



## 2009 FORD F-150 CAB REPAIRS

**Background:** Body Style change in 2004 inverted the pinch weld area of the rocker panel so traditional pinch weld clamping could not be performed for repair of cab only. In 2009 model year intense use of HSS, HSLA made holding and pulling the vehicle more difficult and with added repair processes the need for additional methods to facilitate replacement of panels with proper support and dimensioning.

**Scope:** Determine proper holding, measuring and repair methods using Car-O-Liner Equipment to facilitate OEM factory process and procedures for F-150 Cab Repairs. On-Frame/ Off- Frame repairs were investigated. Cab repairability off the frame of the vehicle was determined to be minimal and possibly less than 10-15% of total repairs so on-frame techniques were also investigated.

**Process:** Joint collaboration between Ford Motor Company Paint and Body Technology Center (FMCPBTC) and Car-O-Liner Company (COL) of research investigation, design, build and test any methods necessary for complete repairs on the F-150 cab.

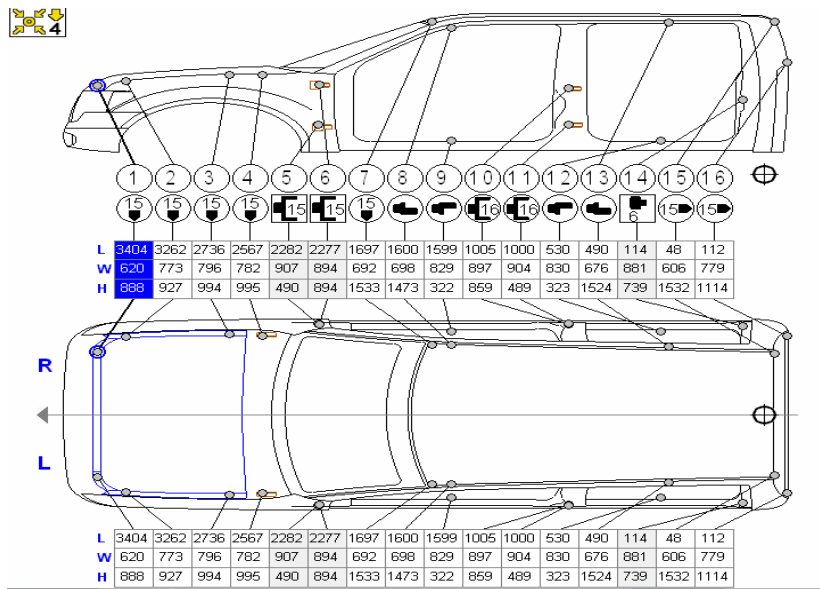
**Detail: 1.** FMCPBTC supplied COL 2009 Ford F-150 bodies from Livernois Engineering for investigation to determine necessary action and compatibility of COL equipment to the body. COL Sourced F-150 from local dealer and employee vehicle for further needs and testing.

**2.** Upon first inspection it was determined that in fact COL has clamps already in the field should the 'cab only' need securing to the bench while disconnected from the frame, this can be performed using B223 Clamp with a B246 Wedge to adjust angle of the connection flange. Cab was secured and measured to determine tolerances for creating a data sheet.



**CLAMPING EXAMPLE (SIDE VIEW, FRONT CLAMP, REAR CLAMP)**

3. When testing to determine tolerances was complete, COL created both lower and upperbody datasheets for the cab only for use with Car-O-Liner Car-O-Tronic Measuring Systems. UpperBody dimensioning will require use of the included High Measuring Pointer (HMP).



**EXAMPLE OF UPPER BODY DATA MEASUREMENTS**

4. Due to most repairs being performed on the vehicle it was determined that repair options should be designed for both light to heavy pulling and repair situations. Using EVO while the vehicle is mounted for frame correction or independently mounted several areas of holding are available using existing EVO 1-2 systems.



**Universal Clamping to Pinchweld Area Using EVO**

5. Additional Repair options are available without removal of the Cab from the frame. This process is as follows:
- A. Remove body mount bolts from the cab and core support connections to the frame.
  - B. Raising the body from the frame can be performed using four Pillar Jacks in the cab corners. ( OPTION: It is possible once the bolts are removed to raise one side at a time.)



**Pillar Jack Lift in Four Cab Corners**

- C. While being supported by the Pillar Jacks, remove the Cab Biscuits (Bushings from frame connection to cab)
- D. Install EVO Towers in place as shown in the Vision X3 and Vision EVO dialog for each individual holding point on the cab only data sheet. An accessory package of Steel Bushing and replacement bolts for holding the cab will be necessary. (UNDER FINAL STAGE OF DEVELOPMENT) The steel bushing will slide between frame mounting and bolt goes through the EVO Holder and bushing while threading into the cab mount cage nut.



**NOTE: MOUNT AREA AND BUSHING PLACEMENT**

**NOTE:** This should be performed at all mount locations depending on extent of the cab damage. In some instances the Accessory Bushing may not be required at the core support.

**ADDITIONAL FINDINGS:** In some instances the 'Caged Nut' in the cab may spin and require securing in order to complete the repair processes. Sample photo below shows procedure to access the nut area from the top by measuring and drilling a hole from inside the cab for access.



**ACCESS HOLE FOR CAGE NUT**

**NEW STEEL MATERIALS:** This cab has extensive use of high strength steel HSS materials not found in previous models to include HSLA 350, HSLA 550, Dual Phase (DP) 600, and Dual Phase (DP) 780. Care must be taken to follow Fords repair and sectioning processes to ensure a correct repair. Areas of concern should include:

**HSLA 550 Inner Rocker Panels**  
**DP 780 Inner A-Pillar and Inner Roof Side**  
**HSLA 350 B-Pillar on Standard and Super Cab**  
**DP 600 B-Pillar on Crew Cab**

**ADDITIONAL MODELS INCLUDED:** While the 2004-2008 F-150 do not share the same steel material usage, some repairs to the cab will also be needed to performed. The above procedures and applications can be used on those models also.

**FURTHER REFERENCE MATERIALS:** ALL Repair Processes are available from Ford Motor Company at [www.motorcraftservice.com](http://www.motorcraftservice.com) . They are found in the Workshop Manual and can be purchased, Short Term (72 Hours), Monthly, or annual Subscriptions.

**CONCLUSION:** Upon completion of a joint collaboration between Ford Motor Company Paint and Body Technology Center and Car-O-Liner Company it has been determined that the EVO Holding System along with an accessory package can be connected to the body mounting positions for cab repairs to the 2004 to present F-150 vehicles.

The EVO system used in conjunction with the Car-O-Tronic Measuring system, and 3D measuring data meets or exceeds the engineering requirements on all F-150 cab configurations to include the 2009 model year collision repair processes.

**FURTHER CONTACT INFORMATION:**

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