

REFERENCE:	Nova Bus Manuals
SECTION:	12: Interior furnishing
RS N°:	MQR 7621-758
EFFECTIVE IN PROD.:	NA

APPLICATION DEADLINE:NA

SUBJECT:	Introduction of brace as Reinforcement for top floor structure
JUSTIFICATION:	Repair procedure for cracks reoccurring on the flooring above the rear axle

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Inspection for cracks underneath the street side rear wheelhouse	Client	Client	—
2	Re-welding the cracks and Installation of brace, plywood and floor covering for top floor structure (If more than one crack) Re-welding the cracks (If there is only one crack)	—	—	—

MATERIAL

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 1				
—	—	—	—	—
—	—	—	—	—
LEVEL 2				
2	N85122	—	FLOOR UPPER BRACE	—
2	N85124	—	FLOOR UPPER BRACE	—
2	N91903	—	FLOORBOARD REAR CENTER	—
20	N56489	—	SCREW 1/4-20X1 3/4 TAP TRX STL	—
400 ML	N21161	—	SIKA PRIMER 206 G+P	—
600 ML	N45283-02	—	SIKAFLEX 252 WHITE (600ML)	—
1 L	N49537	—	SOLVENT DEGREASER	—
200 ML	N16917	—	SIKAFLEX 221 GREY	—
1 L	N10844	—	SIKA aktivator 205 (CLEANER)	—
25 L	N24232-02	—	SIKA ADHESIVE 252	—
500 ML	N35250	—	SIKA REMOVER 208 (TOOLING AGENT)	—
10 L	N37846	—	NEOPRENE ADHESIVE SPRAY RED	—
2	N32782-01	—	FLOOR COVERING RR CENTER AISLE	—
2	N86237	—	TREATED PLYWOOD 1/2" THK X 172 MM WIDTH STRIPE	—
15 LF	N38876	—	MOULDING PVC FLOORING	—

MATERIAL

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 2				
1	G5008576	—	BODY FILLER	—
4	G5007726	—	SPACER BLOCK 1/8"	—
15	N47149-02	—	ROUND VINYL BEAD	—
10	N32776	—	MUSHROOM VINYL BEAD	—
5	N47150-02	—	ANGLE VINYL BEAD	—
6 L	N86624	—	ADHESIVE AQUENCE CD 301	—
1	N33473	—	FLOORBOARD CURBSIDE	—
1	N33475	—	FLOORBOARD STREETSIDE	—

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DISPOSAL OF PARTS

REMOVED PARTS ARE:	DISCARDED *	RETAINED	* Dispose of the unused parts and the defective parts in accordance with local environmental standards in effect.
	Yes	—	

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2017DE12	Initial release	Kumaraswamy K S

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Belleville Transit - Ontario	L179	179-1	179-1	L82UX53000033	L82UX53000033	1
Belleville Transit - Ontario (L168)	L129	—	—	L82S633000199	L82S933000200	2
Brantford - Ontario	L150	—	—	L82U643000173	L82U843000174	2
Durham Region Transit - Ontario	L142	424	429	L82U643000108	L82UX43000113	6
Elliot Lake - Ontario	L148	04-01	04-02	L82U143000162	L82U343000163	2
First Transit Inc. (ref. L173)	L144	—	—	L82U543000049	L82U543000049	1
Grand River Transit - GRT - Ontario	L145	2400	2417	L82U143000114	L82U143000131	18
Grand River Transit - GRT - Ontario	L161	2418	2433	L82U643000254	L82U843000269	16
Guelph - Ontario	L115	169	176	L82P933000080	L82P133000087	8
Guelph - Ontario	L132	177	179	L82P443000019	L82P243000021	3
Guelph - Ontario	L167	180	182	L82U943000250	L82U243000252	3
Regina - Saskatchewan	L166	598	603	L82U453000027	L82U853000032	6
Regina - Saskatchewan	L183	604	608	L82U853000046	L82UX53000050	5
Strathcona County Transit - Alberta	L177	921	923	L82U953000024	L82U253000026	3
Thunder Bay - Ontario	L131	137	141	L82SX43000014	L82S743000018	5
Timmins - Ontario (ref. L189)	L144	—	—	L82U343000048	L82U343000048	1
Walt Disney World - Florida	L113	4862	4884	L82P623000343	L82P523000365	23
Walt Disney World - Florida	L118	4885	4885	L82P723000366	L82P723000366	1
Walt Disney World - Florida	L174	174-1	174-1	L82U553000005	L82U553000005	1

**WARNING**

Follow your internal safety procedures.

**CAUTION**

See Section 12: INTERIOR FURNISHING and Section 01: BODY in the Nova LFS Maintenance Manual for more information on safety precautions before performing the following procedure.

**NOTE**

Please contact the respective Nova Bus Service Representative for any queries related to repair.

PROCEDURE

LEVEL 1: INSPECTION FOR CRACKS

- 1.1. Park the vehicle on an even surface with transmission in neutral (N) and apply the parking brake.
- 1.2. Set the Master control switch in the STOP position (see Figure 1).

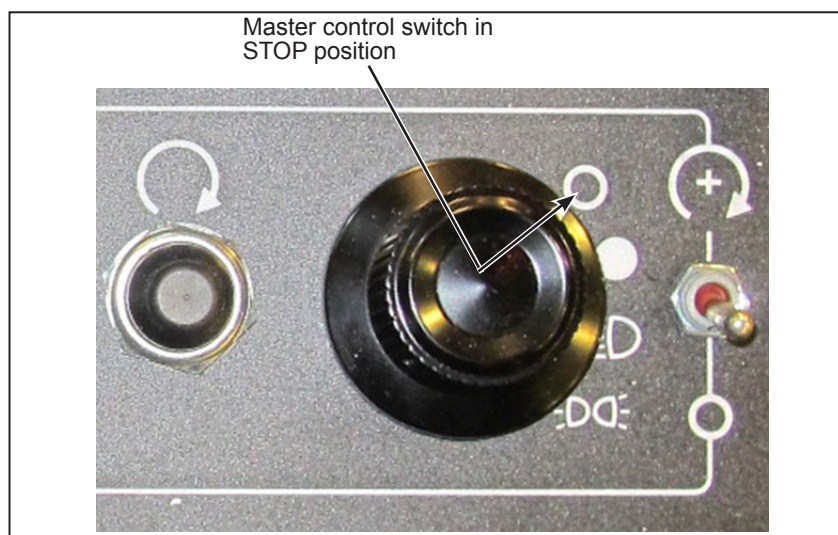


Figure 1 - Master Control Switch in STOP Position

**WARNING**

Before starting any work on the vehicle, make sure the vehicle is completely and securely stationary. Disconnect the starting circuit on the control box at the rear of the vehicle and place the battery disconnect switch in the OFF position.

- 1.3. Raise the vehicle.

**CAUTION**

VEHICLE HOISTING. Follow your internal safety procedures. Use appropriate safety equipment for your protection. See section 18 : HOISTING AND TOWING in the Nova LFS Maintenance manual for more information.

- 1.4. Install the jacking supports under the vehicle to secure the working area.

**NOTE**

See section 05: REAR SUSPENSION for exact information on removal of rear axle.

- 1.5. Remove and retain the rear axle.

**NOTE**

See section 10: TRANSMISSION AND CONTROL for exact information on removal of drive shaft.

- 1.6. Remove the drive shaft from the transmission. Retain the drive shaft and the hardware.
- 1.7. Remove all the mud flaps located in front of the rear axle. Retain the mud flaps and hardware.
- 1.8. Remove and retain the air spring located in front of the rear axle.
- 1.9. Disassemble the fuel and tire lines from the support and install plugs to remove them from the area to be welded.
- 1.10. Locate the area to be inspected as shown (see Figure 2).

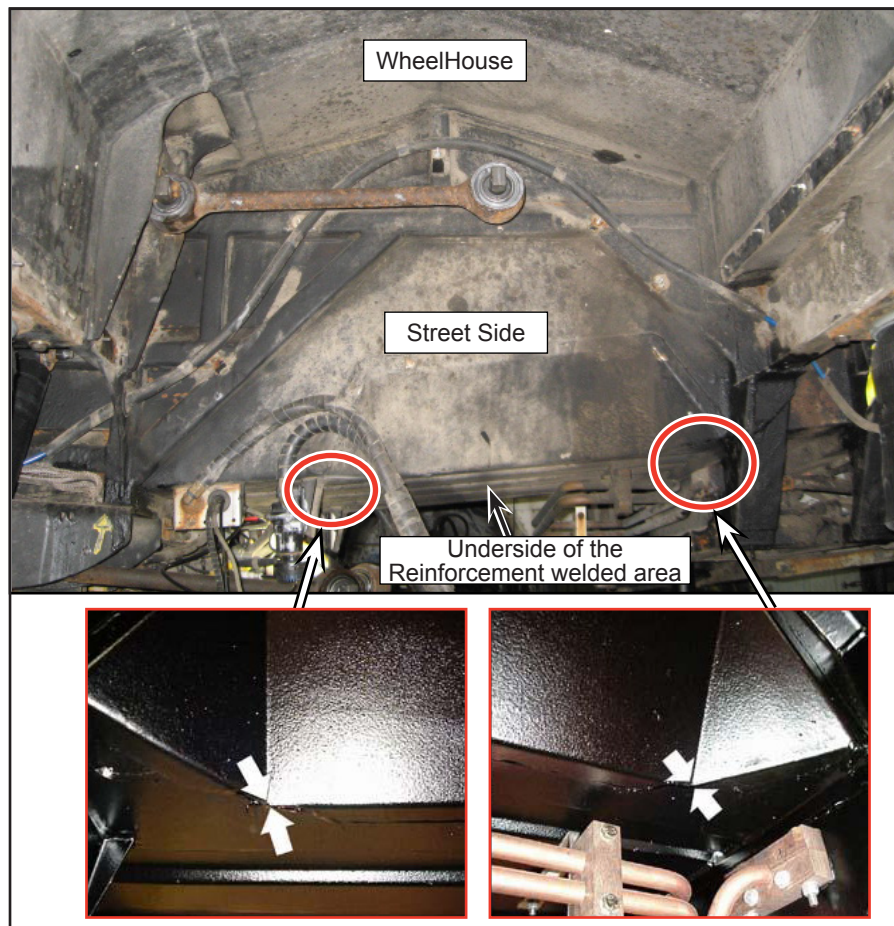


Figure 2 - Inspection for Cracks Underneath the Street Side Wheelhouse

- 1.11. Inspect the area for cracks.
 - 1.11.1. If only one crack is present, proceed to LEVEL 2 (step 2.61 onwards).
 - 1.11.2. If more than one crack is present, proceed to LEVEL 2 (step 2.1 onwards).
 - 1.11.3. If no cracks are found, proceed with the following steps.
- 1.12. Install the retained air springs and hardware.
- 1.13. Install the retained mud flaps with the retained hardware.

**NOTE**

See section 10: TRANSMISSION AND CONTROL for exact information on installation of drive shaft.

- 1.14. Install the drive shaft on the transmission

**NOTE**

See section 05: REAR SUSPENSION for exact information on installation of rear axle.

- 1.15. Install the retained rear axle with the retained hardware.
- 1.16. Remove the jacking supports from beneath the vehicle.
- 1.17. Lower the vehicle.
- 1.18. Set the battery disconnect switch in the battery compartment to ON position.
- 1.19. Place the Master control switch in ON position.
- 1.20. The vehicle may be returned to service.

LEVEL 2: RE-WELDING THE CRACKS, INSTALLATION OF BRACE, FLOOR PLYWOOD AND FLOOR COVERING**CAUTION**

Before performing any welding operation on the vehicle, as well as plasma cutting, sensitive electronic components must be disconnected to prevent damage. Once welding has been completed, the components must be reconnected in the reverse order. See Section 01: STAINLESS STEEL CHASSIS in the Nova LFS Maintenance Manual for more information on safety precautions before performing the following procedure.

- 2.1. Apply degreaser onto the crack surface to remove undercoating.
- 2.2. Apply penetrating liquid to trace the ends of the cracks.
- 2.3. Drill a 3/16 inch to 1/4 inch hole at each end of the crack in order to stop the crack from growing.
- 2.4. Weld the crack from one end to the center and resume welding from the other end towards the center. Make sure the hole at each end of the crack must be welded.
- 2.5. Install the retained air springs and hardware.
- 2.6. Install the retained mud flaps with the retained hardware.

**NOTE**

See section 10: TRANSMISSION AND CONTROL for exact information on installation of drive shaft.

- 2.7. Install the drive shaft on the transmission.

**NOTE**

See section 05: REAR SUSPENSION for exact information on installation of rear axle.

- 2.8. Install the retained rear axle with the retained hardware.
- 2.9. Remove the jacking supports from beneath the vehicle.
- 2.10. Lower the vehicle.
- 2.11. Locate the floor covering between the rear wheelhouses inside the vehicle (see Figure 3).

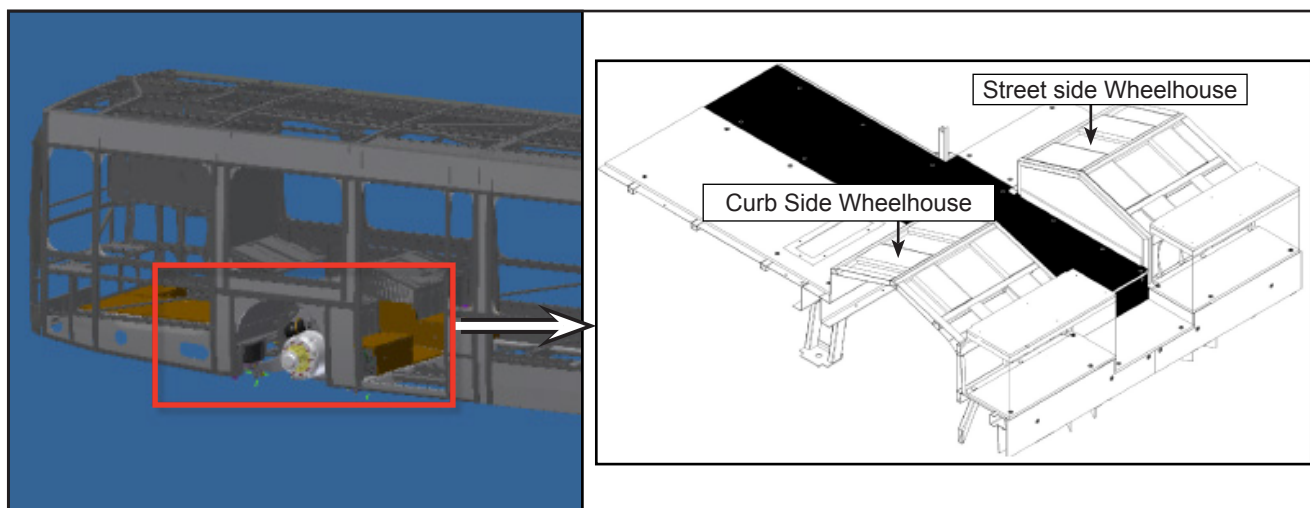


Figure 3 - Typical Location of Floor Covering

**NOTE**

See section 12-400: FLOOR COVERING for exact information on removal of floor covering.

2.12. Mark the outline of the area to be repaired with a washable marker as shown (see Figure 4).

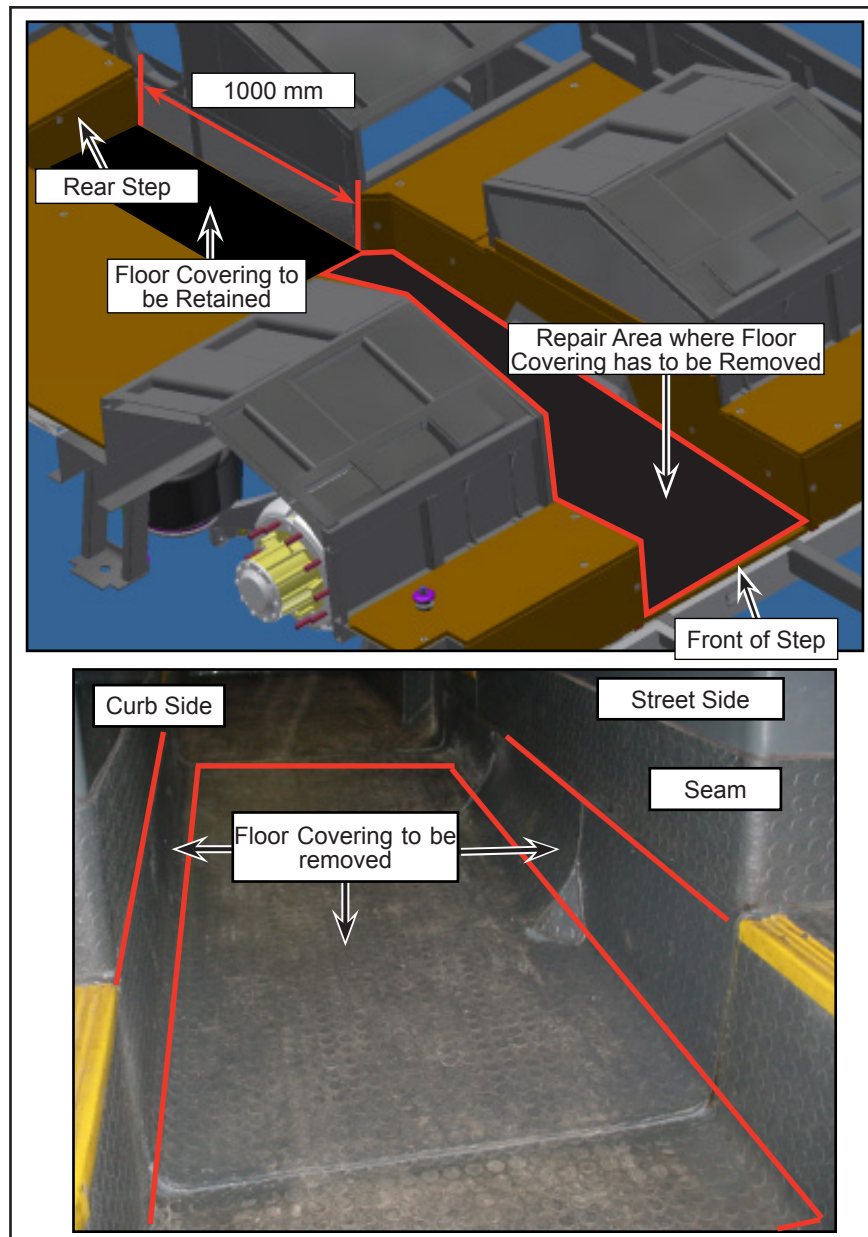


Figure 4 - Typical Location of Repair Area

- 2.13. Cut a piece of new floor covering to fit the repair area.
- 2.14. Place it over the section to be replaced, and cut around it to remove the old floor covering.
- 2.15. Remove the section to be replaced. Retain the new floor covering.
- 2.16. Remove and retain the moulding pvc flooring.

- 2.17. Remove the existing floor plywood in the repair area (see Figure 5).

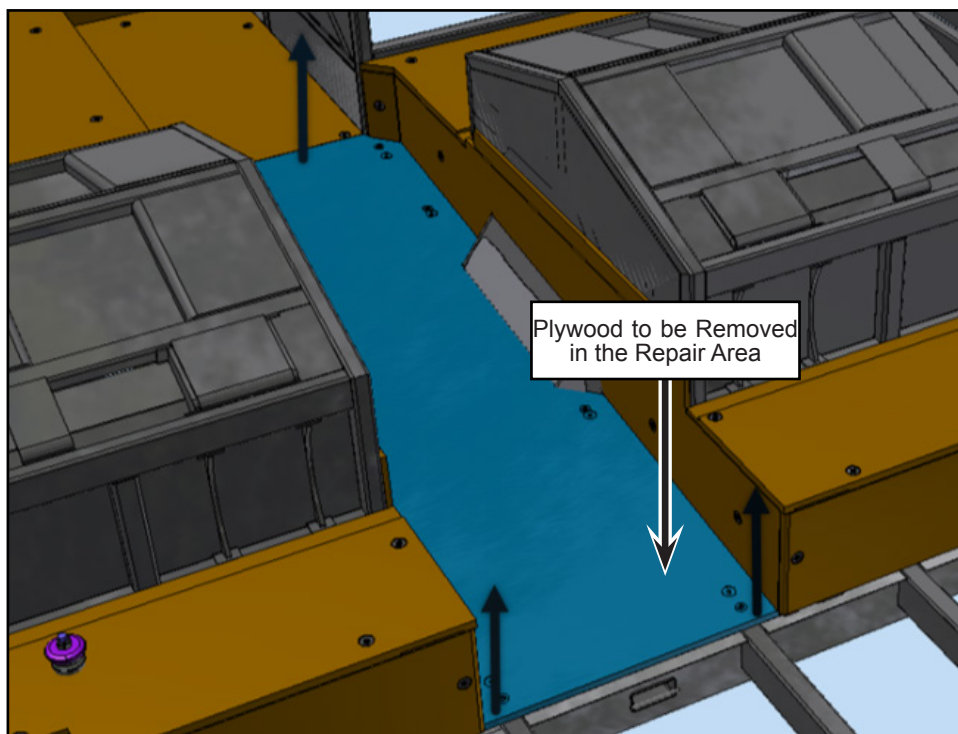


Figure 5 - Removal of Floor Plywood

- 2.18. Remove the plywood on street side and curb side wall (see Figure 6). Make sure to cut the plywood 5 mm below the existing seam on the floor liner.

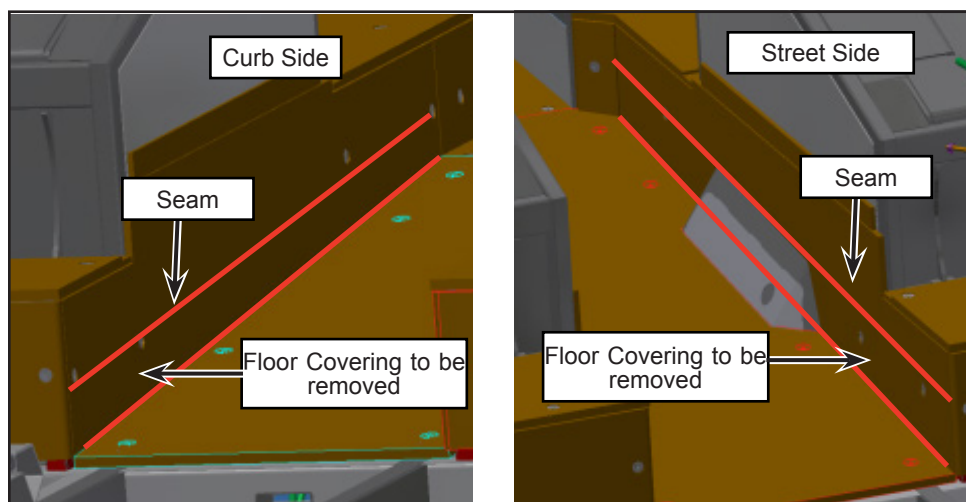


Figure 6 - Removal of Plywood on Street Side and Curb Side wall

- 2.19. Remove substantial dirt, such as mud in the repair area with a spatula.
- 2.20. Remove undercoating stains and other dirt using a chix cloth and cleaning product such as blitz, citrus and ZEP 50.
- 2.21. Wipe the repair area with a clean, dry and white cloth such as wypall X60.
- 2.22. Let the surface dry completely and then roughen the surface by sanding it with a Scotch-Brite pad #7447B, applying medium pressure in a back-and-forth motion, until a matt finish is obtained.
- 2.23. Clean area with a clean, dry, white cloth and ZEP 50.
- 2.24. Wipe off the ZEP from the structure with a clean, dry, white cloth, such as Wypall X60. Do not allow the ZEP 50 to dry on the structure surface (See Figure 7).
- 2.25. Inspect the floor structure for cleanliness with another clean, dry, white cloth, such as Wypall X60. If there are black marks on the cloth, repeat the procedure from step 2.19, else continue with the subsequent steps.

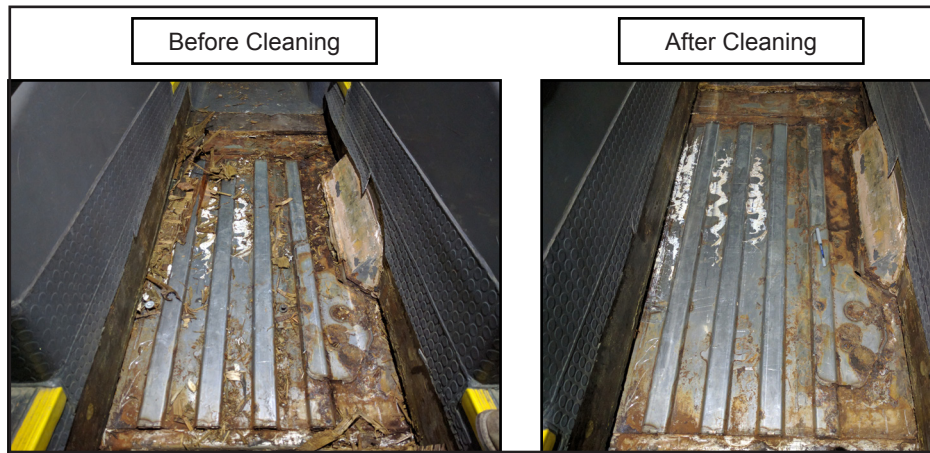


Figure 7 - Typical View of Floor structure Before and After Cleaning

- 2.26. Before installing brace N85122 on the floor structure, add 6 mm x 45° chamfers on brace legs as shown (see Figure 8).

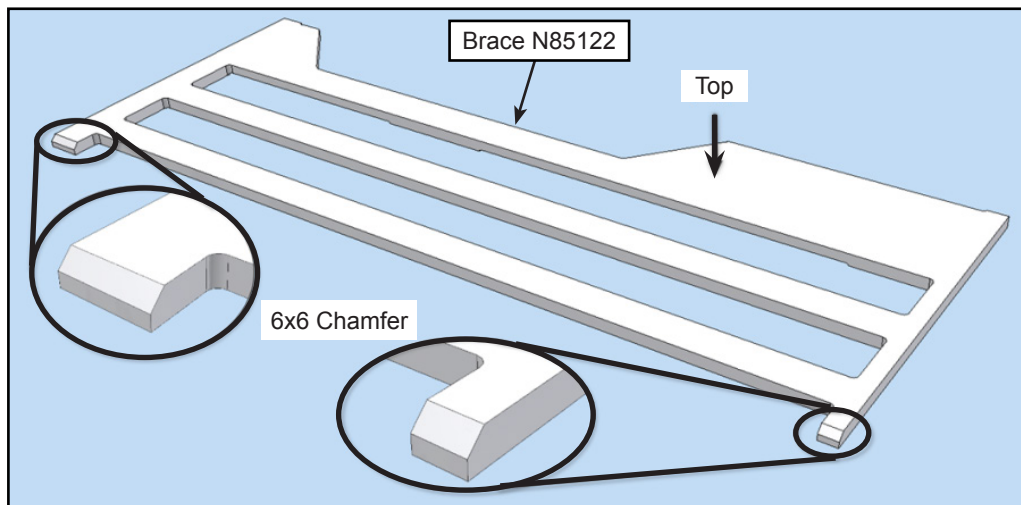


Figure 8 - Preparation of Brace

- 2.27. Clean the brace N85122, using ZEP 50 and Wypall X60.
- 2.28. Position the brace N85122 on the floor structure, close to the street side wall as shown (see Figure 9).

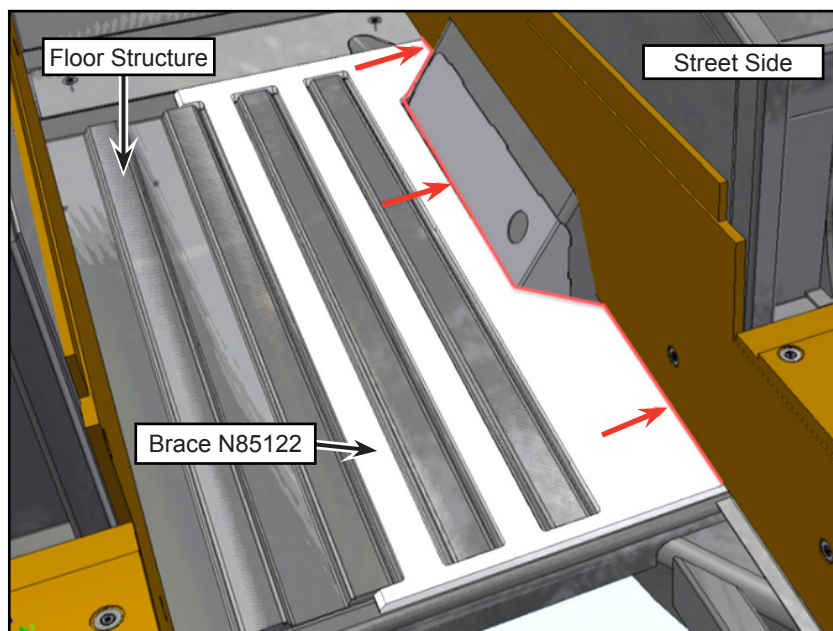


Figure 9 - Typical Position of Brace on Floor Structure

- 2.29. Place brace N85124 on the floor structure, leaning on the curb side wall as shown (see Figure 10) and inspect the length of brace legs.

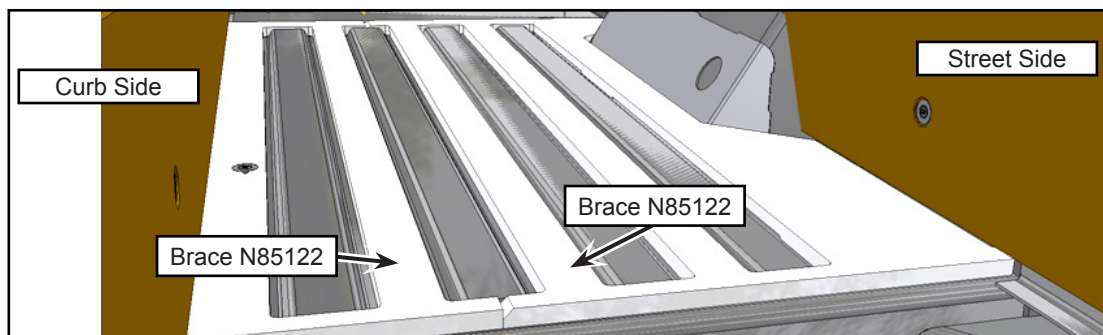


Figure 10 - Inspection of Brace Leg Length

- 2.30. If brace legs length are too long, reduce the brace N85124 leg length as per requirement.
- 2.31. If brace legs length are too short (over 3 mm), fill the gap with the proper thickness stainless plate.

2.32. Add 6mm x 45° chamfers on the brace N85124 legs as shown (see Figure 11).

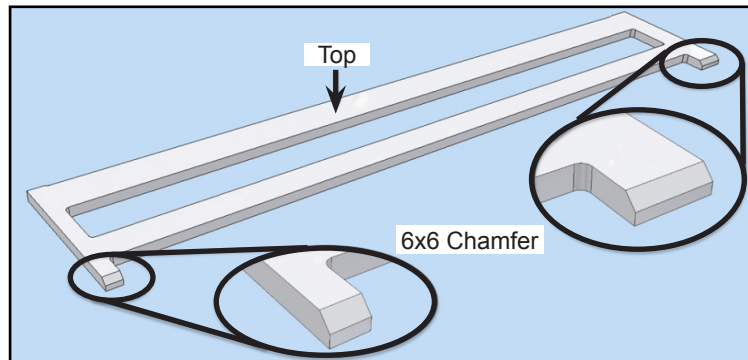


Figure 11 - Preparation of Brace

2.33. Clean the N85122 brace, using ZEP 50 and wypall X60.

2.34. Weld braces in place as per weld specification shown (see Figure12).

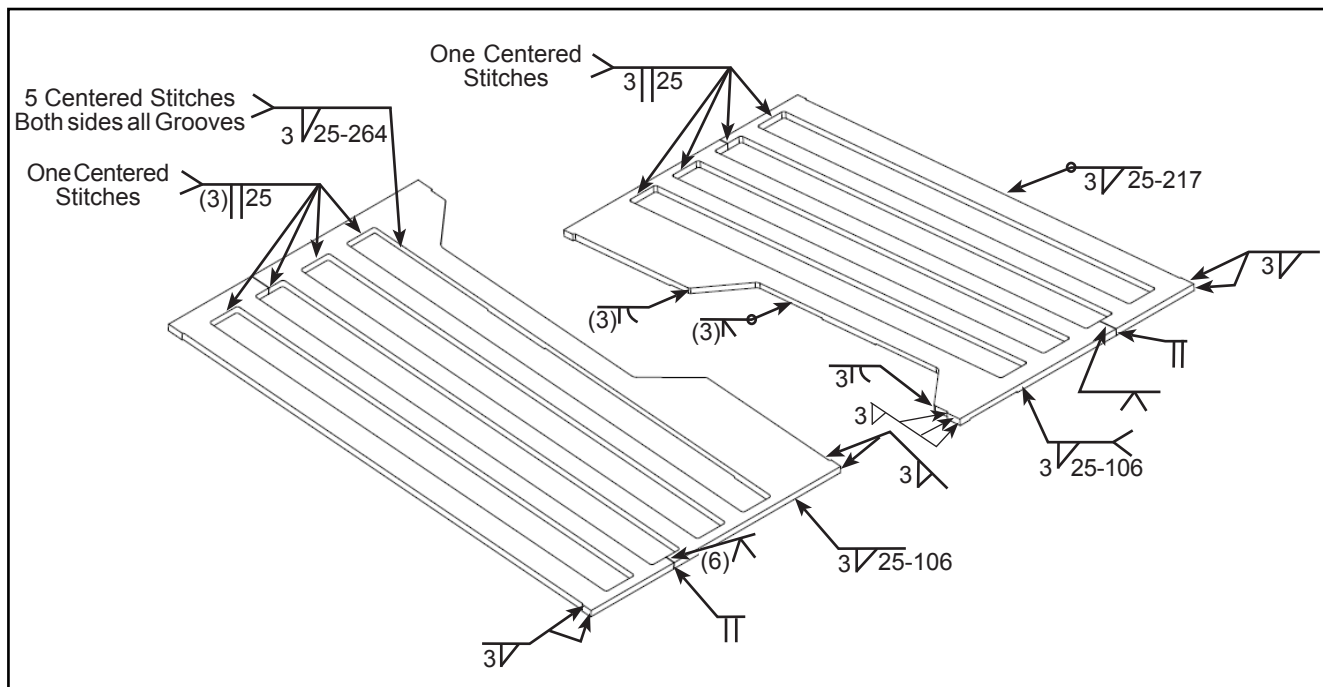


Figure 12 - Welding Specification

2.35. Clean the metal floor structure using a clean towel moistened with Sika 205 cleaner. Allow 10 minutes for drying time.

2.36. Apply a thin and even coat of Sika 206 G+P primer on the floor structure. Allow 20 minutes for drying time.

**NOTE**

The bead of adhesive is applied to the vehicle structure.

- 2.37. Apply one continuous 1/2 to 3/8 in. (10 to 13 mm) bead of Sika 252 glue on the border of the area to repair and several beads inside the area to repair.
- 2.38. Adjust the dimensions of new plywood as per requirement.
- 2.39. Clean the back portion of the new floor plywood using a clean towel moistened with Sika 205 cleaner. Allow 10 minutes to dry.
- 2.40. Install the new floor plywood on the floor structure and side wall by applying uniform pressure.
- 2.41. Remove the excess adhesive with the spatula provided.
- 2.42. Install screws N56489 in the slot provided on the plywood (see Figure 13).

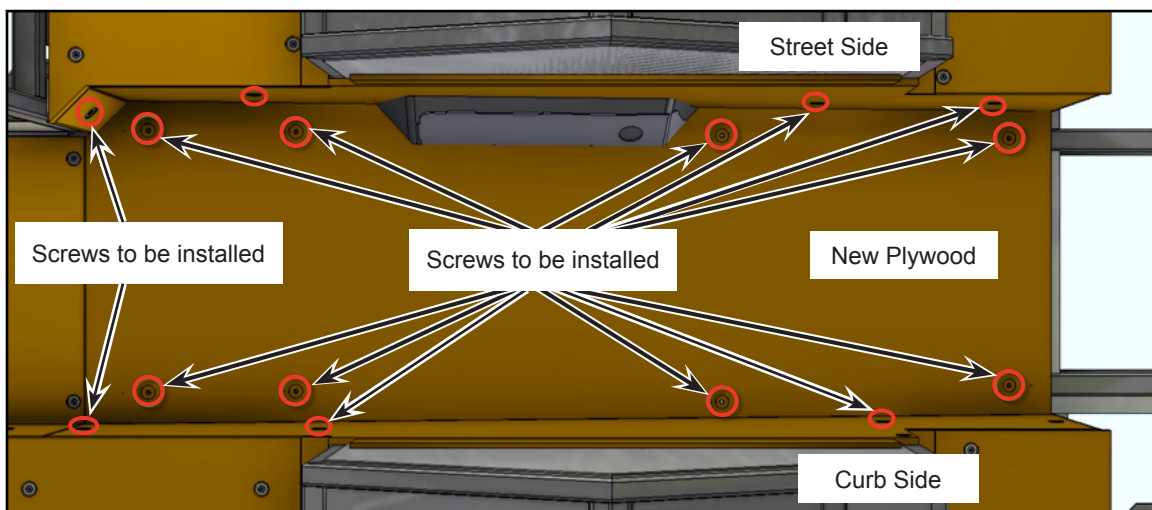


Figure 13 - Installation of Screws

**NOTE**

If required, drill a hole as per specification shown (see Figure 14) for installing additional screws.

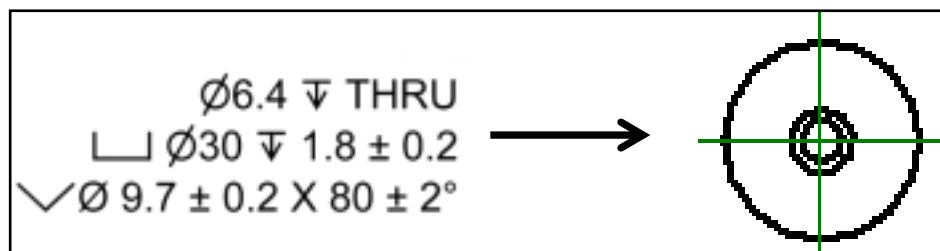


Figure 14 - Recommended Hole Specification

- 2.43. Level the plywood irregularities and screws on the new wood floor surfaces with body filler.
- 2.44. Sand the surface using a 80 Grit Pad, until the floor becomes uniform and level.
- 2.45. Clean the repaired area using a clean moistened cloth such as Sika 205 cleaner. Allow 10 minutes for floor to dry.
- 2.46. Cut the moulding pvc flooring N38876 as per the old removed moulding pieces.

- 2.47. Sand with a 7447B Scotch Brite pad.
- 2.48. Dust with a clean and dry cloth.
- 2.49. Clean the surface with a cleaning solution, such as Sika 205.
- 2.50. Install the pvc moulding on the floor plywood using neoprene adhesive red N37846.

**NOTE**

The glue must be sprayed with a spray gun or with a power pump directly mounted on the adhesive container or manually with a paint brush.

**NOTE**

See section 12-400: FLOOR COVERING for exact information on installation of floor covering.

- 2.51. Apply contact adhesive using airless-type spray equipment to the floor covering.
- 2.52. Allow approximately 15 minutes to dry until the adhesive no longer transfers to the touch joining the two surfaces.
- 2.53. Apply the new piece to the area being repaired, taking care to leave an equal space all around. Lightly flatten the new piece.
- 2.54. Glue the floor covering around the wheel house using a hammer and a wood block (see Figure 15).
- 2.55. Mold the floor covering to the rubber trim and glue the floor covering to the side wall.

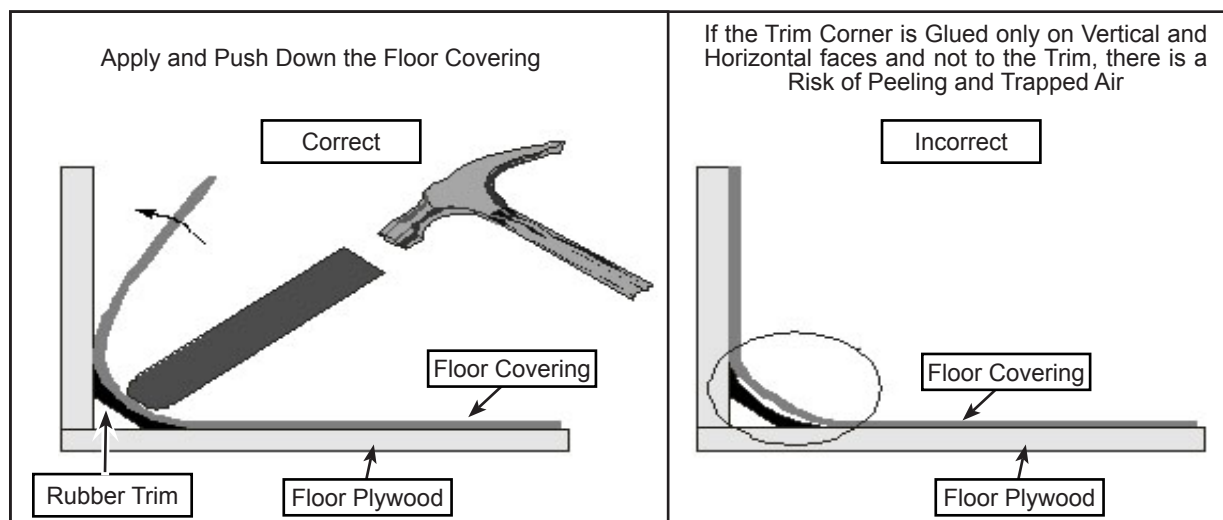


Figure 15 - Technique for Gluing Inside Corners

- 2.56. Roll the floor covering evenly with a carpet roller in order to eliminate any air pockets trapped between the floor covering and the wooden floor. Allow 2 hours for the glue to cure and dry.

- 2.57. Groove the floor covering joint for the vinyl beads with a 0.08 in. (2 mm) maximum width V-shaped blade tool (see Figure 16).

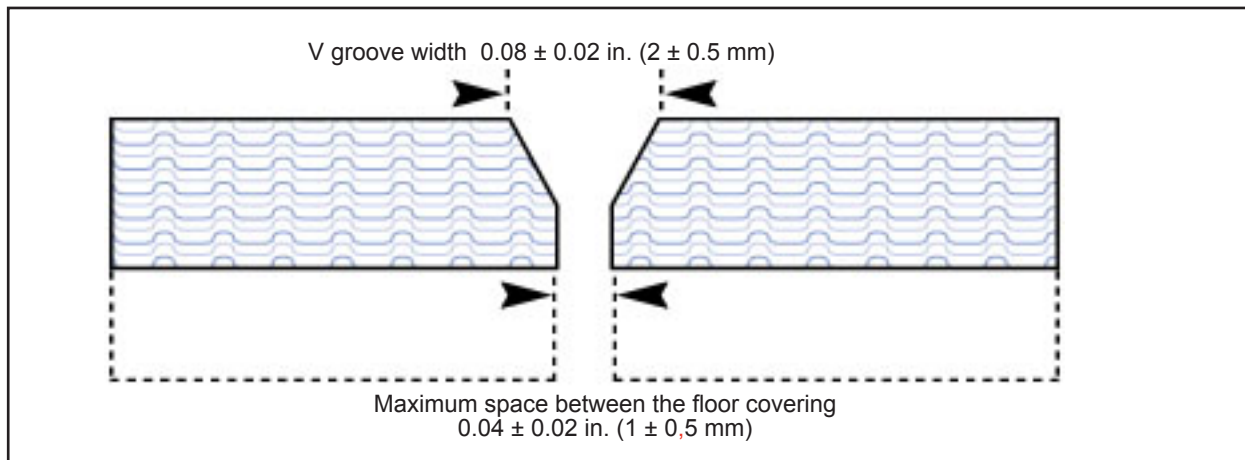


Figure 16 - Recommended Bead Groove

- 2.58. Prepare the hot air welding gun by installing the welding tip for a 3/16" bead and setting the heat to position 5 [662°F (350°C)].
- 2.59. Use the gun to weld the joint with a vinyl bead. Let the joint cool and harden for at least 25 minutes.
- 2.60. Smooth the joint and remove the excess with the spatula provided for this use (see Figure 17). Proceed to step 2.71.

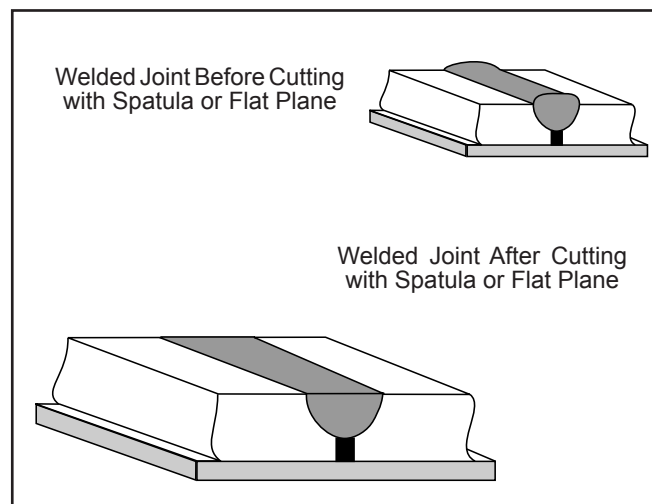


Figure 17 - Welded Joint Before and After Cutting

- 2.61. Apply degreaser onto the crack surface to remove undercoating.
- 2.62. Apply penetrating liquid to trace the ends of the cracks.
- 2.63. Drill a 3/16 inch to 1/4 inch hole at each end of the crack in order to stop the crack from growing.

- 2.64. Weld the crack from one end to the center and resume welding from the other end towards the center. Make sure the hole at each end of the crack must be welded.
- 2.65. Install the retained air springs and hardware.
- 2.66. Install the retained mud flaps with the retained hardware.

**NOTE**

See section 10: TRANSMISSION AND CONTROL for exact information on installation of drive shaft.

- 2.67. Install the drive shaft on the transmission.

**NOTE**

See section 05: REAR SUSPENSION for exact information on installation of rear axle.

- 2.68. Install the retained rear axle with the retained hardware.
- 2.69. Remove the jacking supports from beneath the vehicle.
- 2.70. Lower the vehicle.
- 2.71. Set the battery disconnect switch in the battery compartment to ON position.
- 2.72. Place the Master control switch in ON position.
- 2.73. The vehicle may be returned to service. ❖