

FCA US LLC Chronology

P14 Brake Booster Shield Inspection - 2011-2014 MY WD and WK Vehicles
Submitted on September 18, 2017

- On January 18, 2017, the FCA US Vehicle Safety and Regulatory Compliance (“VSRC”) organization initiated the investigation processes based on field reports indicating customer concerns with the brake booster replacement after completion of the P14 (NHTSA 14V-154) safety recall.
- On February 9, 2017, FCA US began collecting warranty-returned brake boosters for inspection and analysis.
- On February 15, 2017, FCA US received 34 VINs from the National Highway Traffic Safety Administration (“NHTSA”) with a request to confirm whether these VINs were within the scope of P14, if the recall was completed, date of completion and which remedy was applied to the vehicle.
- On February 23, 2017, FCA US supplied NHTSA with the requested information on the 34 VINs. FCA US also requested the NHTSA Office of Defects Investigation (“ODI”) VOQ documents associated with these 34 VINs to understand the customer concern.
- From February 23, 2017, through March 14, 2017, FCA US requested the supplier to perform analysis on 20 returned parts.
- On February 24, 2017, FCA US received the requested VOQ documents from NHTSA and continued research into the conditions of the brake booster related issues.
- On March 14, 2017, NHTSA reported that during independent testing at their in-house laboratory, the Vehicle Research and Test Center (“VRTC”), a brake booster passed a vacuum test but did not have brake assist. FCA US requested details of the testing procedure and the results.
- On March 21, 2017, NHTSA provided the details of the brake booster testing at the VRTC. The brake booster used in the testing had been disassembled by NHTSA and was no longer available for testing. Since FCA US could not corroborate the issues presented due to the test procedure and lack of usable parts, FCA US requested to participate in the next review at the VRTC.
- On April 4, 2017, FCA US and NHTSA arranged to conduct testing on three returned brake boosters at the VRTC on April 11, 2017.
- On April 11, 2017, FCA US and NHTSA conducted testing at the VRTC to verify the plausibility of NHTSA’s claim that a brake booster could pass the vacuum test but fail to provide brake assist. In duplicating the testing conducted by NHTSA in March 2017, it was observed that the methods used by the VRTC technicians were not in accordance with those outlined in the P14 procedure. One of the returned brake boosters was installed in a NHTSA test vehicle (2013 MY Jeep Grand Cherokee (“WK”)) instrumented with accelerometers, brake booster vacuum sensors, and brake pedal force sensors. The vehicle was driven and braking performance exceeded Federal Motor Vehicle Safety Standards (“FMVSS”) requirements.
- On April 25, 2017, FCA US reviewed the April 11, 2017, test results with NHTSA. NHTSA requested that FCA US obtain brake boosters returned from the field where P14 was completed previously and then returned with a brake issue. FCA US agreed to obtain the samples and arrange further testing at the VRTC. NHTSA also expressed an interest in acquiring boosters with varying levels of corrosion for on-vehicle testing, but it was later stated by the supplier, ZF TRW, that it is not possible to gauge the level of corrosion without brake booster disassembly, thus making the booster unusable for vehicle testing.
- From April 4, 2017 through May 22, FCA US was collecting and testing parts that met NHTSA’s criteria request (P14 completed previously then returned with a brake issue) to support VRTC testing.
- On May 23, 2017, FCA US provided engineering assessment requested by NHTSA on the customer detectability of a brake booster vacuum leak, returned part analysis options and an overview of the vehicle’s Hydraulic Boost Compensation (“HBC”) and Panic Brake Assist (“PBA”) operation.

- On July 6, 2017, FCA US visited the NHTSA VRTC to perform the second session of brake performance testing with brake boosters that failed after P14 completion. NHTSA, however, had equipped their test vehicle to simulate variable brake booster leak rates to replicate any level of corrosion. The test vehicle was driven with various simulated leak rates, and braking performance again exceeded FMVSS requirements in part due to the HBC and PBA system operation. After testing, NHTSA observed that one of the warranty-returned parts had a brake booster water shield that was incorrectly installed.
- On July 11, 2017, NHTSA requested FCA US establish the frequency of incorrect installation of P14 brake booster water shields in the field.
- On July 18, 2017, FCA US reported results of shield installation inspections/surveys to NHTSA. A review of 14 returned parts with evidence of shield installation found that 12 were installed incorrectly. Additionally, a vehicle field study of 117 vehicles found that approximately 41% had incorrectly installed shields. NHTSA expressed concerns of water being able to enter the brake booster with an incorrectly installed shield and freeze. FCA US agreed to conduct water flow and cold chamber testing to determine the performance level of an incorrectly placed brake booster water shield.
- On July 27, 2017, FCA US incorrectly placed a brake booster water shield onto a brake booster with a known corrosion induced gross vacuum leak and installed the assembly into a 2014 MY WK. The vehicle was idled in a halo spray booth at the highest setting for two hours and then driven directly into a cold chamber (-20° F) for 24 hours with the engine off. After 24 hours, an attempt was made to start the vehicle in the cold chamber while monitoring pedal force. A pedal force between 22-28 lbf was required to actuate the brake switch and enable engine start. Typical pedal force at start is approximately 4 to 16 lbf.
- On August 8, 2017, FCA US provided NHTSA with the results of the first cold chamber test, as well as videos showing water flow on the brake booster with correctly and incorrectly installed shields. NHTSA requested further testing with varying levels of water in the brake booster to simulate various levels of water intrusion. FCA US also agreed to perform a roll test to determine if a brake booster with water intrusion could freeze while driving.
- On August 11, 2017, FCA US held an internal meeting to discuss test parameters and create a detailed test plan. In addition to the cold start and rolls testing, a third test to measure under-hood temperatures near/at the brake booster from cold start until the vehicle reached operating temperature was devised to understand the potential for water frozen inside the brake booster to thaw.
- On August 22, 2017, FCA US provided NHTSA with the results of the original twelve P14 recall VOQs. Three of the twelve contained the word “frozen”, they were referring to the inability to move the brake pedal. This condition, as well as all three happening at highway speeds, led FCA US to summarize that the vehicles in these VOQs were experiencing conditions related to recall P05 (NHTSA 14V-104) campaign, which was an ABS module reflash with symptoms of hard pedal at highway speeds. All three vehicles were in the P05 population, had recall P05 completed after the VOQ narrative date, and had no further complaints afterwards.
- On August 23, 2017, FCA US placed a 2014 MY Dodge Durango (“WD”) in a roller cold chamber (-20° F). After being driven for one hour, varying engine RPM from 4000-2500 to simulate driving conditions with wind speed dependent on vehicle speed, the brake booster shell temperature ranged from -20° F to 30° F.
- On August 25, 2017, FCA US provided NHTSA with results of the roller cold chamber testing. Additionally, an update of consumer and field complaints for crashes, injuries and/or fatalities was provided showing one confirmed crash and zero injuries.
- On August 28, 2017, FCA US tested a 2011 MY WK and a 2014 MY WD in a cold chamber (-20° F) for

24 hours to determine pedal force with varying levels of brake booster water intrusion (25 ml, 50 ml, 100 ml, 200 ml) when frozen. The resulting pedal force ranged from 22 lbf to 28.1 lbf.

- On August 29, 2017, FCA US provided NHTSA with the results of water intrusion pedal force testing.
- As of September 8, 2017, FCA US identified approximately eight Customer Assistance Inquiry Records, two NHTSA Vehicle Owner Questionnaires and zero field reports related to this issue.
- As of September 8, 2017, total warranty is 10,053 at 11.8 C/1000. *
- As of September 8, 2017, FCA US is aware of one accident and zero injuries potentially related to this issue. On September 11, 2017, FCA US determined, through the Vehicle Regulations Committee, to conduct a voluntary safety recall of the affected vehicles.

** This is the number of vehicles in which the booster was replaced for any reason after the shield was installed out of the total P14 population.*