

FCA US LLC Chronology
2012-2014 MY D-Truck Steering Wheel Wiring Harness
Submitted on July 21, 2015

- Certain 2012-2014 MY Ram Truck vehicles may have a steering wheel wiring harness that contacts the driver airbag module retainer spring end causing wear on the harness wires which may lead to an electrical short. Root cause was determined to be lack of positive steering wheel wiring harness attachment points to ensure clearance to the driver's airbag retainer spring end, changes in the steering wheel wiring harness protective tape, variance in the length of the airbag retainer spring and variation in production which combine to create the possibility of contact and subsequent wiring harness abrasion.
- In September 2014, FCA US LLC's ("FCA US") Vehicle Safety and Regulatory Compliance ("VSRC") office provided the supplier three Steering Column Control Modules ("SCCM") from vehicles with alleged inadvertent driver airbag deployments.
- In October 2014, supplier analysis concluded that an "external" overcurrent condition caused the SCCM conductor ribbon and bus terminals to overheat and melt. FCA US Engineering analyzed the steering wheel wiring harness from one of the suspect vehicles and discovered harness chafing and evidence of a short circuit. Further investigation determined that the chafing was located at a location that may come into contact with the sharp end of the airbag retainer spring.
- On November 3, 2014, as a precautionary product improvement for current production, a production yard hold was issued to cap the sharp ends of the airbag retainer spring and shorten the steering wheel wiring harness until a permanent solution was implemented at Warren Truck Assembly Plant and Saltillo Truck Assembly Plant.
- On November 12, 2014, the FCA US Materials Lab conducted an analysis of a returned steering wheel wiring harness and driver airbag module and observed polymeric material transfer and carbonization due to arcing on the driver airbag retainer spring end due to chaffing and an electrical short of the steering wheel wiring harness. Subsequent review of the circuit architecture linked this short to an electrical overstress condition of the SCCM conductor tape.
- Note: Although cause of these specific inadvertent driver airbag field return samples was understood, the scope of the issue was not clear. The steering wheel, SCCM, steering wheel harness and driver airbag architecture has been in production since the 2009 MY. Therefore, FCA US began a set of studies to determine contributing factors and scope.
- On November 13, 2014, review of steering wheel wiring harness warranty trends indicated an increase in replacements after April 2013. A vehicle survey using employee owned vehicles was requested by the VSRC to understand contributing factors that may have caused the higher occurrence rate (round one).
- On November 18, 2014, FCA US Engineering recreated steering wheel wiring harness abrasion during lab vibration testing on two of seven samples by purposefully routing the steering wheel wiring harness in the worst case position on the driver airbag retainer spring end.
- On December 2, 2014, the VSRC coordinated movement of a customer buyback vehicle (VIN: CG229554) to a local dealership for engineering review.
- On December 11, 2014, the VSRC coordinated movement of a second customer buyback vehicle (VIN: ES256602) to a local dealership for engineering review.
- On January 8, 2015, the VSRC requested that the round one vehicle survey be expanded to include 2012 MY vehicles (round two).
- On January 14, 2015, information was presented to the Investigation Steering Group ("ISG") including a detailed breakdown of warranty rates for related components. The ISG requested analysis of market information including warranty narratives and additional engineering change data.
- On January 15, 2015, the VSRC conducted an extensive review of all applicable engineering and production changes.
- On January 29, 2015, FCA US Engineering reviewed a buy-back vehicle (VIN: CG229554) in the field and confirmed that the failure mode was consistent with the steering wheel wiring harness short to driver airbag retainer spring end.
- On February 5, 2015, the first round of the vehicle survey was completed. One vehicle had evidence of harness wear but did not exhibit any concern. During this study, it was noted that the driver

airbag retainer spring end increased in length by approximately 2.5 mm in vehicles produced after April 2013. This length was likely due to production variance after a sub-supplier change (length of spring end was not controlled via a specific drawing call-out).

- On February 9, 2015, an extensive warranty narrative analysis was conducted which identified additional inadvertent driver airbag deployments, wiper/washer function issues, and several other failure modes related to the steering wheel wiring harness circuits. Failure rate of inadvertent airbag deployment was at a low level (~0.033 C/1000 for Post April 2013 vehicles and occurred at half that rate for vehicles prior to April 2013) and narrative analysis indicated that inadvertent airbag deployment made up less than 1% of repairs that may be related to the steering wheel wiring harness abrasion.
- On February 11, 2015, the VSRC was informed that 2015 MY Ram Trucks began production with SCCM electrical overstress protection in the electrical system architecture (2015 MY Job #1 occurred on August 22, 2014). The circuit protection eliminates the possibility of current above 3 amperes which can damage SCCM electrical trace tape and subsequently cause inadvertent deployment of the driver airbag. Further investigation found that this change cannot be easily retrofit into earlier model years.
- On February 18, 2015, the VSRC requested vibration testing of 2012 MY steering wheel wiring harnesses after noting that harness protective tape changed from a vinyl-backed to a felt-backed design in the 2012 MY. This testing was completed on May 4, 2015. It was concluded that the vinyl tape did not have better wear characteristics but the tape's smooth backing and rigidity reduced the likelihood of point contact with the driver airbag retainer wire end.
- On March 25, 2015, FCA US Engineering reviewed a second buy-back vehicle (VIN: ES256602) in the field and confirmed that the failure mode was consistent with the steering wheel wiring harness short to driver airbag retainer spring end.
- On March 25, 2015, information was presented to the ISG for review and recommendation including a review of warranty trends, narrative analysis and engineering and production changes. The ISG requested further analysis of failures around April 2012 due to a slight increase in incidents that appeared to align with changes in the driver airbag retainer spring geometry during that time period.
- On April 13, 2015, the VSRC requested an engineering review of steering wheel wiring harness design. This review found that vehicles with Electronic Vehicle Information Center ("EVIC") are equipped with a B+ terminal whereas vehicles without EVIC are not. All vehicles with inadvertent deployment due to steering wheel wiring abrasion were equipped with EVIC.
- On April 13, 2015, the VSRC requested an engineering Computer Aided Design review of changes made to the driver airbag retainer wire geometry. It was determined that these changes could not have an effect on steering wheel wiring harness abrasion.
- On May 4, 2015, round two of the vehicle survey was completed for 2012 MY vehicles. No steering wheel wiring harness abrasion was noted in the sample.
- On May 13, 2015, information was presented to the ISG for review and recommendation. The ISG requested an analysis of failure rate by time-in-service/mileage and a second vehicle survey (round three) with a sample size of approximately 100 units to statistically access scope.
- On June 5, 2015, the VSRC requested a second vehicle survey using employee owned vehicles (round three). Approximately 80 vehicles were identified for the survey and were targeted for completion around the end of July 2015.
- On June 24, 2015, information was presented to the ISG for preliminary review prior to submittal to the Vehicle Regulatory Committee ("VRC"). Updated failure rates by build date and incident date were presented.
- On July 8, 2015, information was presented to the ISG for review and recommendation. The ISG recommended presenting the issue to the VRC.
- As of July 13, 2015, FCA US identified approximately 32 CAIRs, 5 VOQ and 18 field reports related to this issue.
- On July 14, 2015, FCA US determined, through the Vehicle Regulations Committee, to conduct a voluntary safety recall of the affected vehicles.