
Seat belt buckle bolts	26-34	19-25	
Seat frame slider bolts	12-14		107-123
Seat stanchion bolts	20-25	15-18	
Seat stanchion cover bolts	8		70
Seat stanchion H-support bolts	20-30	15-22	
Side Panel Bolts	6.8-9.2		60.2-81.4
Side view mirror	20-30	15-22	
Steering column shroud screws	2.7-3.7		23.9-32.7
Steering wheel bolt	47	34	
Stop lamp screws	0.8-1.2		7.1-10.6
Sun roof/roof vent screws	3		26
Sweater basket nut and bolt	23-33	17-24	
Tailgate Latch Receiver Screws	12-16		107-141
Tailgate Support Screws	12-16		107-141
Tow hook bolts	20-30	15-22	
Tow hook bracket bolts	20-30	15-22	

Description	Nm	Lb-Ft	Lb-In
Upper Trim Panel Screws	3.2-4.8		28.3-42.4
Upper windshield roof rail bolts	24-31	18-22	
Wagon box bolts – Lower	24–31	18-22	
Wagon box bolts – Side	24–31	18-22	
Wagon box bracket bolts	24–31	18-22	

* Should be tightened in alphabetic order shown in 2 Passenger Wagon Panels.

Description and Operation

Exterior Body Components



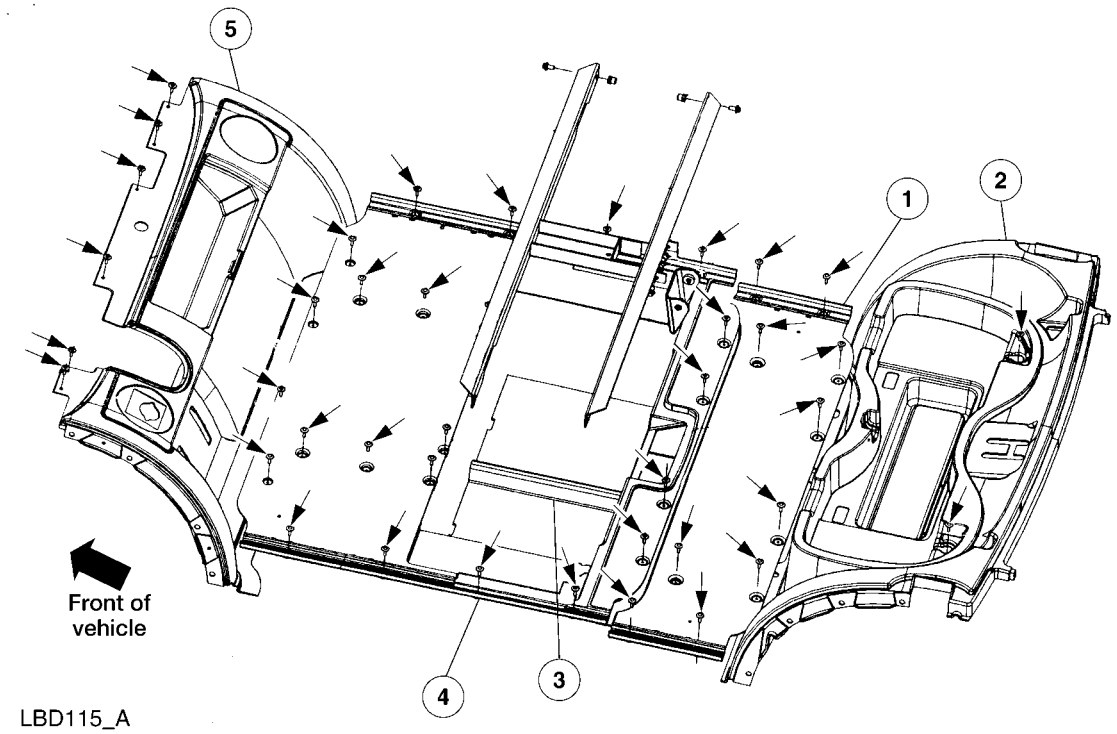
Item	Part Number	Description
1	50202	Roof Panel
2	03100	Windshield
3	02010	Front Fascia

Item	Part Number	Description
4	16006	LH Front Fender
5	16103	LH Front Fender Shield
6	16612	Hood
7	17D957	Front Bumper
8	16005	RH Front Fender
9	16102	RH Fender Shield
10	13208	Scuff Panel
11	10176	Rocker
12	16005	RH Rear Fender
13	243A52	Outer B-pillar Trim Panel
14	19B423	Bag Bay
15	40110	Decklid
16	16006	LH Rear Fender
17	24356	Inner B-pillar Trim Panel

Rivet Locations and Types

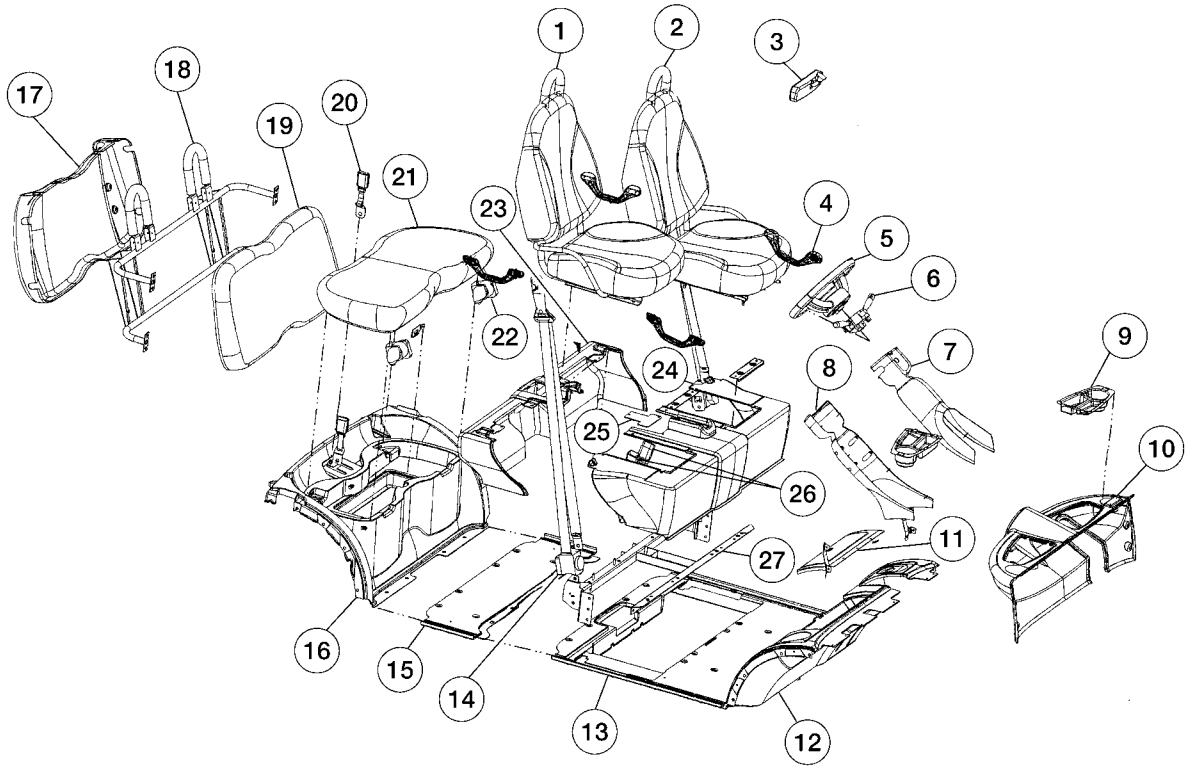
Description	Part Number
Bag Bay Rivets	E647558
Cup Holder Rivets	E647558
DC/DC Converter Rivets	W525158-S417
Fender Shield Rivets	E647558
Floor Rivets	E647558
Front Kick-up Rivets	E647558
Rear Kick-up Rivets	E647558
Rocker Rivets	E647558
Windshield Washer Bottle Bracket Rivets	E647558

Floor and Kick-up Rivet Locations



Item	Part Number	Description
1	11160	Rear Floor
2	11215	Rear Floor Kick-up
3	10755	Battery Tray
4	11160	Front Floor
5	11135	Front Floor Kick-up

Interior Body Components



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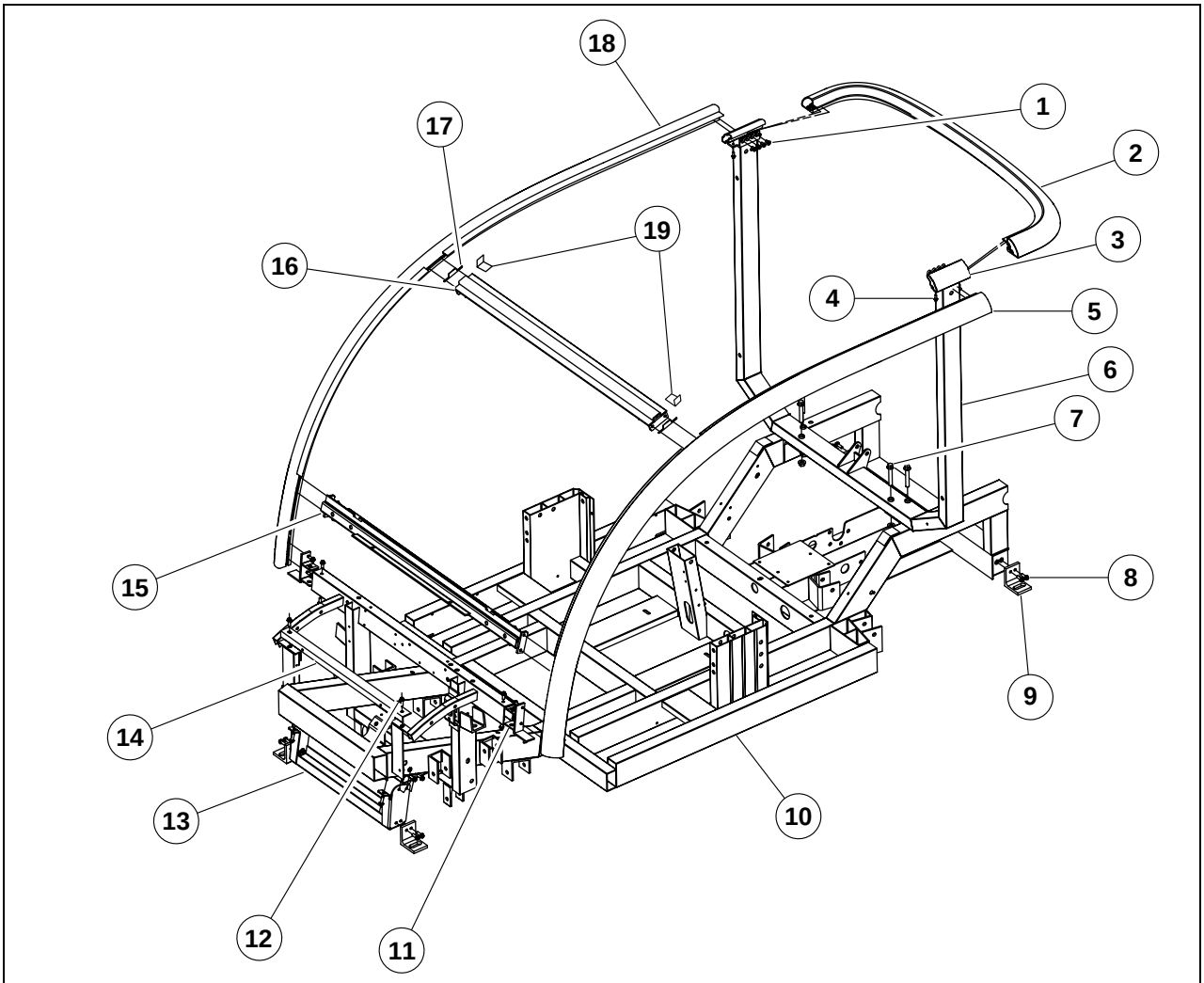
Item	Part Number	Description
1	60004	Passenger Seat
2	60005	Driver Seat
3	17000/17700	Rearview Mirror
4	31406	Grab Handle
5	3600	Steering Wheel

Item	Part Number	Description
6	13341	Multi-function Switch
7	3530	Steering Column Shroud – Upper
8	3530	Steering Column Shroud – Lower
9	06202	Cowl Tray
10	02010	Instrument Panel
11	06024	Glovebox Door
12	11135	Front Floor Kick-up
13	11160	Front Floor
14	15611B08/61216	Front Seat Belt Retractor/Retractor Bracket
15	11160	Rear Floor (Four-Passenger Vehicle Only)
16	11215	Rear Floor Kick-up
17	668C92	Rear Seat Back Cover
18	613A38	Rear Seat Back Frame
19	66892	Rear Seat Back
20	1660044	Rear Seat Belt Buckle
21	60080	Rear Seat Cushion
22	16611B68	Rear Seat Belt Retractor
23	62284	Seat Stanchion Cover – Rear
24	62284	Seat Stanchion Cover – Front
25	62284	Access Cover
26	61202	Front Seat Belt Buckle
27	605A38	Seat Stanchion H-Support

Frame Components



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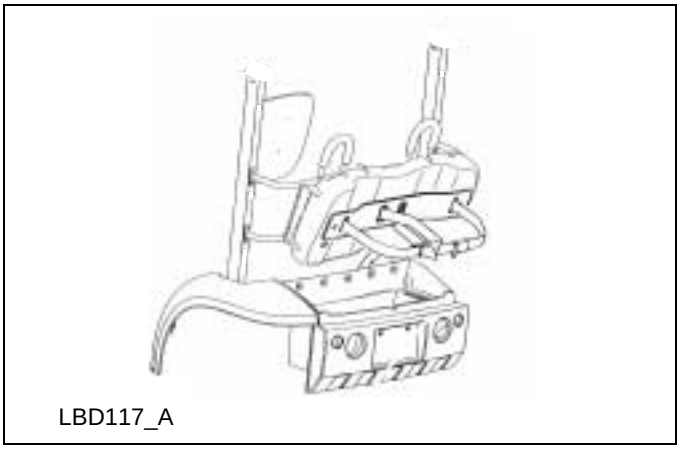
Item	Part Number	Description
1	W505741-S426	Rear Roof Rail Reinforcement to B-pillar Inner Bolts
2	403A10	Rear Roof Rail
3	51248	Rear Roof Rail Reinforcement
4	--	Rear Roof Rail Reinforcement to B-pillar Lower Bolts
5	51181	LH Roof Rail
6	28160	B-pillar
7	W500546-S426	B-pillar Bolts

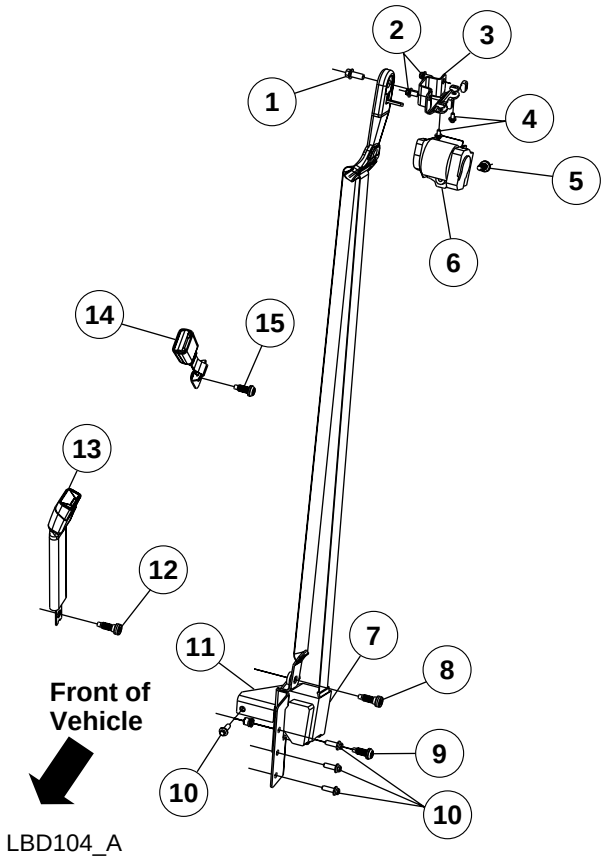
Item	Part Number	Description
8	--	Rear Tow Hook Bolts
9	17T787	Rear Tow Hook
10	5005	Frame Assembly
11	02892	Roof Rail to Cowl Bracket
12	41201	Frame Front Upper Crossmember Rivet
13	17B787	Tow Hook Bracket
14	5D066	Frame Front Upper Crossmember
15	03408	Lower Windshield Roof Rail
16	03408	Upper Windshield Roof Rail
17	034S08	Upper Header Rail Seal
18	51180	RH Roof Rail
19	3M PUL 0612	Adhesive Urethane Film (Ford specification ESB-M99J291-A-A4)

Golf Rack

Four-Passenger Shown, Two-Passenger Similar



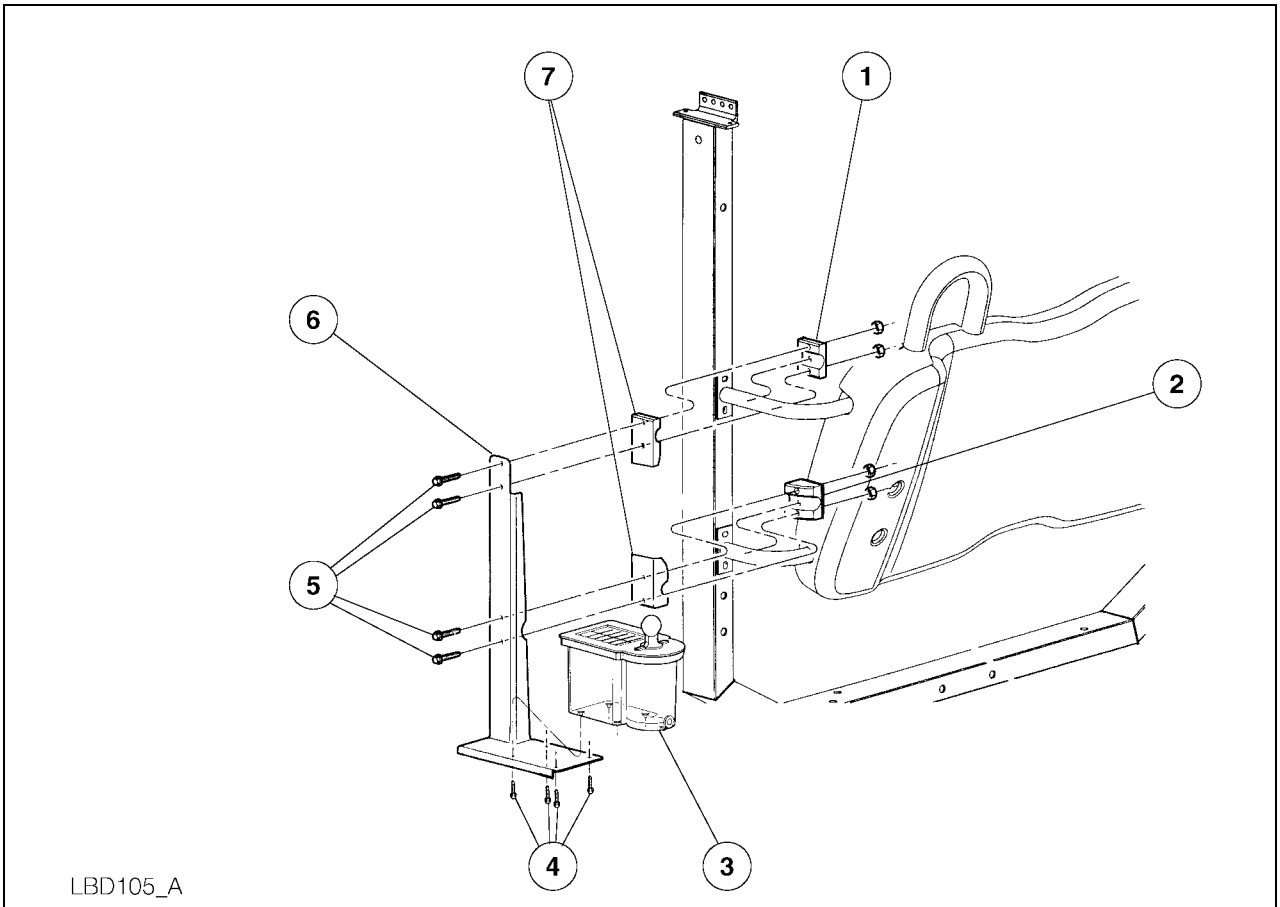
Seat Belts



Item	Part Number	Description
1	5861212	Seat Belt Hanger Bolt
2	W500022-S426	Seat Belt Hanger Bracket Bolts – Side
3	611C70	Seat Belt Hanger Bracket
4	W500011-S426	Seat Belt Hanger Bracket Bolts – Lower
5	W700883-S409M	Rear Seat Belt Retractor Bolt
6	16611B68	Rear Seat Belt Retractor
7	611B09	Front Seat Belt Retractor
8	W707957-S409M	Seat Belt to Bracket Bolt
9	W707957-S409M	Front Seat Belt Retractor Bolt
10	W500023-S426	Front Seat Belt Retractor Bracket Bolts
11	61217	Front Seat Belt Retractor Bracket
12	W500023-S426	Seat Belt Buckle Bolt – Front

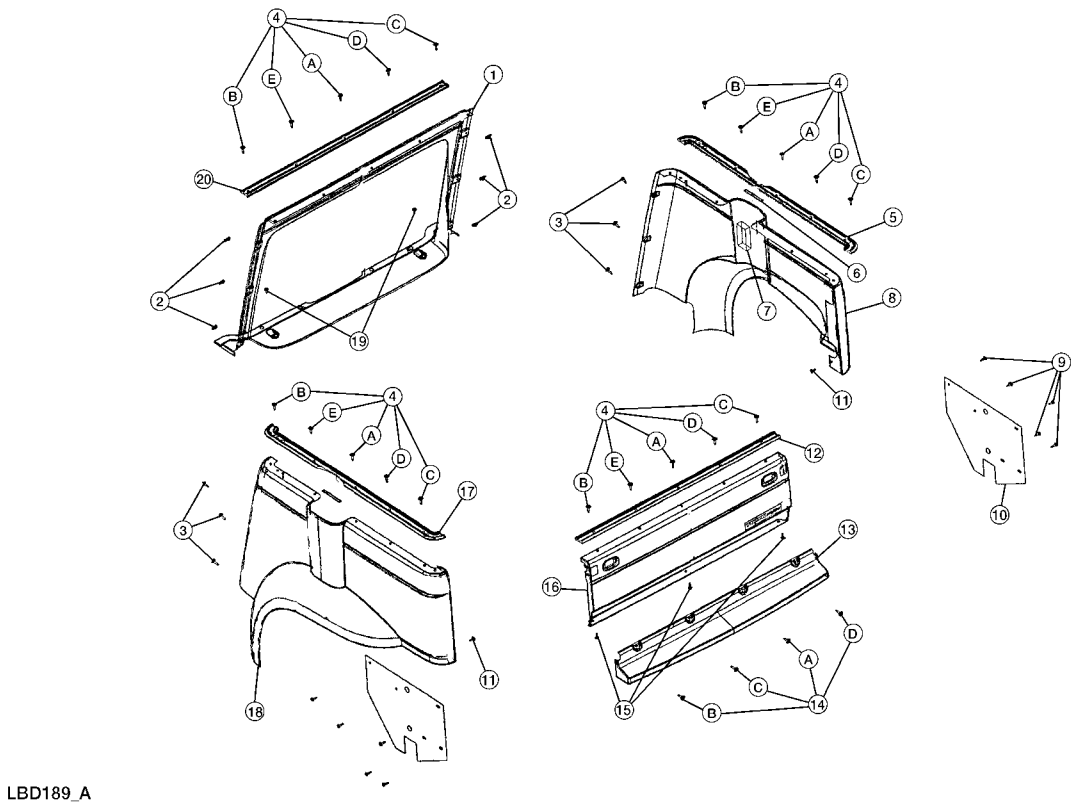
Item	Part Number	Description
13	61202	Seat Belt Buckle – Front
14	1660044	Seat Belt Buckle – Rear
15	W700883-S409M	Seat Belt Buckle Bolt – Rear

Ball and Club Washer



Item	Part Number	Description
1	19B431	Ball and Club Washer Upper Support
2	19B431	Ball and Club Washer Lower Support
3	19G431	Ball and Club Washer
4	--	Ball and Club Washer Screws
5	--	Ball and Club Washer Bracket Bolts
6	19B431	Ball and Club Washer Bracket
7	19B431	Ball and Club Washer Bracket Insulators

2-Passenger Wagon Panels

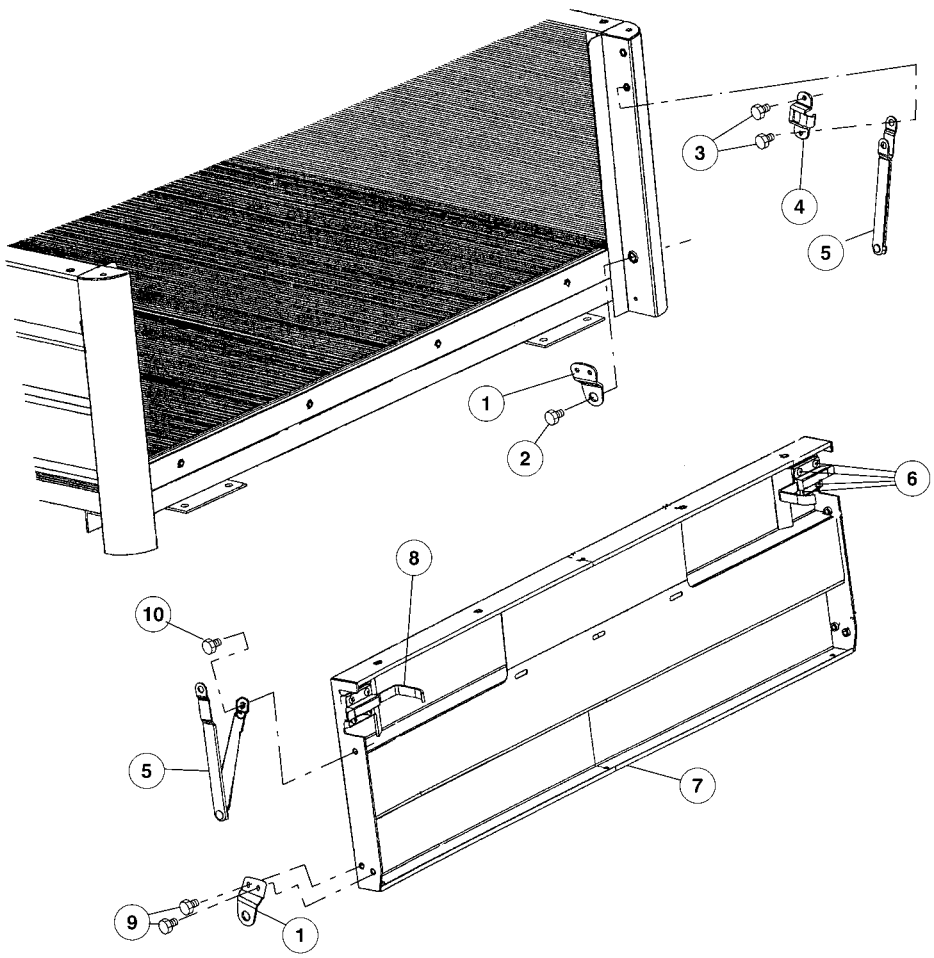


Item	Part Number	Description
1	--	Rear Panel
2	--	Nut
3	--	Side Panel Bolt
4	--	Upper Trim Panel Screw *
5	--	Upper Trim Panel – RH
6	--	Spacer
7	--	Spacer
8	--	Wagon Panel – RH
9	--	Finish Panel Rivets
10	--	Finish Panel – RH
11	--	Side Panel Front Lower Rivet
12	--	Upper Trim Panel – Tailgate

Item	Part Number	Description
13	--	Tailgate Finish Panel
14	--	Tailgate Finish Panel Bolts *
15	--	Tailgate Panel Rivets
16	--	Tailgate Panel
17	--	Upper Trim Panel – LH
18	--	Wagon Panel – LH
19	--	Rear Panel Rivets
20	--	Upper Trim Panel – Rear Panel

* Should be tightened in alphabetic order shown.

Tailgate



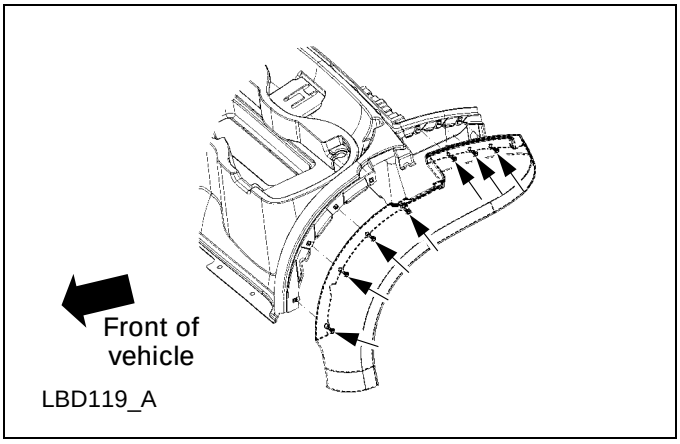
Item	Part Number	Description
1	--	Hinge Bracket
2	--	Hinge Bolt
3	--	Tailgate Latch Receiver Screws
4	--	Tailgate Latch Receiver RH/LH
5	--	Tailgate Support
6	--	Tailgate Latch Rivets
7	--	Tailgate
8	--	Tailgate Latch
9	--	Hinge Bracket Screws
10	--	Tailgate Support Screws

Removal and Installation

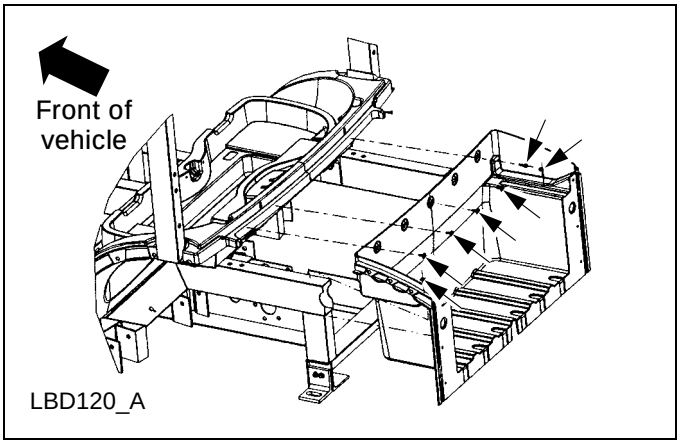
Bag Bay

Removal

1. Unlock and remove the decklid.
2. Remove the six rear bumper bolts and disconnect the electrical connectors. Remove the rear bumper.
3. Raise and support the vehicle. Refer to Lifting in the General Information section.
4. Remove the seven rear fender bolts and the fender. Repeat on the other side of the vehicle.



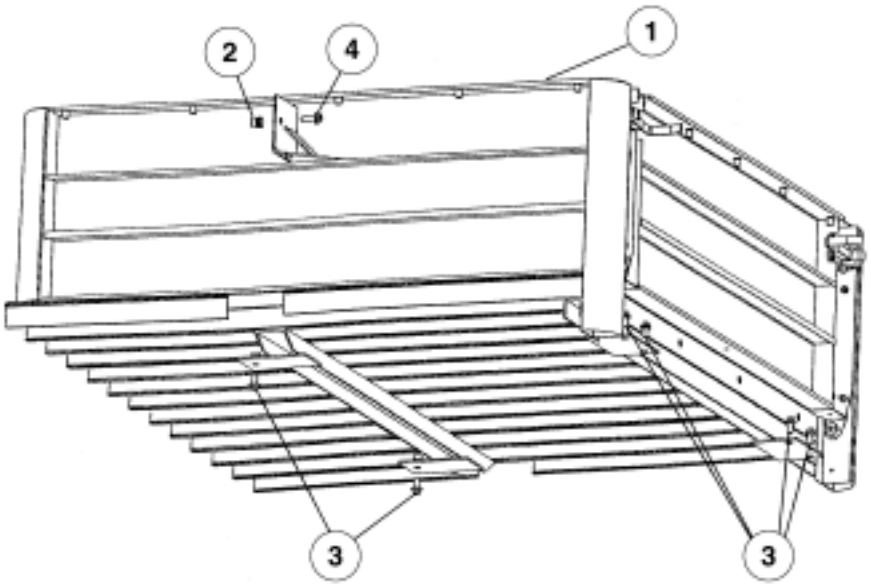
5. Drill out the seven rivets and remove the bag bay.



Installation

1. Reverse the removal procedure.
2. Tighten the rear fender bolts to 8N.m. (70lb-in.).
3. Tighten the rear bumper bolts to 3N.m (29lb-in.).

Box, Wagon



Item	Part Number	Description
1	--	Wagon Box
2	--	Rivnut Nut
3	--	Lower Wagon Box Bolts
4	--	Side Wagon Box Bolts

Removal

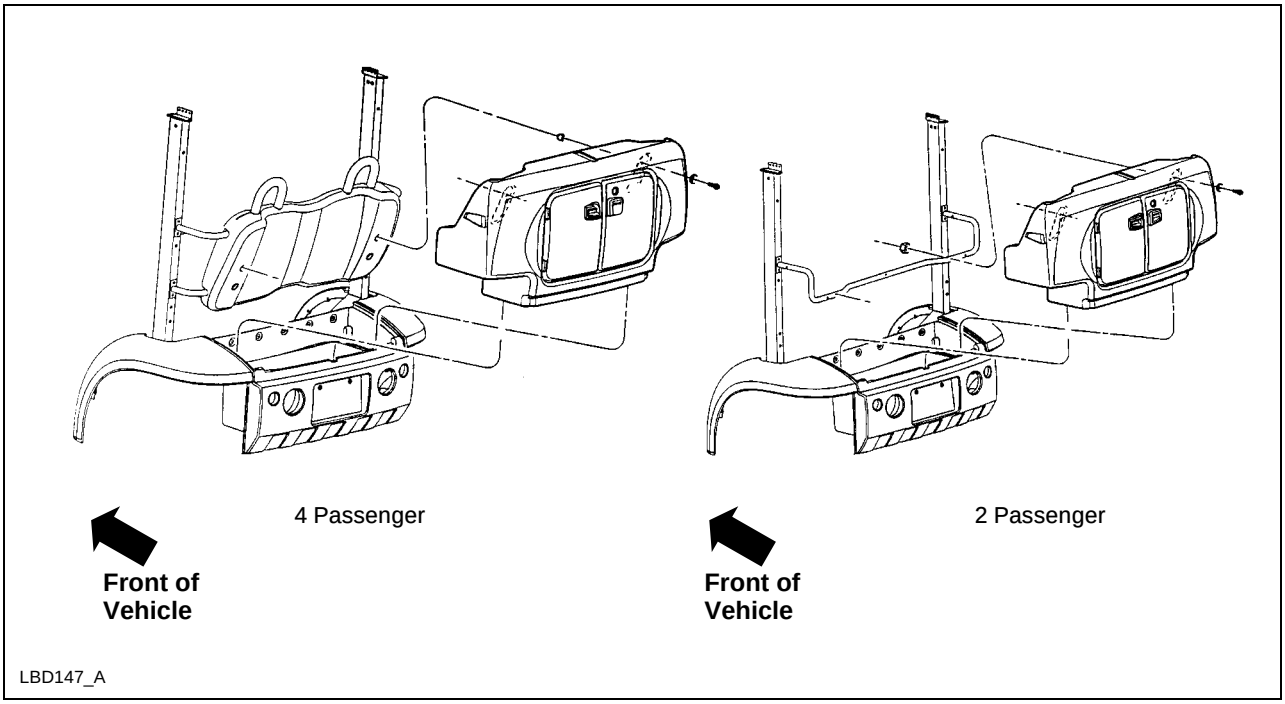
1. If necessary, remove the tailgate. Refer to Tailgate in this section.
2. Remove the wagon panels. Refer to 2-Passenger Wagon Panels for fastener and panel locations.
3. Raise and support the vehicle. Refer to Lifting in the General Information section.
4. Remove the two lower wagon box bolts.

5. Lower the vehicle.
6. Remove the four lower wagon box bolts.
7. Remove the two side wagon box bolts.

Installation

1. Reverse the removal procedure.
2. Tighten the lower wagon box bolts to 24– 31N.m. (18– 22lb-ft.).
3. Tighten the side wagon box bolts to 24–31N.m. (18–22lb-ft.).

Expanded Trunk



Removal

1. Unlock and open the expanded trunk doors.
2. Remove the two expanded trunk bolts and washers.
3. Tilt the top of the expanded trunk forward and carefully remove the expanded trunk.

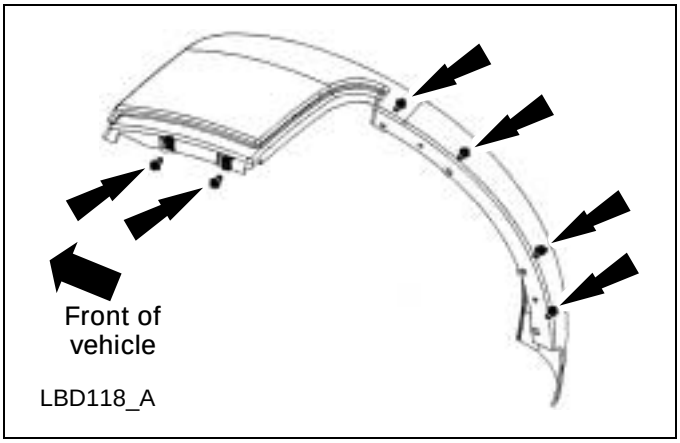
Installation

1. Reverse the removal procedure.
2. Tighten the expanded trunk bolts to 23-33N.m (17-24lb.ft.).

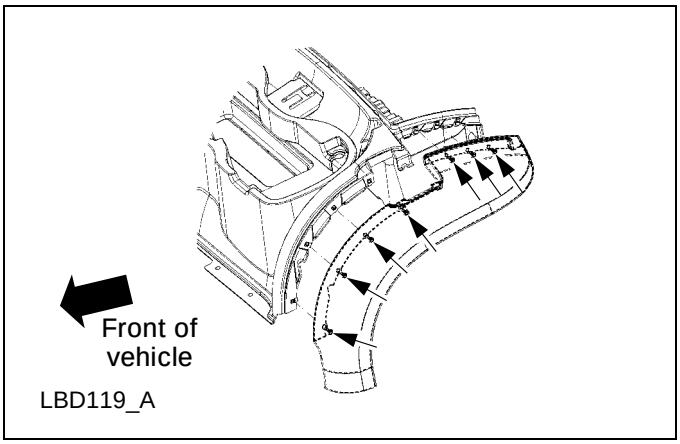
Floor – Front & Rear, Scuff Panels, Rockers

Removal

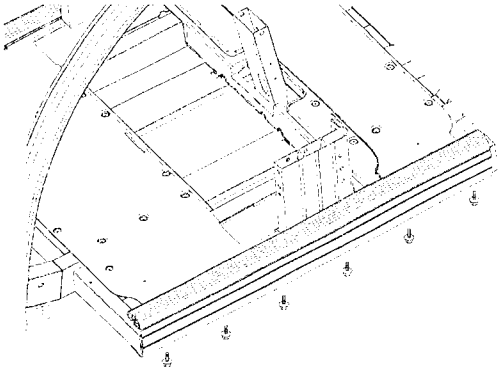
1. Unlock and remove the hood and decklid.
2. Raise and support the vehicle. Refer to Lifting in the General Information section.
3. Remove the six fender bolts and the fender. Repeat on the other side of the vehicle.



4. Remove the seven rear fender bolts and the rear fender. Repeat on the other side of the vehicle.



5. Drill out the six rocker rivets. Repeat on the other side of the vehicle.



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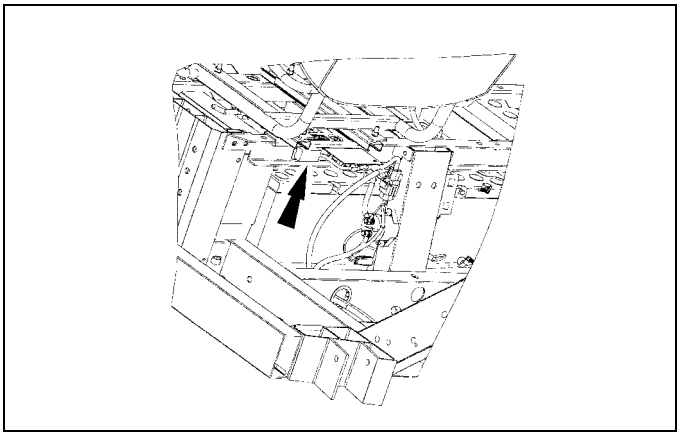
6. Lower the vehicle.
7. Remove the front floor kick-up. Refer to Floor Kick-up – Front in this section.
8. Remove the rear floor kick-up. Refer to Floor Kick-up – Rear in this section.
9. Remove the driver and passenger seat. Refer to Seat Back and Frame – Driver Seat and Seat Back and Frame – Passenger Seat in this section.
10. Remove the parking brake lever. Refer to Parking Brake Lever in the Chassis section.
11. Turn the vehicle power off. Refer to Power Shutdown Procedure in the Electrical section.

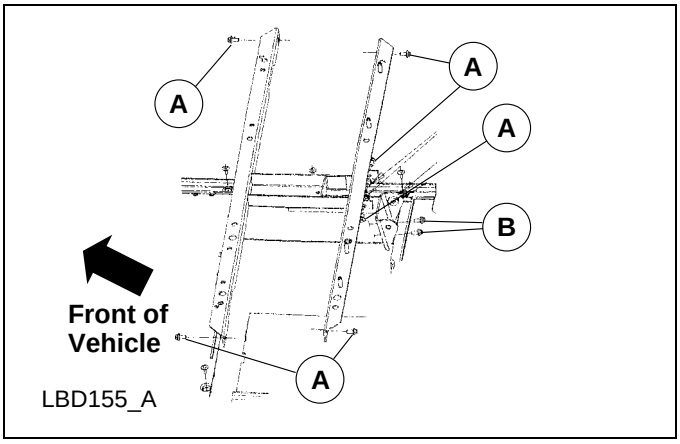
12. If mounted to the seat stanchion H-support, disconnect the service disconnect switch electrical connector.



13. Remove the seat stanchion H-support.

    a. Remove the six seat stanchion H-support bolts (A).

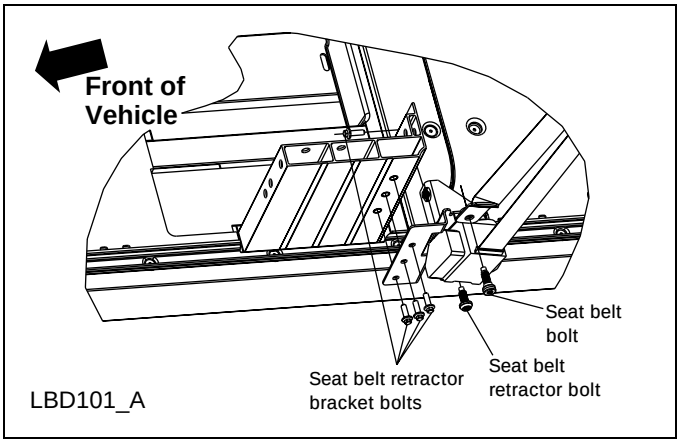
    b. Remove the two front seat belt buckle bracket bolts (B).



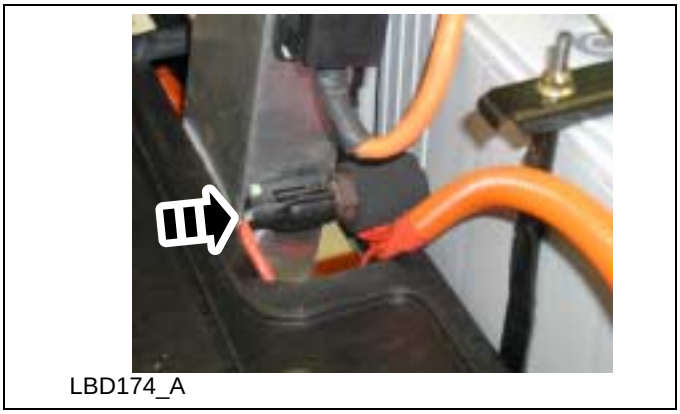
14. Remove the six batteries. Refer to Batteries in the Electrical section.

15. Remove the battery tray.

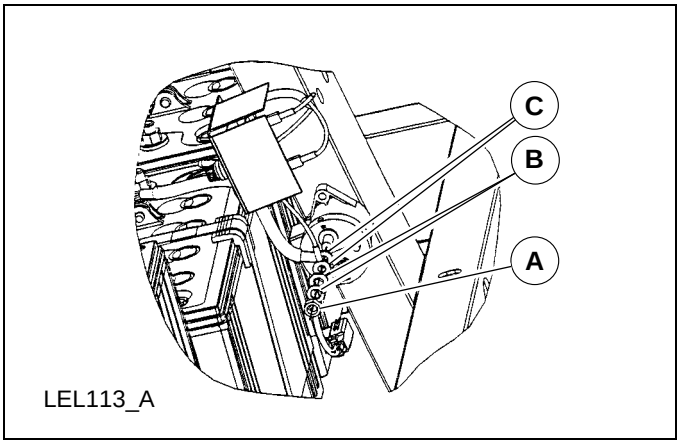
16. Remove the four seat belt retractor bracket bolts and move the bracket and retractor aside. Repeat on the other side of the vehicle.



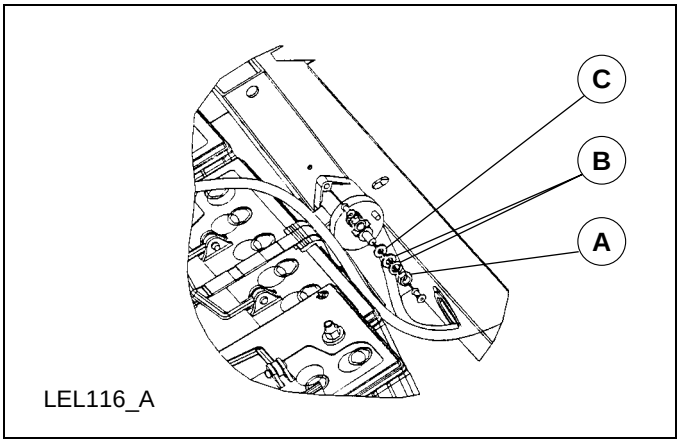
17. Remove the temperature sensor from the seat stanchion support.



18. Remove the upper nut (A) attaching the cable to the service disconnect switch and remove the washers (B) and disconnect the cables (C).



19. Remove the lower nut (A) attaching the cable to the motor controller, remove the washers (B) and disconnect the cable (C).



20. Drill out the two service disconnect switch rivets.

21. Drill out the floor rivets. Refer to Floor and Kick-up Rivet Locations in this section.

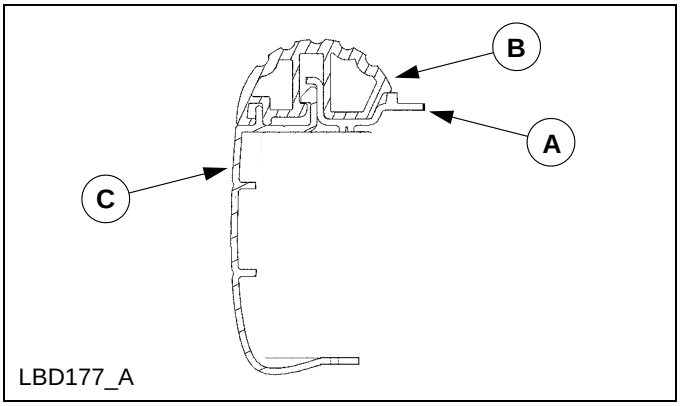
22. Pull outward on the rockers to clear the frame.

23. While lifting the floor assembly push the battery strap rearward to clear the corner of the battery floor. Lift the floor, rocker and scuff panel as an assembly over the seat stanchion support and out of the vehicle.

24. Slide the scuff panel off of the joint between the rocker and the floor.

Installation

1. Assemble the floor (A) scuff panel (B) and rocker (C) by aligning the rocker to the floor and sliding the scuff panel onto the joint between the rocker and the floor.



2. Position the front floor over the seat stanchion support. While lowering the floor assembly push the battery strap rearward to clear the corner of the battery floor and lower the floor assembly into position.

3. Pull outward on the rockers to clear the frame.
4. Install the new floor rivets. Refer to Floor and Kick-up Rivet Locations in this section.
5. Install the temperature sensor onto the seat stanchion support.

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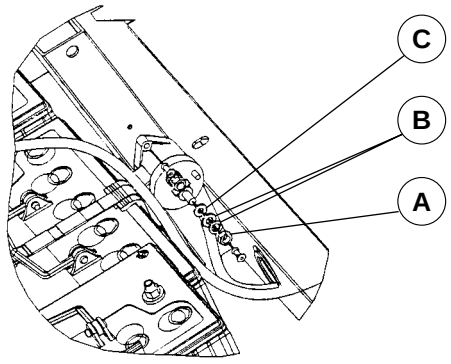
6. Install the cables (C), washers (B) and the lower nut (A). Tighten the contactor lower cable nut to 8-10N.m. (71-88lb-in.).



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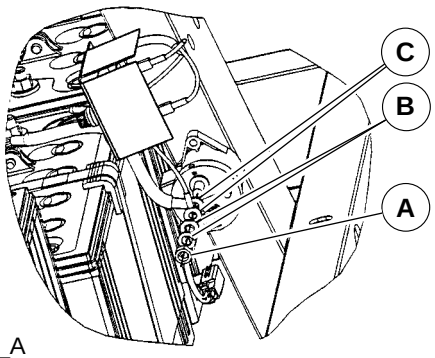
7. Install the cable, washers and the upper nut. Tighten the contactor upper cable nut to 8-10N.m. (71-88lb-in.)



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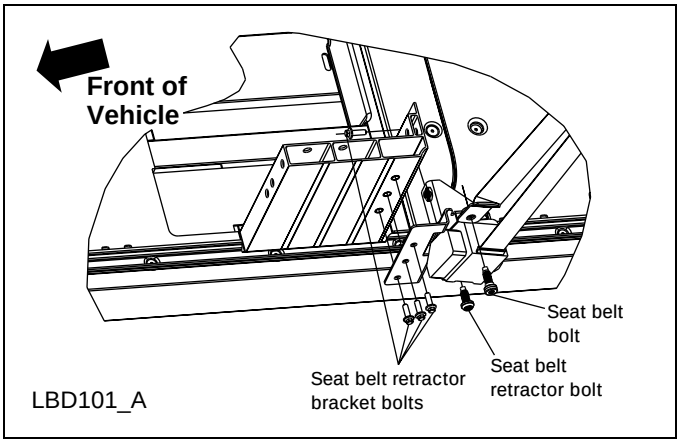
8. Position the service disconnect switch and install two new rivets.

9. Install the seat belt retractor and front seat belt retractor bolt. Tighten the front seat belt retractor bolt to 26-34N.m (19-25 lb-ft.).



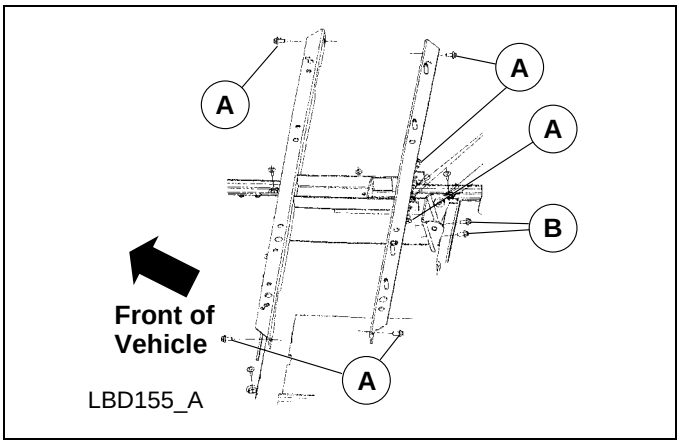
10. Install the battery tray.

11. Install the six batteries. Refer to Batteries in the Electrical section.

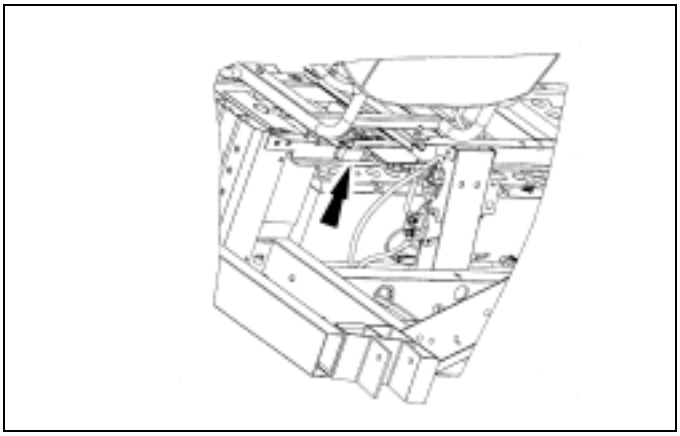
12. Install the seat stanchion H-support

13. Install the six seat stanchion H-support bolts (A). Tighten the six seat stanchion H-support bolts (A) to 20-30N.m (15-22lb-ft.).

14. Install the two front seat belt buckle bracket bolts (B). Tighten the two front seat belt buckle bracket bolts (B) to 20-30N.m (15-22lb-ft.).



15. If mounted to the seat stanchion H-support, connect the service disconnect switch electrical connector.



16. Turn the vehicle power off. Refer to Power Shutdown Procedure in the Electrical section.

17. Install the front floor kick-up. Refer to Floor Kick-up – Front in this section.

18. Install the rear floor kick-up. Refer to Floor Kick-up – Rear in this section.

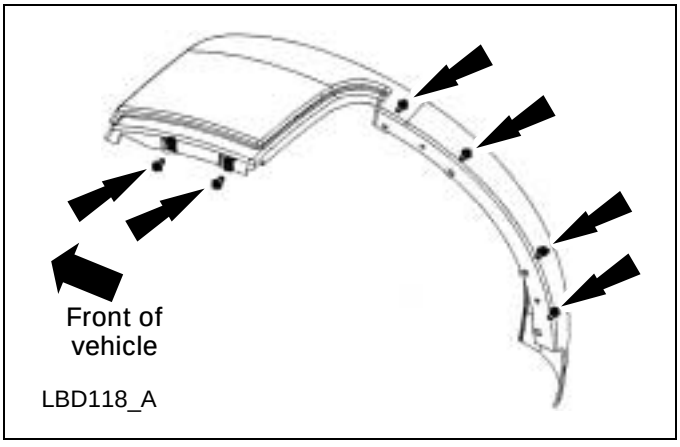
19. Install the parking brake lever. Refer to Parking Brake Lever in the Chassis section.

20. Install the driver and passenger seat. Refer to Seat back and Frame – Driver Seat and Seat back and Frame – Passenger Seat in this section.

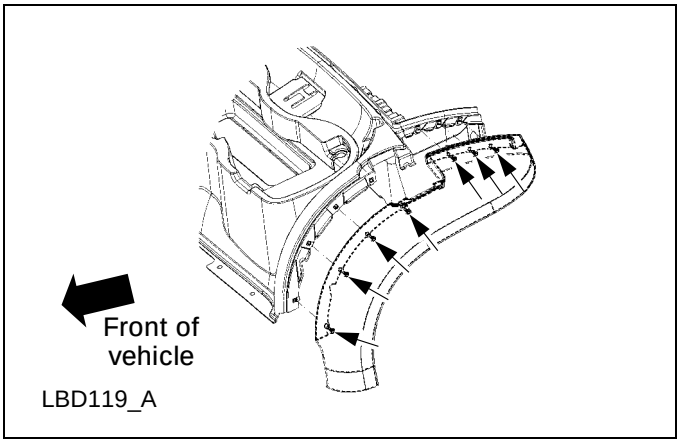
21. Raise and support the vehicle. Refer to Lifting in the General Information section.

22. Install the six new rocker rivets. Repeat on the other side of the vehicle.

23. Install the front fender and the six fender bolts. Tighten the front fender bolts to 8N.m (70lb-in.). Repeat on the other side of the vehicle.



24. Install the rear fender and the seven rear fender bolts. Tighten the rear fender bolts to 8N.m (70lb-in.). Repeat on the other side of the vehicle.



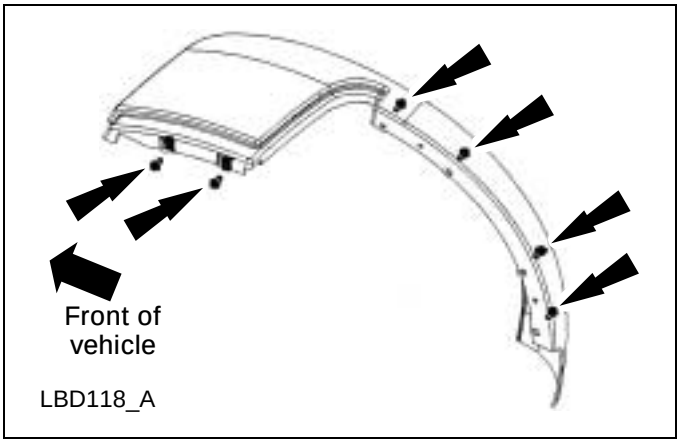
25. Lower the vehicle.

26. Install and lock the hood and decklid.

Floor Kick-up – Front

Removal

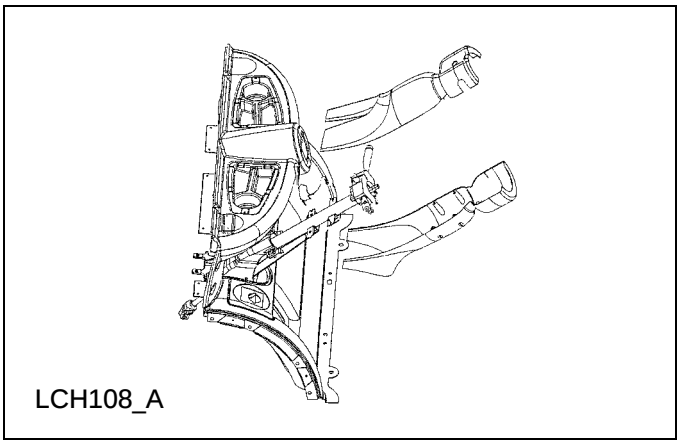
1. Unlock and remove the hood.
2. Raise and support the vehicle. Refer to Lifting in the General Information section.
3. Remove the six fender bolts and the fender. Repeat on the other side of the vehicle.



4. Lower the vehicle.

5. Remove the four steering column shroud screws.

6. Remove the two pushpins on the front of the steering column shroud assembly. Separate and remove the steering column shroud.



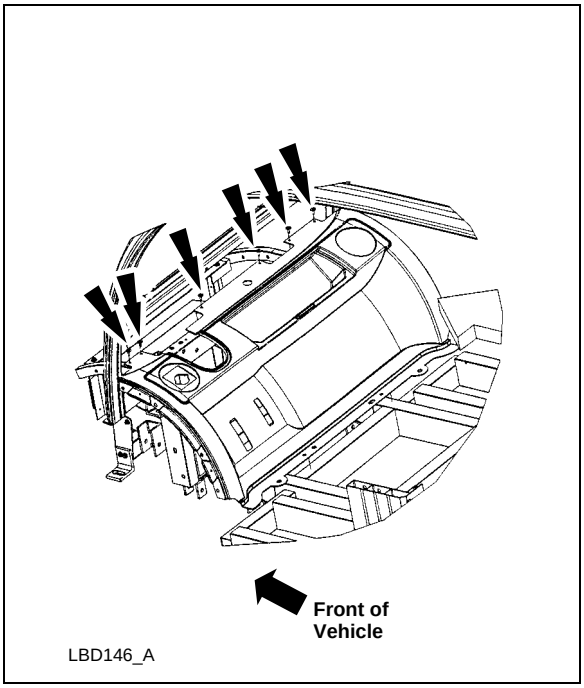
7. Remove the instrument panel. Refer to Instrument Panel in this section.

8. Remove and discard the accelerator pedal pad.

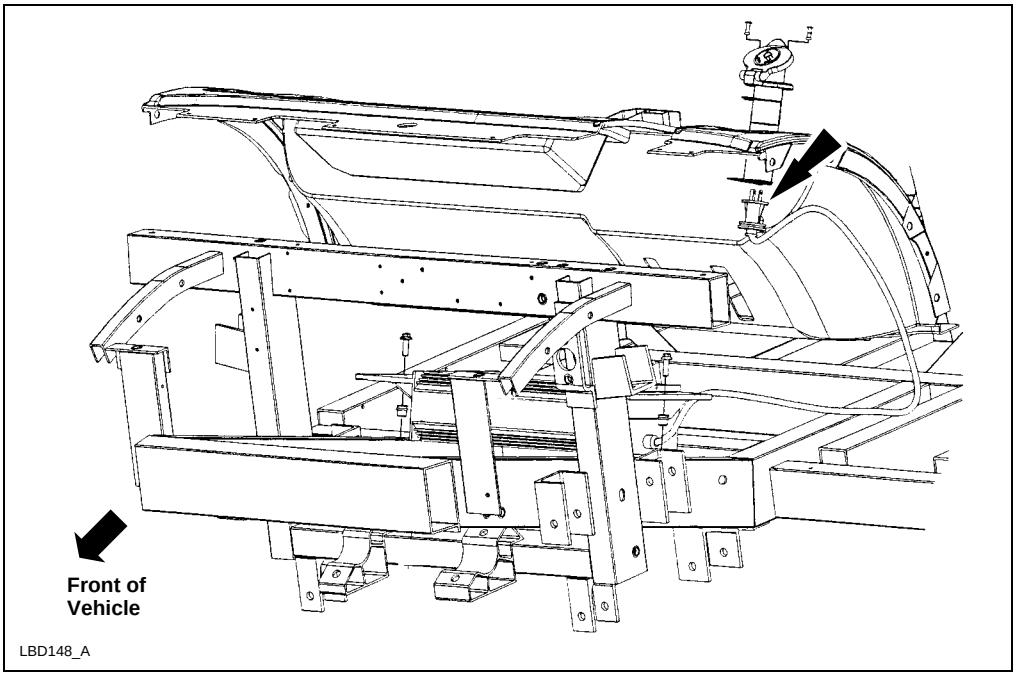
9. Remove the brake pedal pad nut and bolt and remove the brake pedal pad.

10. Drill out the four floor rivets nearest to the front floor kick-up. Refer to Floor and Kick-up Rivet Locations in this section.

11. Drill out the six front floor kick-up rivets.



12. Carefully tilt the top of the front floor kick-up rearward. Press in the retaining button on the battery charger inlet plug and remove the battery charger inlet plug from the front floor kick-up.



13. Remove the front floor kick-up.

14. If necessary, remove the glove box door rivets and the glove box door.

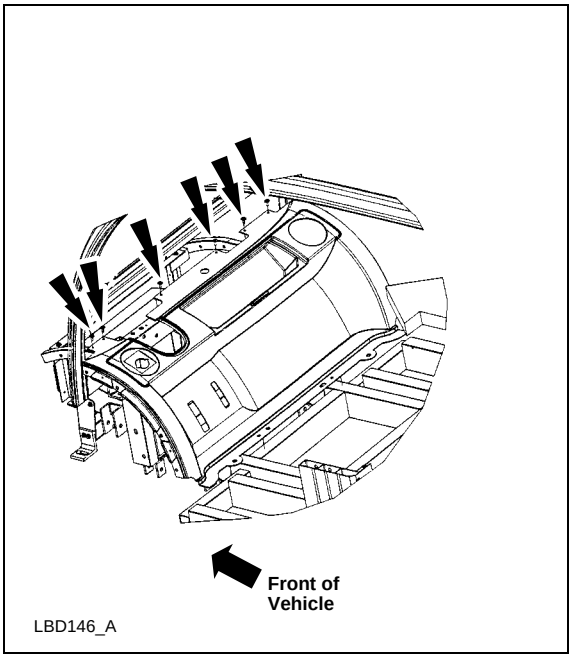
Installation

1. If necessary, position the glove box door and install the glove box door rivets.

2. Carefully tilt the top of the front floor kick-up rearward and slide the front floor kick-up under the front floor.

3. Connect the battery charger inlet plug.

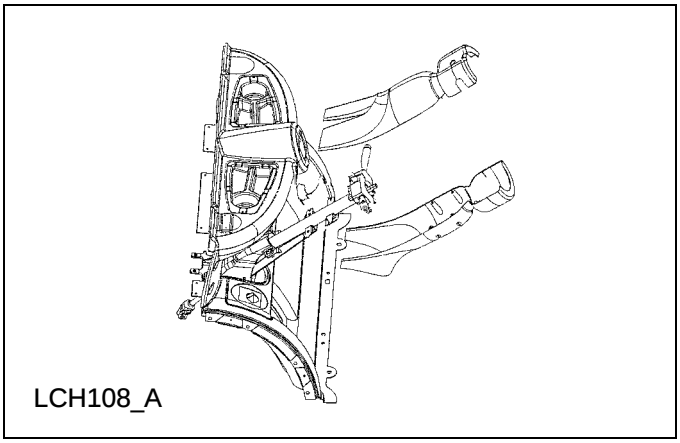
4. Align the holes in the front floor kick-up with the holes in the crossmember and install the six new front floor kick-up rivets.



5. Align the holes in the front floor kick-up with the holes in the front floor and install the four new floor rivets nearest to the front floor kick-up. Refer to Floor and Kick-up Rivet Locations in this section.

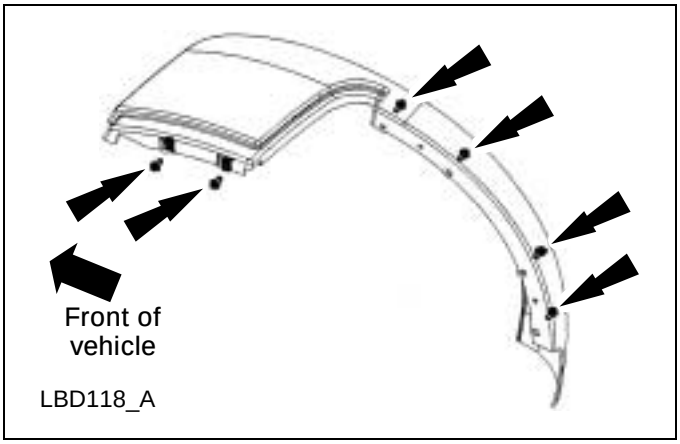
6. Install the brake pedal pad and the brake pedal pad nut and bolt. Tighten the brake pedal pad bolt to 24-31N.m (18-22lb-ft.).

7. Position the steering column shroud halves and install the four steering column shroud screws and two pushpins. Tighten the steering column shroud screws to 2.7-3.7N.m. (23.9-32.7lb-in.).



8. Install a new accelerator pedal pad.

9. Install the instrument panel. Refer to Instrument Panel in this section.
10. Raise and support the vehicle. Refer to Lifting in the General Information section.
11. Install the fender and the six fender bolts. Tighten the fender bolts to 8N.m (70lb-in.). Repeat on the other side of the vehicle.

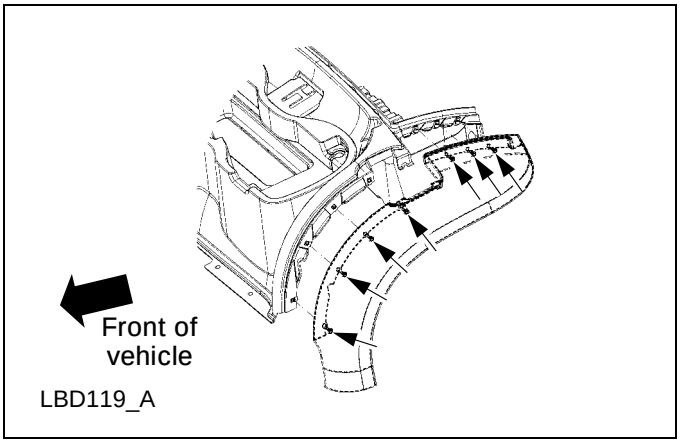


12. Lower the vehicle and check the fit.
13. Install and lock the hood.

Floor Kick-up – Rear

Removal

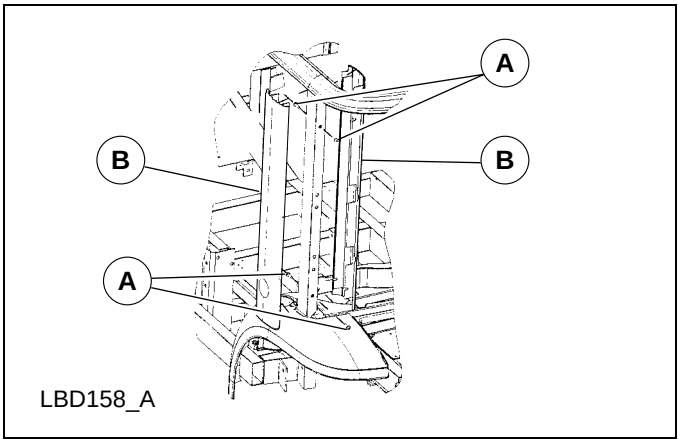
1. Unlock and remove the decklid.
2. Raise and support the vehicle. Refer to Lifting in the General Information section.
3. Remove the seven rear fender bolts and the fender. Repeat on the other side of the vehicle.



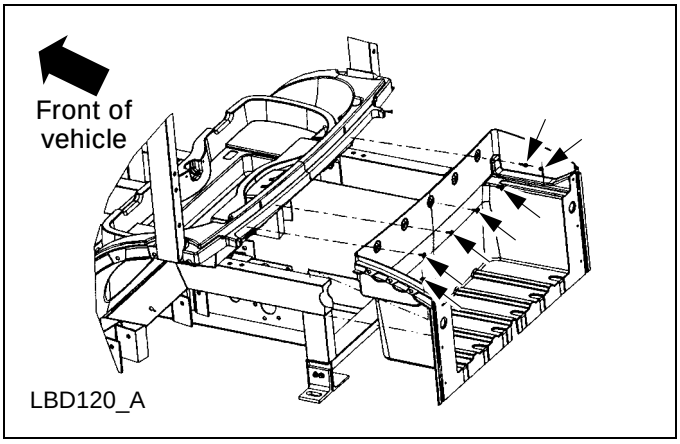
4. Lower the vehicle.

5. Remove the B-pillar seal.

6. Loosen the four B-pillar trim screws (A) and remove the B-pillar trim (B). Repeat on the other side of the vehicle.



7. Drill out the rear five rivets from the bag bay.

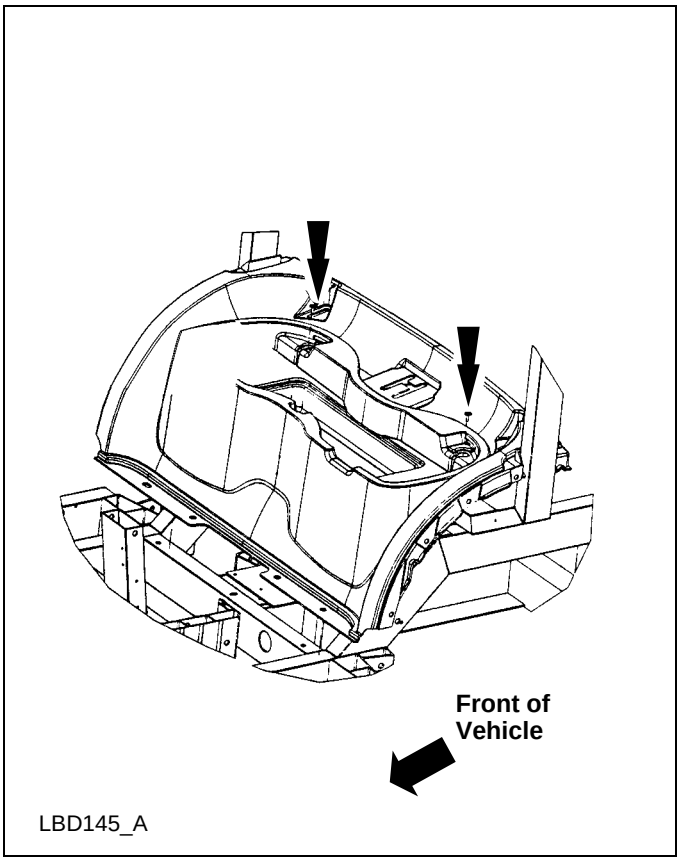


8. If equipped, remove the rear seat cushion.

9. If equipped, remove the two rear seat belt buckle bolts and the two rear seat belt buckles.

10. Drill out the four floor rivets nearest to the rear floor kick-up. Refer to Floor and Kick-up Rivet Locations in this section.

11. Drill out the two rivets at the top of the rear floor kick-up.



12. Carefully tilt the top of the rear floor kick-up forward and remove the rear floor kick-up.

Installation

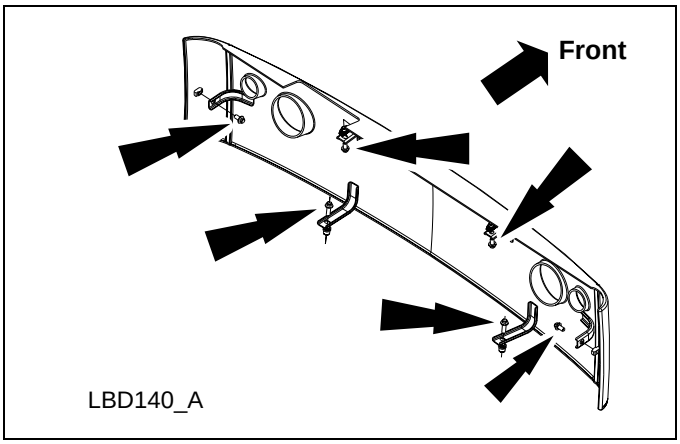
1. Carefully tilt the top of the rear floor kick-up forward and slide the rear floor kick-up into place.
2. Install the two new rivets at the top of the rear floor kick-up.
3. Install the four new floor rivets nearest to the rear floor kick-up. Refer to Floor and Kick-up Rivet Locations in this section.
4. If equipped, install the two rear seat belt buckles and the two rear seat belt buckle bolts. Tighten the two rear seat belt buckle bolts to 26-34N.m (19-25lb-ft.).
5. If equipped, install the rear seat cushion.
6. Install the new rear five rivets onto the bag bay.
7. Install the B-pillar trim (B) and tighten the four B-pillar trim screws (A) to 20-30N.m (15-22lb-ft.). Repeat on the other side of the vehicle.

8. Install the B-pillar seal.
9. Raise and support the vehicle. Refer to Lifting in the General Information section.
10. Install the rear fenders and the seven rear fender bolts. Tighten the rear fender bolts to 8N.m (70lb-in.).
11. Lower the vehicle.
12. Install and lock the decklid.

Fascia - Front

Removal

1. Unlock and remove the hood.
2. Remove the instrument panel. Refer to Instrument Panel in this section.
3. Remove the front fascia bolts.



4. Carefully remove the front fascia, being careful not to scratch the front fascia.

Installation

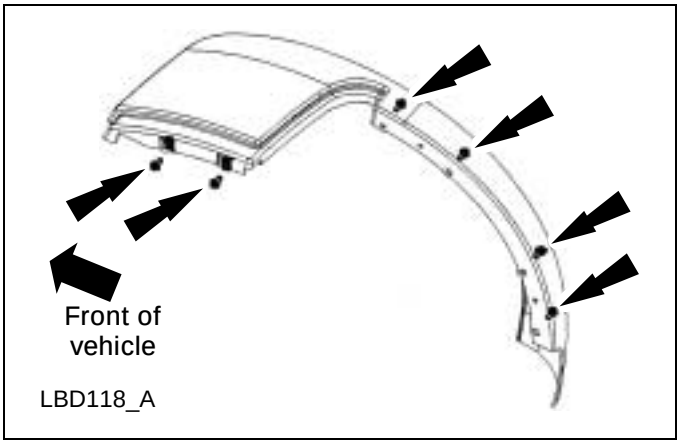
1. Reverse the removal procedure.
2. Tighten the front fascia bolts to 3.3N.m (29lb-in.).

Fender - Front

Removal

1. Unlock and remove the hood.

2. Raise and support the vehicle. Refer to Lifting in the General Information section.
3. If removing the RH fender, drill out the four fender shield rivets and remove the fender shield.
4. If removing the RH fender, separate the wire retainers from the fender.
5. Remove the six fender bolts and the fender.



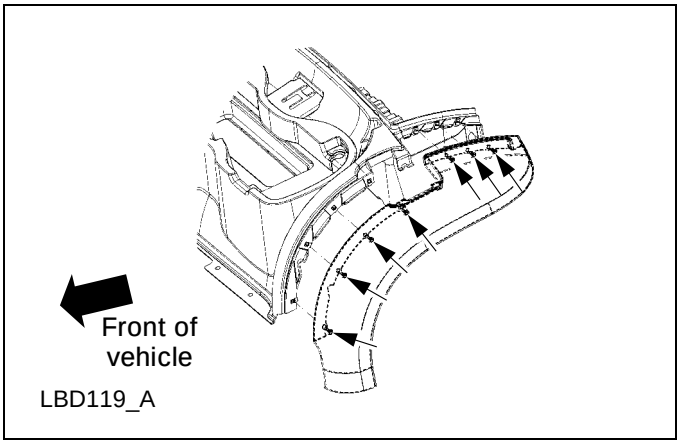
Installation

1. Reverse the removal procedure.
2. Tighten the fender bolts to 8N.m (70lb-in.).

Fender - Rear

Removal

1. Unlock and remove the decklid.
2. Remove the seven rear fender bolts and the rear fender.



Installation

1. Reverse the removal procedure.
2. Tighten the rear fender bolts to 8N.m (70lb-in.).

Instrument Panel

Removal

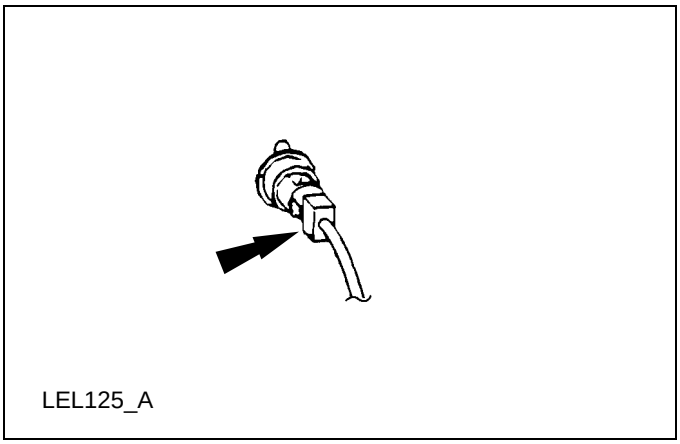
Note:

When replacing the instrument panel a new gauge overlay for the instrument cluster gauge will have to be ordered.

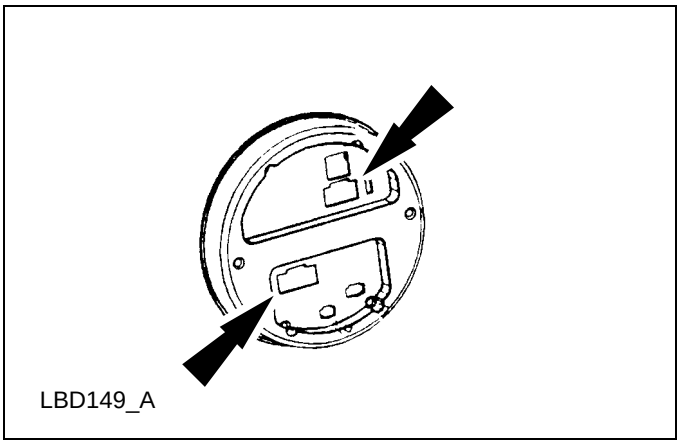
Note:

The VIN plate on the instrument panel may need to be replaced when replacing an instrument panel. Contact the field representative for assistance with the process for ordering a new VIN, if the VIN plate must be replaced.

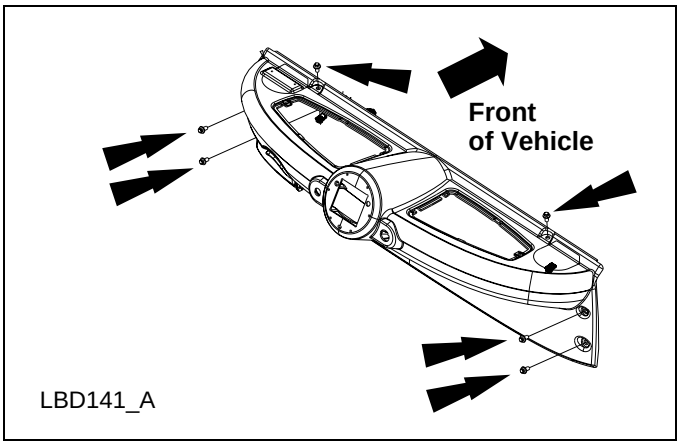
1. Turn the vehicle power off. Refer to Power Shutdown Procedure in the Electrical section.
2. Remove the two cowl tray scrivets and the cowl trays.
3. If equipped, disconnect the power point electrical connector.



4. Disconnect the two instrument cluster gauge electrical connectors.



5. Remove the six instrument panel bolts and carefully remove the instrument panel.



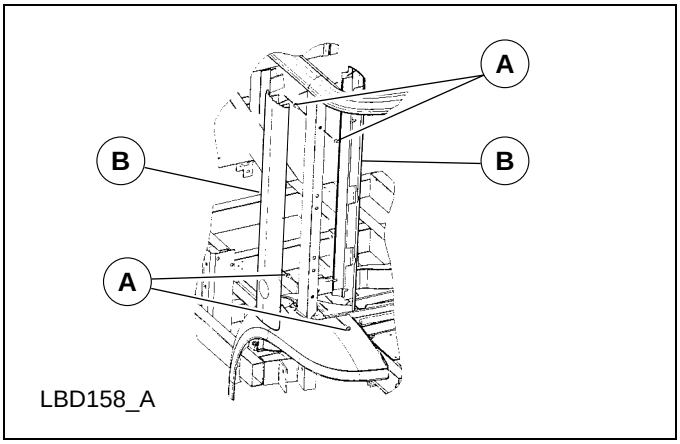
Installation

1. Carefully install the instrument panel and the six instrument panel bolts. Tighten the six instrument panel bolts to 10N.m (88lb.-in.).
2. Connect the two instrument panel gauge electrical connectors.
3. If equipped, connect the power point electrical connector.
4. Install the two cowl trays and the cowl tray scrivets.
5. Turn the vehicle power on. Refer to Power Shutdown Procedure in the Electrical section.

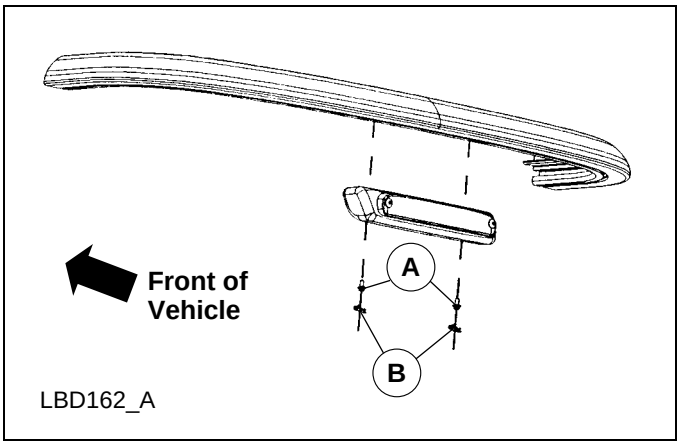
Roof Rail – Rear

Removal

1. If necessary, remove the rear storage compartment. Refer to applicable procedure in this section.
2. Remove the roof panel. Refer to Roof Panel in this section.
3. Remove the B-pillar seal.
4. Loosen the four B-pillar trim screws (A) and remove the B-pillar trim (B). Repeat on the other side of the vehicle.



5. Remove the seal from the rear roof rail.
6. Remove the two screw covers (B) and two high-mount stop lamp screws (A). Remove the high-mount stop lamp and carefully pull the wiring harness out of the channel.



7. Loosen the roof rail reinforcement to B-pillar inner bolts from both sides of the vehicle.
8. Loosen the roof rail reinforcement to B-pillar lower bolts from both sides of the vehicle.

9. Slide the rear roof rail rearward off the vehicle.
10. Remove the rear roof rail reinforcement if left in the vehicle.

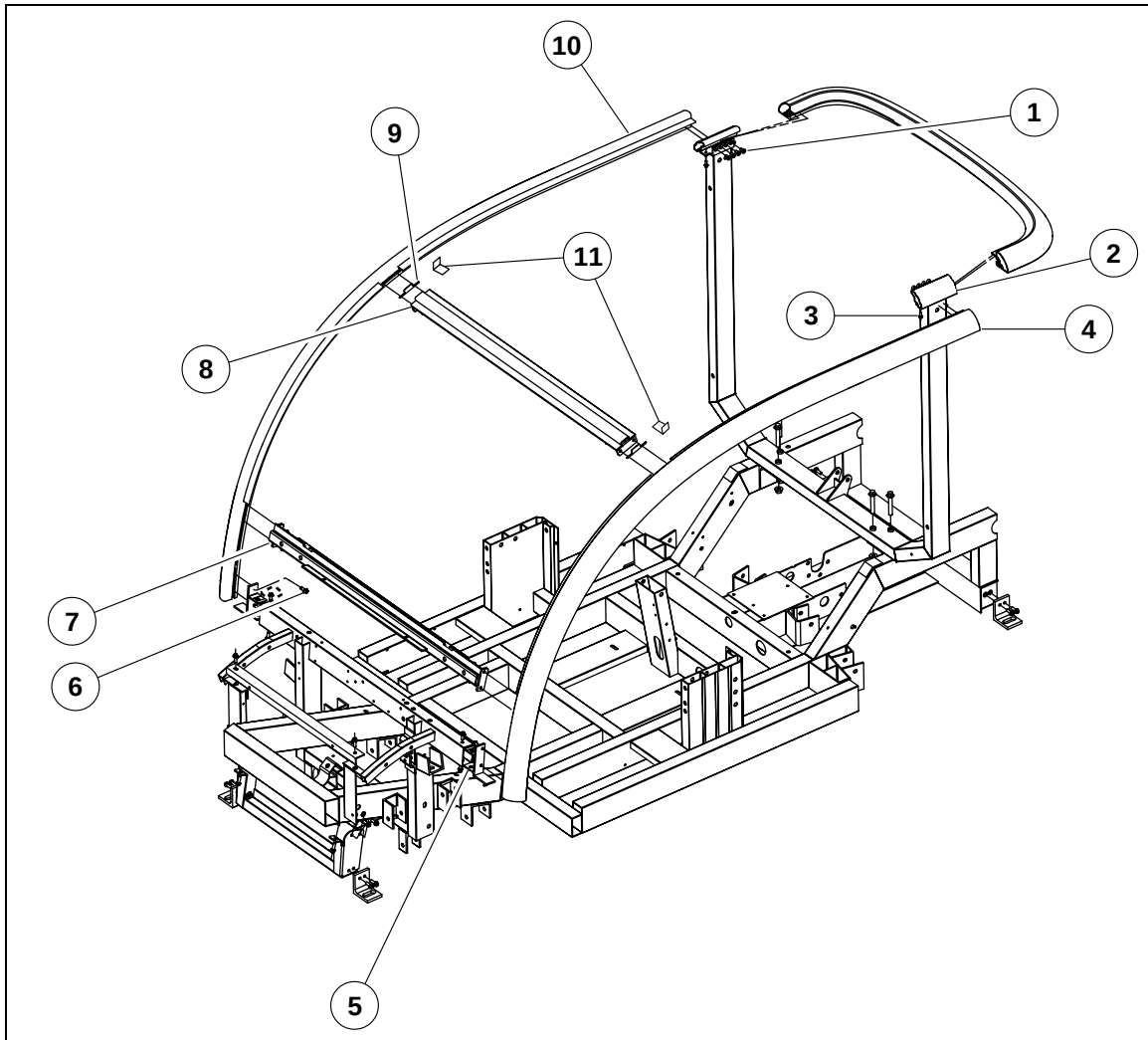
Installation

Note:

The rear roof rail reinforcement must be installed in the rear roof rail prior to installing the rear roof rail to ensure proper installation and alignment of the rear roof rail reinforcement.

1. Install the rear roof rail reinforcement into the rear roof rail.
2. Slide the rear roof rail forward onto the vehicle.
3. Tighten the roof rail reinforcement to B-pillar lower bolts on both sides of the vehicle to 11-13N.m (98-115lb-in.).
4. Tighten the roof rail reinforcement to B-pillar inner bolts from both sides of the vehicle to 24-31N.m (18-22lb-ft.).
5. Install the high-mount stop lamp and two high-mount stop lamp screws. Tighten the two high mount stop lamp screws to 9-12N.m (80-106lb-in.). Install the two screw covers.
6. Press the wiring harness into the channel and install the seal.
7. Install the B-pillar trim and tighten the four B-pillar trim screws to 20-30N.m (15-22lb-ft.). Repeat on the other side of the vehicle.
8. Install the B-pillar seal.
9. Install the roof panel. Refer to Roof Panel in this section.
10. If necessary, install the rear storage compartment. Refer to applicable procedure in this section.

Roof Rail – Side



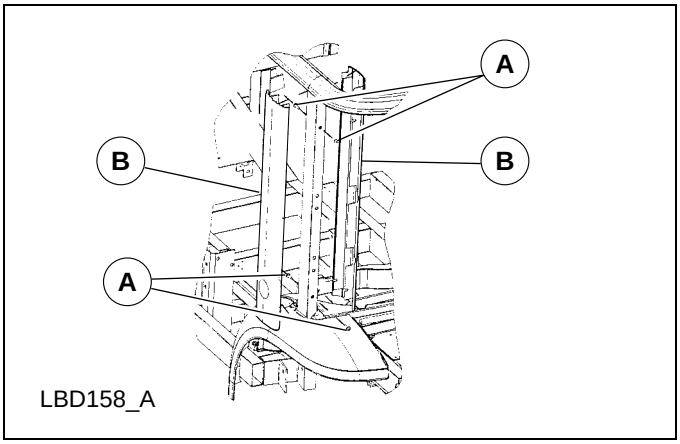
LBD156_A

Item	Part Number	Description
1	W505741-S426	Roof Rail Reinforcement to B-pillar Inner Bolts
2	51248	Roof Rail Reinforcement
3		Roof Rail Reinforcement to B-pillar Lower Bolts
4	51181	LH Roof Rail
5	02892	Roof Rail to Cowl Bracket
6		Roof Rail to Cowl Bracket Bolt
7	03408	Lower Windshield Roof Rail
8	03408	Upper Windshield Roof Rail

Item	Part Number	Description
9	034S08	Upper Header Rail Seal
10	51180	RH Roof Rail
11	3M PUL 0612	Adhesive Urethane Film (Ford specification ESB-M99J291-A-A4)

Removal

1. Remove the grab handles.
2. Remove the two lower and two side seat belt hanger bracket bolts. Set the seat belt hanger aside.
3. If equipped, remove the side view mirror.
4. Remove the B-pillar seal.
5. Loosen the four B-pillar trim screws and remove the B-pillar trim.



6. Remove the instrument panel. Refer to Instrument Panel in this section.
7. Remove the front fascia. Refer to Front Fascia in this section.
8. Remove the windshield. Refer to Windshield in this section.
9. Remove the roof panel. Refer to Roof Panel in this section.
10. Remove the four upper windshield roof rail bolts, upper windshield roof rail and upper header rail seal.
11. Remove the two lower windshield roof rail bolts and support the lower windshield roof
12. Loosen the roof rail reinforcement to B-pillar inner bolts.

13. Loosen the roof rail reinforcement to B-pillar lower bolts.

14. Remove the roof rail to cowl bracket bolt and slide the side roof rail forward off the vehicle.

Installation

1. Slide the side roof rail rearward onto the roof rail reinforcement to B-pillar and install the roof rail to cowl bracket bolt. Tighten the roof rail to cowl bracket bolt to 24-31N.m (18-22lb-ft.).

2. Tighten the roof rail reinforcement to B-pillar inner bolts to 24-31N.m (18-22lb-ft.).

3. Tighten the roof rail reinforcement to B-pillar lower bolt to 11-13N.m (98-115lb-in.).

4. Install the two lower windshield roof rail bolts. Tighten the two lower windshield roof rail bolts to 24-31N.m (18-22lb-ft.).

5. Install the upper windshield roof rail and the four upper windshield roof rail bolts. Tighten the four upper windshield roof rail bolts to 24-31N.m (18-22lb-ft.).

6. Install the roof panel. Refer to Roof Panel in this section.

7. Install the windshield. Refer to Windshield in this section.

8. Install the front fascia. Refer to Front Fascia in this section.

9. Install the instrument panel. Refer to Instrument Panel in this section.

10. Install the B-pillar trim and tighten the four B-pillar trim screws to 20-30N.m (15-22lb-ft.).

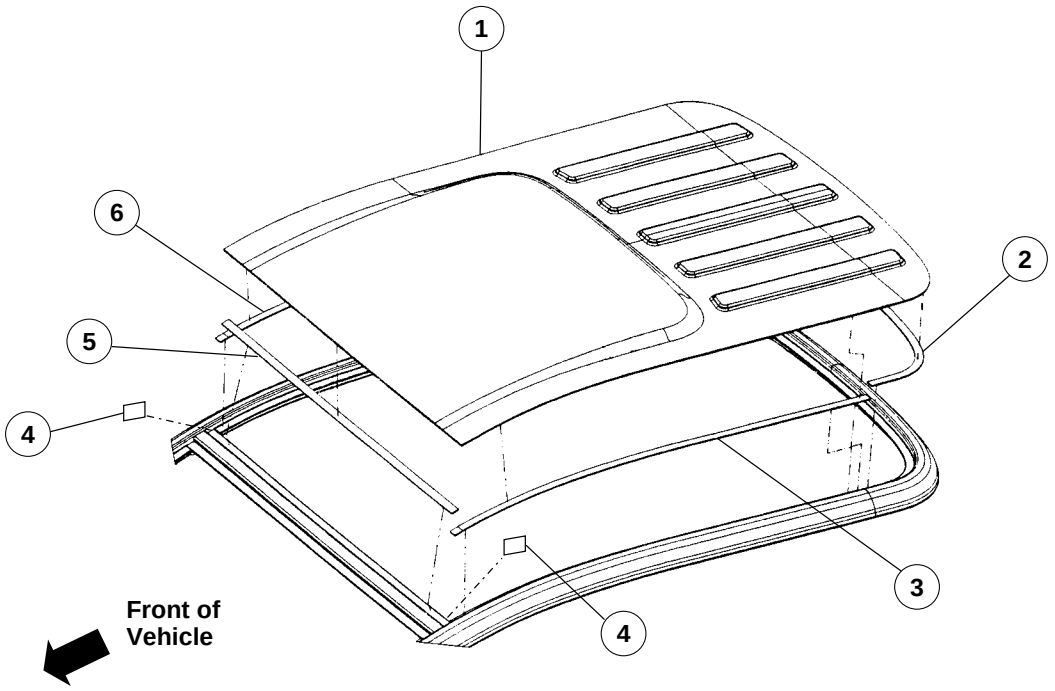
11. Install the B-pillar seal.

12. If equipped, install the side view mirror. Tighten the side view mirror screws to 20-30N.m (15-22lb-ft.).

13. Position the seat belt hanger bracket and install the two lower and two side seat belt hanger bracket bolts. Tighten the two side seat belt hanger bracket bolts to 20-25N.m (15-18lb-ft.). Tighten the two lower seat belt hanger bracket bolts to 9-12N.m (80-106lb-ft.).

14. Install the grab handles. Tighten the grab handle bolts to 20-30N.m (15-22lb-ft.).

Roof Panel



LBD159_A

Item	Part Number	Description
1	50202	Roof Panel
2	502S02	Roof Panel Rear Adhesive Strip
3	502S02	Roof Panel LH Adhesive Strip
4		Rail Seal
5	502S02	Roof Panel Front Adhesive Strip
6	3M PUL 0612 (Ford specification ESB-M99J291-A-A4)	Adhesive Urethane Film

Removal

1. Sharply push on the roof panel near the roof rail, from the inside of the vehicle. Continue pressure and gradually peel the roof away from the rail.

Installation

Note:

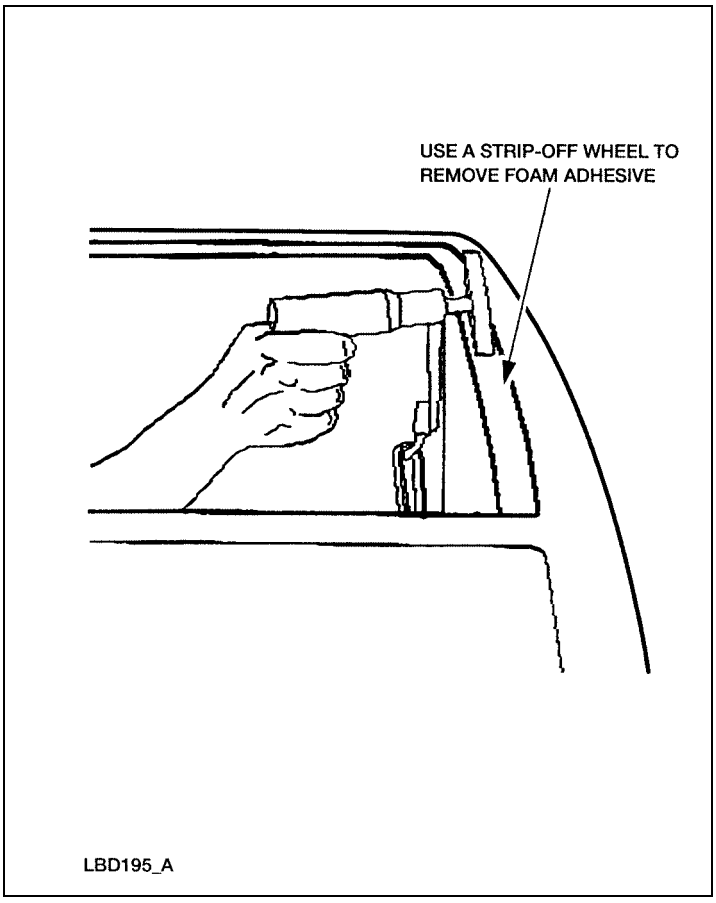
The roof is attached to the roof rails with double-sided adhesive coated tape. Some vehicles will also be sealed with silicone adhesive, and/or have hot melt sealant in the corners. All of these materials need to be removed and the surface cleaned.

Note:

If the adhesive tape is difficult to remove, gently apply heat to the tape using a heat gun.

1. Remove the foam tape and silicone adhesive from the roof panel, rails, and header.

2. Use rubber stripe removal wheel such as #M 07498 on an air drill (tool optimal speed is 1500-2000 rpm) to remove remaining foam adhesive. The surface should relatively clean, recognizing that it may not be possible to remove all traces of the silicone adhesive.



CAUTION:

Do not use metal to scrape the roof rails or the roof panel. The roof rails are anodized and the metal will corrode if scratched through the anodized layer. The roof is ABS plastic and metal objects may gouge the surface.

3. Use compressed air and blow away any debris from the rubber stripe removal wheel.

4. Wipe the roof rail, upper windshield roof rail and roof panel bonding area using a clean rag and wax and grease remover or alcohol.

Note:

The bonding surfaces must be clean to achieve a watertight bond.

5. Apply 1” masking tape to the top, outer edge of the roof panel.

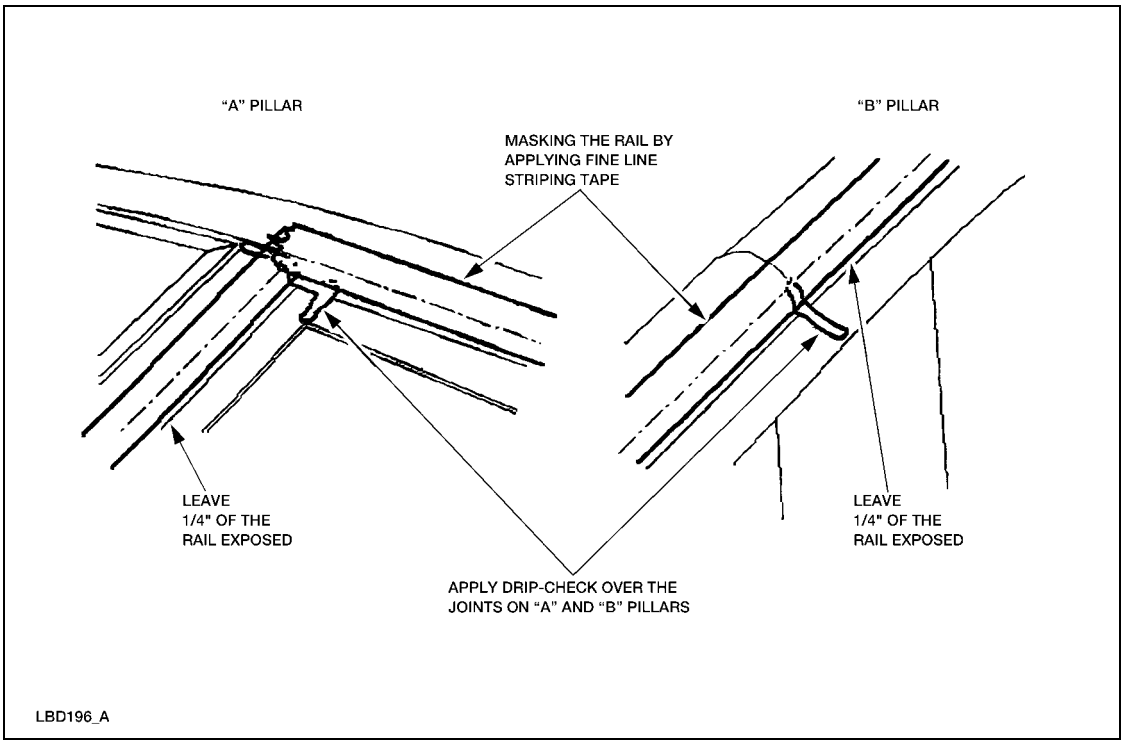
Note:

Drip-check will shrink considerably as it cures. If the Drip-Check is not cured before the foam tape is applied, the bonding ability of the foam tape will be compromised and leaks may result.

Note:

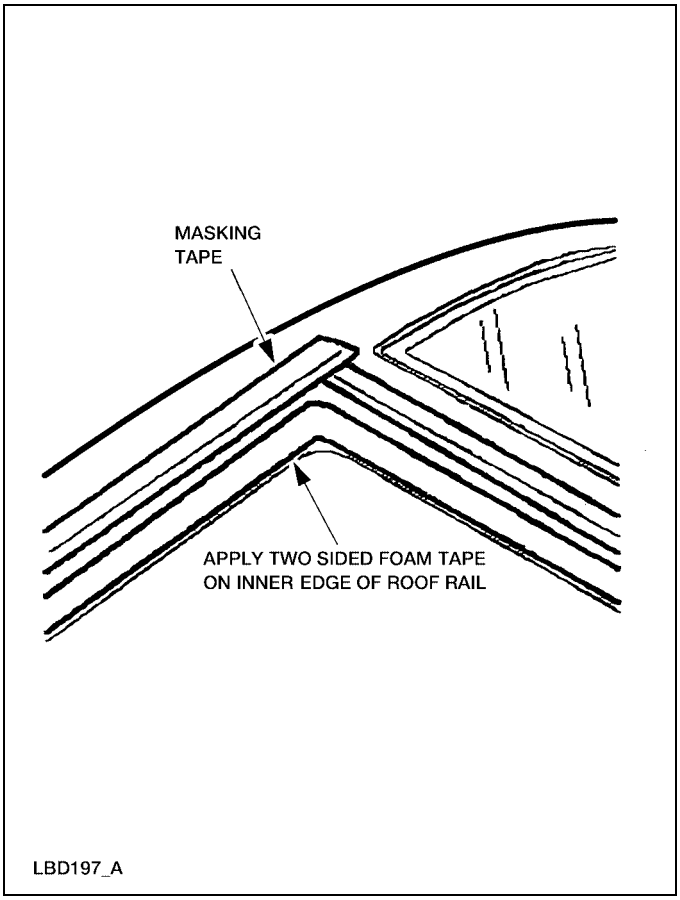
If the gap at the A-pillar is greater than 2mm (0.078in) place a piece of masking tape under the joint (from inside the vehicle) to support the Drip-Check as it cures and fills the gap.

6. Apply a 5-7mm (0.20-0.27in) bead of 3M Drip-Check 08531over the joints at the A- and B-pillars. Make sure the joint will be filled when the material dries. Allow the Drip-Check to cure 3-4 hours before proceeding.

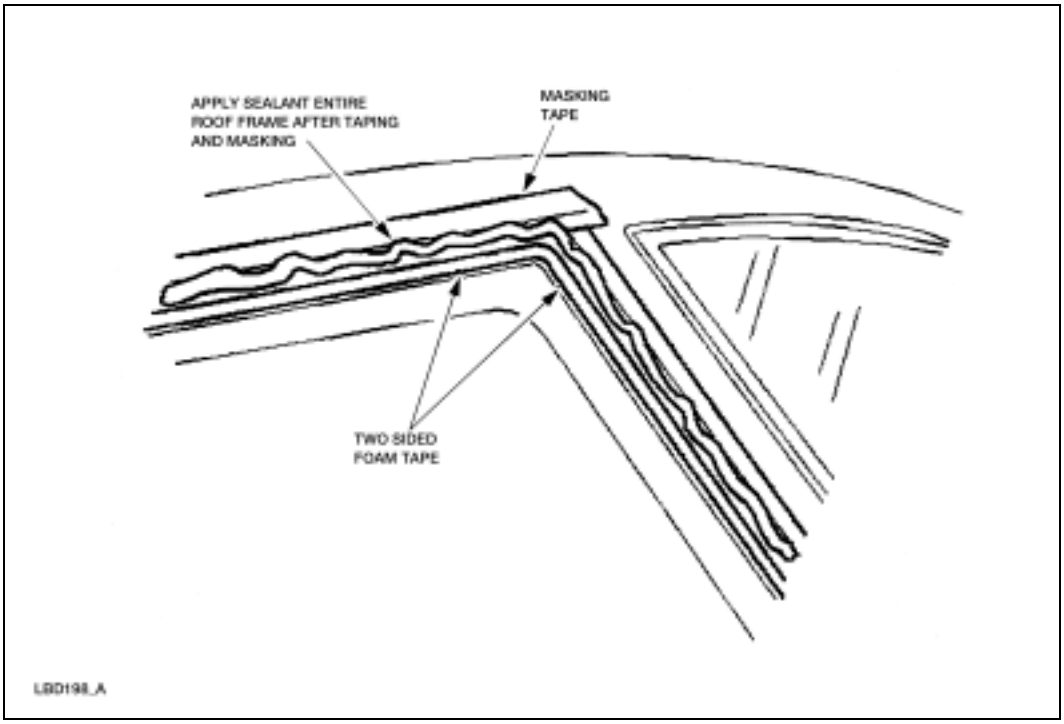


7. Mask the rail by applying fine line striping tape such as 3M 06314 on the vertical surface of the roof rail and upper windshield roof rail, and then peeling the lower ¼" of the tape away. You may also apply ¼" fine line striping tape such as 3M 06301 on the lower vertical surface of the rail then 1" masking tape directly above the fine line tape, and finally removing the fine line tape to expose the lower ¼" of the rails vertical surface.

8. Apply 12.7mm x 1.14mm (.5 x .045in) double-sided foam tape such as 3M 06380 around the roof rail perimeter, beginning at the middle rear of the vehicle. Use a continuous piece, and ease the tape by pulling a little around the corners. Do not use thicker tape, as this is difficult to ease around the corners. Remove the backing, and apply a second layer of tape at this time. This will serve as a dam for the urethane adhesive. Press down on the tape, all the way around the perimeter, to ensure the tape has completely bonded to the roof rail.



9. Apply a 5-6mm(0.197-0.236in) bead of 3M 08360 Ultra-Pro White Urethane Seam Sealer on the roof rails and upper windshield roof rail beginning on the outside by the masking tape, and then apply a second bead next to the foam tape. Do not get urethane adhesive on the foam tape. Be sure to apply sufficient material in the A-pillar area. This material requires a special applicator gun, 3M 08398. Use only white urethane.



10. Remove the backing on the foam tape. Set the roof panel into the opening carefully, lining the leading edge of the roof panel up with the upper windshield roof rail and then setting the rear of the roof panel into place. Press the roof firmly, and visually inspect all areas of the bond from the inside of the vehicle, and you should see the urethane spilling into the trench between the roof panel and the roof rail.

Note:

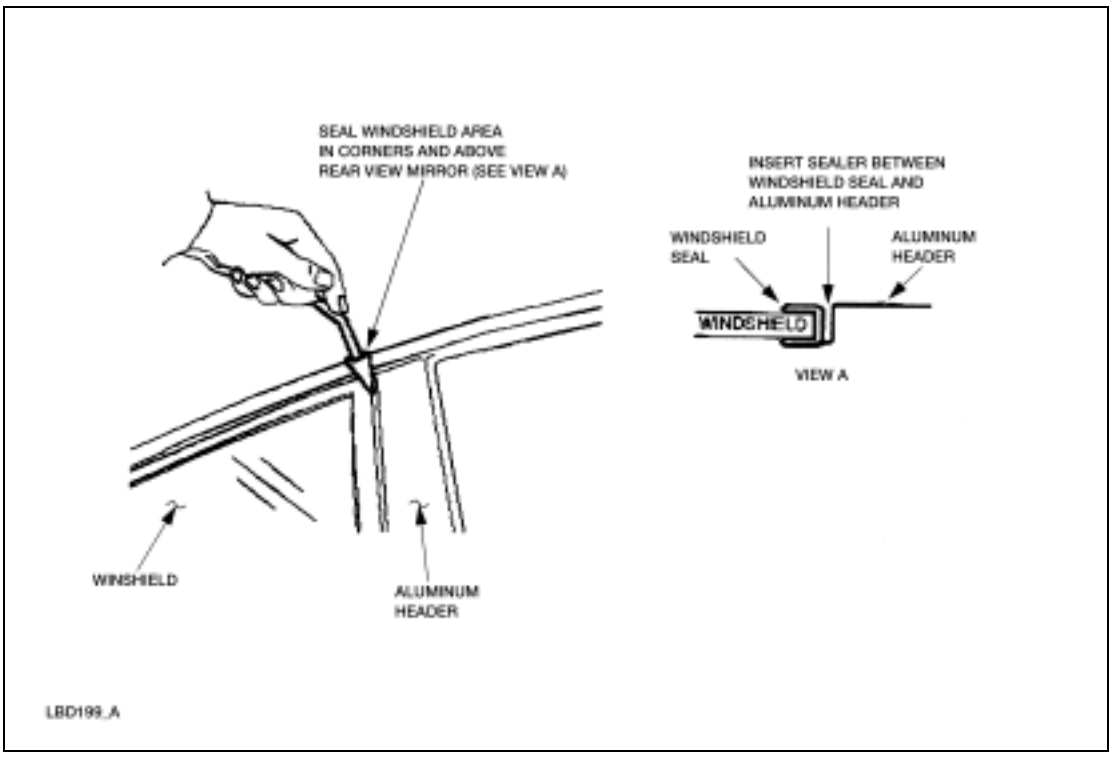
Lightly spraying adhesive cleaner such as 3M 08987 on the glove and urethane will make it easier to spread and smooth the adhesive.

11. Wearing latex gloves, smooth the urethane adhesive in the ditch area between the roof panel and the roof rails. You may with to fill additional urethane adhesive into the ditch for cosmetic purposes.

12. Clean any misapplied urethane adhesive using adhesive cleaner such as 3M 08987 before it has cured.

13. Carefully remove the masking tape from the roof panel and the roof rails.

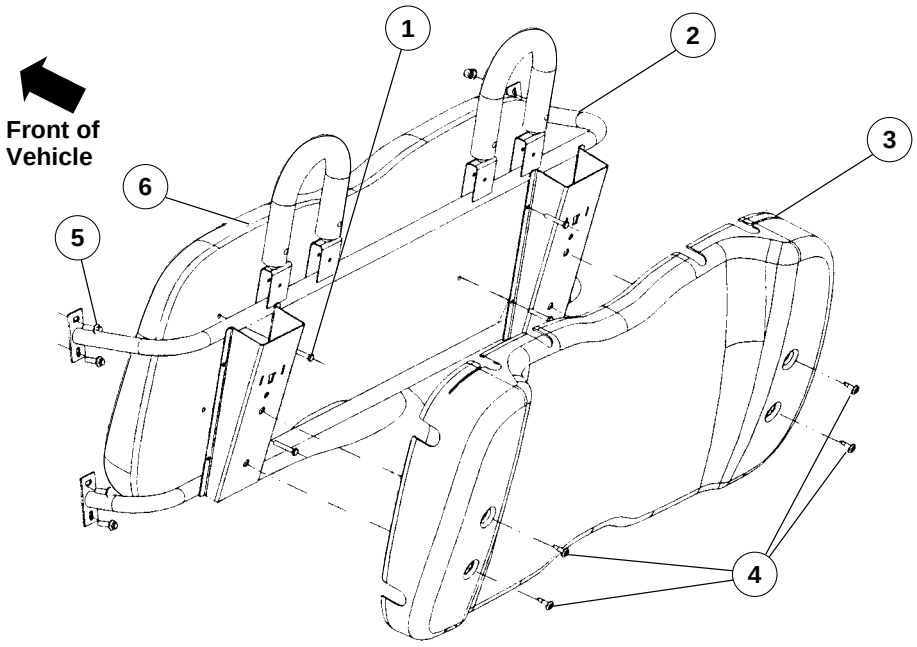
14. Seal the upper edge of the windshield, and above the rear view mirror, using 3M 08994 Windo-weld flow grade resealant. Inject the resealant between the rubber windshield seal and the upper windshield roof rail.



15. Allow curing for 2-4 hours.

16. Water test the vehicle to verify the repair.

Seat Back and Frame – Rear Seat



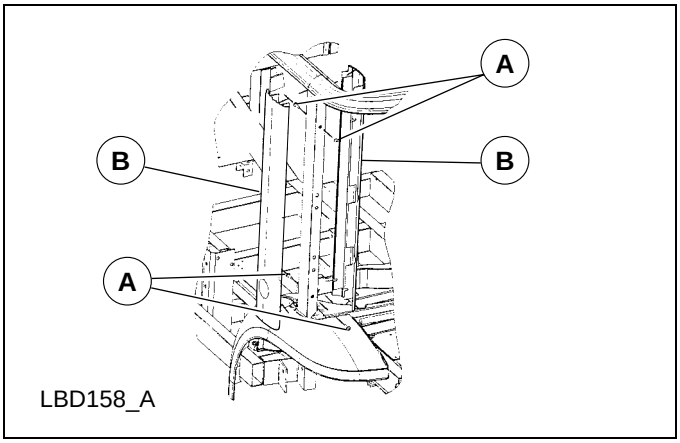
LBD157_A

Item	Part Number	Description
1	60108	Rear Seat Back Bolt
2	613A38	Rear Seat Back Frame
3	668C92	Rear Seat Back Cover
4	W505545-S306	Rear Seat Back Cover Screws
5	W500023-S426	Rear Seat Back Frame Bolts
6	66892	Rear Seat Seat Back

Removal

1. Remove the four rear seat back cover screws and the rear seat back cover.
2. Remove the four rear seat back bolts and the rear seat seat back.
3. Remove the B-pillar seal.

4. Loosen the four B-pillar screws (A) and remove the B-pillar trim (B). Repeat on the other side of the vehicle.



5. Remove the eight rear seat back frame bolts and the rear seat back frame.

Installation

1. Install the rear seat back frame and the eight rear seat back frame bolts. Tighten the eight rear seat back frame bolts to 20-30N.m (15-22lb-ft.).

2. Install the B-pillar trim and tighten the four B-pillar screws to 20-30N.m (15-22lb-ft.). Repeat on the other side of the vehicle.

3. Install the B-pillar seal.

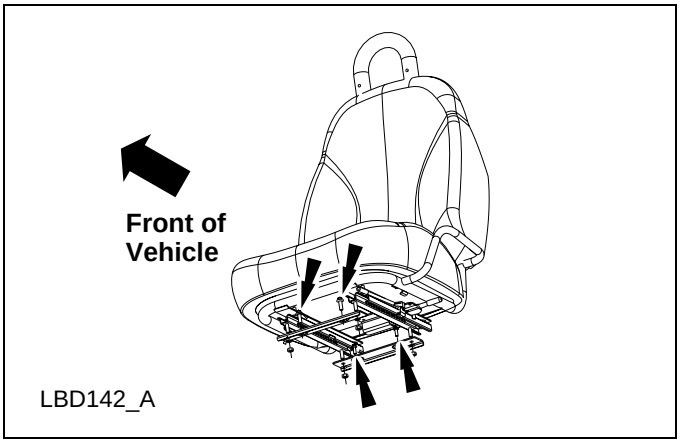
4. Install the rear seat seat back and the four rear seat back bolts. Tighten the four rear seat back bolts to 9-12N.m (80-106lb-in.)

5. Install the rear seat back cover and the four rear seat back cover screws. Tighten the rear seat back cover screws to 10N.m (88lb-in.).

Seat Back and Frame – Driver Seat

Removal

1. Pull up and remove the front seat cushion.
2. Remove the four seat back and frame bolts.



3. Carefully lift the seat assembly off the seat stanchion.
4. If necessary, remove the four seat frame slider bolts and remove the seat frame slider.

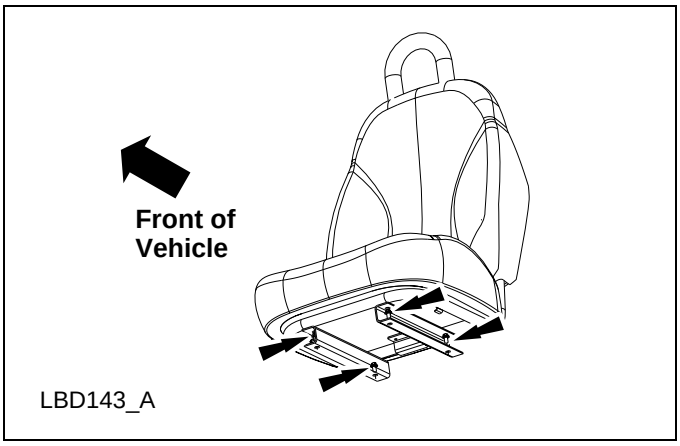
Installation

1. If necessary, install the four seat frame slider and the seat frame slider bolts. Tighten the seat frame slider bolts to 12-14N.m (107-123lb-in.).
2. Carefully lower the seat assembly onto the seat stanchion.
3. Install the four seat back and frame bolts. Tighten the four seat back and frame bolts to 20-30N.m (15-22lb-ft.).
4. Firmly press down on the front seat cushion to lock it in place.

Seat Back and Frame – Passenger Seat

Removal

1. Remove the four seat back and frame bolts.



2. Carefully lift the seat assembly off the seat stanchion.

Installation

1. Reverse the removal procedure.
2. Tighten the four seat back and frame bolts to 20-30N.m (15-22lb-ft.).

Seat Back Cushion Cover

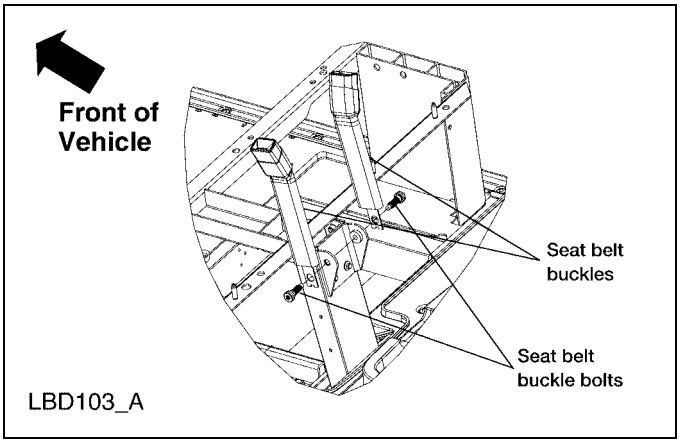
Removal and Installation

Seat back cushion covers are not serviceable separate from the seat back. Refer to Seat Back and Frame- Driver Seat and Seat Back and Frame- Passenger Seat in this section.

Seat Belt Buckle - Front

Removal

1. Remove the seat stanchion cover. Refer to Seat Stanchion Cover in this section.
2. Remove the seat belt buckle bolt and the seat belt buckle.



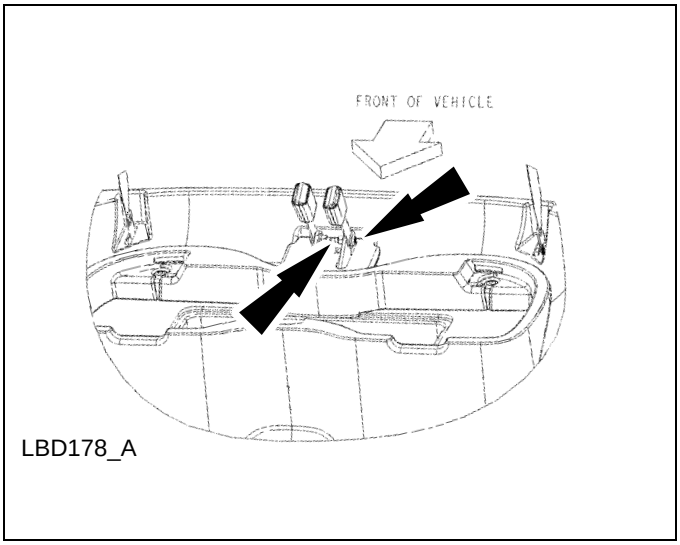
Installation

1. Reverse the removal procedure.
2. Tighten the seat belt buckle bolt to 26-34N.m (19-25 lb-ft.).

Seat Belt Buckle - Rear

Removal

1. Pull up and remove the rear seat cushion.
2. Remove the rear seat belt buckle bolt and the rear seat belt buckle.



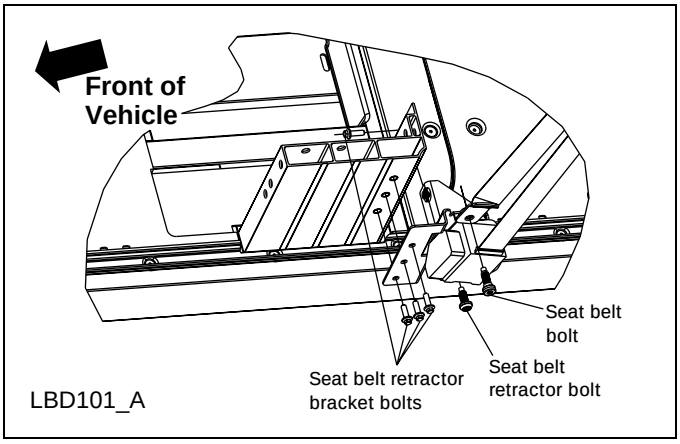
Installation

1. Reverse the removal procedure.
2. Tighten the seat belt buckle bolt to 26-34N.m (19-25 lb-ft.).

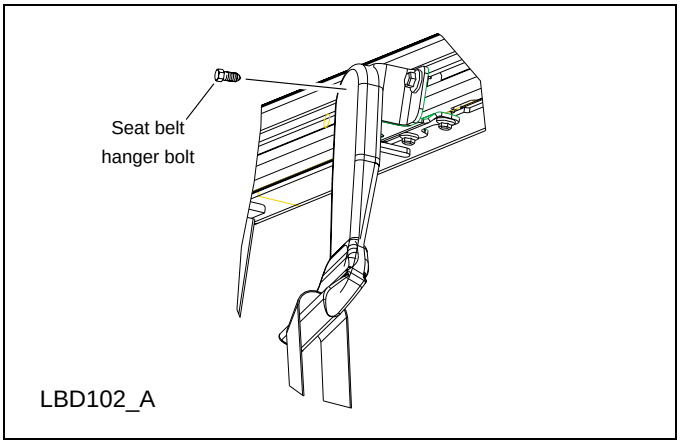
Seat Belt Retractor - Front

Removal

1. Remove the seat stanchion cover. Refer to Seat Stanchion Cover in this section.
2. Remove the seat belt bolt and seat belt retractor bolt.



3. Pry down the rubber hanger cover. Remove the seat belt hanger bolt and the retractor and belt assembly.



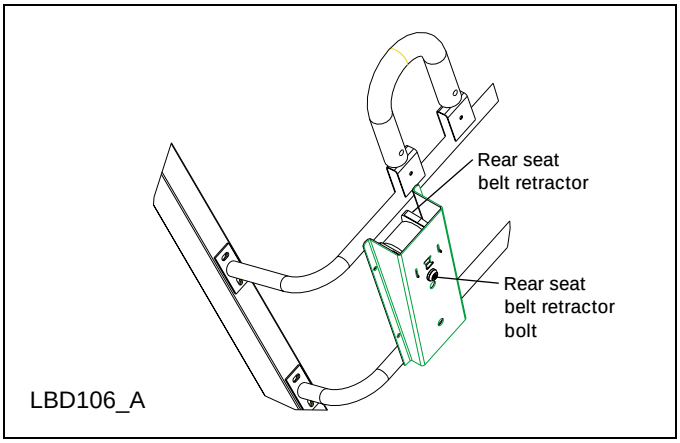
Installation

1. Reverse the removal procedure.
2. Tighten the seat belt hanger bolt to 26-34N.m (19-25 lb-ft.).
3. Tighten the front seat belt retractor bolt to 26-34N.m (19-25 lb-ft.).
4. Tighten the seat belt bolt to 26-34N.m (19-25lb-ft.).

Seat Belt Retractor - Rear

Removal

1. If equipped, remove the golf rack. Refer to Golf Rack in this section.
2. Remove the four rear seat back cover screws and the rear seat back cover.
3. Remove the rear seat belt retractor bolt and the retractor.



Installation

1. Reverse the removal procedure.
2. Tighten the seat belt retractor bolts to 26-34N.m (19-25lb-ft.).
3. Tighten the four rear seat back covers to 10N.m (88lb-in.).

Seat Cushion

Removal

Remove the seat cushion by lifting up on the cushion to disengage the seat clips.

Installation

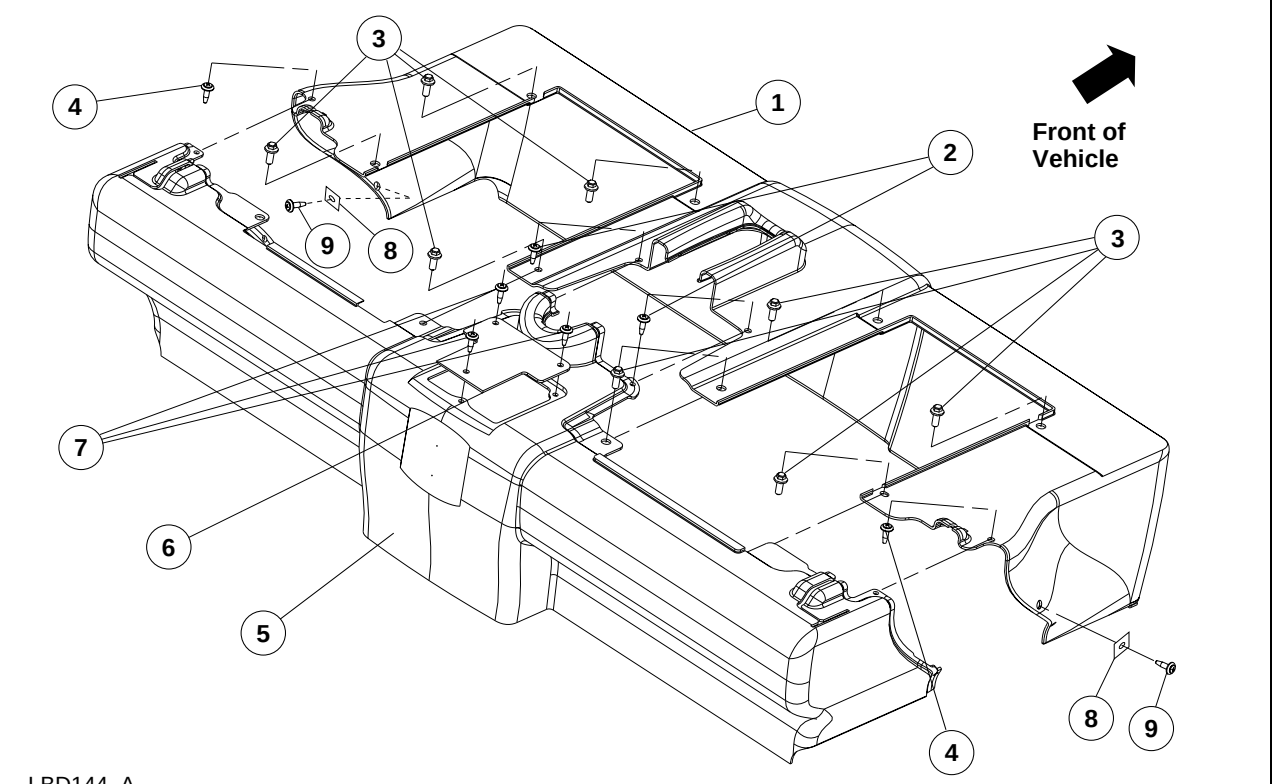
Set the seat cushion in place and firmly push down to engage the clips.

Seat Cushion Cover

Removal and Installation

Seat cushion covers are not serviceable separate from the seat cushion. Refer to Seat Cushion in this section.

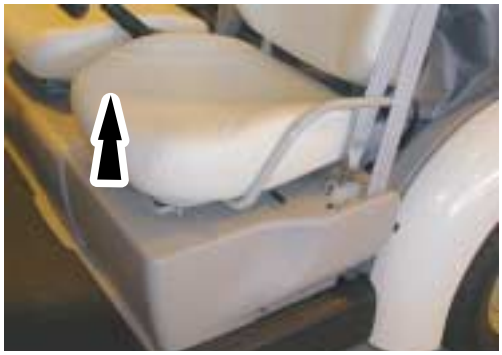
Seat Stanchion Cover



Item	Part Number	Description
1	62284	Seat Stanchion Cover – Front
2	--	Seat Stanchion Cover Pushpin – Center
3	--	Seat Stanchion Cover Bolts
4	--	Seat Stanchion Cover Pushpin – Side
5	62284	Seat Stanchion Cover – Rear
6	62284	Access Cover
7	--	Cover Panel Pushpins
8	--	Insert Nut
9	--	Seat Stanchion Cover Screw – Side

Removal

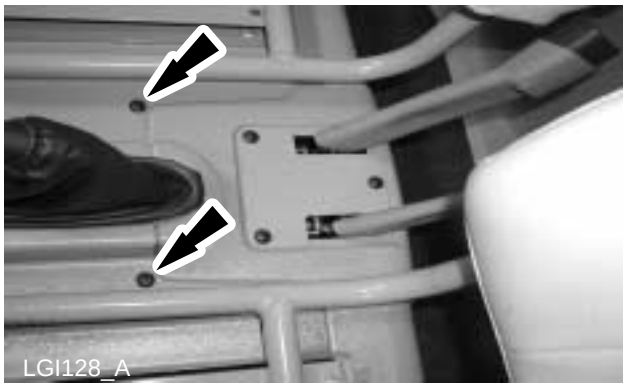
1. Pull straight up on the front seat cushions to release the clips.



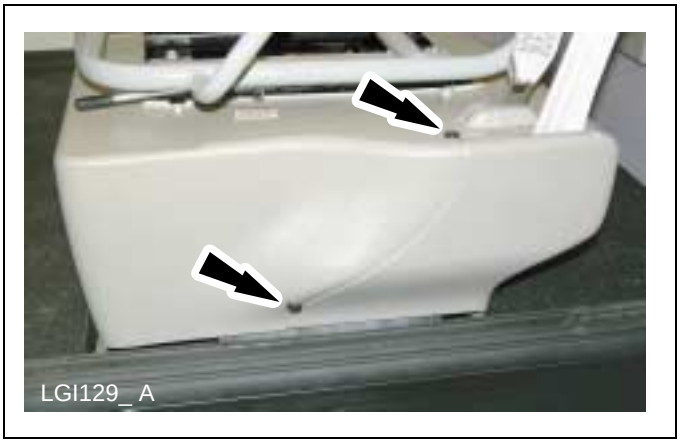
LGI127_A

2. On two-passenger vehicles, remove the front seats. Refer to Seat Back and Frame – Driver Seat and Seat Back and Frame - Passenger Seat in this section.

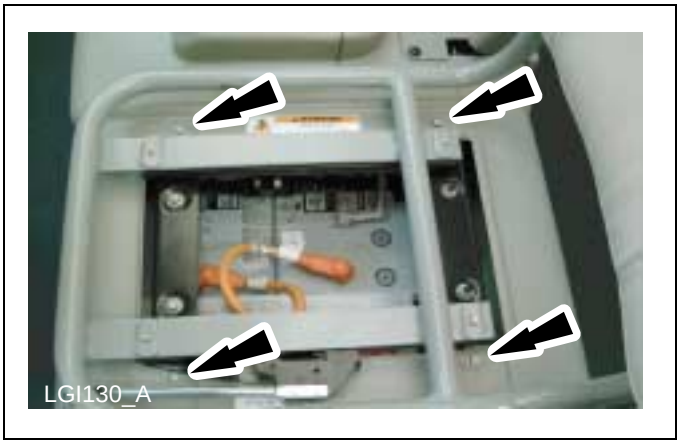
3. Remove the two center pushpins.



4. Remove the side pushpin and screw. Repeat on the other side of the vehicle.



5. Remove the eight seat stanchion cover bolts.



6. Carefully slide the front seat stanchion cover forward and out of the vehicle.
7. Carefully slide the rear seat stanchion cover rearward and lift out of vehicle.

Installation

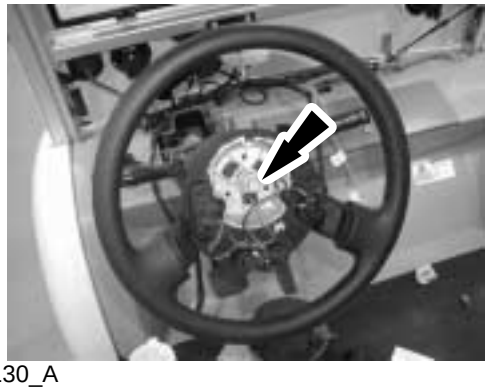
1. Reverse the removal procedure.
2. Tighten the seat stanchion cover bolts to 8N.m (70lb-in.).

Steering Wheel

Removal

1. Carefully pull on the edges of the steering wheel cover and remove from the steering wheel.

2. Remove the steering wheel bolt and pull the steering wheel straight off the steering column.



LEL130_A

Installation

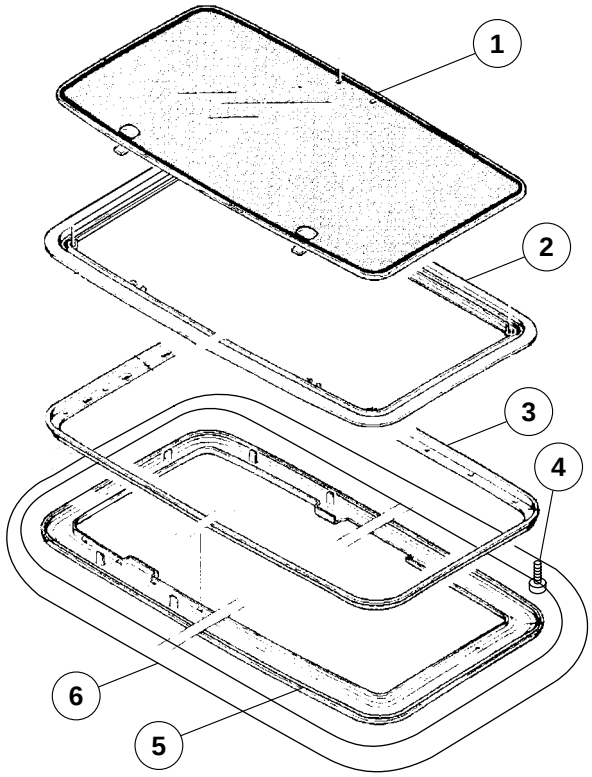
Note:

If necessary, adjust the toe equally to ensure clear vision.

1. Reverse the removal procedure.

2. Tighten the steering wheel bolt to 47N.m (34lb-ft.).

Sun Roof/Roof Vent



LBD154_A

Item	Part Number	Description
1	Part of 502A82	Sun Roof/Roof Vent Glass (includes handle and hinges)
2	Part of 502A82	Sun Roof/Roof Vent Glass Frame
3	Part of 502A82	Sun Roof/Roof Vent Retainer
4	Part of 502A82	Sun Roof/Roof Vent Screws
5	Part of 502A82	Sun Roof/Roof Vent Trim
6	034S08	Sun Roof/Roof Vent Trim Seal

Removal

1. Carefully pull down on the sun roof/roof vent trim and remove.
2. Remove the 24 sun roof/roof vent screws and the sun roof/roof vent retainer.
3. Carefully lift the sun roof/roof vent glass and frame off the vehicle.

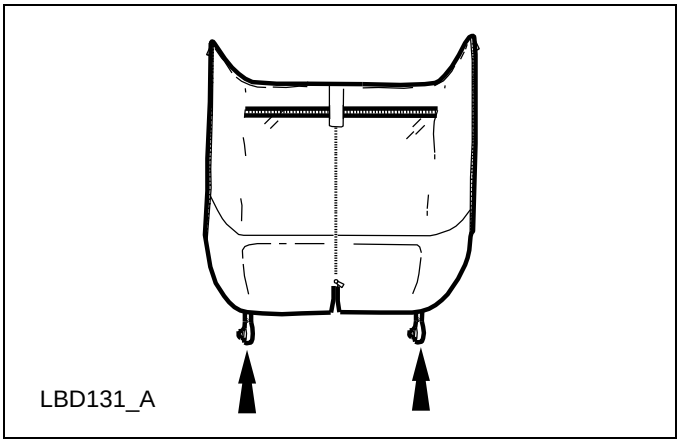
Installation

1. Clean an area 12mm (0.47in) from the edge around the sun roof/roof vent opening with Multi-Purpose Cleaner Concentrate B8A-19523-AA meeting Ford specification ESR-M14P4-A (diluted to proper concentration) or equivalent.
2. Carefully lower the sun roof/roof vent glass and frame onto the vehicle.
3. Install the sun roof/roof vent retainer and the 24 sun roof/roof vent screws. Tighten the sun roof/roof vent screws to 3N.m (26lb-in.).
4. Press the sun roof/roof vent trim into place.

Weather Enclosure

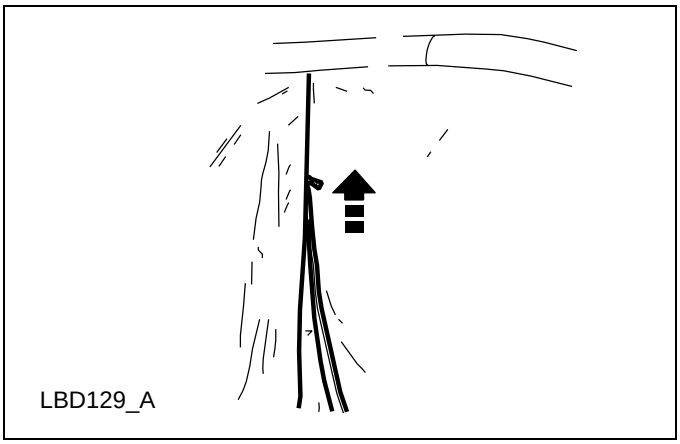
Removal

1. On 2-passenger and 4-passenger vehicles, unfasten the two rear mounting hooks from the rear fenders.

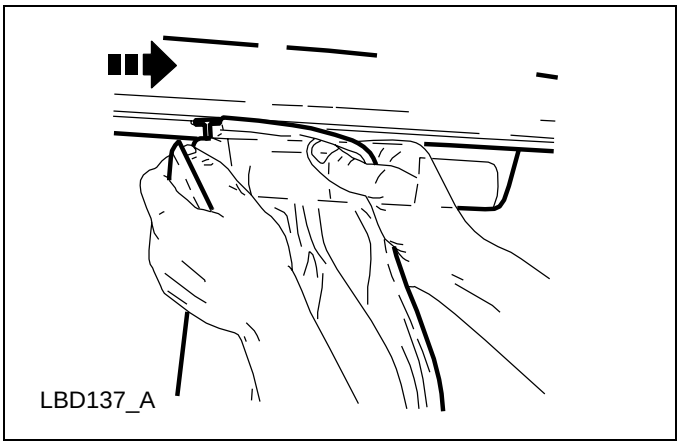


2. On 2-passenger wagons, unfasten the two rear mounting hooks from the rear bumper.

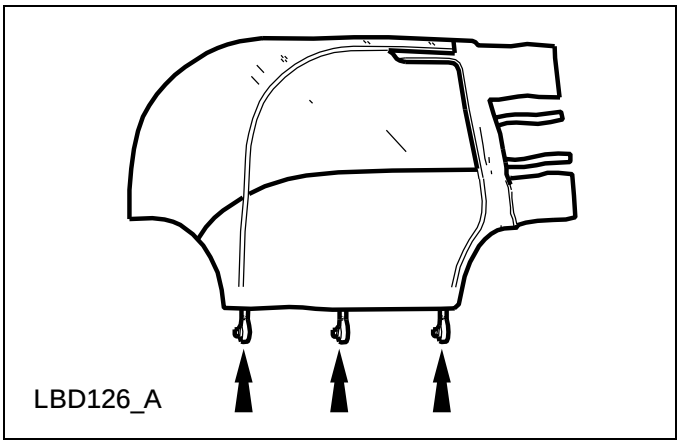
3. Unzip the two rear weather enclosure to side weather enclosure zippers.



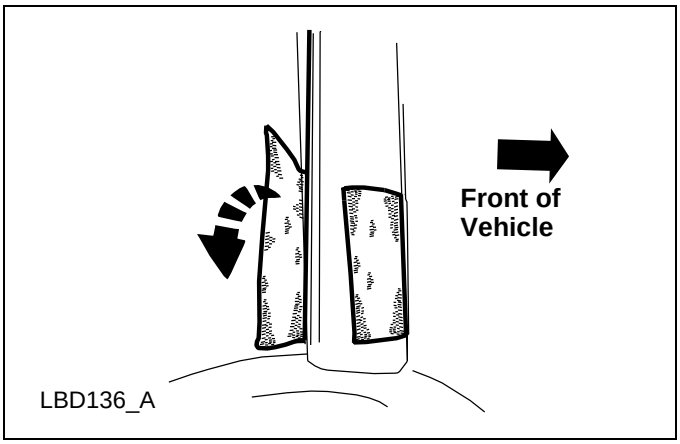
4. Remove the rear weather enclosure hangers from the slots near the high-mount stop lamp.



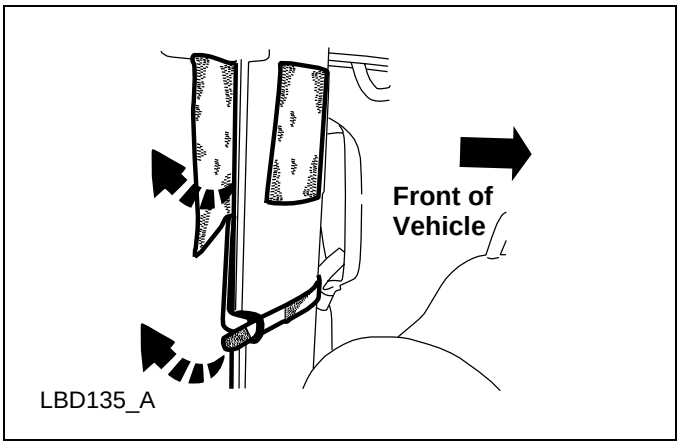
5. Unfasten the three side weather enclosure mounting hooks from the openings in the frame rail.



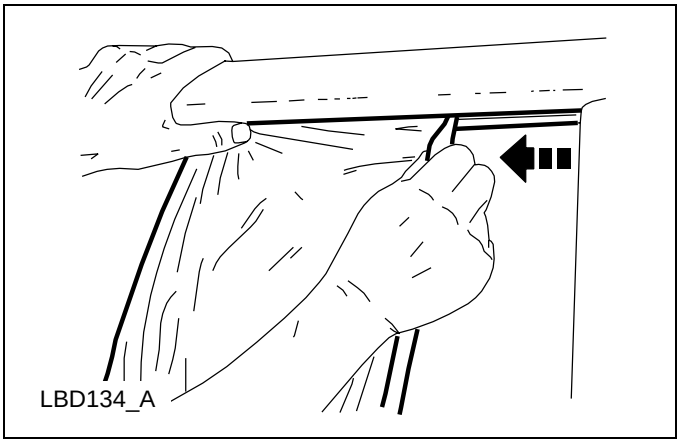
6. Pull apart the large lower attaching strap.



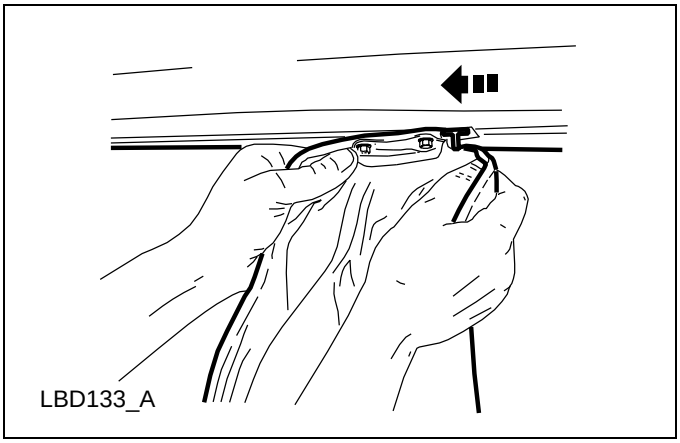
7. Pull apart the large upper attaching strap and the thin attaching strap.



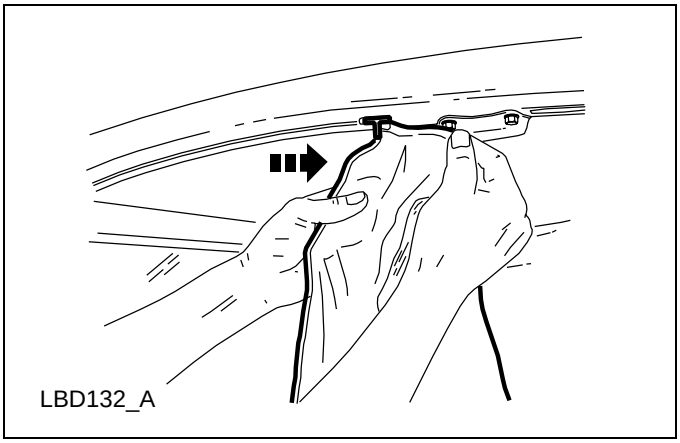
8. Slide the hanger forward, away from the B-pillar.



9. Remove the side weather enclosure rear hanger from the slot on the underside of the roof rail by the seat belt hanger bracket.



10. Slide the hanger away from the front fender.



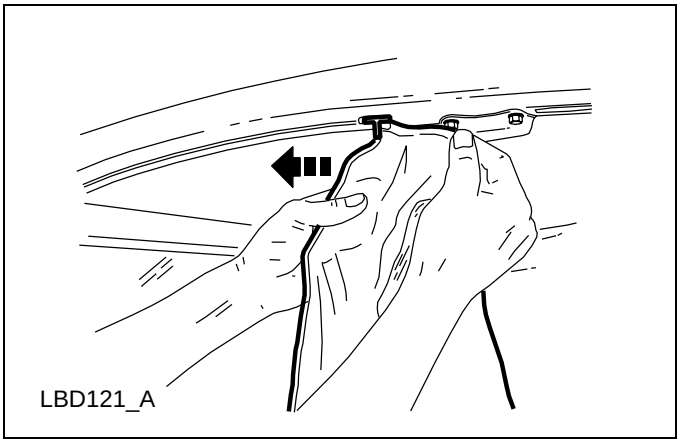
11. Remove the side weather enclosure front hanger from the slot on the underside of the roof rail by the seat belt hanger bracket.

12. Repeat steps 5 - 11 for the opposite side of the vehicle.

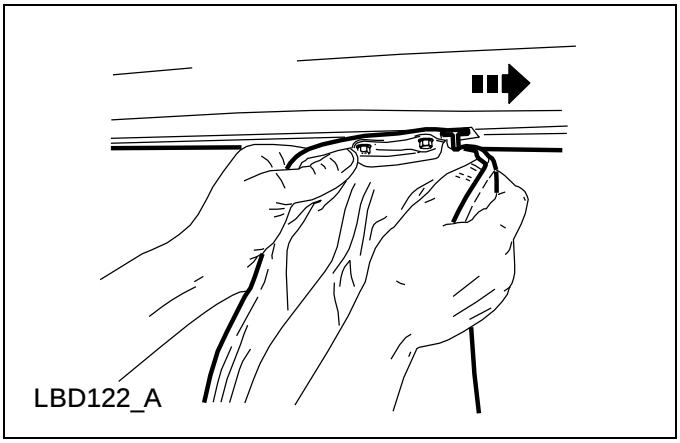
Installation

1. Insert the side weather enclosure front hanger into the slot on the underside of the roof rail by the seat belt hanger bracket.

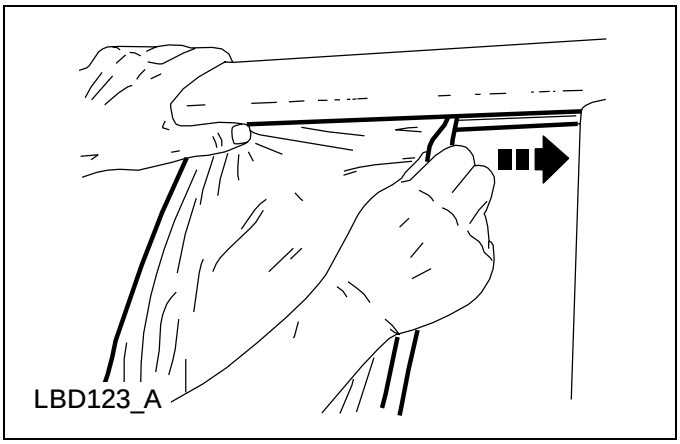
2. Slide the hanger forward until it reaches the front fender.



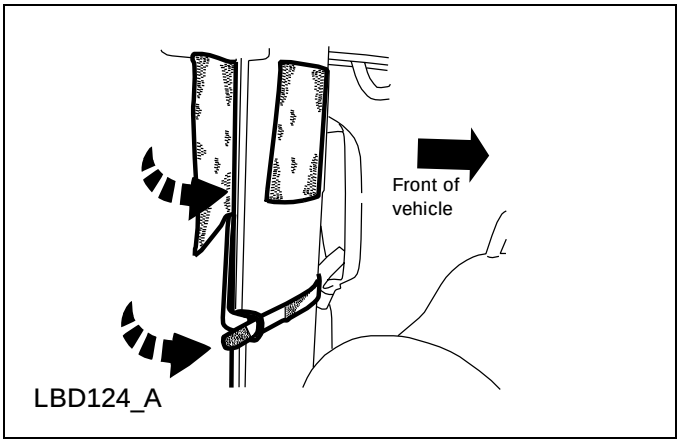
3. Insert the side weather enclosure rear hanger into the slot on the underside of the roof rail by the seat belt hanger bracket.



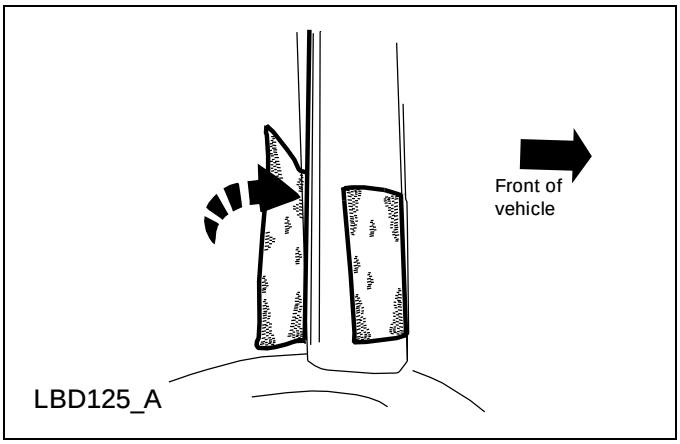
4. Slide the hanger rearward until it reaches the B-pillar.



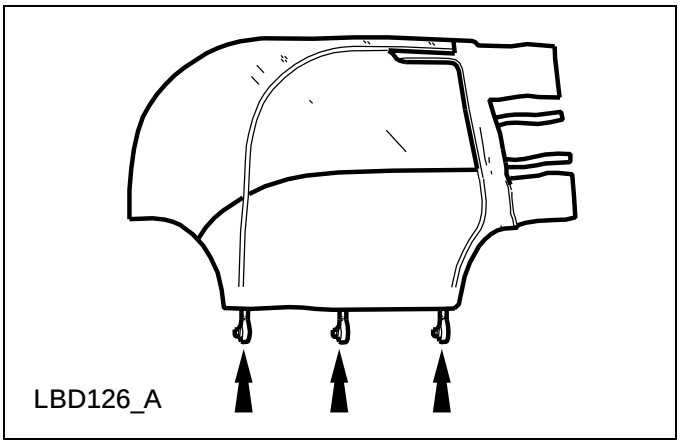
5. Wrap and fasten the large upper attaching strap. Insert the thin attaching strap through the D-ring and fasten securely.



6. Wrap and fasten the large lower attaching strap.

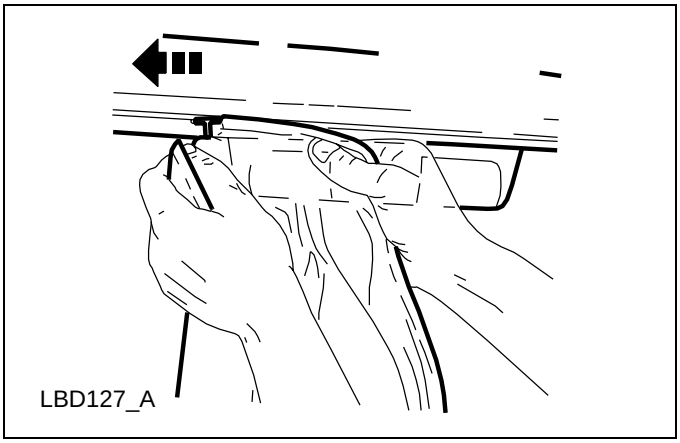


7. Attach the three mounting hooks to the openings in the frame rail.

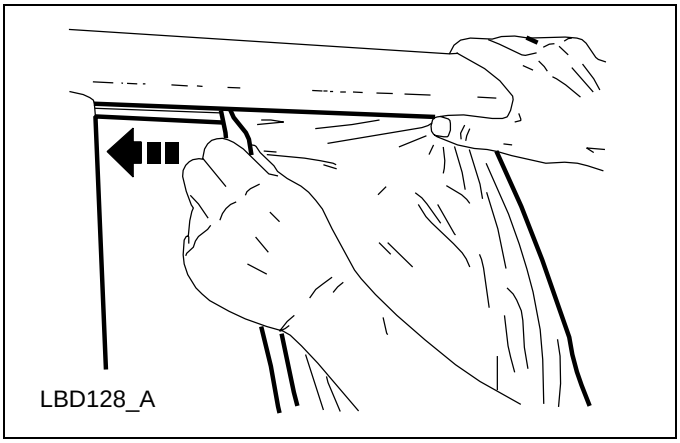


8. Repeat steps 1 - 7 for the opposite side of the vehicle.

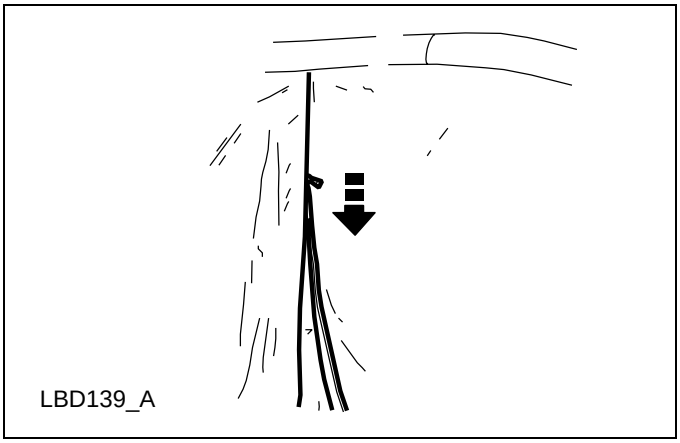
9. Insert the rear weather enclosure hanger into the slot near the high-mount stop lamp.



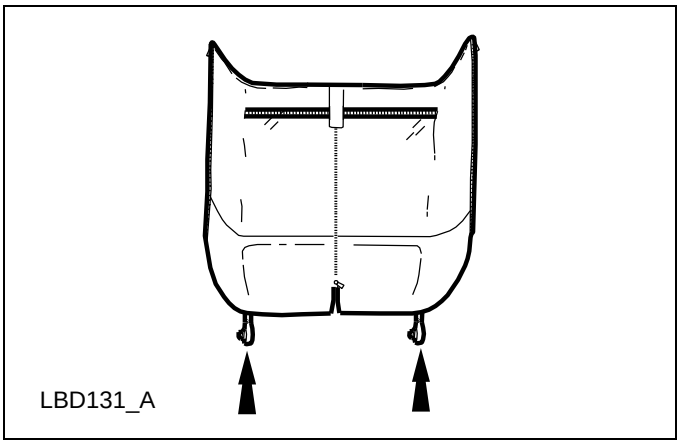
10. Slide the hanger towards the B-pillar.



11. Zip the weather enclosure to side weather enclosure zipper. Repeat on the other side of the vehicle.



12. On 2-passenger and 4-passenger vehicles, attach the two rear mounting hooks to the rear fenders.



13. On 2-passenger wagons, attach the two rear mounting hooks to the rear bumper.

Windshield

Required Tools

Knife, Windshield Glass Sealant T70P-42006-A or Equivalent	 LBD193_A

Removal

1. Remove the windshield wiper arms.

2. Remove the rearview mirror.

3. Lubricate the urethane sealant with a soap and water solution to aid the Windshield Glass Sealant Knife when cutting the urethane sealant.

WARNING!
TO PREVENT GLASS SPLINTERS FROM ENTERING THE EYES OR CUTTING THE HANDS, WEAR SAFETY GLASSES AND HEAVY GLOVES WHEN CUTTING THE GLASS FROM THE VEHICLE.

4. Insert the Windshield Glass Sealant Knife into the urethane sealant at the upper center of the vehicle interior, and work toward the bottom corners.

Note:

Support the windshield, to prevent the glass from dropping, before cutting the bottom edge of the urethane sealant.

5. Insert the Windshield Glass Sealant Knife into the bottom center of the urethane sealant on the vehicle exterior, and work toward the corners.

CAUTION:
Removing the glass requires more than one technician.

6. Carefully remove the windshield glass from the vehicle.

7. Trim the remaining urethane. The old urethane must be smooth and free of cuts and contamination.

8. Remove the inner seal from the windshield mounting flange.

Installation

1. Check the windshield mounting area for damage, or foreign material that could cause glass damage.

2. Clean the mounting flange inside the vehicle where the inner seal is mounted using Extra Strength Tar and Road Oil Remover B7A-19520-AA or equivalent meeting Ford specification ESR-M5B106-A.

3. Apply Essex Betaseal 43532 (Body Primer) or equivalent meeting Ford specification WSB-M2G234-C to any exposed metal on the windshield mounting surface using either a clean rag or clean sponge applicator.

   - Do not apply the primer to the existing urethane bead.

   - Let the primer dry for a minimum of 6-10 minutes before proceeding.

4. Properly align the windshield glass to the body, mark the body-mounting surface, and remove the windshield glass from the vehicle.

   - Place the windshield glass in the opening, and center it from top to bottom and side to side with about equal clearance on all sides.

   - Make alignment marks on each of the four sides of the windshield glass.

   - Remove the windshield glass from the vehicle, and place it inside up.

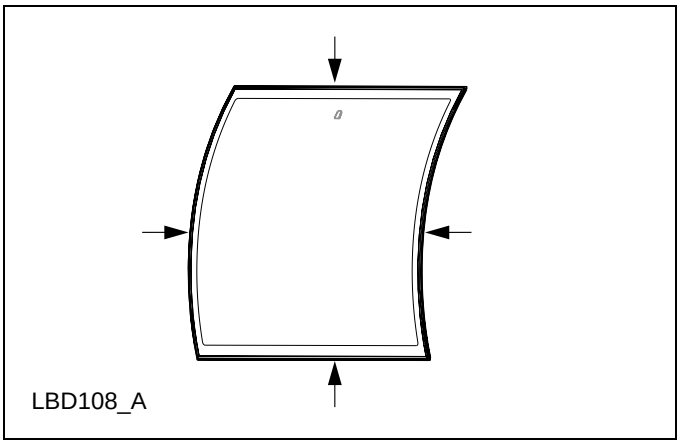
5. If re-installing the same windshield glass, remove all remaining traces of urethane sealant.

6. Clean the inside of the windshield glass using isopropyl alcohol wipes or Ultra-Clear Spray Glass Cleaner E4AZ-19C507-AA or equivalent meeting Ford specification ESR-M14P5-A.

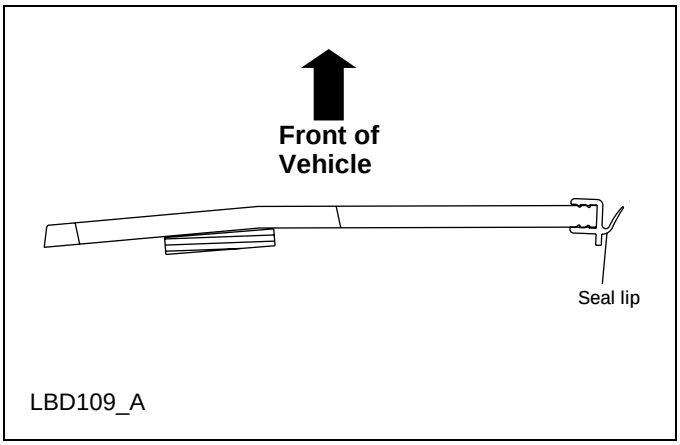
7. Apply Essex Betaseal 43519 (Glass Primer) or equivalent meeting Ford specification WSB-M5B280-B to the entire inside perimeter of the windshield glass. Wipe off immediately after each application.

8. Apply Essex Betaseal 43520A (Glass Primer) or equivalent meeting Ford specification WSB-M2G314-B to the entire inside perimeter of the windshield glass. Allow a minimum of 5 minutes drying time.

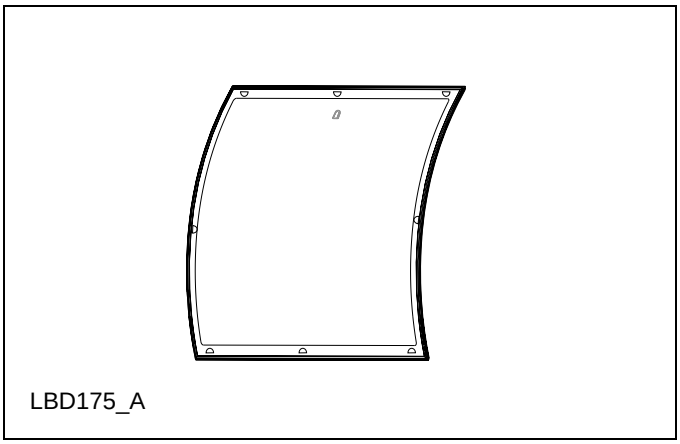
9. Install the windshield seal (4G4631) on the windshield.



10. Make sure the seal lip faces outward of the vehicle.



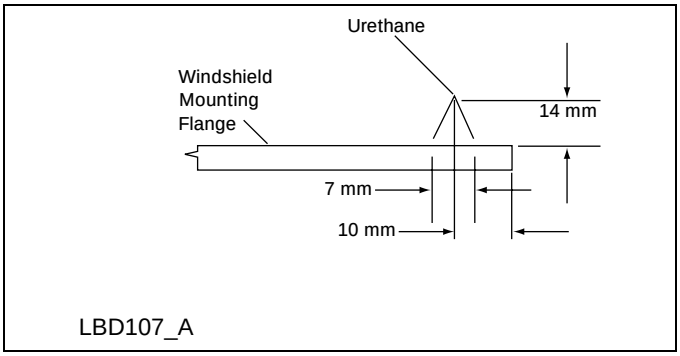
11. Cut four spacers (V030T12) in half to be half moon shaped. Install the spacers on the windshield glass with the flat edge against the windshield seal.



Note:

The windshield glass must be positioned within 10 minutes of applying the urethane sealant.

12. Apply a 7mm (0.28inch) wide bead of Essex Betaseal 57302 (Urethane) or equivalent meeting Ford specification WSB-M2G316-B to the entire primed area of the windshield glass.



CAUTION:

After replacing the urethane-installed glass, the vehicle must not be driven until the urethane has cured. The curing time at temperatures above 13ºC (55ºF) and relative humidity above 50% is 12-24 hours (decreasing at higher temperatures and lower humidity). Inadequate curing of the urethane can adversely affect the strength of the urethane sealant bond.

13. Position the windshield glass on the vehicle, aligning it with the marks.

14. Wipe off any excess urethane sealant.

15. Install the rearview mirror.

16. Install the windshield wiper arm.

Body Repair and Cleaning

Note:

If the surface of any of the body panels, including the instrument panel, has been scratched to the point where it has gone through the top gel coat, the panel cannot be repaired and will have to be replaced to ensure proper color and shine. Only minor surface scratches can be polished out.

Light Scuff Repair

Required Tools

1,000 rpm buffing tool

1. Clean the entire area of the repair. Clean water is fine for this purpose; do not use solvent, as this will damage the plastic surface.

2. Install the cutting pad #7006 on the buffer. (Maroon pad.)

3. Spread the compound on the area of repair. Use about as much as it takes to cover a half-dollar coin; this is a good starting point.

4. Set the buffing tool to the lowest possible speed on the dial. Do not buff at a high speed as this will heat and warp the material.

5. Buff the damaged area until the surface scuff disappears. A second and third application of the compound may be required. Keep the buffer moving over the surface, this will help keep the surface cool. Clean the compound residue off the surface after each buffing operation. Do not continue to buff the compound until dry, or buff the surface of the plastic when dry. When all of the scuff marks have been buffed out, the surface may still appear a little dull; if so, proceed to step #6.

6. Install the polishing pad #9006 on the buffer. (Tan pad.)

7. Spread the #8232 polish on the surface as in step #3.

8. Polish to a high luster, or as required to match the surrounding material.

9. Wipe clean with a soft clean cloth; any dirt on the cloth will mar the surface.

Scratch Repair

Required Tools

1,000 rpm buffing tool

1. Clean the entire area of the repair. Clean water is fine for this purpose, do not use solvent, as this will damage the plastic surface.

2. Install the interface-sanding pad onto the finishing sander. Attach the sanding film to the interface pad. (Take care in centering the sanding pad and film on the sander.)

3. Sand the surface using about 45 psi. air pressure at the tool inlet; do not sand at a high pad speed because the speed causes the sanding film to load with dust and heats the surface of the plastic. Proper sander pad speed is based on cut and travel speed of the pad, and the downward pressure applied by the operator. To clean the sanding pad surface, run the sander face at 90 degrees on the edge of a piece of cardboard. This cleaning operation will help keep the sanding film clean and run cooler. Continue to sand the surface until the original scratch damage is no longer visible. Wipe the surface with a cloth, and then inspect to be sure the entire original scratch has been fully sanded away.

4. Install the cutting pad #7006 on the buffer. (Maroon pad.)

5. Spread the compound #8432 on the area to be repaired. Use about as much as it takes to cover a half-dollar coin; this is a good starting point.

6. Set the buffing tool to the lowest possible speed on the dial; do not buff at a high speed as this will heat and warp the material.

7. Buff the sanded area until the sanding marks disappear.

8. A second and third application of the compound may be required. Keep the buffer moving over the surface; this will help keep the surface cool. Clean the compound residue off of the surface after each buffing operation. Do not continue to buff the compound until dry, or buff the surface of the plastic when dry.

9. When all of the scuff marks have been buffed out, the surface may still appear a little dull. If so, proceed to step 10.

10. Install the polishing pad #W-9006 on the buffer. (Tan pad.)

11. Spread the #8232 polish on the surface as in step 5

12. Polish to a high luster, or as required to match the surrounding material.

13. Wipe clean with a soft clean cloth; any dirt on the cloth will mar the surface.

Deep Gouge Repair for White Body Panels

Required Tools

1,000 rpm buffing tool

1. Clean the entire area of the repair. Clean water is fine for this purpose; do not use solvent, as this will damage the plastic surface.

2. Install the interface-sanding pad onto the finishing sander. Attach 500 grit sanding film to the interface pad. (Take care in centering the sanding pad and film on the sander.)

3. Sand the surface using about 45 psi air pressure at the tool inlet; do not sand at a high pad speed because the speed causes the sanding film to load with dust and heats the surface of the plastic. Proper sander pad speed is based on cut and travel speed of the pad, and the downward pressure applied by the operator. To clean the sanding pad surface, run the sander face at 90 degrees onto the edge of a piece of cardboard. This cleaning operation will help keep the sanding film clean and run cooler. Continue to sand the surface until the original gouge damage is no longer visible. Wipe the surface with a cloth, and then inspect to be sure the entire original gouge has been fully sanded away (very important).

4. Attach 800 grit sanding film to the sander and sand the surface so as to remove all of the 500 grit sand scratches.

5. Pay close attention to the edges surrounding the gouge. Any 500 grit scratches left behind will be very hard to remove with the buffing operation.

6. Install the cutting pad #W-7006 on the buffer. (Maroon pad.) Spread the compound on the area to be repaired. Use about as much as it takes to cover a half-dollar coin; this is a good starting point.

7. Set the buffing tool to the lowest possible speed on the dial; do not buff at a high speed as this will heat and warp the material.

8. Buff the sanded area until the sanding marks disappear. A second and third application of the compound may be required. Keep the buffer moving over the surface; this will help keep the surface cool. Clean the compound residue off of the surface after each buffing operation. Do not continue to buff the compound until dry, or buff the surface of the plastic when dry.

9. When all of the scuff marks have been buffed out the surface may still appear a little dull; if so, proceed to step 10.

10. Install the polishing pad #W-9006 on the buffer. (Tan pad.)

11. Spread the #8232 polish on the surface as in step 6.

12. Polish to a high luster, or as required to match the surrounding material

13. Wipe clean with a soft clean cloth; any dirt on the cloth will mar the surface.

Deep Gouge Repair for Non-White Body Panels

Required Tools

1,000 rpm buffing tool

1. Clean the entire area of the repair. Clean water is fine for this purpose; do not use solvent, as this will damage the plastic surface.

2. Install the interface-sanding pad onto the finishing sander. Attach 500 grit sanding film to the interface pad. (Take care in centering the sanding pad and film on the sander.)

3. Sand the surface using about 45 psi air pressure at the tool inlet; do not sand at a high pad speed because the speed causes the sanding film to load with dust and heats the surface of the plastic. Proper sander pad speed is based on cut and travel speed of the pad, and the downward pressure applied by the operator. To clean the sanding pad surface, run the sander face at 90 degrees onto the edge of a piece of cardboard. This cleaning operation will help keep the sanding film clean and run cooler. Continue to sand the surface until the original gouge damage is no longer visible. Wipe the surface with a cloth, and then inspect to be sure the entire original gouge has been fully sanded away (very important).

4. Fill damaged area with Evercoat body filler (2-part system) and allow to completely dry.

5. Sand down high spots with 500-grit paper. If recesses are still visible due to filler shrinkage, apply second skim coat and again allow to dry completely, then sand surface flush with surrounding area.

6. Apply DuPont Full-Thane Primer 421-15 over body filler.

7. Once primer is completely dry, clean surface with DuPont 3939 cleaner, and again allow surface to dry completely.

8. Apply 42470 Sealer over body filler.

9. Apply color-matched paint system with HVLP paint sprayer according to supplier's recommendations to meet WeatherPro G's surface finish, i.e. DuPont's two part Base/clear coat system.

Wagon Box Cleaning

The wagon box is an all aluminum unit that can be cleaned using commercially available wheel cleaners. A very mild abrasive household cleaner can be used to clean mild blemishes but may change the appearance of the box and should be done with the grain of the panel and may have to be done on the entire panel to ensure a consistent appearance.

If the box has minor scratches they can be removed using “Scotch-Brite” pads. The appearance of the box may be affected and should be done with the grain of the panel and may have to be done on the entire panel to ensure a consistent appearance.

If the above procedures do not work cleaning and polishing the box may be necessary. An aluminum wheel cleaner & polish can be used but will change the appearance of the box and should be done to the entire visible surface of the box to ensure a consistent appearance.

Frame Repair

Aluminum Alloys, Notes for Manual Welding

- Aluminum alloys melt without changing color when heated. Temperature crayons should be used to monitor temperature.
- Aluminum is more susceptible to heat distortion than steel.
- Approximate melting temperatures for 6061 and 6063 aluminum alloys are 582-654°C (1080-1210° F).
- Make sure to check all measurements prior to welding.
- Non Silicon grinding equipment only. Silicon residue may cause subsequent weld failure.

Manual Welding Equipment

- MIG welder with output current of approximately 200A and maximum output at 30% duty cycle.
- Protective hat, gloves, eyewear, eye shield, dust proof mask, apron, welding gloves and safety shoes.
- Only welding wire 4043 should be used while welding the aluminum on this frame.
- Welding wire diameter should be 0.9-1.2mm (0.035-0.047in.).
- Do not use welding gas other than 100% argon gas.

- The argon gas flow rate should be set per manufacturers recommendation, typically: to a rate or 35-50 cubic feet/hour. Normally the higher the flow rate within specification the better quality weld.

- MIG welding is the only approved method.

Manual Welding Techniques

Individuals trained and experienced with aluminum welding should only perform welding.

When welding is performed anywhere on the vehicle, precautionary measures should be taken to prevent damage to electrical system wiring or components. Prior to welding, any parts that could be damaged by excessive temperatures should be removed or adequately shielded. Also prior to welding, remove the batteries and then disconnect the instrument cluster gauge, motor controller, DC/DC converter(s) and battery charger. Computer processors should be removed if welding is to be done within their close proximity. Welding cables should never be allowed to lie on, near, or across any electrical wiring or electronic component during welding. After welding, when parts are cool, carefully inspect wiring and electrical components for shorts or other damage which could draw excessive currents and possibly cause an electrical system short when the battery is reconnected.

- The welding ground clamp should be positioned as close to the weld area as possible.

- Aluminum alloys are welded at a higher gun feed speed than steel plates.

- Using the forehand welding sequence for the gun advance direction may help minimize the formation of black soot.

- Prior to servicing the frame, practice welds should be performed on the damaged area removed from the frame to establish welding parameters.

- Emphasis should be placed upon weld application techniques to avoid stress risers that may adversely affect frame-operating stresses.

- When welding multiple layers of a thick material, brush the surface of the welded area thoroughly using a stainless steel wire brush after each pass.

- If possible, back fill welds to protect against cracks propagating from “fisheye”.

Cleaning

Note:

The use of compressed air is not recommended due to contaminants in the airline. If compressed air is required, re-clean the surface afterwards using and oil/grease remove and a clean dry cloth.

Note:

Whatever oil/grease remover is used must evaporate completely and CANNOT leave a film or residue on the surface.

1. Use a wax and grease remover to clean any dirt, oil or grease prior to welding.

2. If the aluminum alloy surface is coated with a paint film or other coatings, use a disc sander and #80 sanding disc to remove the paint or coatings from the weld lines to a width of approximately 40mm (1.57inch) from the top and 20mm (0.78inch) from the bottom. If sanding a large area, sand in phases allowing sufficient time for the part to cool between phases.

3. Use a stainless steel wire brush to brush the surface of the aluminum alloy.

4. Do this on both the top and the bottom surfaces to remove thick oxide layer.

5. Use a wax and grease remover to completely clean away any loose oxide from the surface.

Additional Tools

- Tools for welding, grinding, sanding, filing and/or cleaning must be used exclusively for aluminum or steel repair work. Never use the same tools for both aluminum and steel welding.

- Use a stainless steel wire brush; do not use an iron wire brush.

- Sanding discs are very useful for large quantities of material removal. However, they should be used with caution not to decrease the original part gauge (only to remove protrusion or excess surface material).

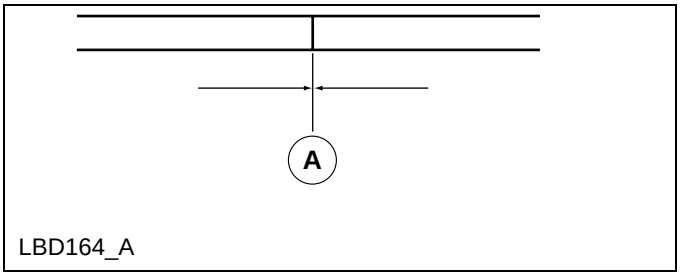
- Do not operate the sanding tool continuously as this heats the surface of the metal. If sanding a large area, sand in phases allowing sufficient time for the part to cool between phases.

- Do not use clogged sanding tools or sandpaper.

Butt Welding

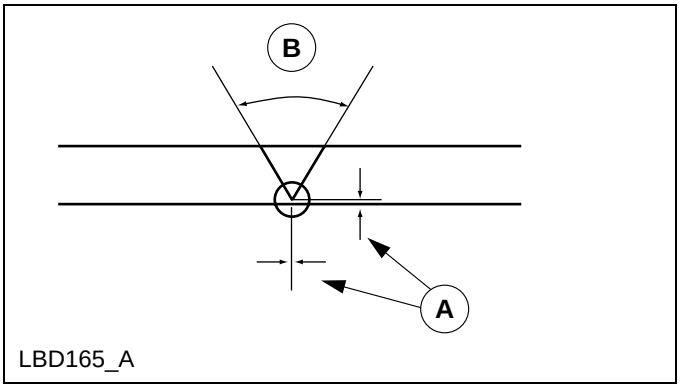
Preparation

- Use a smooth-cut file to prepare the edge to a smooth finish.
- With plates less than 3mm (0.11inch) thick reduce the clearance between plates to 0-0.5mm (0-.01inch) (A) maximum.



LBD164_A

- With plates more than 3mm thick reduce the clearance between plates to 0-.5mm maximum.
- Edge preparation should be performed as follows:
  1. Use a disc grinder or file (rough cut or vixen) to initial prep edges.
  2. Use a disc sander with #80 sanding disc and a file (smooth-cut) to finish preparation of edges.
  3. Edges need to be filed and sanded to the specifications indicated.

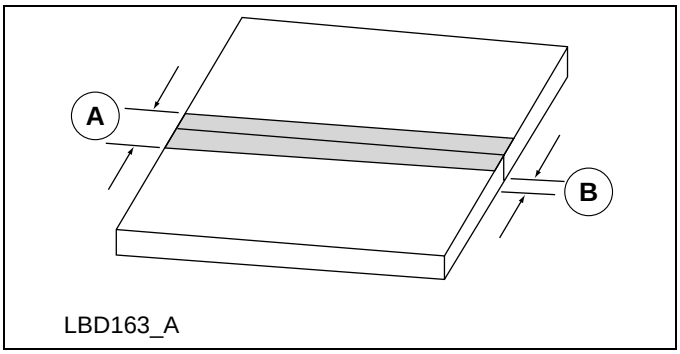


LBD165_A

- Reverse side beads occur because of edge preparation indicated.

Square Edge Sanding

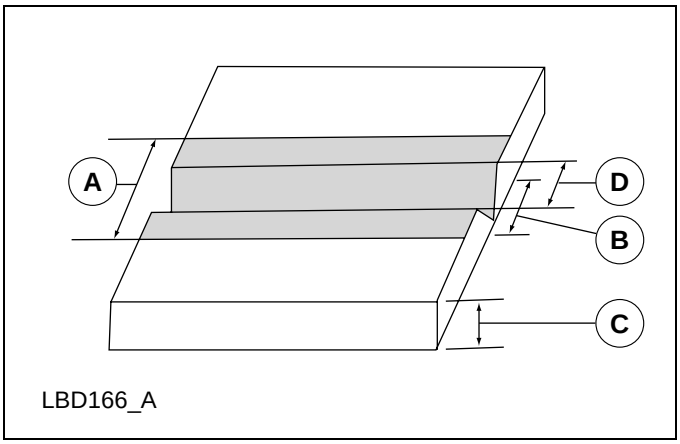
- Sand the top to a width or approximately 40mm (1.57inch) (A) and the bottom width of approximately 20mm (0.78inch) (B).



V-Edge Sanding

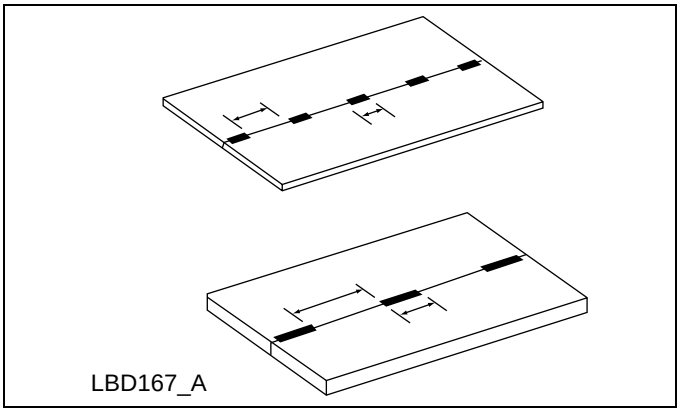
- Sand the top (A) to a width of approximately three times the width of the edge and the bottom width (B) approximately the same as the edge (C).

- Sand the edge preparation area (D).



Tack Welding

- Prior to finish welding, tack weld the areas to prevent strain and enhance joint precision. Weld the plates at several points with short beads.
- The thinner the sheet or plate, the shorter the tack welding pitch and bead.
- Avoid tack welding the ends and corners of the base metal.
- Since the beads left are not ground down afterward, this process should be done as carefully as finish welding.



Note:

Use a stainless steel wire brush to clean the tack weld zones prior finish welding.

Finish Welding

Note:

Use a stainless steel wire brush to clean the tack weld zones prior finish welding.

- Stand in a stable position so that the gun does not move around and is firmly held.
- The weld zone must be visible.
- Maintain the proper distance and gun angle between the gun contact tip and the base metal.
- Adjust the gun feed speed while observing the penetration.
- The gun angle should split the angle of the weld joint cross section. For example, if the parts being welded are at a 90° angle the gun should be held at a 45° +/- 15° angle with a push of 5-15°.

Burn-Through Weld Repair

- Grind off excess weld from the top surface, using a disc having a maximum coarseness of 60 grit.
- Bevel the edges of the hole using either a thin grinding wheel or tapered drill bit
- Clean the weld with an oil/grease remover - wipe the surface dry with a clean cloth.
- Stainless steel wire brush the weld / mating surfaces
- Blow any contaminates out of the weld with compressed shop air.
- Clean the weld with an oil/grease remover - wipe the surface dry with a clean cloth.
- Apply back-up tape to the underside of the melt though hole / slot.
- Re-weld along the same weld line, until the burn-through condition in completely filled.
- Inspect the weld for any other defects and take corrective actions.

Crack Inspection

After welding aluminum alloy, welds must be inspected for cracks.

A penetrating solution containing coloring enables the tester to find minute cracks.

Note:

Perform in a well-ventilated area and follow the manufacturer’s instructions.

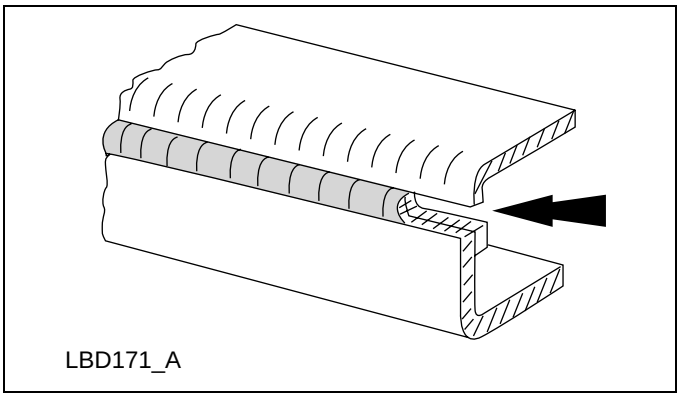
Application method:

1. Wash the inspection surface with the washer.
2. Apply the penetrant solution to the surface and allow ample time to soak in.
3. Wash off any excess penetrant solution remaining on the surface.
4. Apply the developing solution and inspect for cracks

Acceptability Criteria

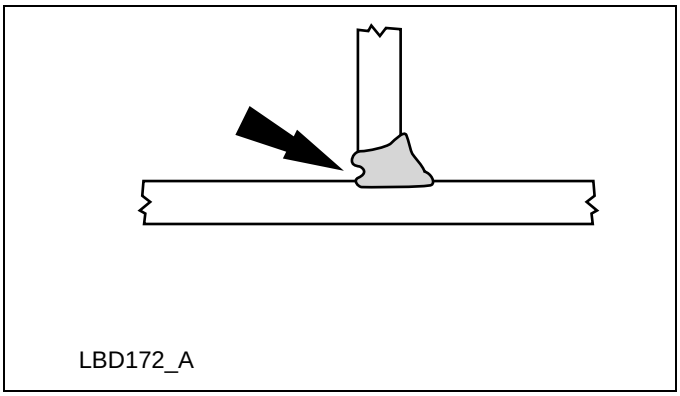
Definitions

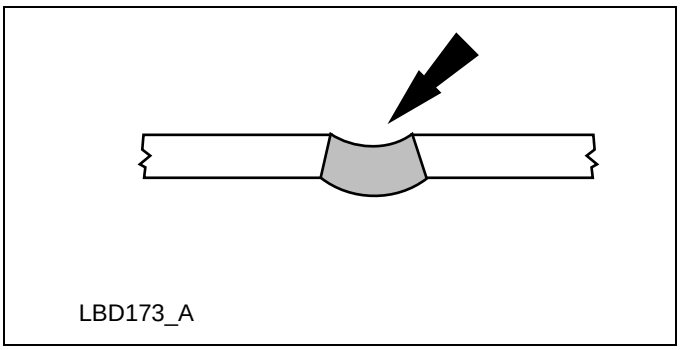
Notching - Gouging of the base metal at the ends or edge of the welded joint.



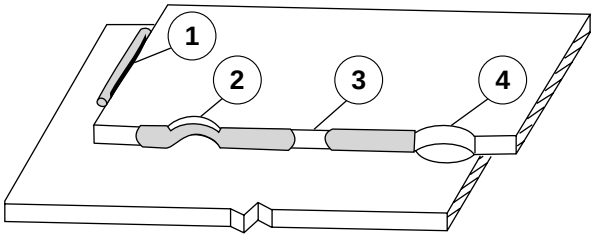
Skip - An unwelded portion of a designated weld.

Suck-back - A concave surface on the side of the base metal opposite the point of weld metal application. It is caused by the solidification shrinkage (6% by volume) when penetrating a high percentage of the base metal without complete penetration through the opposite side. This is illustrated in Figure 4. It also occurs in the overhead position when the weld volume is such that the gravitational force exceeds the surface tension.





Surface Porosity. Individual pinholes, separated by at least their own diameter, and other scattered surface porosity should be permitted. The extension of a single pore must be $\leq$ 0.4t (where t is the gage), max 2 pores / 10mm weld length, and a maximum 10% of the total welding area is allowed to be filled with pores



LBD170_A

Item	Part Number	Description
1	--	Surface Porosity
2	--	Meltback
3	--	Skip
4	--	Burn Through

Blow-hole - A void within the weld, in which there is an absence of filler material and is common to butt joints with internal nodes (aka square groove).

Discrepant weld - A weld that differs from the requirements of this standard. Even though this weld differs, it still may have useful engineering properties.

Gap - The distance or air space between two base components (see Figure 1). Note, that for butt weld joints this distance can be referred to as the root opening.

Melt back - This occurs where the base metal melts back from an edge, but does not become part of the weld. This condition, also referred to as button hooks, leaves a void between the weld deposit and the base metal.

Joint Gap

Maximum allowable joint gap for specific joints is determined by the structural performance required in service and the ability to accommodate the gap during welding. The maximum allowable weld joint gap between adjacent members less than 4.0mm (0.16in.) in thickness should be one-quarter the thickness of the thinner member or 1.5mm (0.059in.). In the case of welding heavier gauges above 4mm (0.16 in.), the gap should not exceed 1.5 mm (0.06 in.). The gap values listed above are the maximum recommended because tighter restrictions may be needed depending on the welding process and joint configuration used. Larger gaps than specified can adversely affect weld geometry, quality, and structural performance, i.e., fatigue life, strength.

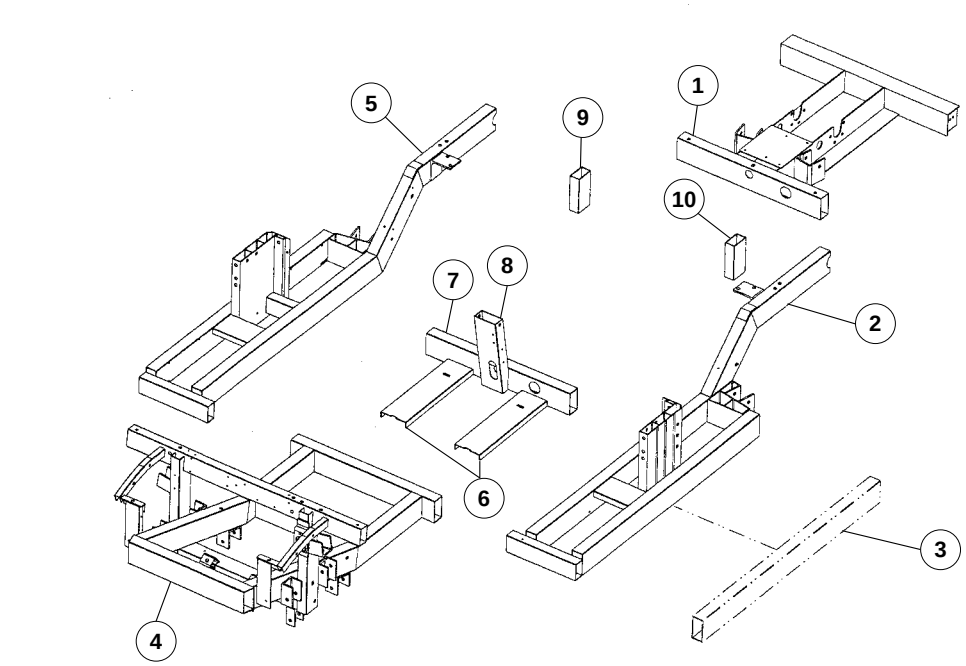
Crack Repair

1. File or grind down a length twice as long as the crack.
2. Thoroughly clean the area. If necessary, refer to Cleaning in this section.
3. Reweld the area.

Frame Straightening

Since the frame consists of extrude honed frame rails, the frame should not be straightened if bent.

Frame Service Parts



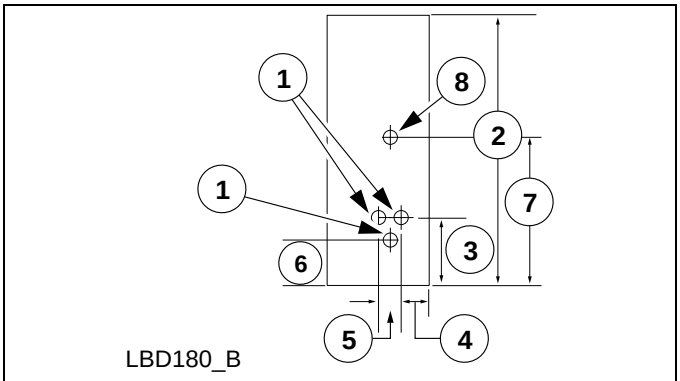
LBD110_A

Item	Part Number	Description
1	5005	Rear Frame Assembly
2	5005	LH Frame Assembly
3	5B010	Frame Extension Sidemember
4	5005	Front Frame Assembly
5	5005	RH Frame Assembly
6	Use flat stock to service	Battery Tray Supports
7	Use 5B010 and cut to specification	Frame Center Support
8	Use 5B010 and cut to specification	Seat Stanchion Center Support
9	Use 5B010 and cut to specification	Rear Frame to Side Frame Extensions - RH
10	Use 5B010 and cut to specification	Rear Frame to Side Frame Extensions - LH

Rear Frame to Side Frame Extensions

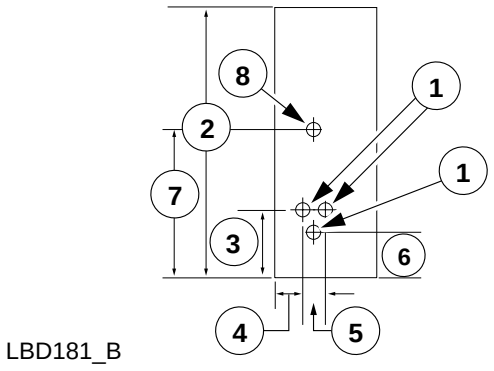
To service the rear frame to side frame extensions, the frame extension sidemember must be used and cut and drilled to the dimensions provided below. The holes should only be drilled on one side of the support.

Left Rear Frame to Side Frame Extension



Item	Specification
1	13.65mm (0.537in)
2	264mm (10.393in)
3	61.1mm (2.405in)
4	28.1mm (1.106in)
5	20mm (0.787in)
6	39.1mm (1.539in)
7	140.4mm (5.527in)
8	13.5mm (0.531in)

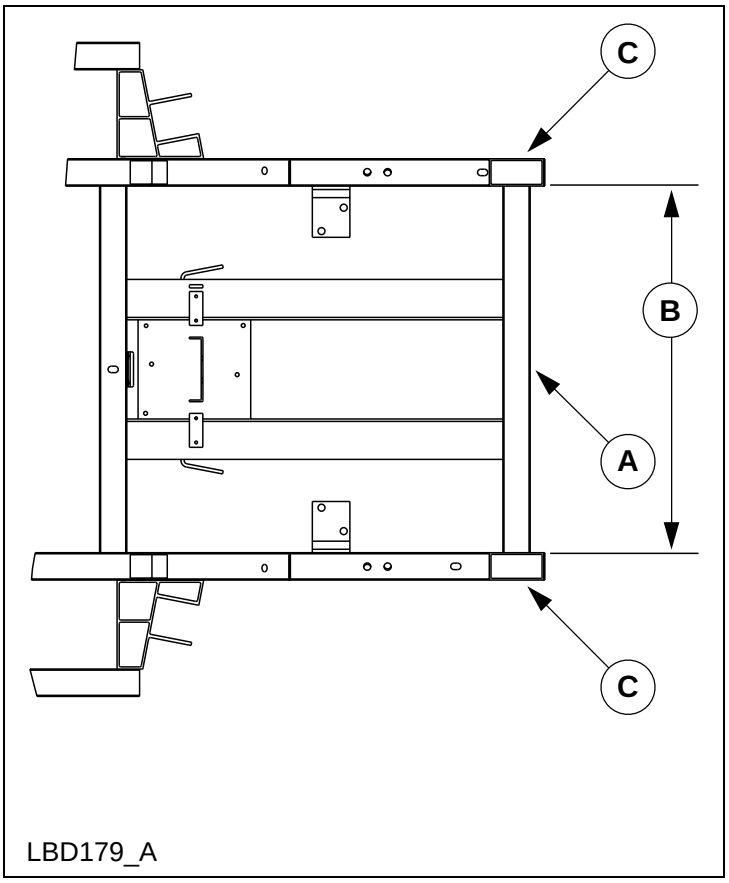
Right Rear Frame to Side Frame Extension



LBD181_B

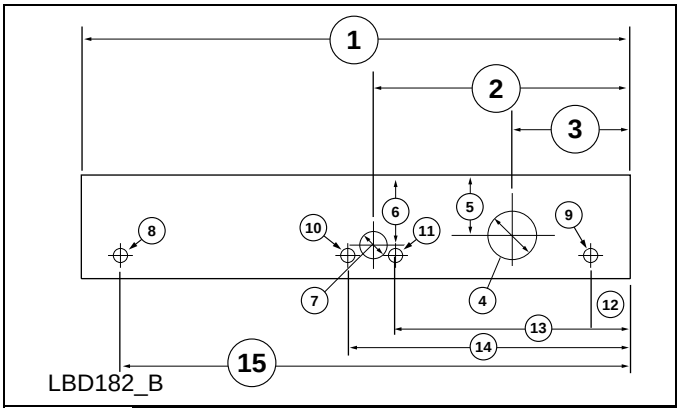
Item	Specification
1	13.65-13.50mm (0.537-0.531in)
2	264mm (10.393in)
3	61.1mm (2.405in)
4	53.5mm (2.106in)
5	20mm (0.787in)
6	39.1mm (1.539in)
7	140.4mm (5.527in)
8	13.5mm (0.531in)

The center section of the rear frame assembly (A) must be cut down to (B) 680.29mm (26.783in.) to properly install the new rear frame to side frame extensions (B). This is necessary to ensure a clean solid weld and proper alignment of the new rear frame to side frame extensions (C).

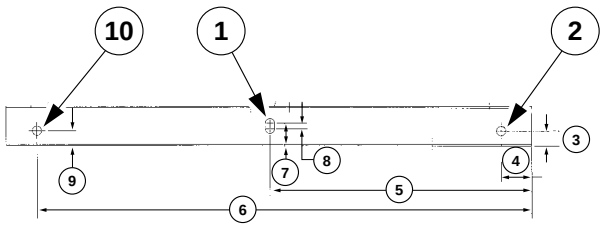


Frame Center Support

To service the frame center support, the frame extension sidemember must be used. Cut and insert holes as indicated in the dimensions provided below. Holes 4 and 7 should be drilled through both sides of the support. Holes 8 – 11 should be drilled through one side of the support.



Item	Specification
1	680.29mm (26.7831in)
2	340.15mm (13.391in)
3	130.15mm(5.124in)
4	50.8mm (2.0in)
5	60.8mm (2.393in)
6	72.6mm (2.858in)
7	35mm (1.377in)
8	6.5mm (0.255in)
9	6.5mm (0.255in)
10	6.58mm (0.259in)
11	6.58mm (0.259in)
12	55.15mm (2.171in)
13	315.15mm (12.400in)
14	365.15mm (14.376in)
15	625.15mm (24.612in)



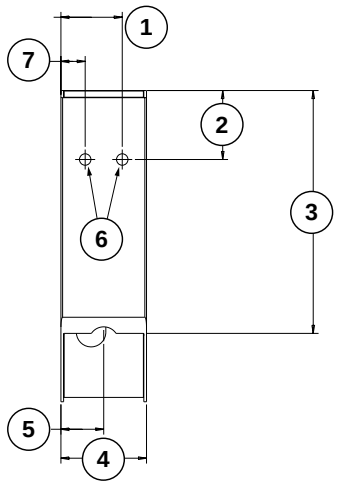
LBD194_A

Item	Specification
1	12mm (0.472in)
2	12mm (0.472in)
3	19.2mm(0.755in)
4	40.15mm (1.580in)
5	340.15mm (13.391in)
6	640.15mm (25.202in)
7	28.9mm (1.378in)
8	7mm (0.275in)
9	19.2mm (0.755in)
10	12mm (0.472in)

Seat Stanchion Center Support

To service the seat stanchion center support, the frame extension sidemember must be used. Cut and insert holes as indicated in the dimensions provided below.

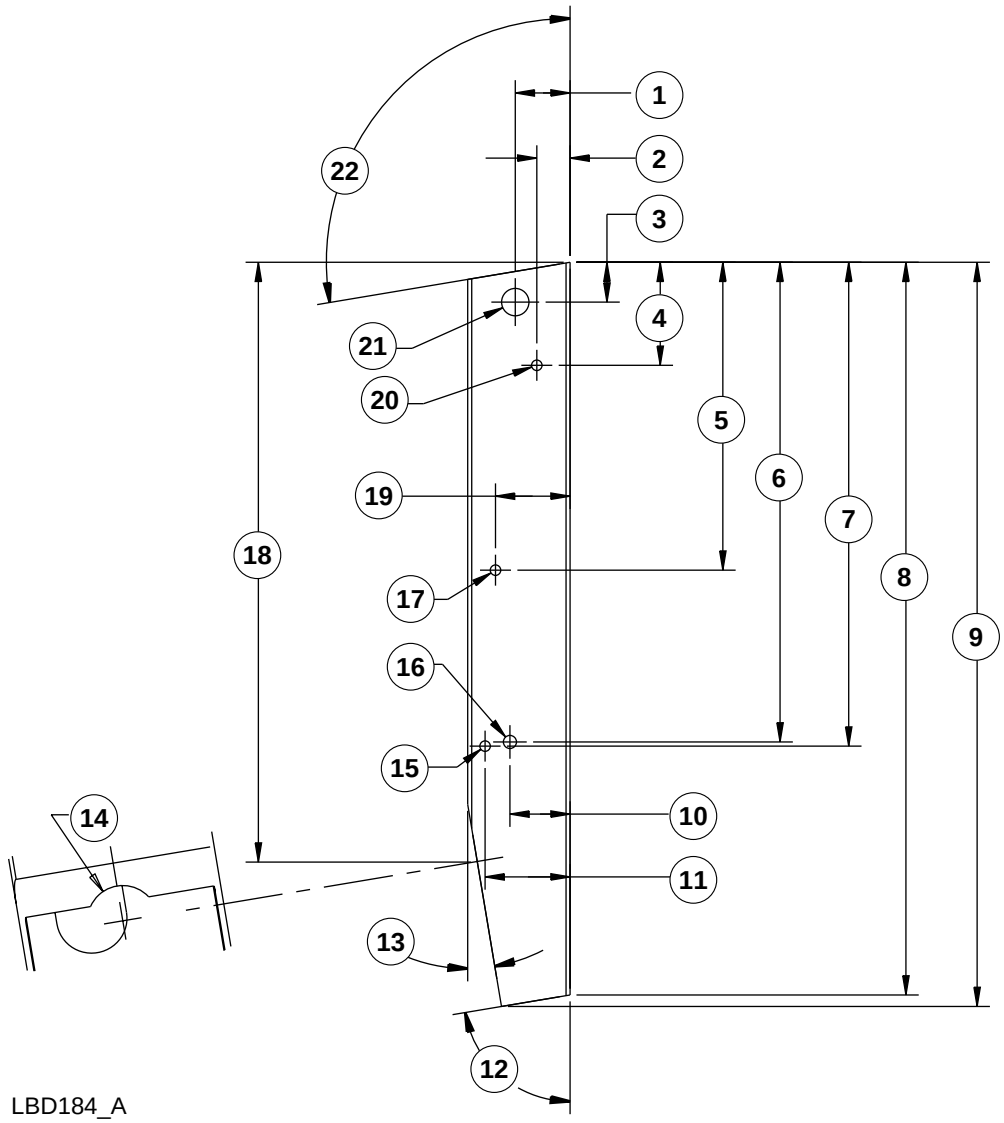
Front View



LBD183_A

Item	Specification
1	72.8mm (2.866in)
2	81.8mm (3.220in)
3	287.99mm (11.388in)
4	101.6mm (4.000in)
5	50.8mm (2.000in)
6	13.58mm (0.534in)
7	28.8mm (1.133in)

Right View

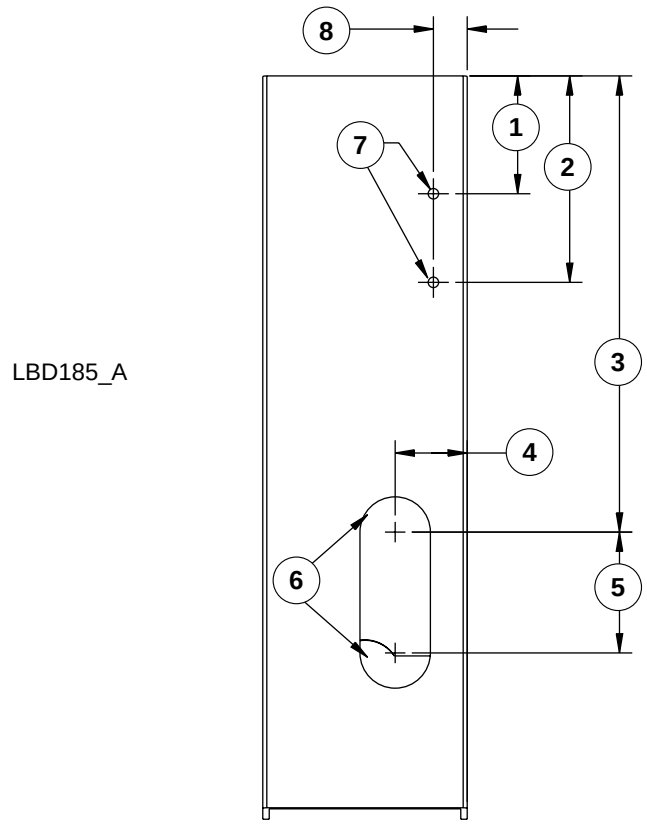


LBD184_A

Item	Specification
1	27.19mm (1.070in)
2	16.5mm (0.649in)
3	19.76mm (0.777in)
4	51.1mm (2.011in)
5	152.7mm (6.011in)
6	237.9mm (9.366in)
7	239.96mm (9.447in)

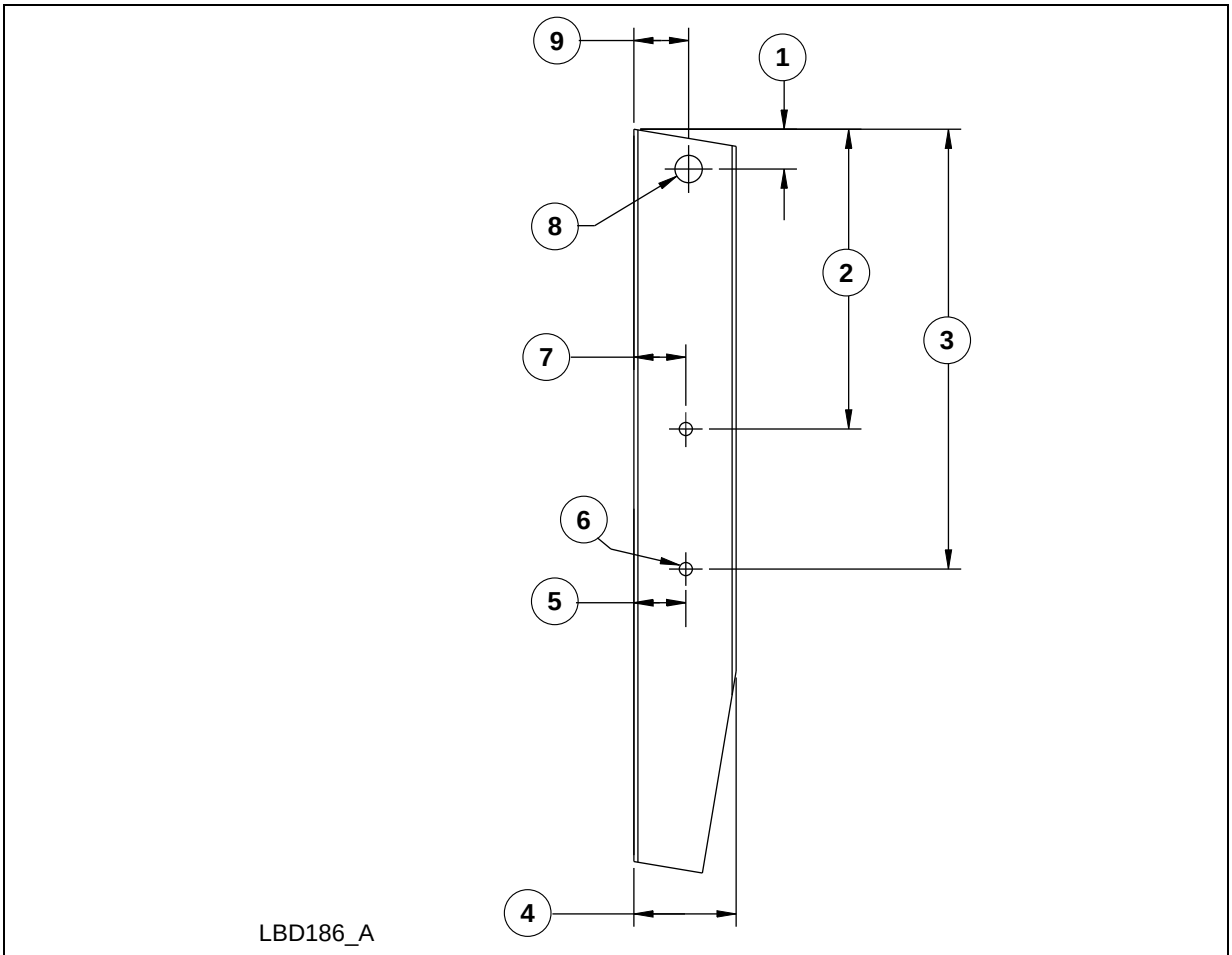
Item	Specification
8	363.38mm (14.306in)
9	369.08mm (14.530in)
10	29.84mm (1.174in)
11	42.17mm (1.660in)
12	80.5°
13	9.5°
14	17.5mm (0.688in) radius
15	5.2mm (0.204in)
16	6.5mm (0.255in)
17	5.2mm (0.204in)
18	297.47mm (11.711in)
19	37mm (1.456in)
20	5.2mm (0.204in)
21	13.58mm (0.534in)
22	99.5°

Left View



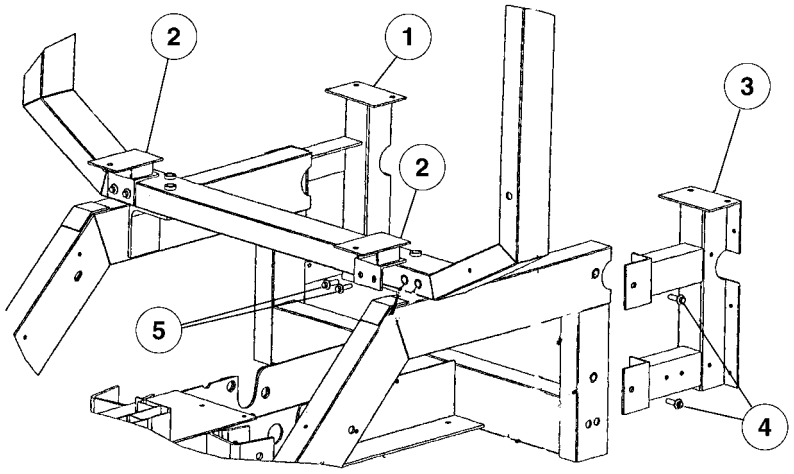
Item	Specification
1	58.5mm (2.303in)
2	102.5mm (4.035in)
3	226.51mm (8.917in)
4	35.8mm (1.409in)
5	60mm (2.362in)
6	35mm (1.377in)
7	5.2mm (0.204in)
8	16.8mm (0.661in)

Rear View



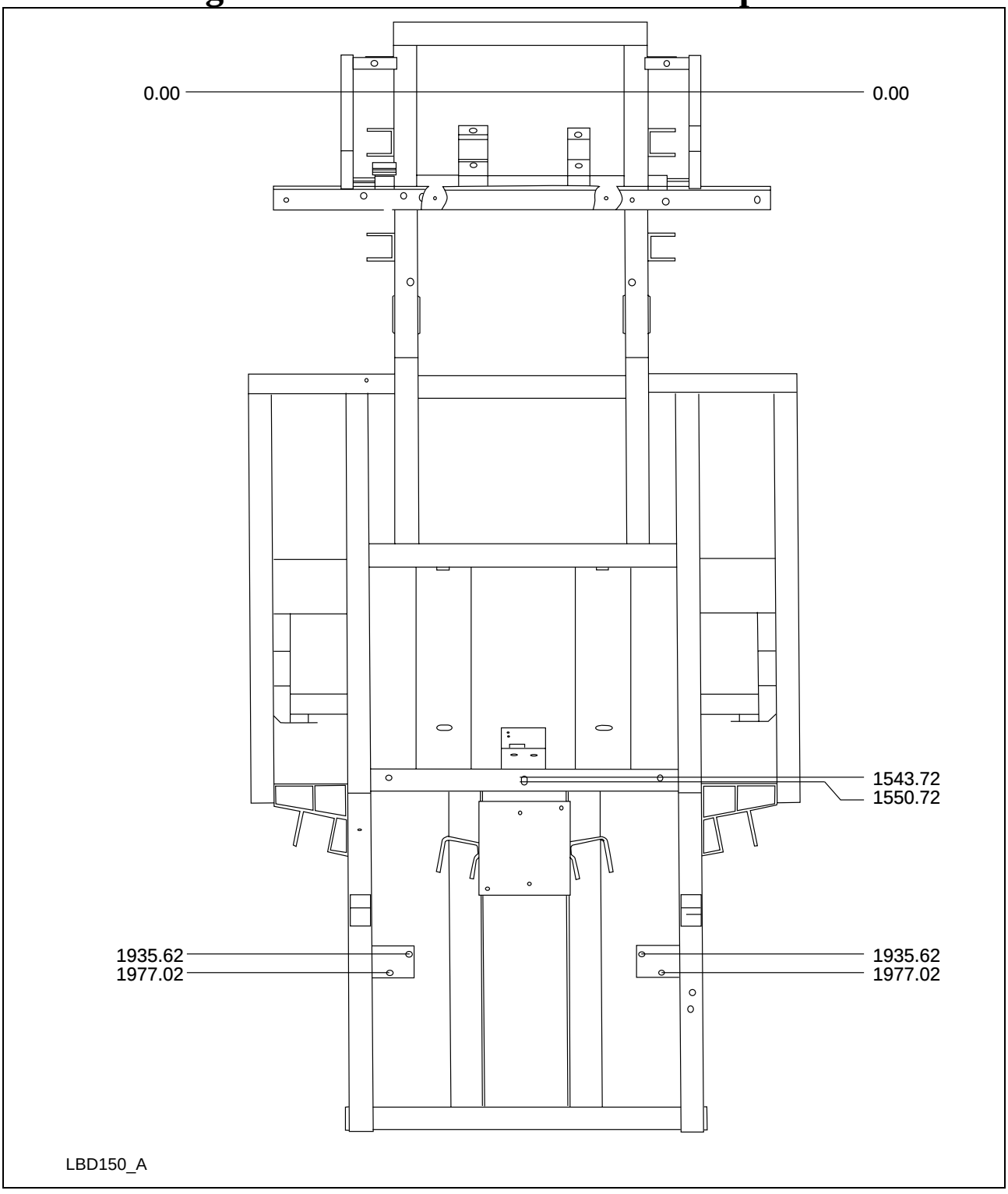
Item	Specification
1	19.76mm (0.777in)
2	148.75mm (5.856in)
3	218.25mm (8.592in)
4	50.8mm (2.000in)
5	25.8mm (1.015in)
6	6.5mm (0.255in)
7	25.8mm (1.015in)
8	13.58mm (0.534in)
9	27.19mm (1.070in)

Two-Passenger Wagon Frame Extenders and Mounts

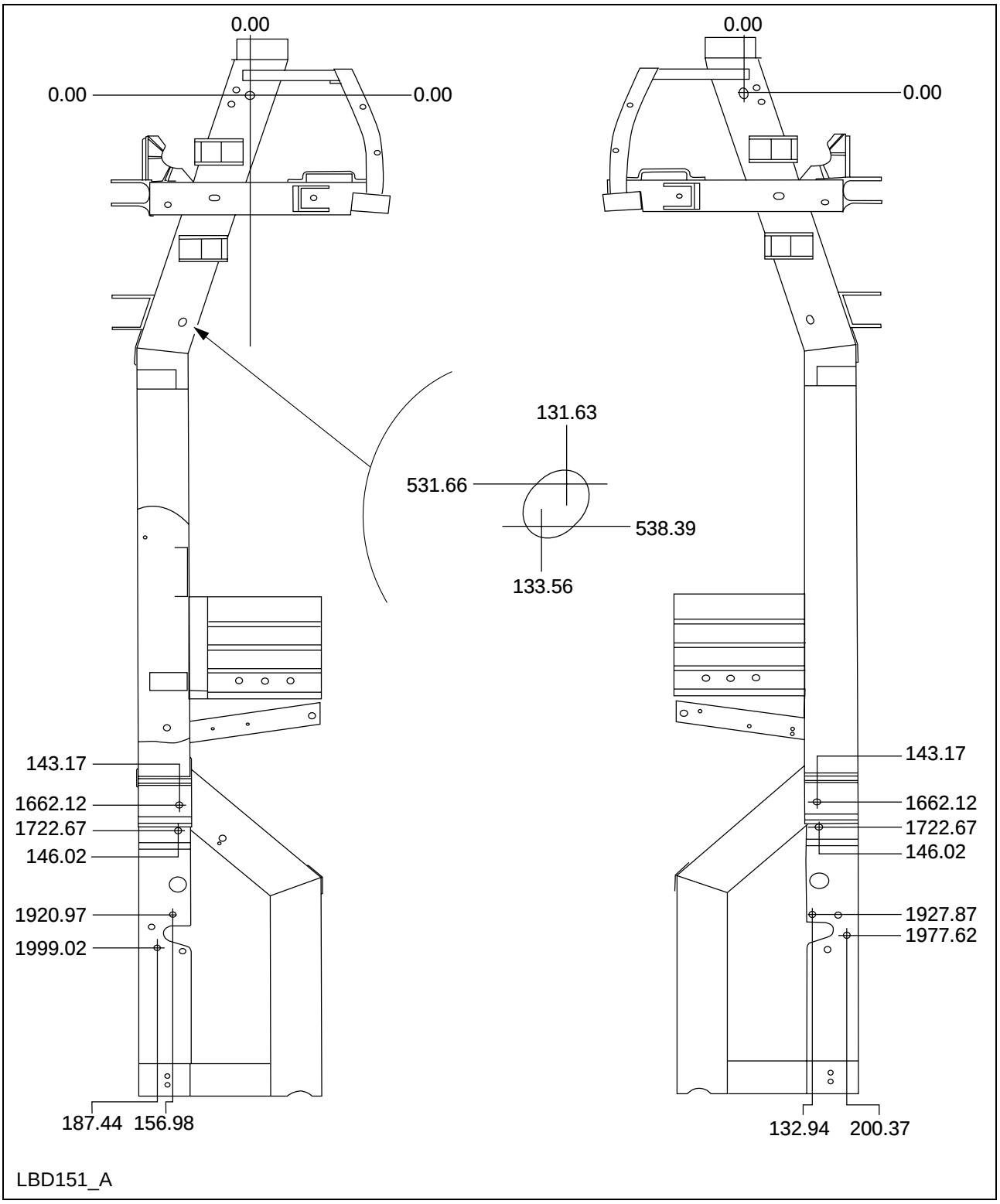


Item	Part Number	Description
1	--	RH Frame Extender
2	--	Wagon Box Brackets
3	--	LH Frame Extender
4	--	Frame Extender Bolts
5	--	Wagon Box Brackets Bolts

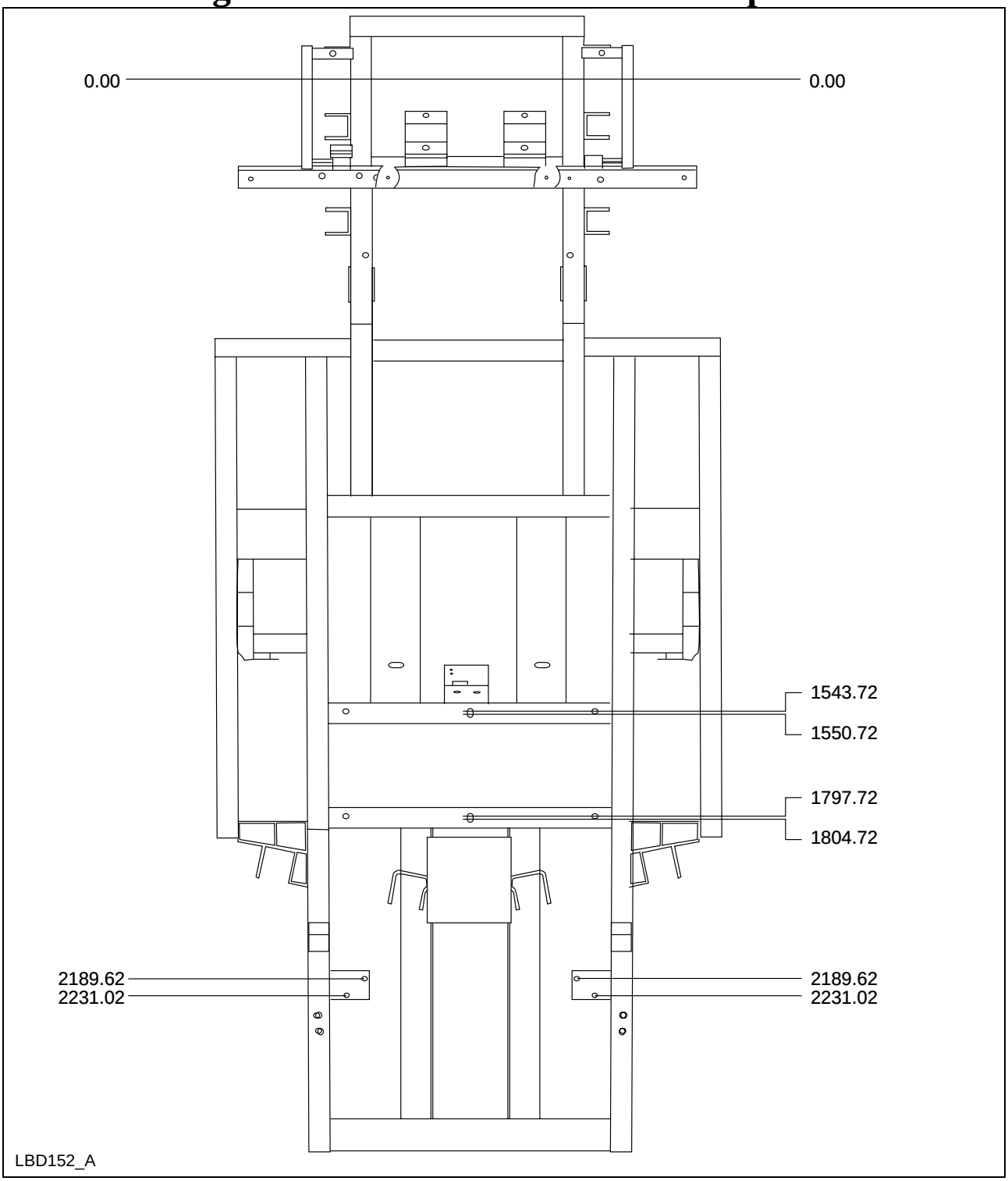
Two-Passenger Frame Hole Locator Art – Top View



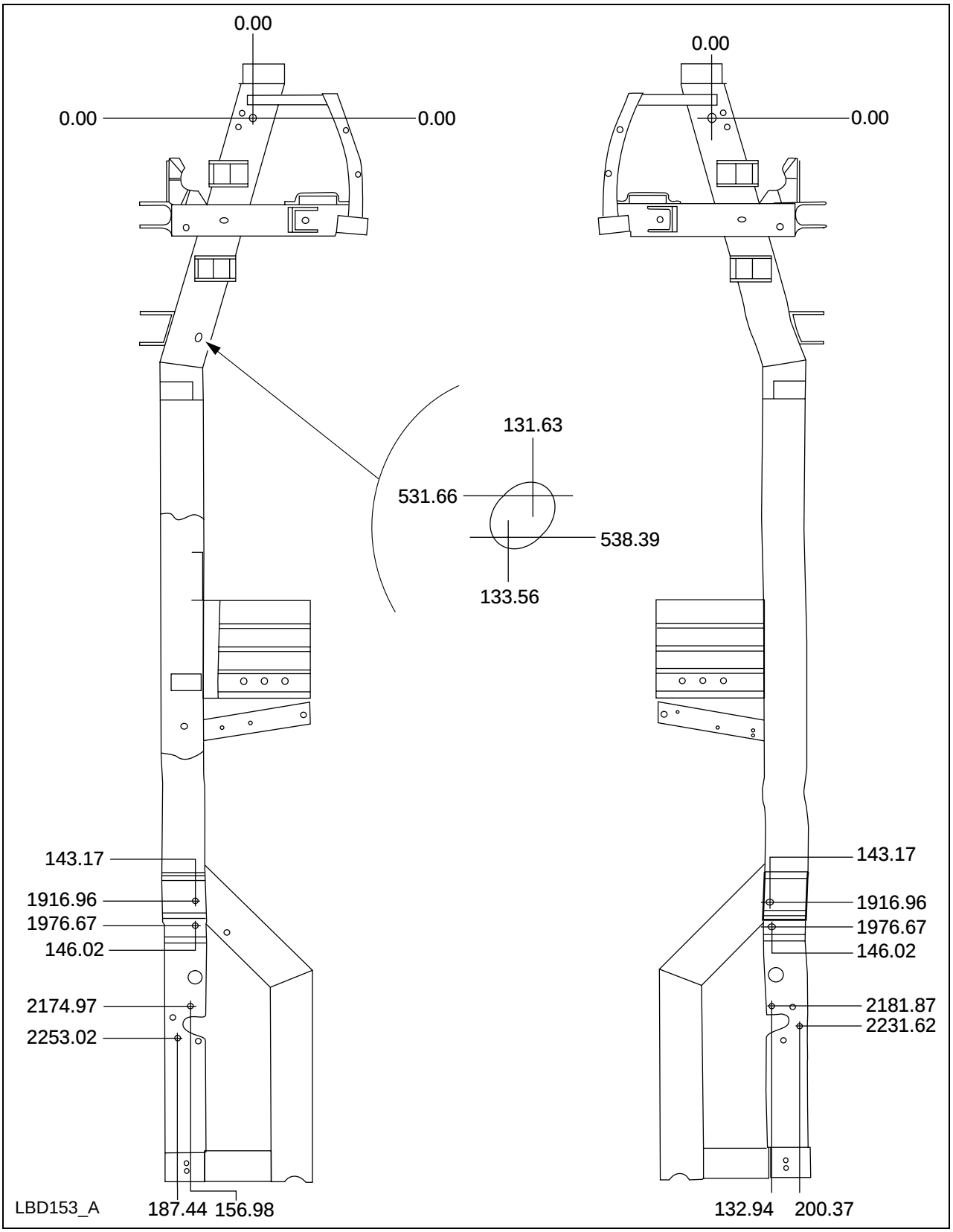
Two-Passenger Frame Hole Locator Art – Side View



Four-Passenger Frame Hole Locator Art – Top View



Four-Passenger Frame Hole Locator Art – Side View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0.00
0.00
0.00
0.00
131.63
531.66
538.39
133.56
143.17
1916.96
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146.02
2174.97
2253.02
187.44
156.98
143.17
1916.96
1976.67
146.02
2181.87
2231.62
132.94
200.37
LBD153_A