

The recommendations below are suggestions for the best practices of frame alterations to accommodate specialty upfit components. However the persons modifying the frame must assume complete responsibility for assembly, performance, reliability and compliance to applicable FMVSS standards.

Holes

Holes are not to be drilled in the top or bottom flanges of the frame rails. Holes to mount equipment should always be in the vertical web of the rail. Preferably, in existing holes if possible. If new holes are required, they should meet the following guidelines:

1. Hole diameter should not exceed 20mm (0.75 in.)
2. The edge of the hole should be no less than 40mm (1.60 in.) from the top or bottom of the frame.
3. The minimum distance edge to edge between any two holes should be no less than twice the diameter of the larger hole.
4. All holes should be drilled in the frame using appropriate drilling practice and safety precautions.
5. Be especially careful if holes must be drilled near the fuel tank. Pay particular attention to the routing of brake lines, fuel lines, or wiring on the inside of the rail when drilling holes on the outside of the rail.

Welding

1. Avoid welding near the fuel tank, fuel lines, brake lines or other components that may be damaged.
2. Components near the welding area which could be damaged by excessive heat must be removed or adequately shielded.
3. Disconnect the battery(ies), negative terminal posts, and the main ground to the TIPM / Battery (See Figure A)
4. Precautionary measures should be used to prevent electrical system component or wiring damage.
5. The frame e-coating must be removed from the weld and surrounding area.
6. Use proper welding techniques to avoid stress risers that may adversely affect frame performance.

After welding:

1. Carefully inspect electrical components and wiring for shorts or other damage.
2. Apply protective coating to the areas where the coating was removed.

Frame Length Alterations

If shortening the frame at the rear overhang:

1. Drill out the rivets that attach the rearmost crossmember to the rear of the frame.

1. Reinstall the crossmember in the forward mounting location. This location shares the attachment holes for the rear spring rear hanger on the web of the rail and pre-pierced holes on the flanges. If the cutoff dimension is longer than the minimum dimension described above, use the crossmember as a template to drill additional holes in the rear rails to allow for the attachment of the crossmember at the rear of the frame.
2. If required, a second crossmember can be added using the second set of holes located on the front of the rear spring front hanger. (See Figure B)
3. The preferred method to cut the frame is with a saw or cutoff wheel. If a torch is used any rivets within 4 inches must be replaced with equivalent size grade 8 (or grade 10.9 metric) bolts and any existing bolts must be retorqued.
4. Areas of the frame that have now become exposed metal should be coated with a corrosion protecting coating.

If lengthening the frame:

1. In preparation for welding, clean the e-coat from the frame surface with a wire wheel or equivalent.
2. Use a mild (low carbon) steel material of comparable thickness to the rails.
3. Chamfer the two mating areas to be joined by welding.
4. If extending the rear of the frame, include a reinforcement that is welded to the extension channel and extends forward far enough to allow bolting through the rear crossmember lower rivet (requiring drilling out this rivet).
5. Disconnect the battery (ies negative terminal posts, and the main ground to the TIPM/Battery (See Figure A).
6. Butt weld the frame and extension together on the top and side omitting welding on the lower flange if extending the rear of the frame as above.
7. Grind smooth the outer surface of the vertical web of the rail. Clamp on a reinforcement plate ¼" mild steel 4"x12". If extending the rear of the frame, drill two holes in the reinforcement through the upper shear plate hole and the lower rear crossmember hole. 'Mirror' two more of these holes in the reinforcement through the extension piece (See Figure C). Stitch weld the reinforcement onto the rail and extension avoiding the corners. Install ½" bolts with flange heads (or hardened washers) into the four holes.
8. Coat the frame with a corrosion protective coating. Reconnect the electrical components.

Rivet Replacement

If the original rivets require replacement, bolts of the same size or larger that fit in the existing holes are acceptable. The nuts and bolts should include flanged heads. Hardened washers are acceptable in placed of flanged heads. The fasteners should be at least grade 8 or grade 10.9 metric. The joint and fasteners should be covered with corrosion protection after tightening the fasteners.

FIGURE A:

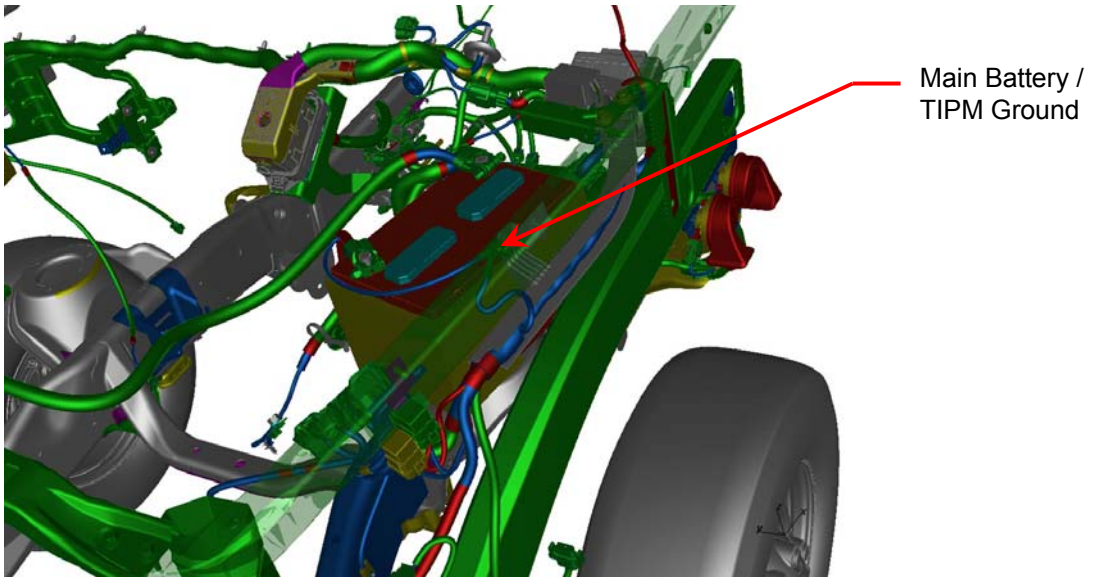
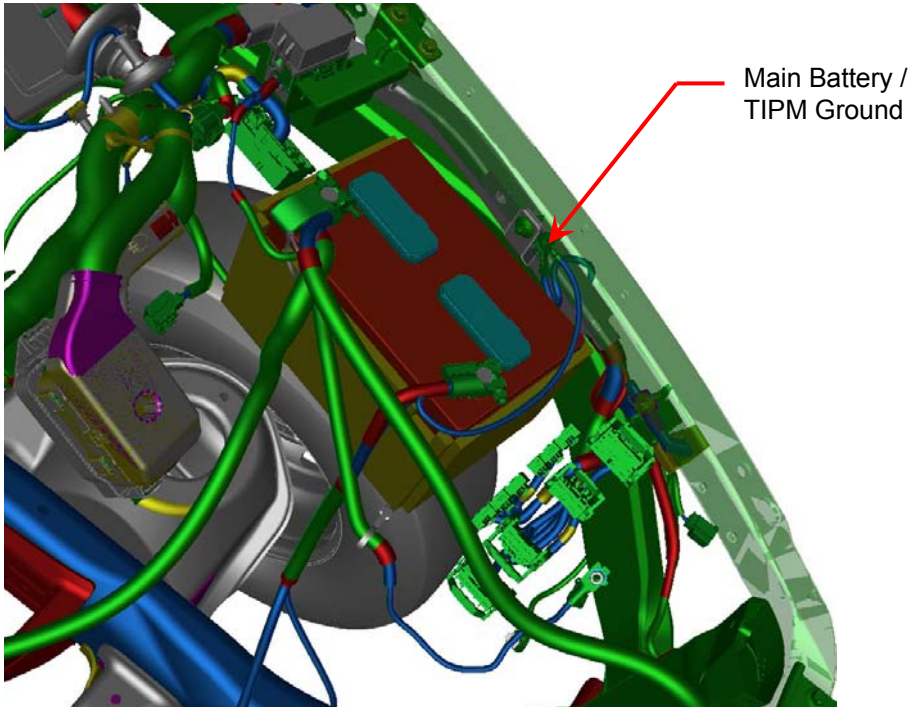


FIGURE B:

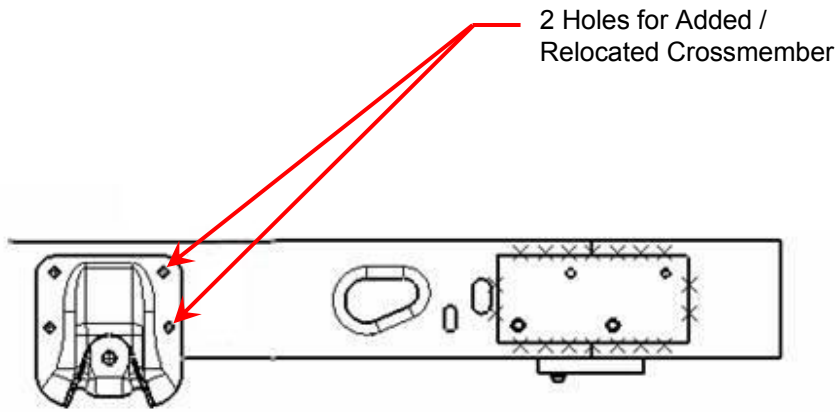


FIGURE C:

