

**IN THE UNITED STATES DISTRICT COURT FOR  
THE SOUTHERN DISTRICT OF WEST VIRGINIA**

**HUNTINGTON DIVISION**

CHARLES JOHNSON, et al.,

Plaintiffs,

v.

CIVIL ACTION NO. 3:13-6529

FORD MOTOR COMPANY,

Defendant.

**MEMORANDUM OPINION AND ORDER**

Pending before the Court are Defendant “Ford Motor Company’s Motion to Exclude Plaintiffs’ Designated Expert Witnesses Hubing, van Schoor, and Koopman” (ECF No. 1046) and the balance of Ford’s Motion for Summary Judgment. ECF No. 1055.<sup>1</sup> On January 17, 2018, the Court held an extensive hearing on the motion regarding these experts and held a hearing on the summary judgment motion on February 1, 2018. Upon consideration of the issues, the Court **GRANTS** Ford’s Motion to Exclude and the balance of its Motion for Summary Judgment.

**I.  
BACKGROUND**

Plaintiffs consist of nineteen individuals from seventeen states seeking economic loss damages for allegedly defective Ford vehicles manufactured between 2004 and 2010. *See generally Second Am. Master Consol. Class Action Compl.*, ECF No. 686. Plaintiffs’ theory is that the electronic throttle control (ETC) system contains a defect in its ability to identify and mitigate

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<sup>1</sup>On February 27, 2018, the Court entered a Memorandum Opinion and Order granting Ford’s Motion for Summary Judgment on Plaintiffs’ warranty and unjust enrichment claims. *Johnson v. Ford Motor Co.*, Civ. Act. No. 3:13-6529, 2018 WL 1083043, at \*6 (S.D. W. Va. Feb. 27, 2018). The Court held in abeyance Ford’s motion as to Plaintiffs’ remaining claims. *Id.*

unintended acceleration. Plaintiffs allege that every vehicle in these model years with Ford's Gen II ETC system—literally millions of vehicles sold and driven hundreds of millions of miles—was worth less than the purchase price because of this inherent defect, whether the defect manifested itself (as an unintended acceleration) or not.<sup>2</sup> Each Plaintiff also seeks class action status for the pending state law claims. As the challenged expert opinions are critical to the remaining summary judgment issues, the Court addresses both matters together.

## **II. Admissibility of Expert Testimony**

Rule 702 of the Federal Rules of Evidence governs the admissibility of expert witness testimony. A qualified expert's testimony is admissible if it “rests on a reliable foundation and is relevant[.]” *Daubert v. Merrell Dow Pharm. Inc.*, 509 U.S. 579, 597 (1993). Pursuant to Rule 401 of the Federal Rules of Evidence, “[e]vidence is relevant if: (a) it has any tendency to make a fact more or less probable than it would be without the evidence; and (b) the fact is of consequence in determining the action.” Fed. R. Evid. 401. There is no mechanistic test for determining if an expert's proffered relevant testimony also is reliable. Rather, “‘the test of reliability is flexible’ and ‘the law grants a district court the same broad latitude when it decides *how* to determine reliability as it enjoys in respect to its ultimate reliability determination.’” *United*

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<sup>2</sup>Plaintiffs’ counsel conceded at oral argument that their experts could not testify that the alleged defect caused an unintended acceleration in any of Plaintiffs’ specific vehicles. However, they said they disagreed with, and intended to appeal, this Court’s prior ruling that they must demonstrate a manifestation of the alleged defect in the form of an unintended acceleration in order to maintain their warranty claims. *Tr. of Mot. Hrg.*, at 61-62 (Feb. 1, 2018), ECF No. 1161, at 64-65.

*States v. Wilson*, 484 F.3d 267, 274 (4th Cir. 2007) (quoting *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141-42 (1999) (italics original in *Kumho*)).<sup>3</sup>

To fulfill its gatekeeping responsibility, the court must determine whether: (1) “the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;” (2) “the testimony is based on sufficient facts or data;” (3) “the testimony is the product of reliable principles and methods;” and (4) “the expert has reliably applied the principles and methods to the facts of the case.” Fed. R. Evid. 702(a)–(d). “This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.” *Daubert*, 509 U.S. at 592-93.

In considering reliability, the Court must ensure that the expert opinions are ““based on scientific, technical, or other specialized *knowledge* and not on belief or speculation, and inferences must be derived using scientific or other valid methods.”” *Nease v. Ford Motor Co.*, 848 F.3d 219, 229 (4th Cir. 2017) (quoting *Oglesby v. Gen. Motors Corp.*, 190 F.3d 244, 250 (4th Cir. 1999) (italics original)). Although not definitive or exhaustive, *Daubert* sets forth several helpful factors for courts to bear in mind when deciding if expert opinions are admissible. *Id.* Courts consider a number of factors in conducting these evaluations, including, but not limited to: (1) “whether a theory or technique . . . can be (and has been) tested”; (2) “whether the theory or

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<sup>3</sup>Although *Daubert* focused on scientific testimony, the Supreme Court in *Kumho Tire* clarified its broader application to all expert testimony falling under Rule 702. *Kumho Tire*, 526 U.S. at 141.

technique has been subjected to peer review and publication”; (3) the “known or potential rate of error”; (4) the “existence and maintenance of standards controlling the technique's operation”; and (5) whether the theory or technique has garnered “general acceptance.” *Daubert*, 509 U.S. at 593-94 (citations omitted); *see also Nease*, 848 F.3d at 229 (discussing *Daubert* factors). “[E]xpert witnesses have the potential to be both powerful and quite misleading[.]” *PBM Prods., LLC v. Mead Johnson & Co.*, 639 F.3d 111, 123 (4th Cir. 2011) (internal quotation marks and citations omitted). Therefore, the Court’s gatekeeping role with respect to experts is critical. In situations in which experts formulate opinions from existing data, “nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.” *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). When an expert's opinion is based upon mere *ipse dixit*, “[a] court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.” *Id.* (citation omitted).

In this case, testing of ETC systems was central to the experts’ opinions. However, the Court finds this testing was flawed, and Plaintiffs have failed to establish other means by which their experts can meet the reliability standard. The only peer-reviewed publication relied upon was an article by one of Plaintiffs’ experts, Todd H. Hubing, Ph.D. However, the National Highway Traffic Safety Administration (NHTSA) and its partner in unintended acceleration investigations, the National Aeronautics and Space Administration (NASA), concluded his theory lacked real-world evidence.<sup>4</sup> Additionally, at least one aspect of Plaintiffs’

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<sup>4</sup>At oral argument, Ford included in its PowerPoint presentation a public document entitled “NASA Engineering and Safety Center Technical Assessment Report: National Highway Traffic Safety Administration Toyota Unintended Acceleration Investigation.” Although prepared as part

defect theory is unfalsifiable: that is, inherent in a computerized electronic system, there are transient defects which cannot be replicated and leave no trace. Assuming the impossibility of replicating some defects is true, Plaintiffs nonetheless failed to evaluate and test adequately those elements of their hypotheses that can be reproduced, tested, and observed.

At its core, Plaintiffs' theory is that many predictable flaws may occur with the pedal sensors. Plaintiffs theorize that these flawed sensors produce faulty voltage signals that should trigger the ETC system's failsafe modes. However, due to a defectively designed ETC system, the failsafe modes are not activated, resulting in unintended accelerations.

Plaintiffs argue Ford's design development history and complaints found in the Common Quality Indicator System (CQIS) database establish a connection between faulty sensors and the possibility that faulty signals can lead to unintended accelerations. Although Plaintiffs' experts purport to test that theory, they leave a gap between analytical possibility and actual proof of occurrence. The experts attempt to excuse this gap by reporting that the defect leaves no evidence of its effect. However, this position shifts the burden to Ford to prove the negative. Furthermore, there is no "general acceptance" within the automotive safety or engineering

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of the Toyota unintended acceleration investigation, the NASA Engineering and Safety Center (NESC) team evaluated Dr. Hubing's theory that the unintended accelerations were caused by pedal circuit faults on pedal assembly sensors. The NESC team concluded the theory was not supported by real-world evidence. The Court could not readily find this particular document in the thousands of pages of exhibits the parties filed with the Court. Nevertheless, Plaintiffs did not object to Ford's reference to the document or contest the document's authenticity at the motion hearing. Moreover, it was marked as Ford's Exhibit 5 for identification purposes at Dr. Hubing's deposition, and this particular conclusion by NESC was discussed at the deposition. *See Dep. of Todd H. Hubing Ph.D.*, at 132-35 (July 18, 2017), ECF No. 1101-3, at 133-36.

community that underpins Plaintiffs' theory. The causes of unintended acceleration are myriad. Some events are attributable to driver error, while others are tied to different defects from cruise control to mechanical issues. Even though many drivers' complaints of unintended acceleration are credible and likely caused by some defects, Plaintiffs' theory here is still largely hypothetical, as the Court explains below with respect to the three experts challenged by Ford in this motion.

**III.**  
**Todd H. Hubing, Ph.D.**

Ford first challenges the testimony of Dr. Hubing, an electrical engineer who has studied the field of electromagnetic compatibility in automobiles for many years, principally as a professor at Clemson University. His credentials are not challenged by Ford. As part of his work related to the automotive industry, he has published a number of peer-reviewed articles through the Institute for Electrical and Electronics Engineers (IEEE). One of those articles published in June 2015 focused on his examination of five vehicles equipped with ETC systems, including two Ford models. Dexin Zhang & Todd H. Hubing, *Comparison of the Accelerator-Pedal-to-Engine-Control-Module Interfaces on Vehicles With Low and High Reported Rates of Unintended Acceleration*, 3 IEEE Access 852, 853 (June 26, 2015), ECF No. 1101-1. His report in this case relied primarily on this article, where he mapped the operational lanes of each vehicle reading two acceleration pedal sensors to see when diagnostic trouble codes (DTCs) and wide open throttle (WOT) resulted.

Comparing accelerator pedal performance among the five vehicles, Dr. Hubing concluded that Ford's Gen II ETC system was flawed in that it failed to mitigate or correct sensor faults that could result in unintended acceleration. *See Expert Report of Todd H. Hubing, Ph.D.*,

at 12 (June 15, 2017), ECF No. 1101-24, at 13. He noted that pedal sensors may be expected to generate faulty signals for a variety of reasons, such as wear and tear, contamination, water intrusion, and chafing among other causes. *Id.* at 13-14, ECF No. 1101-24, at 14-15. Dr. Hubing criticized Ford's system as "unnecessarily vulnerable" to unintended acceleration in several scenarios, and he opined that Ford's Gen II ETC system failures caused unintended acceleration "at a rate approximately 1,000 time higher" than "the industry standard." *Id.* at 15 & 17, ECF No. 1101-24, at 16 & 18.

To reach these conclusions, Dr. Hubing relied on the testing he performed for the June 2015 article. Though his article was peer-reviewed, the Court finds his study insufficiently reliable to support his testimony in this case. First, his testing protocol was developed to test vehicles with "two track" pedal sensor configurations. As Ford used "three track" pedal sensors, Dr. Hubing had to alter his testing by giving a set value to one of the three sensors in the Ford vehicles, the negative slope sensor. *Dep. of Todd H. Hubing, Ph.D.*, at 111-12 & 116 (July 18, 2017), ECF No. 1101-3, at 112-13 & 117.<sup>5</sup> Though he defends this approach, he does not purport to know how Ford's computer source code and other components of the Ford system were affected by this alteration. *See id.*, 28-29, 274-75, & 307-08, ECF No. 1101-3, at 29-30, 275-76, & 308-09. In at least some of his testing, he set this third sensor at a value consistent with an open throttle. *Id.* at 113-16, ECF No. 1101-3, at 114-17. If either of the other two sensors matched this static

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<sup>5</sup>The Court notes that the deposition questioning of Dr. Hubing is lengthy, argumentative, frequently redundant, and fragmented. As such, at times, the substance of his testimony does not lend itself easily to precise pinpoint citations and must be derived from a careful reading of the overall testimony.

sensor, open throttle would result as the design intended. *See id.* at 212-15, & 277, ECF No. 1101-3, at 213-16, & 278. However, open throttle also would occur in a two-track system if both sensors fault by producing values that were close enough to each other within the operational lanes designed to produce an open throttle. *Id.* at 273, 279, & 343-44 ECF No. 1101-3, at 274, 280, & 344-45.

Further undermining the reliability of the study for this case, Dr. Hubing's testing largely assumed that the faulty values, generally expressed as voltages, which he injected into the system were values that were representative of real-world circumstances such as degraded sensors. For instance, the tests that produced wide-open throttle did so because (1) the voltages injected in place of two sensors were in the range intended to produce open throttle and (2) those voltages were close to the same in each input, as though each sensor was faulting in the same way. Neither his article nor his report offer any testing of sensors to verify the assumption that both sensors should be expected to fault and that they do so in the same way.<sup>6</sup> The sources for this assumption seem to be two-fold: first, by reference to various documents, such as Ford's CQIS database (complaints relating to either pedal faults and/or unintended acceleration) and Ford's design and development phases for the Gen II ETC system; second, the inherent knowledge of the expert.

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<sup>6</sup>In his deposition, Dr. Hubing specifically was asked by Ford's counsel whether he was ever able to produce an unintended acceleration in one of the class vehicles by using "a worn sensor, loose connector, tin whisker, chaffed wire, water intrusion, a solder ball, metal [flake] or a software bug or EMI[.]" *Id.* at 308, ECF No. 1101-3, at 309. Dr. Hubing stated he had done no testing in that manner and, instead, relied upon simulations based upon his assumptions of what would happen if those things existed. *Id.* at 308-09, ECF No. ECF No. 1101-3, at 309-10.

While the former, such as the reports in the CQIS database, support posing the hypothesis (bad sensors may produce faults which the ETC may misinterpret as intentional acceleration), they do little to answer it. These reports are brief, and very few reflect an inspection, testing, or analysis by a trained eye. Dr. Hubing's qualifications give some measure of reliability to his assumption, but that is not enough. Plaintiffs should have obtained further inspection or testing of faulting sensors to support this pillar in the foundation of their defect claim.

To be clear, the Court understands that degraded sensors are not the defect, nor are they the only precipitating cause of unintended acceleration, according to Plaintiffs' claim. However, Dr. Hubing's theory of defect rests significantly on the system's inability to properly recognize and mitigate faulty sensors. In fact, Plaintiffs' damage claim seeks, in part, replacement of the pedal sensors to lessen the possibility that faults will mimic intended acceleration. However, Dr. Hubing readily concedes that he has not inspected or tested any of Plaintiffs' vehicles, nor has he attempted to produce, with degraded sensors, voltages that would cause unintended acceleration. *Id.* at 64-66, 294-96, & 308, ECF No. 1101-3, at 65-67, 295-97, & 309.<sup>7</sup> In fact the

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<sup>7</sup>The Court also discounts the CQIS and other Ford documents Dr. Hubing relies upon in his article to support his opinions in this case. In his report, Dr. Hubing only can point to potential sources of pedal sensor faults, and he states in the Conclusion of his article that “[i]t is difficult to say to what extent, if any, [design differences in the five vehicle models he tested] contributed to the rate of customer complaints.” *Comparison of the Accelerator-Pedal-to-Engine-Control-Module Interfaces on Vehicles With Low and High Reported Rates of Unintended Acceleration*, 3 IEEE Access at 862, ECF No. 1101-1, at 12. Then, Dr. Hubing wrote that the manufacturers of the vehicles he tested “made significant updates to their electronic throttle control systems since the 2008 model year[,]” and he and his co-author were “unaware of any data that suggests that any recent model year vehicles have unusually high reported rates of unintended acceleration.” *Id.* As Dr. Hubing has not performed any additional testing since the article, he fails to demonstrate how his findings apply to these later model years.

NHTSA and NASA investigation which Dr. Hubing noted in his article rejected his theory; while “conceptually possible,” it lacked “real-world evidence” that faulting sensors would trigger unintended acceleration. *Id.* at 148, ECF No. 1101-3, at 149. When questioned at his deposition about whether he ever saw “dual faults occur in the same resistive ranges” in the “real world,” Dr. Hubing ultimately answered no. *Id.* at 148-49, ECF No. 1101-3, at 149-50.

The Court also is troubled by Dr. Hubing’s opinion that Ford’s Gen II ETC system allows unintended acceleration at a rate above industry standards. *See Expert Report of Dr. Hubing*, at 17, ECF No. 1101-24, at 18. First, his testing of non-Ford vehicles revealed some vulnerability to unintended acceleration in all the models tested. *See Comparison of the Accelerator-Pedal-to-Engine-Control-Module Interfaces on Vehicles With Low and High Reported Rates of Unintended Acceleration*, 3 IEEE Access at 853, ECF No. 1101-1, at 3. Thus, some risk of unintended acceleration seems unavoidable, at least with respect to those model years in his study. Second, the article alludes to the “recent NASA investigation” and the NHTSA database of unintended acceleration complaints. *Id.* at 852, ECF No. 1101-1, at 2. However, Dr. Hubing does not explain in his article, or his report, the basis for relying on this data to make the claimed comparison of rates of unintended acceleration. The NHTSA database consists of voluntary complaints, not specific incidents that were verified or even examined. Additionally, neither source presents any definitive survey by which an expert could compare anything more than general complaints. For instance, Toyota’s extreme high rate of unintended acceleration was attributed somewhat to Toyota’s increased adverse publicity at the time. *Id.* at 853 (Table 1), ECF No. 1101-1, at 3. Also, these complaint rates were selected for models with new or modified ETC

systems, and though Plaintiffs repeatedly assert that the Gen II system is identical in all the models within their proposed class, the complaint rate for 2005 Mustangs was twice the rate for 2006 Explorers. *Id.* at 853, ECF No. 1101-1, at 3. The fact that complaints increased may trigger a study or investigation, but it does not serve as proof of the defect asserted by Plaintiffs. For these reasons, Ford's Motion to Exclude Dr. Hubing's opinions is **GRANTED**.

**IV.**  
**Marthinus van Schoor, Ph.D.**

Next, Ford challenges the opinions of Dr. Marthinus van Schoor, who holds a M.S. and a Ph.D. in aeronautics and astronautics. Dr. van Schoor performed what Plaintiffs' counsel characterized as measurements and inspection of Ford class vehicle pedals. He offers opinions on "technical performance and safety issues related to the Accelerator Pedal Assembly[.]" *Expert Report of Marthinus van Schoor, Ph.D.*, at 5 (June 12, 2017), ECF No. 1101-25, at 6. In addition to his criticism of Ford's ETC system, he explains an alternative design employing Brake Over Accelerator (BOA) technology and related safety features. *Id.* at 18-19, ECF No. 1101-25, at 19-20.

In particular, he found Ford's accelerator pedal sensors could be subject to wear or to a buildup of "gunk," either of which may cause sensor faults. *Id.* at 19, ECF No. 1101-25, at 20. His report concludes that the use of contacting sensors is a defect, *id.* at 28, ECF No. 1101-25, at 29, but Plaintiffs' counsel in argument essentially limited his opinion to the proposition that sensors may be expected to produce faulty signals. *Tr. of Mot. Hrg.*, at 9-10 (January 17, 2018), ECF No. 1154, at 12-13. Counsel explicitly stated that Plaintiffs were not offering his opinions as to a defect. *Id.* at 10, ECF No. 1154, at 13 ("stipulat[ing] on the record that Dr. van Schoor will

not offer defect opinions per se”); *see also id.* at 8, ECF No. 1154, at 11 (stating “[n]ow in his report, candidly I will concede to the Court that he couches all of his conclusions in the form of a defect opinion. Candidly I’ll say to the Court that I don’t know that Dr. van Schoor in this case tested his opinions against the rigor that is required for Federal Rules of Evidence”). However, Dr. van Schoor performed no inspections nor surveys to support his theory about contacting sensors. *Dep. of Marthinus van Schoor, Ph.D.*, at 124-25 (July 31, 2017), ECF No. 1101-15, at 125-26. In addition, he did not attribute any of Plaintiffs’ unintended acceleration events to the problems he identified in his report. *Id.* at 138-39, ECF No. 1101-15, at 139-40.

Dr. van Schoor also claims that when Ford’s gas pedal is operated (that is, pressed then released) in a particular way, it may cause the accelerator pedal sensors to “learn” a pedal angle that is not back to zero degrees (foot-off pedal position). *Dep. of Dr. van Schoor*, at 97-98 & 100-01, ECF No. 1101-15, at 98-99 & 101-02; *see generally Expert Report of Dr. van Schoor*, ECF No. 1101-25. He performed several tests on Ford pedals to measure how the pedal position is read by the sensors when the pedal is operated. He concluded that applying lateral or sideways force on the pedal and then releasing the pedal resulted in a significant effect on sensor outputs that caused the sensors to “ratch” upward. *Id.* at 28-29 & 100-01, ECF No. 1101-25, at 29-30 & 101-02. This “ratching” effect was considered by another of Plaintiffs’ experts, Dr. Philip Koopman, to contribute to the defect in the system that led to unintended acceleration.<sup>8</sup> *Expert Report by Philip Koopman, Ph.D.*, at 33 & 58 (June 14, 2017); ECF No. 1101-4, at 34 & 59.

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<sup>8</sup>“Ratching” is the intended process Ford developed so that its accelerator pedals would “learn,” or adjust, an idle pedal angle.

However, Dr. van Schoor's actual measurements of this phenomenon demonstrated very small effects on the pedal angle, and these measurements were not even used by Dr. Koopman in his testing. *Dep. of Dr. van Schoor*, at 98, ECF No. 1101-15, at 99; *Dep. of Philip Koopman, Ph.D.*, at 110 & 126-27 (Vol. I July 28, 2017), ECF No. 1101-2 at 111 & 127-28; *Tr. of Mot. Hrg.*, at 47-48, ECF No. 1155 at 50-51.

The Court finds Dr. van Schoor's measurements of pedal-angle return from lateral force to be irrelevant. He simply has no explanation of how such lateral forces on a gas pedal may be expected in the normal operation of a vehicle. *Dep. of Dr. van Schoor*, at 104-05, ECF No. 1101-15, at 105-06. Consequently, his finding that lateral force on the pedal may result in faulty sensor output is irrelevant to Plaintiffs' theory of defect. Furthermore, Dr. van Schoor's criticism of Ford's use of contacting sensors is confusing. As Plaintiffs apparently do not expect to elicit his opinion that these sensors are a defect in this system, his criticism also is irrelevant.

In addition to these subjects, Dr. van Schoor offers evidence of an alternative design: the use of BOA to provide a last stand against any unintended acceleration caused by the alleged inadequate failsafes in Ford's Gen II ETC system. *Expert Report of Dr. van Schoor*, at 18-19 & 28, ECF No. 1101-25, at 19-20 & 29. In a design defect case like this, evidence of the availability of a safer alternative may be relevant. However, Plaintiffs' evidence of the design defect must be adduced first. Merely demonstrating a safer alternative exists does not render the chosen design defective. Accordingly, in light of the above discussion, the Court **GRANTS** Ford's motion to exclude Dr. van Schoor's testimony.

**V.**  
**Philip Koopman, Ph.D.**

Finally, Ford challenges the opinions of Dr. Koopman. Ford focuses on whether his testing provides a reliable basis for his opinions. In his lengthy reports, consisting of his primary report and his supplemental reports concerning testing and software analysis, Dr. Koopman concludes that Ford's Gen II ETC system is prone to allowing unintended acceleration due to the design defect alleged by Plaintiffs. His qualifications are extensive and unchallenged, but Ford vigorously disputes the support for his conclusions. Though he summarizes and criticizes Ford's design, development, and implementation of its Gen II ETC system, his conclusion that the system is defective rests primarily on his testing.

Dr. Koopman performed testing on two models: a 2005 Mustang and a 2006 Fusion. *Expert Report of Dr. Koopman*, at 36, ECF No. 1101-4, at 37; *see generally Suppl. Expert Report on Vehicle Testing of Philip Koopman, Ph.D.* (June 15, 2017), ECF No. 1101-9, at 46-51, ECF No. 1101-10, at 1-53. Generally, he used a break-out box to inject voltages into the accelerator pedal wiring harness in place of the three accelerator pedal sensors. *Suppl. Expert Report on Vehicle Testing of Dr. Koopman*, at 4, ECF No. 1101-9, at 50. He opined that performing the testing in this manner allowed him to conduct fault injection to see how the ETC system reacted to different voltage inputs and combinations received from the three sensors. *Id.* Like Dr. Hubing, he asserted that the voltages injected into the system were representative of the voltages likely produced by sensors degraded in one or more ways, such as from wear and tear, loose wires, and water intrusion. *See generally Expert Report of Dr. Koopman*, at 270, ECF No. 1101-9, at 36; *Suppl. Expert Report on Vehicle Testing of Dr. Koopman*, ECF No. 1101-10. He found that an

open throttle would result when two or more sensors were close enough in voltages to produce similar pedal angle signals. Following this “benchtop testing,” Dr. Koopman placed dynamometers on the vehicle and repeated his version of fault injection to view what he characterized as actual vehicle performance. *Suppl. Expert Report on Vehicle Testing of Dr. Koopman*, at 4, ECF No. 1101-9, at 50. He found the same result: at higher voltages when two or more sensors were close enough together, acceleration resulted.

In particular, Dr. Koopman’s testing produced two scenarios that he relied on as proof of his design defect claim. All of his fault injection tests used “in range” voltages, meaning between 0 to 5 volts based on their power source and within the range of voltages the ETC was designed to recognize. First, he described the “ratching” effect by which he produced unintended acceleration through a series of inputs. *Id.* at 15-19, ECF No. 1101-10, at 11-15. Then, in a scenario he referred to as “correlated faults,” Dr. Koopman introduced two faults, representing two sensors producing faulty voltages at once or in a sequence. *Id.* at 33-38, ECF No. 1101-10, at 29-34. He theorized that two sensors could fault in essentially the same way or for the same reason, thereby producing close to the same voltages. *Id.* at 33, ECF No. 1101-10, at 29. In the ratching and in the correlated faults scenarios, the Ford system sometimes failed to go into protective or “limp” mode, the failsafe condition Ford claims exists in its design. Instead, Dr. Koopman purports that open throttle, or acceleration, resulted. However, Dr. Koopman admits that in many of his tests, he injected faults with voltages designed to produce pedal angles consistent with acceleration. *Dep. of Philip Koopman, Ph.D.*, at 309 (Vol. II Aug. 18, 2017), ECF No. 1101-2, at 304.

For reasons similar to those cited in excluding Dr. Hubing's testing results, the Court finds Dr. Koopman's approach flawed. As did Dr. Hubing, Dr. Koopman declares the use of the three-track contacting sensors is an important part of his defective design theory. He joins in the call for replacement of these sensors as essential to the repairs that he and Plaintiffs advocate in the damage claim. Yet, nowhere does he validate his hypothesis that degraded sensors, presumably to be expected, will actually cause or, in fact, have produced faulty voltages in the way he arranged for his testing. During oral argument, counsel for Ford claimed that Dr. Koopman's testing used voltage inputs that he knew were designed by Ford to instruct the system to accelerate. In his deposition, Dr. Koopman was asked many questions about how he selected the inputs to inject in his tests. Though both the questions and his answers are confusing and disjointed, Ford cited several passages in support of this argument. Upon review of his reports and his deposition, the Court finds Ford's argument persuasive. The testing was an artificial demonstration that essentially mimicked intentional acceleration. Dr. Koopman offers no testing of Plaintiffs' vehicles, or the exemplars he chose, to demonstrate how degraded sensors or the other circumstances can produce similar voltages that result in unintended open throttle.

Both Drs. van Schoor and Koopman identify "ratching" as evidence of design defect. According to them, when the gas pedal is pressed and released, it does not return precisely to its resting, foot-off-pedal-position. Instead, by design, the pedal learns an idle pedal position and that position also may vary due to "repeatability" problems, an inconsistency in return to idle during usage. *Id.* at 349, ECF No. 1101-2, at 309. Dr. van Schoor's measurements actually showed minimal variability in the pedals' return to idle, so neither Dr. Koopman nor Plaintiffs purport to

rely on his work. Dr. Koopman, however, discusses ratching extensively in his reports, and Plaintiffs use his “ratching” tests to portray vividly how Ford’s design is vulnerable to unintended acceleration. However, his testing method requires multiple steps: injecting in two or more sensors, then clearing inputs repeatedly in a sequence that has no “real-world” support. His testing procedure to obtain this result required injecting a negative angle in place of one sensor, followed by repeatedly injecting then releasing signals for the other sensors, with the brakes on until the last step. *Id.* at 424-5 & 430, ECF No. 1101-2, at 328 & 330. The only “real-world” support Dr. Koopman mentioned in his report is a failure mode and effects analysis (FMEA), which considered intermittent pedal sensor failures as a concern during development. Dr. Koopman has not shown that this test is a realistic example of sensor faults.

The fact Plaintiffs made no effort through any of their experts to test or inspect any of Plaintiffs’ vehicles to confirm these opinions is disturbing. As this Court explained in granting partial summary judgment to Ford on Plaintiffs’ common warranty and unjust enrichment claims, Plaintiffs fail to address their burden of demonstrating manifestation of the alleged defect by offering evidence that Plaintiffs’ unintended acceleration events likely were caused by the alleged defect. *Johnson v. Ford Motor Co.*, Civ. Act. No. 3:13-6529, 2018 WL 1083043, at \*6 (S.D. W. Va. Feb. 27, 2018). Neither Plaintiffs’ briefing nor their experts’ reports attempt to connect their testing to any of Plaintiffs’ vehicles. There are nineteen Plaintiffs who present numerous claims with regard to a variety of Ford vehicles that collectively are identified in the Consolidated Complaint. *See Second Am. Master Consol. Class Action Compl.*, at 31-32, ECF No. 686, at 39-40 (listing models of vehicles). None of those specific vehicles were selected by Plaintiffs’ experts

for testing. Instead, Plaintiffs insist that the testing, findings, and necessarily then the defects are applicable across the board to every class vehicles. Therefore, Plaintiffs assert it is unnecessary to their claims that the defect be demonstrated in their particular vehicles.

Contrary to Plaintiffs' argument, however, Dr. Hubing's testing revealed significant differences between the two Ford vehicles, which he asserts had identical ETC systems. Likewise, Dr. Koopman maintains that his opinions apply universally to Ford's Gen II ETC vehicles, but somehow results may be different because of calibration or different pedals. *Dep. of Dr. Koopman*, at 336 & 374 (Vol. II), ECF No. 1101-2, at 306 & 316; *Suppl. Expert Report on Vehicle Testing of Dr. Koopman*, at 7, ECF No. 1101-10, at 3. Dr. Koopman admits he has not "looked into" why complaint rates with the Gen II ETC three-track system are different from one model to another. *Dep. of Dr. Koopman*, at 147 (Vol. I), ECF No. 1101-2, at 148. He concedes that "some pedals will activate the defects and some pedals won't[.]" *Id.* at 147-48, ECF No. 1101-2, at 148-49. He also found that, despite the alleged uniformity of the design defect over all the class models, his testing revealed differences in the "arbitrated pedal angle" between the Fusion and the Mustang in his "ratching" test results. *Id.* at 408-09 (Vol. II), ECF No. 1101-2, at 324. Similarly, Dr. van Schoor stated that there were differences among the pedal sensors and pedal assemblies across the class models. *Dep. of Dr. van Schoor*, at 70-71, ECF No. 1101-15, at 71-72. Plaintiffs are inconsistent: Plaintiffs maintain the Gen II ETC system used by Ford is exactly the same in all vehicles, but then they excuse results when it is not.

Dr. Koopman makes much of the problems Ford encountered with pedal sensors during the development phase. *Expert Report of Dr. Koopman*, at 158-69, ECF No. 1101-6, at 30-39, ECF No. 1101-7, at 2-3. For example, in Section 5 of his Report he goes through Ford documents pertaining to sensor issues in Ford's vehicle durability testing. He relates that Ford identified pedal faults as a significant problem leading to the work of its Critical Concerns Review Group and issuance of its "8-D report." *Id.* at 171-75, ECF No. 1101-7, at 5-9. Importantly, however, Dr. Koopman fails to acknowledge the context in which Ford identified these pedal sensor issues. Ford recognized the issues during the development testing of Gen II ETC vehicles, and substantially addressed the issues by replacing a sensor manufacturer, KSR. *See generally Dep. of Dr. van Schoor*, at 125-36, ECF No. 1101-15, at 127-37. As *Nease* warns, issues such as Ford encountered with pedal sensors during the design phase cannot serve "as a proxy for the testing that [an expert] failed to do." *Nease*, 848 F.3d at 233. Though Dr. Koopman reports that contacting sensors like those used by Ford in the class vehicles should be replaced with non-contacting sensors, he has done no analysis of unintended acceleration complaint rates between the two designs or examined vehicles using non-contacting sensors. *Id.* at 155-56, 202, & 204-05, ECF No. 1101-2, at 156-57, 203, & 205-06. This gap amounts to a failure to validate his theory.

Dr. Koopman's testimony, that Plaintiffs' complaints are consistent with his design defect opinion, is inadequate to tie his opinions to this case. First, he relies on nothing more specific than the Consolidated Complaint to understand Plaintiffs' unintended acceleration events. Second, there are profound inconsistencies between the general complaints and his opinions. Nearly every Plaintiff described a failure of their brakes to counteract the unintended acceleration, yet in Dr.

Koopman's own testing procedure, the brakes restrained the acceleration. *See generally Suppl. Expert Report on Vehicle Testing of Dr. Koopman*, ECF Nos. 1101-9 & 10. Further, some Plaintiffs reported that their gas pedals were moving up and down without a foot-on-pedal, a circumstance not replicated in any of the tests done by Plaintiffs' experts. If these Plaintiffs were right, this pedal problem likely would be mechanical, perhaps caused by the return spring. Ultimately, Dr. Koopman's testing fails to serve as a reliable basis for his opinions regarding the design defects alleged by Plaintiffs in this case. Therefore, the Court **GRANTS** Ford's motion to exclude his testimony.

## VI. SUMMARY JUDGMENT

A key argument in Ford's *Daubert* and summary judgment motions is that Plaintiffs' liability experts—Drs. Hubing, van Schoor, and Koopman—should be excluded, leaving Plaintiffs' with no evidence of their core allegation that there is a design defect in Ford's Gen II ETC system. Following oral arguments on both motions, the Court granted partial summary judgment to Ford on Plaintiffs' common claims for breach of warranty and unjust enrichment. The Court based this decision upon Plaintiffs' failure to produce evidence as to manifestation of the defect in terms of causing the unintended accelerations in their vehicles, as this Court previously ruled was required for those claims. *Johnson*, 2018 WL 1083043, at \*6. Candidly conceding this failure of proof, Plaintiffs nonetheless maintain that their numerous remaining state law claims survive.

In its motion, Ford disagrees with Plaintiffs and argues it is entitled to summary judgment on the remaining claims because they all require evidence of the defect. Plaintiffs do not

dispute this proposition, but focus instead on their evidence of defect that they believe is sufficient to warrant denial of the motion. Though much of Plaintiffs' briefing focuses on their experts' criticism of Ford's design and development of the Gen II ETC system, the testing performed by their experts is the necessary link between Ford's Gen II ETC history and the alleged vulnerability of these vehicles to unintentionally accelerate.

Plaintiffs also cite the findings of David Bilek, P.E., a forensic engineer, and David Madigan, Ph.D., a statistician, who pored over Ford documents such as CQIS and other compilations of complaints. However, both of these experts' opinions were offered to prove notice to Ford of a defect, not the defect itself. Mr. Bilek admitted that of the over 9,000 complaints identified in the CQIS and "FMC 360" databases, only about 350 were verified as potential unintended acceleration events. *Suppl. Expert Report of David Bilek, P.E.*, at 2-3 (July 3, 2017), ECF No. 1093-15, at 3-4. In addition, he explicitly agreed that he was not offering evidence that any of the class vehicles have a defective condition. *Dep. of David Bilek, P.E.*, at 14-15 (July 14, 2017); ECF No. 1101-14, at 6. Similarly, Dr. Madigan performed a comparison of the rate of consumer complaints of unintended acceleration for the model years before and after adopting the Gen II ETC system, but he did not offer his report as evidence of a defect. *Dep. of David Madigan, Ph.D.*, at 35-36 (July 26, 2017), ECF No. 1071, at 8; *Pls. Mem. in Opposition to Defs.' Motion to Exclude the Expert Test. of Dr. David Madigan*, at 18 (Dec. 14, 2017) (ECF No. 1095) (stating "other experts, not Dr. Madigan, are opining on the causation of UA in Ford vehicles").

Without the testimony of Drs. Koopman, van Schoor, and Hubing, or any other expert who can establish there is a design defect in Ford's Gen II ETC system, Plaintiffs are unable to prove the fundamental theory of their case. Lacking such evidence, the balance of Plaintiffs' claims cannot survive. Therefore, the Court **GRANTS** summary judgment in favor of Ford on the remaining claims. *See Nease*, 848 F.3d at 234 (finding summary judgment must be entered in favor of Ford where the plaintiffs' expert's testimony should have been excluded under *Daubert* analysis).

## **VII. CONCLUSION**

Accordingly, for the foregoing reasons, the Court **GRANTS** "Ford Motor Company's Motion to Exclude Plaintiffs' Designated Expert Witnesses Hubing, van Schoor, and Koopman" (ECF No. 1046), and **GRANTS** the remainder of Ford's Motion for Summary Judgment. ECF No. 1055.

The Court **DIRECTS** the Clerk to send a copy of this Order to counsel of record and any unrepresented parties.

ENTER:            March 26, 2018

  
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ROBERT C. CHAMBERS  
UNITED STATES DISTRICT JUDGE