Conditions Necessary to Create Elevated CO Levels Within the Cabin of the Subject Vehicles

Within the cabin of the Subject Vehicles, there is no vehicle-originated source that generates CO. Therefore, if CO levels become elevated within the cabin, the source must be either manmade (such as smoking a cigarette), or the source must be external to the vehicle. Any external source of CO must then find an entry pathway.

CO can be present in the ambient atmosphere through which the Subject Vehicles travel, and CO can be present in the exhaust stream of the Subject Vehicles. These two situations will be discussed separately.

Ambient levels of CO, particularly in roadways, will vary from time-to-time and place-to-place. In 2014, Potchter et al. published a paper reporting the results of their investigation of commuter exposure to CO while traveling in cars, buses and motorcycles in the Tel Aviv metropolitan area.[5] In their paper, they described measurements of CO exposure inside private cars, motorcycles and buses along main metropolitan roads during rush hours in Tel Aviv. They found that commuters in cars with closed windows were exposed to the highest mean CO levels. The mean levels of CO for those commuters varied from 5.9 parts per million (PPM) to 27.2 PPM with an overall average of 11.6 PPM. The highest momentary CO level reached during their monitoring was 210 PPM. This paper demonstrates that commuters can be exposed to CO from environmental air contamination, regardless of whether they are driving a Subject Vehicle.

Another cause for increased CO concentration in the cabin is driving behind a vehicle that is producing elevated levels of CO. If the engine controls or catalytic converter system (if it exists) are not functioning properly on a vehicle ahead of the one being driven (whether or not it is a Subject Vehicle) the result can be elevated CO emissions that can enter the cabin of the following vehicle. This would be true of any vehicle, not just the Subject Vehicles, as illustrated in the Potchter paper.

Yet another cause for increased CO intrusion is a compromised exhaust system. The exhaust systems of motor vehicles are designed to transport exhaust gases from the engine and expel them at the rear of the vehicle. If the exhaust system has developed cracks or damage, the exhaust gases may escape the exhaust system and be released into the engine compartment or underside of the vehicle where they may find pathways into the vehicle. Exhaust gases released into the engine compartment may mix with the fresh air being drawn into the passenger cabin because the engine compartment is located just in front of the cabin's fresh air intake port below the windshield. Damage to the exhaust system can arise from many causes that include underbody impacts or improper repairs to the exhaust manifold, piping or mufflers.

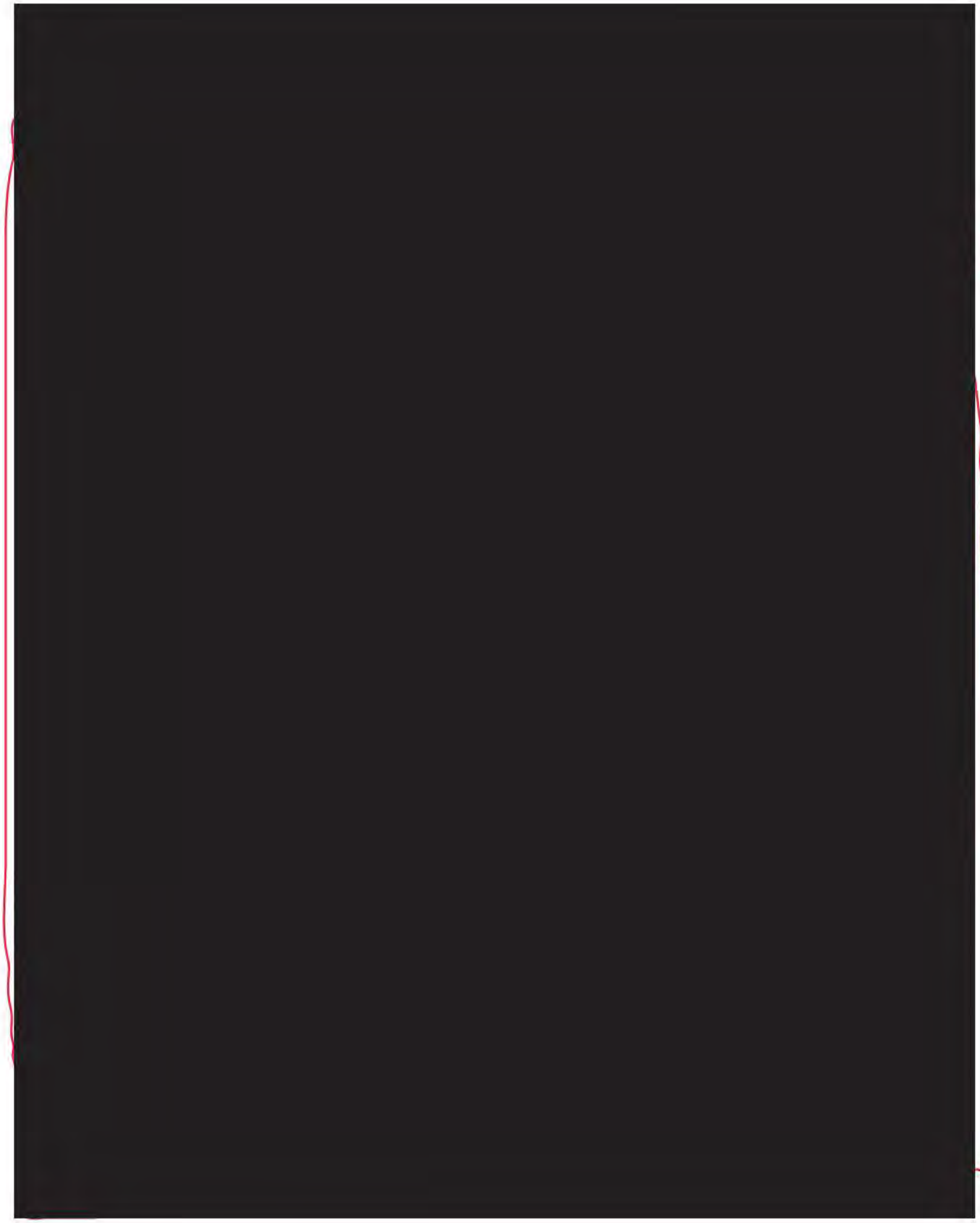
[redacted]

[5] Potchter, Oz, Brenner, Taakov & Schnell, "Exposure of Motorcycle, Car and Bus Commuters to Carbon Monoxide on a Main Road in the Tel Aviv Metropolitan Area, Israel"; Environ Monit Assess (2014) 186:8413-8424.

6 Similar SUVs will be discussed later in the report.

7 https://www.youtube.com/watch?v=WYwiMhBXtL8

[8] EST08 009643 (Expert Report of Dr. Michael E. Cundy, Sanchez-Knutson v Ford, Dec. 14, 2015, page 28.)



[redacted]

[9] EST08 006428-006429.

[10] Deposition of Arie Groeneveld, 4/17/2019, ("Groeneveld deposition"), 85:2-25.

[11] Ibid., 86:1-12.

[12] Deposition of Petros Frantzeskakis, 7/11/2019, ("Frantzeskakis deposition"), 102:9-103:12.

[13] Lokesh Setti deposition exhibit 63.

Figure 4. Liftgate seal on Mr. Drummond's Explorer

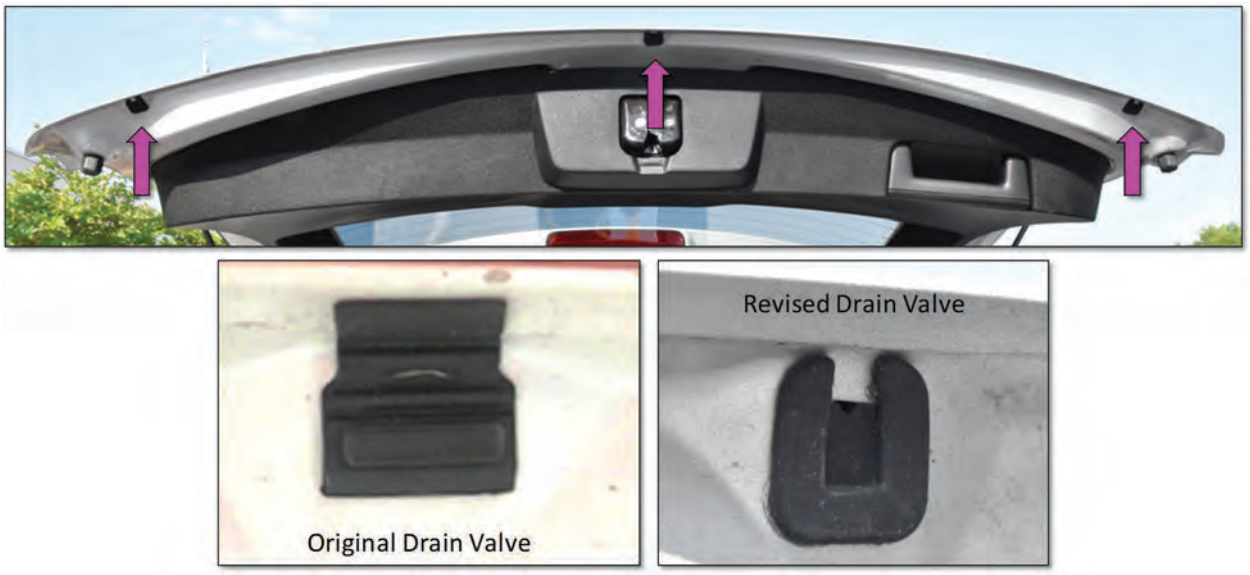


Figure 5. Location of drain valves along bottom of liftgate (top photo), original drain valve design (lower left photo), revised drain valve design (lower right photo)

Figure 6. Photograph of an air extractor (image from TSB 17-0044).

[redacted]

[14] Groeneveld deposition, 87:12-23.

[15] Deposition of Christopher Eikey, 3/20/19, (Eikey deposition), 108:21-109:21.

[16] Frantzeskakis deposition exhibit 96 at EST07 112472.

[17] Eikey deposition exhibit 24, EST03-009960, Eikey deposition 125:22-126:6.

Are Model Year 2011-2015 Explorers Substantially Similar to the Subject Vehicles Relative to the Subject Concern?

[18] Groeneveld deposition, 70:21-74:10.
[19] Ibid., 180:10-19.
[20] Ibid., 112:10-113:2.
[21] Ibid., 114:15:22.
[22] Ibid., 115:6-12.
[23] Ibid., 119:1-7.
[24] Ibid., 117: 4-25.
[25] Ibid., 115:13-18.
[26] Ibid., 116:13-22.
[27] Ibid., 118:4-15.
[28] Groeneveld deposition exhibit 31, discussed in Groeneveld deposition 119:20-120:13.

[29] EST07 114910 – 114925.
[30] Ibid., page 2.
[31] Ibid., page 3.

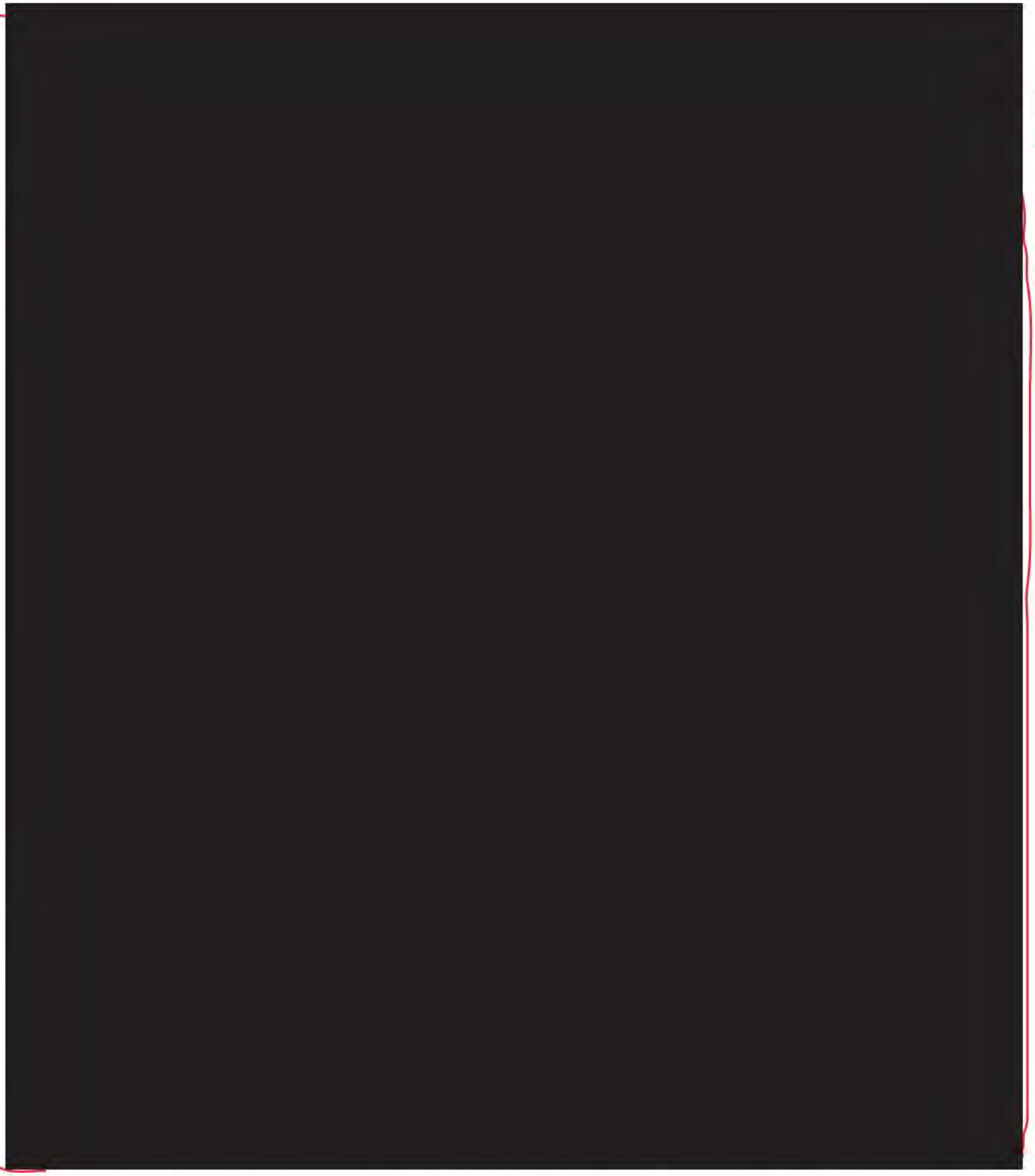
Figure 7. Photographs of the rear of a 2013 Ford Explorer (top) and a 2016 Ford Explorer (bottom: Persad vehicle).

Figure 8. Liftgate seal for a 2011 Explorer (top), and a 2016 Explorer (bottom).

[redacted]

[32] Deposition of Arthur Gariepy, 5/14/19, 264:18-266:16.

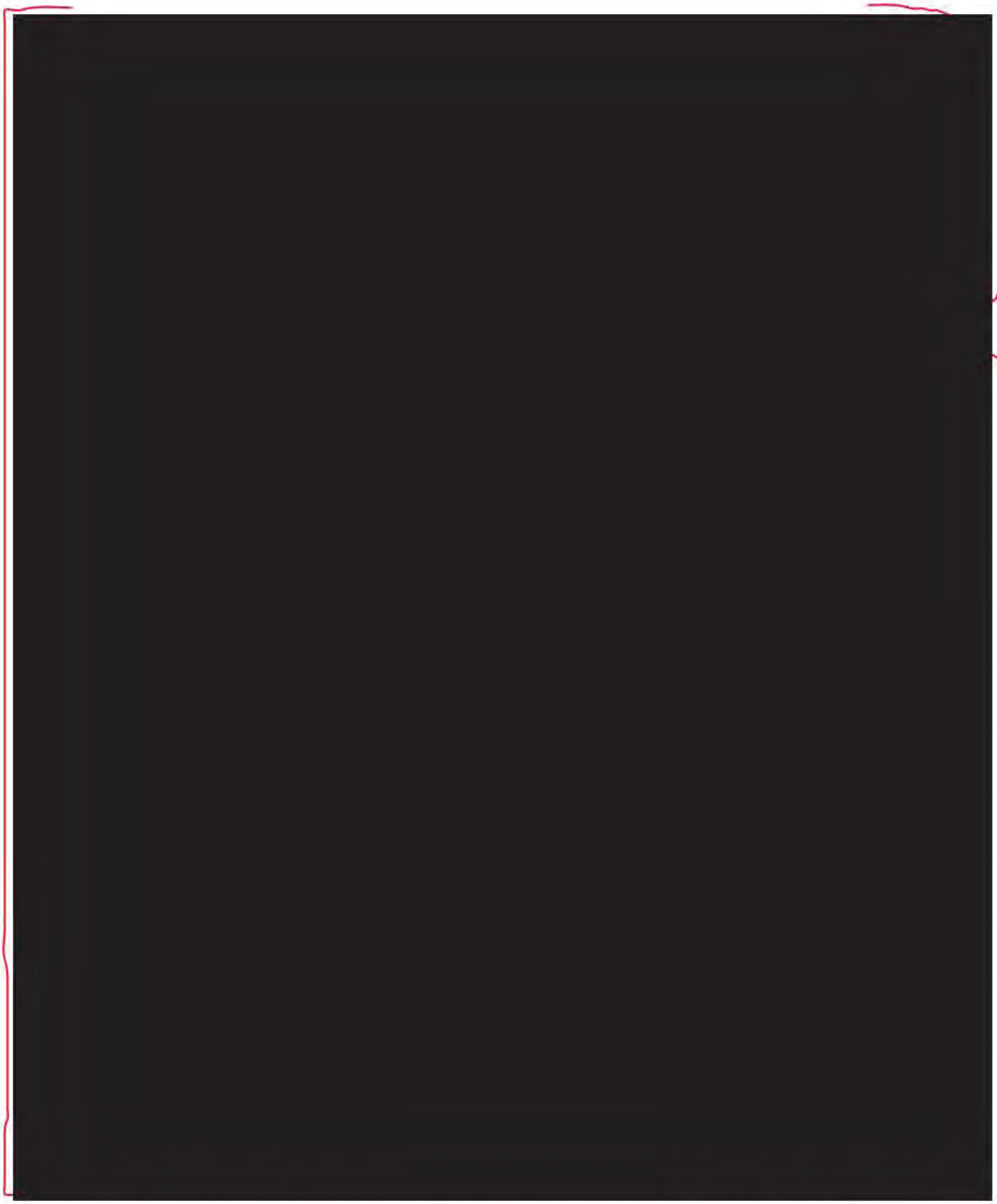
[33] Frantzeskakis deposition, 179:6-180:6.



[34] Ford Warranty Manual, (Exhibit 23 to the deposition of Daniel Wright, March 5, 2019, pages 8-15).
[35] Owner Letter, 17N03, EST03 000057-58.
[36] Customer notice for Customer Satisfaction Program 17B25, September 2017, EST04 000042-44.
[37] Frantzeskakis deposition, 15:11-24.
[38] Ibid., 152:10-2.

[39] Police Interceptor Utility vehicles have the characters "K8A" in positions 5-7 of the VIN.

Table 2. Repairs captured by search criteria that were not related to the Subject Concern.



40 The term "potentially relevant" is used because as discussed, not all the repairs identified by the search strategy related to exhaust odor/CO in the cabin from the Subject Concern. See Exhibit D for a further discussion.

[41] TSB 17-0044, p. 4.

[42] Ibid., p. 16.

[43] Repair records were provided in an Excel file: PERSAD_049427-7.24.19 Downturn Tips AWS.xlsx.

Table 3. Exhaust odor repairs subsequent to CSP 17N03 repairs performed for a variety of reasons.

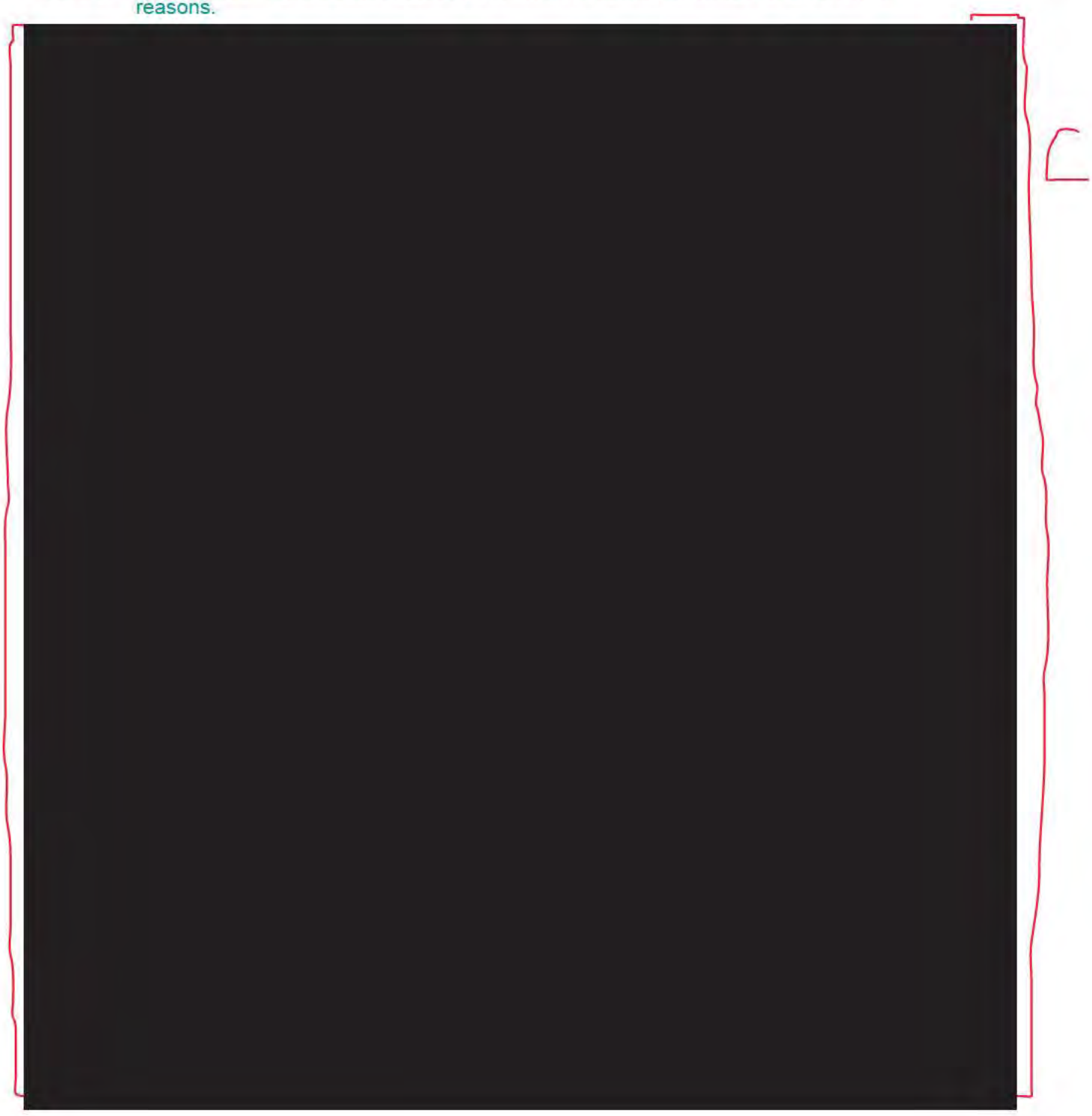


Table 4. Summary of rate calculations for likely relevant repairs and repairs performed under CSP 17N03.

Table 5. Ford-paid muffler (with the down-turned exhaust tips) repair counts and rates for the Subject Concern

Experiences of the Three Named Plaintiffs

Plaintiffs have named three class representatives: [redacted] I have reviewed the depositions and repair records of these Named Plaintiffs, and have inspected, instrumented and driven their Explorers. I will discuss my findings on each of these Named Plaintiffs.

[redacted]

[redacted]d was deposed on March 15, 2019.[44] Mr. [redacted] testified that prior to purchasing his Explorer, he considered the fact that his sister owns a 2011 Explorer and that she had not had any problems with her Explorer.[45] Mr. [redacted] purchased his 2017 Ford Explorer on November 26, 2016 from John Kennedy Ford Lincoln Mercury ("Kennedy Ford") in Pottstown, PA.[46] In January 2017, Mr. [redacted] had a repair performed at Kennedy with an odometer reading of 1,240 miles where the body control module needed replacement.[47] When Mr [redacted] went to Kennedy Ford for this repair, he did not mention anything about exhaust odor or carbon monoxide.[48] Mr. [redacted] took his vehicle to Kennedy Ford for regular maintenance at 10,354 miles on August 28, 2017. At the same time, Mr. [redacted] had a repair for the keyless door code, and also had a PA state inspection and an emission test.[49] At this visit, he testified that he did not mention anything about exhaust odors or carbon monoxide.[50] Mr. [redacted] received a letter from Ford about a customer satisfaction program (17N03) where he could have a free service if he had concerns about exhaust gas or carbon monoxide.[51] Mr. [redacted] estified that prior to receiving the letter, he had no concerns about exhaust or carbon monoxide.[52] He testified that he reviewed the letter but did nothing in response.[53] On June 30, 2018 at 20,042 miles, Mr. [redacted] took his Explorer to Kennedy Ford for routine maintenance and an inspection, where his tires and brakes were found to be marginal.[54] While at Kennedy Ford for this maintenance work, Mr. [redacted] did not mention anything about exhaust odor or carbon monoxide, or inquire about the letter discussing CSP 17N03.[55] On Feb. 7, 2017, at 27,712 miles, Mr. [redacted] brought his vehicle to Kennedy Ford for routine maintenance, and also had a PA state inspection and an emission test.[56] At this visit, Mr. [redacted] did not ask Kennedy Ford about the letter discussing CSP 17N03, and he did not mention anything about exhaust odor or CO.[57]

[redacted] 15, 2019, [redacted] eposition").

[redacted] ition 72:21-73:17.

Mr. [redacted] testified about his experience with exhaust smell. He testified that he first noticed an exhaust smell a few weeks after he bought the vehicle and before his repair at 10,354 miles.[58] He had no recollection of any of the circumstances about when he noticed the smell.[59] Mr. [redacted] could not recall if he noticed the exhaust smell every time he drove, but later said he would notice exhaust smell on a weekly basis.[60] Mr. [redacted] did not know of any actions that cause the exhaust smell to appear, and he would roll down the windows a bit to make the smell go away.[61] He could not recall any details of other occasions when he noticed exhaust odors, including the speed or acceleration of vehicle, whether he noticed it when he first started the vehicle, or whether anyone who was riding with him ever noticed an exhaust smell, including his wife.[62] Mr. [redacted] testified that no passenger ever told him that they smelled exhaust.[63]

Mr[redacted] testified that he noticed the smell on average once a week and he thought this was a problem.[64] He testified that he did not take his vehicle to a Ford dealership to address the exhaust smell because Ford told him in the CSP letter that there was no problem, but could not answer why he did not mention the odor when he brought his vehicle in before receiving the letter from Ford.[65]

Mr. [redacted]estified that he still notices the exhaust smell today at about the same frequency, and has not noticed any correlation between when the exhaust smell occurs and the speed of the vehicle or the use of the air conditioning.[66]

Despite having his vehicle at a Ford-authorized dealership multiple times for repairs prior to my inspection, Mr. [redacted] never mentioned anything about exhaust odors or carbon monoxide, even after receiving a letter from Ford describing free service he could receive if he had concerns about exhaust gas or carbon monoxide. Even though he considered the exhaust odors to be a problem, which would be a concern, he testified that he never mentioned this when he brought his vehicle in for service. Unless a customer mentions a problem and a repair shop attempts or performs a repair, Ford would not have the opportunity to remediate the concern.

Mr. [redacted] testified about his driving habits. He testified that on the highway he drives at 65-70 mph and does not drive above the speed limit even if the flow of traffic is faster.[67] He testified that he tries to drive smoothly when operating either the accelerator or the brake.[68]

Mr. [redacted] driving habits do not indicate excessive speeds or repeatedly going full-throttle during drives. His inability to identify the circumstances of when he notices exhaust odor – even after becoming involved in this litigation – provide little guidance to diagnose whether his concerns relate to the Subject Concern.

I inspected Mr. [redacted] 2017 Explorer on March 28, 2019 at Kaiser and Miller Ford, in Collegeville, PA. At the start of my inspection, his vehicle had 29,186.6 miles. During the

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58 Ibid., 80:3-15.
59 Ibid., 80:16-82:1.
60 Ibid., 82:2-11.
61 Ibid., 82:18-24.
62 Ibid., 83:9-84:8
63 Ibid., 84:22-84:24.
64 Ibid., 86:2-7.
65 Ibid., 86:8-87:6, 88:20-89:22.
66 Ibid., 93:4-17.
67 Ibid, 107:2-17
68 Ibid., 107:18-108:7.

inspection, I checked for indications of contact of the rear seal with the hatch and found contact marks around the entire perimeter. I checked the surface of the seal and found that it was in good condition with no obvious damage that would compromise its ability to seal. Mr [redacted] made no mention in his deposition of a water leakage problem; that would be an indication of a significant breach in the seal. The three rear drain plugs were present, and the feed-through grommets were sealed and intact.

Upon receipt of the vehicle, the HVAC system was in Fresh Air mode, not in Recirculation mode, and the fan was at mid-position (see Figure 9). Recirculation would be indicated if the corresponding button (circled) was lit. The rear fan was set at low.

Figure 9. Settings of the [redacted] HVAC system upon receipt of the vehicle.

The [redacted] vehicle was instrumented for the test drive. The OBD-II port was instrumented so that throttle position and speed could be recorded during the test. A video camera was affixed to the dashboard facing forward, and a GPS recorder with storage capability were used to document the test drive. In addition, two recording CO monitors (QRAE 3 Model PGM-2500) were placed in the vehicle – one in the cupholder between the seats of the driver and front passenger (Figure 10), and one between the two seats in the rear row of the vehicle (Figure 11).

Figure 10. CO monitor placed in the cup holder between the two front seats.

Figure 11. CO monitor placed between the seats in the third row.

I took the [redacted] vehicle on a test drive, which included a portion on city streets and a portion on the highway. The drive consisted of an outbound drive from the dealership of about 15.1 miles, followed by an inbound drive of comparable length returning to the dealership. The inbound drive followed the same route as the outbound drive except in the opposite direction. During the outbound drive, the HVAC system was maintained in the mode in which the vehicle was received. During the inbound drive, the HVAC system was placed in Recirculation mode, and the front and rear fans were set to full speed. A photograph of the HVAC settings for the inbound trip are shown in Figure 12. The circle identifies the HVAC being set to Recirculation mode. At the top of the photo, the video camera mount and GPS monitor are visible.

During the outbound drive, I drove in a smooth manner consistent with the deposition testimony of Mr. [redacted] I did operate the vehicle at full throttle one time when entering the highway and kept my speed at about 60 MPH for most of the highway drive. Neither the front nor the rear CO monitors, which had a detection limit of 2 PPM and a resolution of 1 PPM, recorded any CO – i.e. any CO levels in the vehicle were below the detection limit.

During the inbound drive, I accelerated more aggressively. During the inbound drive, I accelerated full-throttle three times: once while entering the highway, and twice while on the highway. Neither the front nor the rear CO monitors recorded any CO above the detection limit, despite operating the vehicle in a manner that would be conducive to CO intrusion – namely having the HVAC in recirculation mode and driving at full-throttle while at highway speeds. At no time during the test drive did I notice any exhaust odors. Details of the outbound and inbound test drives are provided in Exhibit E.

After the test drive, the Explorer was brought into the dealership repair shop and CSP 17N03 was performed. I observed and documented the process. The air extractors were inspected and found

to be in good condition. The current software level of Mr. [redacted]s vehicle was IDS-112.06. During the inbound test drive, I noted that when applying full throttle, I could hear the sound of the HVAC system blend door change as Fresh Air mode was engaged.

Figure 12. HVAC settings for the inbound trip showing Recirculation mode and full fan speed.

[redacted] was deposed on March 5, 2019.[69] Mr. [redacted] purchased his 2016 Ford Explorer as a used vehicle from Bergey's Lincoln Mercury ("Bergey's Lincoln") in Lansdale PA on August 19, 2016 with an odometer reading of 28,451 miles.[70] He brought his vehicle to Bergey's Lincoln on Sep. 14, 2017 at 51,104 miles for regular maintenance, an emission test, replacement of the rear tires, and an alignment.[71] Mr. [redacted] testified that at the time he brought his vehicle to Bergey's Lincoln, he did not say anything about exhaust odor or carbon monoxide.[72] On Feb. 9, 2018 with 57,739 miles on the odometer, Mr. [redacted] brought his Explorer to Bergey's Lincoln because he had hit a pothole and the right front tire needed to be repaired.[73] At that time, he also had the CSP 17N03 performed on his vehicle. Mr. [redacted] testified that he did not take his Explorer to get CSP 17N03 performed, but rather was informed (by the service manager) about the CSP and he agreed to have the repair performed even though he had not made any complaints about odor or CO.[74] Mr. [redacted] brought his vehicle to Pep Boys on May 6, 2018 at 60,581 miles for brakes and maintenance, and did not mention anything about exhaust odor being a problem.[75] On Sep. 15, 2018, at 66,143 miles, Mr. [redacted] brought his Explorer to Pacifico Marple Ford Lincoln for a tire change and did not mention anything about exhaust odor being a problem.[76] On Oct. 10, 2018, Mr. [redacted] went to Matthew's Paoli Ford for a PA state and emissions inspection, routine maintenance, to repair his brakes, and to reset a low tire warning.[77] Mr. [redacted] t did not mention anything about exhaust odor being a problem when at Matthew's Paoli Ford.[78] He testified that he never went to a dealership and asked them to do a repair relating to exhaust odor in his car.[79]

Mr. [redacted] testified about his experience with odor in his Explorer. He testified that he did not have a specific recollection of noticing an exhaust smell in the interior of his Explorer.[80] He was asked more details about when he noticed exhaust smell, and he responded:[81]

> *The only thing I can recall is being either stationary, moving slowly, or kind of like at the beginning of a trip, beginning of a – the start of a, you know, the first – the early stages of starting a car and going to a destination.*

Mr. [redacted] testified that when he did smell exhaust, he could not identify the source, whether it was coming from his car, or smelling exhaust in the city,[82] or from other cars.[83]

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69 [redacted] ion of Daniel Wright, March 5, 2019 ("[redacted] deposition").
[redacted] eposition exhibits 4-6.
eposition exhibit 12.
eposition, 115:8-12.
73 Ibid., 115:13-25.
74 Ibid., 118:11-119:9.
75 Ibid., 147:20-149:7.
76 Ibid., 149:8-151:5.
77 Ibid., 151:6-152:10.
78 Ibid., 152:14-19.
79 Ibid., 131:3-8.
80 Ibid., 122:13-20.
81 Ibid., 123:11-20.
82 Ibid., 122:1:11.
83 Ibid., 122:21:123:5.

Mr. [redacted] was asked why he decided to bring this lawsuit and he responded:[84]

> *Because ultimately I was – when I was starting my car in the morning, I would – from when I started it, I would feel either tired or I would feel – or I would get headaches from which I believe to be something, you know, going on when I started the car, whether it be fumes or whatever it was.*
>
> *I know – as – as I said, I'm not a car expert; but it seemed like every time I started my car, if I did not open my windows, I would feel some type of tire, you know, tiredness or I would have a headache some – at times.*

Mr. [redacted] did not recall the first time he noticed an exhaust smell in the Explorer.[85] He stated that he never noticed a specific smell when he started the car, but he was more or less noticing this feeling of tiredness, or just a little bit of dizziness and sometimes getting headaches from starting the car.[86] When he did smell exhaust, he would be traveling around the city or close to home, at speeds from zero to 30 or 35 MPH.[87] Mr. [redacted] id not recall whether the smell was continuous or intermittent, but he said it started generally at the beginning of a trip, and though he could not recall exactly, it would occur every time he used his vehicle.[88] Mr. [redacted] testified that the setting on the air conditioner was on recirculation when he would notice an exhaust odor.[89] He testified that the odor seemed to be more prevalent when he was at idle or at lower speeds,[90] Mr. [redacted] testified that he could not recall whether the exhaust smell depended on the speed or acceleration of the vehicle, whether he was driving at highway or interstate speeds, whether it got worse over time, whether he noticed it every trip, or whether there was a particular route where he experienced the smell more often.[91] Mr. [redacted] testified that he thought there was a pattern of a dizziness feeling and occasional headaches and a feeling of tiredness when he started the vehicle and began a trip.[92] These feelings would happen in the first five to ten minutes after starting his vehicle.[93] Mr. [redacted] was asked whether the 17N03 repair eliminated the problem he previously had with smelling exhaust odor, and he responded that he did not know.[94]

Mr. [redacted] t testified about his driving practices. He said that on the highway, he attempts to maintain the speed limit but might sometimes unintentionally exceed the speed limit.[95] He was asked whether he ever pressed the accelerator all the way to the floor and he stated he did not.[96] Mr. [redacted] testified that almost all the time he tries to accelerate gradually.[97]

Mr. [redacted] estified that the concerns he had would start when he started the vehicle, and manifested as fatigue, dizziness and/or headaches. These conditions do not fit the profile of a

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84 Ibid., 39:25-40:13.
85 Ibid, 123:6-10.
86 Ibid., 121:2-17.
87 Ibid., 123:21-124:2.
88 Ibid., 124:3-13.
89 Ibid., 124:14-23.
90 Ibid., 125:25-126:5.
91 Ibid., 124:24-125:24.
92 Ibid., 127:3-14.
93 Ibid., 128:9-17.
94 Ibid., 131:20-133:2.
95 Ibid., 164:4-165:3.
96 Ibid., 165:4-7.
97 Ibid., 165:8-12.

problem consistent with the Subject Concern. If Mr. [redacted]t still thought he had an exhaust odor problem after having 17N03 performed, he could have brought his vehicle back to the dealership, where the more extensive repairs detailed in TSB 17-0044 could have been performed. Ultimately, if the repairs in Procedure 1 did not fully resolve the concerns, the repairs in Procedure 2 (the down-turned exhaust tip) could have been applied.

I inspected Mr. [redacted] 2016 Explorer on March 29, 2019 at Bergey's Lincoln Mercury in Lansdale, PA. At the start of my inspection, his vehicle had 73,388.8 miles. The HVAC system as received had the front fan on just over half, recirculation was off (see Figure 13), the rear climate was on, and the rear fan was on low. The front defroster was on.

The seals, grommets, and drain valves were in place, and evidence of CSP 17N03 work was evident, such as the mastic patches (an example is shown in Figure 14). The liftgate seal was mispositioned in two locations as shown in Figure 15. It is not known how or why the liftgate seal was not properly in position. There was evidence of liftgate seal contact around the perimeter of the liftgate frame. The down-turned exhaust tip had not been installed on this vehicle.

Figure 13. HVAC settings on the [redacted] vehicle as received.

Figure 14. Mastic patch applied to underside of Explorer as part of CSP 17N03 repairs.

Figure 15. Two locations where the liftgate seal was not properly in position.

As with the [redacted] vehicle, the [redacted] vehicle was instrumented with an OBD-II reader, video camera, GPS, and two CO sensors. One CO sensor was placed in the cupholder between the driver and front passenger seat (Figure 16), and one CO sensor was placed in the second row, right passenger side above the child seat (Figure 17).

As with the [redacted] test drive, I drove an outbound and an inbound route (returning via the same path) including city and highway driving. The outbound route was run with the HVAC in the as-received condition. The inbound route was driven with the HVAC on Recirculation mode with the front and rear fans on full. On the outbound route, I drove smoothly, as Mr. [redacted] testified he attempted to drive, but I was able to incorporate two full throttle events including one on the highway. On the highway, my speed varied between 55 and 65 mph. No CO was measured by either detector, even at the start, and I detected no exhaust odors. The outbound trip was about 14.1 miles and lasted about 20 minutes.

On the inbound trip, I stopped to add gas, and then drove more aggressively, including three full-throttle events, reaching a speed on one event of over 70 mph. A little over three minutes after the last full-throttle event, the front CO sensor rose to a peak of 4 PPM. The rear CO sensor did not register any CO concentrations above threshold except for a brief period several minutes after the

front CO sensor started registering CO. During this test drive, I did not detect any exhaust odors. During the wide-open throttle events, I heard the HVAC system transition to Fresh Air mode. The onboard computers were queried, and Mr. [redacted] Explorer was found to have IDS version 112.07.

I smelled no exhaust odors in the vehicle before, during or after my test drives. In the first 5-10 minutes, the CO sensors detected no CO in the cabin of the vehicle. I do not have any information from my testing that would identify the cause of the ailments that Mr. Wright claimed he would experience at the start of trips in his Explorer. Details on the test drive of Mr. [redacted] Explorer are provided in Exhibit F.

Figure 16. Location of the front CO sensor.

Figure 17. Location of the rear CO sensor.

[redacted]

[redacted] was deposed on March 27, 2019.[98] Mr. [redacted] purchased his 2016 Explorer on May 5, 2016 from Allan Vigil Ford in Fayetteville, GA.[99] He testified that he first noticed an exhaust smell the first day he took his vehicle home.[100] Specifically, he testified that he got the smell when he parked the car at home and switched off the engine.[101] Mr. [redacted] testified that he noticed the exhaust smell almost every time he drove.[102] Mr. [redacted] estified that most of the time when he noticed the exhaust smell, he was on the interstate at interstate speeds, and most of the time the driving situation was operating under a wide-open throttle condition.[103]

Ford has a CQIS record (Central Quality Indicator System – part of Ford's customer relations center) dated January 9, 2017 describing an odor concern with Mr. [redacted] s vehicle. The report states: "*He has a 2016 explorer[sp], every time the veh accelerates with the gas pedal all the way down to the floor, he smells carbon dioxide in the veh.*"[104] The record went on to recommend that the vehicle be diagnosed at the Ford dealership. Mr. [redacted] verified that he was advised to go to the dealer in that call.[105] Mr. [redacted] had not had any repairs for the odor issue prior to this call.[106] He produced some

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[98] Deposition of Suresh Persad, March 27, 2019 ([redacted] deposition").
[99] [redacted] deposition exhibit 5.
[100] [redacted] deposition, 94:19-21.
[101] Ibid., 96:13-18.
[102] Ibid., 98:1-7
[103] Ibid., 99:2-12.
[104] [redacted] deposition exhibit 13.
[105] [redacted] deposition, 105:7-11.
[106] Ibid., 106:6-9.

text messages between himself and Ford service where he stated: "*Gary. The only time it will ark[sp] up is when you is driving at about 65 mph. Then step down on the gas to the floor-board, until it gets up to 75 mph,*"[107] The dealer was unable to verify the concern in a note dated 1/11/2017, mileage 7093.[108]

Ford has a second CQIS report dated March 1, 2017 where the customer stated that ever since he bought the car and stepped on the gas, there is an exhaust odor, and that he brought the vehicle to the dealer three months ago and could not find anything.[109] Mr. [redacted] ecalled that conversation and also recalled that he was advised to have the vehicle serviced back at the dealership.[110] Mr. [redacted] responded that he did not take it back to the dealer because he didn't trust the dealership.[111]

Ford has a third CQIS report dated July 28, 2017.[112] The comments reiterate that the customer smells exhaust whenever he steps on the gas, and the customer wants to trade in the vehicle if a repair is not applicable. Mr. [redacted] did not recall this communication and did not do anything about the odor problem.[113]

Mr. [redacted] testified every time he drives, he has a situation where he puts the pedal to the floor (wide-open throttle) and experiences an odor every time he does so.[114]

In November 2017, Mr. [redacted] received a letter advising him of a free service (CSP 17N03) if he had concerns about CO.[115] Mr [redacted] testified that prior to receiving the letter he had concerns about CO, yet he did not do anything in response (such as take his vehicle to the dealership for repair) because he did not trust the dealer anymore.[116]

In January 2018, Mr. [redacted] received a safety recall notice about a seat issue, and in response he later took his vehicle to a different Ford dealership (Allan Vigil Ford in Morrow, GA) where the recall was performed.[117] On March 21, 2018 at 15,539 miles, during his visit to the dealership for the recall, he had another seat-related repair.[118] The dealer repair order does not mention anything about exhaust odor or CO, and Mr. [redacted] testified that he did not mention his exhaust odor or CO concerns to this dealer.[119]

Mr. [redacted] brought his Explorer to Allan Vigil Ford in Morrow, GA on Sept. 7, 2018 at 19,202 miles, because he had a transmission fluid leak that was repaired to Mr [redacted] satisfaction.[120] This same repair order records that CSP 17N03 was performed, but Mr [redacted] had not requested the dealer to do so.[121] Mr. [redacted] testified that his only recollection with the dealership was about the

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[redacted] eposition exhibit 14
[redacted] eposition exhibit 15.
[redacted] eposition exhibit 16.
[redacted] eposition: 112:7-113:4.
Ibid., 113:5-14.
[redacted] position exhibit 17.
[redacted] position, 114:2-115:4.
[redacted] 4-16.
[redacted] osition exhibit 19 (Owner notification 17N03)
[redacted] position, 118:16-119:9
[117] Ibid., 120:5-121:15.
[redacted] eposition exhibit 22.
[redacted] deposition, 123:3-11.
[120] Ibid., 124:4-20.
[121] Ibid., 125:2-9. Also [redacted] on exhibit 24.

transmission fluid leak and getting a loaner car.[122] Mr. [redacted] testified that the 17N03 repairs helped with the exhaust odor problem because he wasn't getting the smell as much anymore.[123] He testified that the improvement from the 17N03 repair was "quite a lot".[124]

Mr. [redacted] testified that the odor would come most of the times at speed under wide-open throttle, but once he got the odor going on the highway at 40 mph with light throttle.[125] Other than highway speed with wide-open throttle, he would get an odor at 60-70 miles per hour, or sometimes overtaking a vehicle when he had been driving more slowly. Mr. [redacted] testified that the last time he drove wide-open throttle was a week or couple of weeks ago and he did not experience any exhaust odor, nor did he notice any exhaust odor on his drive over to the deposition.[126]

Mr. [redacted] testified that sometimes he drives smoothly, but sometimes he drives wide-open throttle such as accelerating on a highway entrance or overtaking a car.[127]

Mr. [redacted]s testimony about when he usually experienced exhaust odor before having CSP 17N03 is consistent with a vehicle that has a competent leak path. Mr. [redacted]s first visit to the dealership in January 2017 was before Ford had released TSB 17-0044 (issued May 15, 2017), the TSB that addressed exhaust odors in 2016-2017 Explorers. The repairs in TSB 17-0044 are more extensive than those listed in CSP 17N03. Had Mr. [redacted] advised a Ford dealership after TSB 17-0044 was issued and before CSP 17N03 was noticed, the Ford dealership would have had the opportunity to inspect and repair Mr. [redacted] vehicle accordingly. Mr. [redacted] did not even notify the dealership about his exhaust odor concerns when the dealership performed CSP 17N03. Even after having CSP 17N03 performed, Mr. [redacted] did not notify a Ford dealership that his exhaust odor concerns – while somewhat abated – still continued. Had he done so, the Ford dealership would have had the opportunity to perform the more thorough inspection and remediation for leaks detailed in TSB 17-0044. Ultimately, the dealership could perform Procedure 2 – installation of down-turned exhaust tips, as another means to remediate Mr. [redacted]s odor concerns.

I inspected Mr [redacted] 2016 Explorer on May 23, 2019 at Allan Vigil Ford, Mount Zion Blvd, Morrow, GA. At the start of my inspection, the vehicle had 25,807.6 miles, and the ventilation fan was Off. Evidence of CSP 17N03 was apparent, including the mastic patches on the underside of the vehicle. The current software version was IDS-113.04. The liftgate seal was intact with evidence of contact around the perimeter of the frame. I observed a slight warp in one of the air extractor flaps on the passenger side (Figure 18) – slight external pressure on the flap closed it off. The three drain valves were installed in the bottom of the liftgate.

[122] Ibid., 125:14-126:4.
[123] Ibid., 128:10-15.
[124] Ibid., 162:2-8.
[125] Ibid., 128:20-129:17.
[126] Ibid., 141:6-23.
[127] Ibid., 142:2-17.

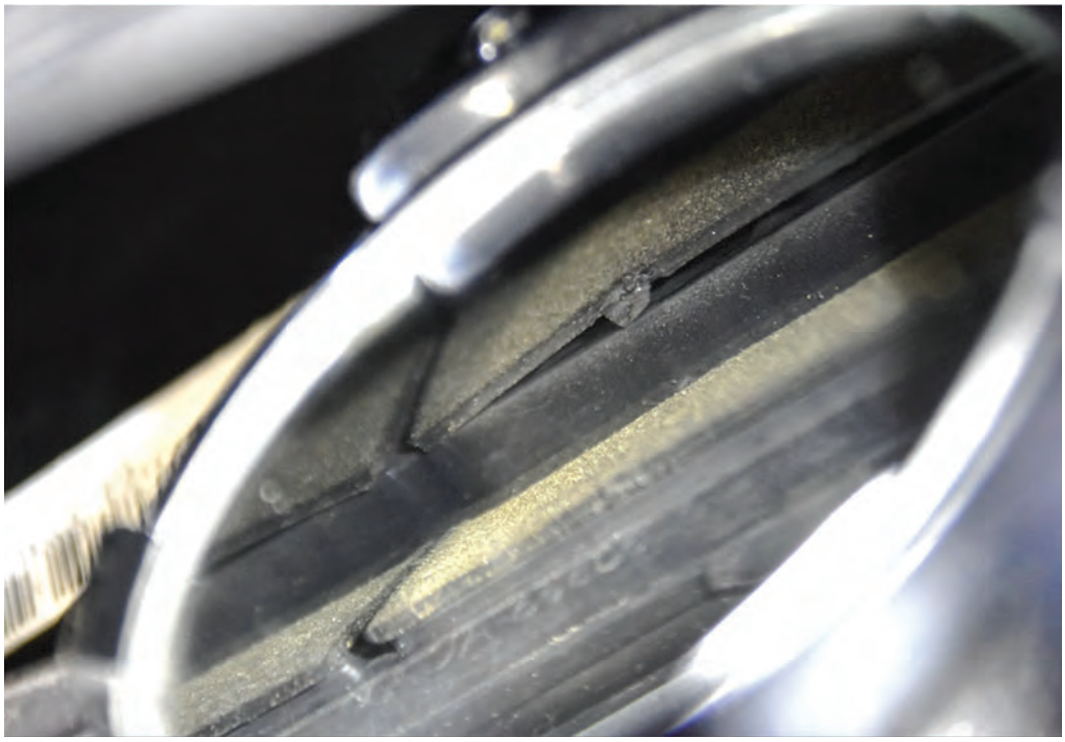


Figure 18. View of slight warp in one flap of the passenger side air extractor.

Mr. [redacted] Explorer was instrumented with an OBD-II reader, video camera, GPS recorder, and CO sensors in the same manner as during the inspections of Mr [redacted] nd Mr [redacted] Explorers. The front CO sensor was placed in the cupholder between the driver and front passenger seat (Figure 19), and the rear CO sensor was placed under the headrest of the second-row seat facing rearward (Figure 20). Outbound and inbound test drives, about 10 miles each way, were performed. Most of the drive was on the highway, consistent with when Mr. [redacted] testified he would most commonly notice exhaust odors. For the outbound trip, the HVAC system was in the as-received condition: off (Figure 21). For the return trip, the HVAC system was placed in recirculation mode with the front and rear fans on full (Figure 22).

I engaged full-throttle three times on the outbound portion of the test drive. For about five minutes on the highway, my speed varied between 60 mph to 75 mph (reaching the peak after the last full throttle.) On the outbound trip, no CO was detected until about ½ minute after the third wide-open throttle, when the rear-mounted CO sensor started detecting CO, eventually reaching a peak of 4 PPM. After stopping the vehicle in a parking lot near an idling truck, the front CO sensor detected some CO, reaching a peak of 4 PPM.

On the inbound portion of the test drive, I engaged full-throttle four times. My speed on the highway was generally between 60 and 70 mph. The first full-throttle event was entering the highway (going from 20 to 65 mph, while the remaining three full-throttle events started at about 50 mph and ended at speeds between 65 and 70 mph. No CO was detected by either sensor until about 40 seconds after the last wide-open throttle event, where the rear CO sensor reached a peak of 4 PPM. The front CO sensor did not record any CO measurements above the detection threshold of 2 PPM. I did hear the ventilation fan switch to Fresh Air mode during the wide-open throttle events.

During the test drives, I did not smell any exhaust odors. The data on the test drives of Mr. [redacted] Explorer are provided in Exhibit G.

Figure 19. Location of front CO sensor during the test drive of Mr. [redacted] Explorer.

Figure 20. Location of the rear CO sensor during the test drive of Mr. P[redacted] Explorer.

Figure 21. Settings for the HVAC system during the outbound portion of the test drive of Mr. [redacted] Explorer.

Figure 22. HVAC settings for the inbound portion of the test drive of Mr [redacted] Explorer.

Observations on the Report Prepared by Dr. Galastis

Mr. Galastis stated in his report that he did not rely upon any case facts or discovery, reviewing only two websites: one containing information on CSP 17N03, and the other a NHTSA website for investigation PE16-008.[128] He was told by counsel that the Named Plaintiffs' Explorers had received CSP 17N03. He did not review the testimony of any of the Named Plaintiffs, and thus did not consider their driving habits, or when or how they experienced their odor concerns.

Mr. Galastis's report describes some of the information about his testing, such as CO levels, HVAC settings, course route, and whether the vehicle was in Drive or Sport Mode. In his report, he describes carbon monoxide as entering the cabin during "normal vehicle operation."[129] However, Dr. Galastis's report does not define "normal vehicle operation." In particular, his report contains no information on throttle position or speed at any time. While he stated that his GPS recorded position every 30 meters, he did not report that speed could be derived from whatever readings it stored. In any case, Mr. Galastis did not present any speed information in his report.

As discussed earlier, fuel enrichment (which can lead to elevated levels of CO production at the tailpipe) occurs only under certain, very specific throttle conditions; throttle conditions were not reported (or apparently even recorded) by Dr. Galastis. Also, negative pressure conditions are a function of vehicle speed, and vehicle speed was not reported. Third, the HVAC will switch to Fresh Air mode if the throttle is held at high or fully depressed conditions for a certain period of time. If the throttle had been depressed to levels that would initiate fuel-rich conditions, the length of time and/or conditions of engagement were not recorded or coordinated with the CO readings. None of these important measurements were reported, much less coordinated with the CO readings he reported.

I tested the Named Plaintiffs' vehicles and got no or minimal CO levels during my tests. For Dr. Galastis to have achieved the levels of CO that he measured would have required operating in a manner that resulted in prolonged fuel enrichment, and further operating in a manner that side-stepped the Fresh Air strategy, such as by pumping the throttle – e.g. not holding it at wide or near wide-open-throttle those few seconds needed to engage Fresh Air mode.

Dr. Galastis did not rely on any case facts or discovery except learning from his client that the CSP 17N03 was performed on Named Plaintiffs' vehicles.[130] Therefore he would not have reviewed, much less relied upon, Ford's Corporate Engineering Test Procedure (CETP) 00.00-R-404, a test procedure whereby CO levels are measured inside the cabin of a vehicle operated under specified test conditions. As will be discussed in the next section, Ford's test standards are based on the resulting CO levels when specified tests are performed. Since Dr. Galastis did not know these test procedures, he would not have been able to follow them. Thus Ford' acceptance criteria for CO levels would not be applicable to whatever poorly documented driving procedure(s) Dr. Galastis used to achieve his measurements.

Dr. Galastis's CO measurements had noticeable vehicle-to-vehicle variation. For example, the peak measurement of CO when he tested Mr. [redacted]'s Explorer was 13 PPM inside the cabin, but he had a higher peak of 16 PPM of CO measured outside of the cabin.[131] When testing Mr. [redacted]

[128] Report of Kos Galastis, undated but filed 6/25/19 (Galastis report), page 3.

[129] Ibid., pp. 27-28.

[130] Ibid., p. 3.

[131] Galastis report, Exhibit 3D

Explorer, the maximum level of CO he detected was 38 PPM, with a maximum outdoor peak of 14 PPM.[132] Since Dr. Galastis did not report measuring the throttle conditions at any time during his testing, and did not report any vehicle speeds, the differences he observed might be due to vehicle-to-vehicle variations, or how he drove the vehicle, or some combination of both.

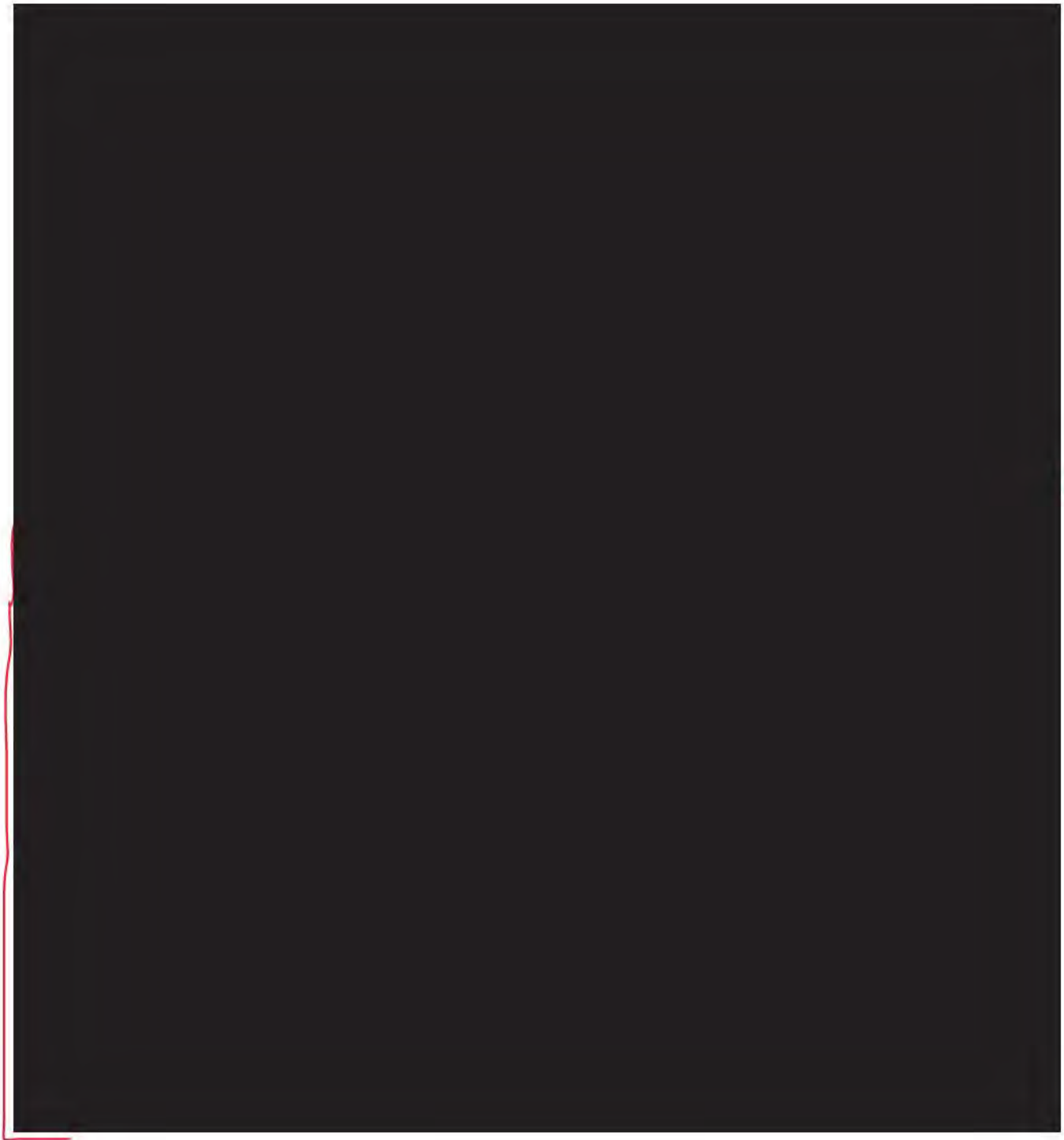
Dr. Galastis did not opine that the Subject Concern would be present on every vehicle, nor could he legitimately make such a statement since he only tested the Named Plaintiffs' Explorers, all of whom had odor complaints. None of the Named Plaintiffs had the TSB17-0044 repair Procedure 1 performed. None of the Named Plaintiffs had TSB repair Procedure 2 (down-turned exhaust tip) repair performed. Dr. Galastis therefore cannot extend his measurements to identify how much, if any, odor or CO would be present in a) vehicles where the owner never had an odor complaint , b) vehicles that had CSP 17N03 repairs performed where the owners had no odor or CO after the repair, c) vehicles that had TSB 17-0044 repair Procedure 1 performed which solved the odor concern, or d) vehicles that had TSB 17-0044 repair Procedure 2 performed which solved the odor concern.

[132] Galastis report, Exhibit 3C.

[133] EST08 009573-80
[134] Ibid. page 8.
[135] Ibid., page 4.
[136] Ibid., page 1.
[137] EST08 009581-0009584.
[138] Ibid., page 3.
[139] Arie Groeneveld deposition, Exhibit 30.
[140] Explorer Exhaust Odor presentation, 9/27/2017, 10/17/2017 & 10/20/2017, EST07 126596-126624, slide 18.

[141] Ibid., page 19.
[142] Ibid., page 4.
[143] Ibid., page 6.

Is the Subject Concern Common Across All Subject Vehicles?



Appendix A

Curricula Vitae of Paul M. Taylor, Ph.D., P.E.

Exponent®
Engineering & Scientific Consulting

Paul Taylor, Ph.D., P.E.

Principal Engineer | Vehicle Engineering
149 Commonwealth Drive | Menlo Park, CA 94025
(650) 688-7286 tel | ptaylor@exponent.com

Professional Profile

Dr. Taylor specializes in the investigation and analysis of products and systems in the consumer, transportation, and industrial environments. His practice focuses on the investigation of accidents involving consumer products, vehicles, or industrial equipment, and concerns relating to the mechanical design of parts or systems, such as automotive components. Dr. Taylor's practice areas include fire cause and origin, liquid and gas flow, heat transfer, and vibration and mechanics. He regularly performs analyses of warranty and accident databases during his evaluations of the real world performance of products, particularly in automotive applications. His engineering work includes laboratory investigations and experiments, such as accident reconstruction and vehicle testing.

Prior to joining Exponent, Dr. Taylor was an independent consultant.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Stanford University, 1986

M.S., Mechanical Engineering, Stanford University, 1979

B.S., Mechanical Engineering, Rensselaer Polytechnic Institute, *cum laude*, 1978

Stanford University Fellowship

Tau Beta Pi; Pi Tau Sigma

Licenses and Certifications

Licensed Professional Mechanical Engineer, California, #31069

OSHA 40-Hour Certification, Hazardous Waste Operations and Emergency Response Training; OSHA Supervisory Training

Professional Affiliations

American Society of Mechanical Engineers (member)

National Fire Protection Association (member)

Society of Automotive Engineers (SAE)

Patents

Patent 5,651,810: Apparatus and method for filtering and sampling airborne respiratory contaminants.

Publications

Ray R, Zhao K, Taylor PM, Saraf V. Evaluation of the Robustness of Statistical Software for Warranty Analysis, 2019 Annual Reliability and Maintainability Symposium (RAMS), 978-1-5386-6554-1/19.

Mikolajczak CJ, Taylor PM. A method for assessing the potential for a dermal burn hazard from malfunctioning consumer electronic devices. J Burn Care Res 2008; 29(2):338-345.

Flaherty DK, Taylor PM, Hopkins WE, Holland ME, Schlueter DP. A new mask filter cartridge used to determine applicator inhalation exposure to an alachlor herbicide (Lasso ®) during normal spraying operations. J Occupat Env Med 1995; 37(9).

McCarthy GE, Taylor PM. The effect of sample width on burn rate in Federal Motor Vehicle Safety Standard 302 testing. Proceedings, American Society of Mechanical Engineers Winter Annual Meeting, SERA-Vol. 2, Safety Engineering and Risk Analysis, November 1994.

Taylor P, Dudek R, Flaherty D, Kaempfe. Evaluation of two instruments for the measurement of aerosols. J Aerosol Sci 1994; 25(2):419-423.

McCarthy GE, Taylor PM, Kendall GR, Aboba BD, Subbaiah MV. Review of selected computational programs for atmospheric dispersion. Proceedings, 5th American Institute of Aeronautics and Astronautics/American Society of Mechanical Engineers Thermophysics and Heat Transfer Conf., Seattle, WA, June 1990.

Taylor PM. The dynamics and damping of formed metal bellows. Ph.D. Thesis, Stanford University, June 1986.

Presentations

Adler D, Taylor PM. A procedure for obtaining velocity vector from two high response impact pressure probes. 14th Israel Conference on Mechanical Engineering, Technion — Israel Institute of Technology, Haifa, Israel, 1980.

Reports

Mikolajczak CJ, Taylor P, Heberer C. Cell phone usage at gasoline stations. Exponent Failure Analysis Associates, Inc., December 1999.

McCarthy G, Marble F, Taylor P, Malladi S. Flow and water quality computations in a canal with closed ends. Exponent Failure Analysis Associates, Inc., March 1996.

Taylor PM, Lee J, et al. Final report, TWT reliability improvement study. TMEC-152, December 1984.

Taylor PM, Shitzer A, Cohen Y, Stotter A. Cooling methods for inland power stations, Part I. Energy Engineering Center, Technion, Report EEC-102, June 1980.

Appendix B

Testimony History

Exhibit B

Testimony History

Case Title	Deposition / Trial/Hearing	Date
[redacted]	Deposition	7/19
	Deposition	6/19
	Deposition	10/18
	Deposition	7/18
	Deposition	4/18
	Trial	4/18
	Deposition	3/18
	Trial	1/18
	Deposition	11/17
	Deposition	9/17
	Deposition	4/17
	Deposition	9/16
	Deposition	4/16 9/16
	Deposition	1/16
	Deposition	10/15
	Deposition	10/15

Billing Rate: $460/hr

Appendix C

Materials Reviewed

Appendix C: Materials Reviewed

Pleadings

[redacted] t al., v. Ford Motor Company, *Amended Class Action Complaint and Demand for Jury Trial*, U.S.D.C. District of Michigan, Southern Division, Ca[redacted] T[redacted]

[redacted]. Ford Motor Company, *Motion for Class Certification and Appointment of Class Counsel and Class Representatives*, U.S.D.C. District of Michigan, Southern Division, C[redacted]

[redacted] v. Ford Motor Company, *Plaintiffs' Brief in Support of Motion for Class Certification*, U.S.D.C. District of Michigan, Southern Division, [redacted]-[redacted]

Depositions and Exhibits

[redacted]

Declarations and Reports

Plaintiffs:

[redacted]

Ford:

Expert Report of Dr. Michael Cundy (in S[redacted]n v. Ford), 12/14/15

TSBs, Recalls and ONPs

CSP 17B25	Exhaust odor and Carbon Monoxide Complaints
CSP 17N03	Carbon Monoxide Concerns
TSB 12-12-04	Explorer exhaust odor in vehicle
TSB 14-0130	Exhaust odor in vehicle
TSB 16-0166	Exhaust odor in vehicle
TSB 17-0029	Exhaust odor in vehicle
TSB 17-0044	Exhaust odor in vehicle
SSM 16-0165	2011-2015 – Explorer Exhaust Odor in Vehicle (12/13/16)

Ford Publications:

2016 VIN Guide

2017 VIN Guide

Production Materials:

Bates #s	Document Title	Document Type
EST03 009980-81	GCQIS Technical Service Detail	ISM No. 18-03-003 (3/7/18)
EST03 000067-68	Customer Satisfaction Program 17N03	Letter to Owners (Nov. 2017)
EST04 00042-44	Customer Satisfaction Program 17B25	Letter to Owners (Sept. 2017)
EST07 114910-925	Odor Task Force	Presentation (5/11/17)
EST07 115863-886	Police Interceptor Utility Task Force	Presentation (7/20/17)

EST07 126596-624	Explorer Exhaust Odor	Presentation
EST08-007139	Air extractor images	From PE16-008 000868 RC
EST08 009573-580	Corporate Engineering Test Procedure: Carbon Monoxide Concentration Test	CETP: 00.00-R-404
EST08-009581-584	Customized Requirement Std. Report	Trustmark: CO Concentration (4/19/16)
EST08 006428-429	Aero Investigation- 20 & 80 mph	Presentation (PE16-008)
EST08 006946	Part Pedal Enrichment	Presentation
EST13 002485	RQT-003000-003767	CETP CO guidelines
EST13 002493	RQT-003000-003767	Current CETP CO guidelines

Vehicle Warranty and Sales Data

2016-2017 Explorer Sales

2016-2017 Explorer Repairs (through January 3, 2019)

2016-2017 [redacted] Downturn Tips AWS.xlsx

Papers

O. Potchter, Oded, Oz, Brenner, Taakov and Schnell, "Exposure of Motorcycle, Car and Bus Commuters to Carbon Monoxide on a Main Road in the Tel Aviv Metropolitan Area, Israel," Environ Monit Assess (2014) 186:8413-8424

Appendix D

Description of Record Selection for the Subject Condition

Appendix D: Description of Record Selection for the Subject Condition

The AWS database contains records of repairs where Ford has paid for some or all the repair costs. Each record contains a multitude of fields used to uniquely identify the repair, the vehicle involved in the repair, and repair details including the date, mileage, dealership, causal part number, nature of repair, and free-form text fields containing descriptions of the concern by the customer and the diagnosis and repair performed by the technician.

A three-step process was used to identify Ford-paid repairs associated with the Subject Vehicles. First, the unique vehicle identification numbers (VINs) for the Subject Vehicles[144] were identified, along with the country of sale (U.S.). These are the Subject Vehicles. For analyses of a single state (i.e. GA or PA), VINs were identified by the state in which the vehicle was sold, independent of where the vehicle was serviced.

In the second step, all repairs associated with the Subject Vehicles were extracted from the AWS data using the VINs identified in the first step. Repairs were queried to identify records with any of the following information:

- TSB numbers associated with exhaust odor for any model year 2011-2015 or any model year 2016-2017 Explorer were searched in the free-form text fields (customer concern or technician diagnosis or repair comments). Variations in the numbers were also searched, such as with or without spaces or hyphens. The search strings are listed at the end of Exhibit D.
- Any of the part numbers listed in the TSBs were identified using the base causal part number (see list at end of Exhibit D).
- Free-form text fields (customer concern or technician diagnosis or repair comments) were searched using a list of keywords. The list of keywords is provided at the end of this exhibit.
- The transaction code field was searched for 17N03 or 17B25, the character sequences associated with the Customer Satisfaction Programs for odor concerns for the Subject Vehicles and for Police Interceptor Utility vehicles, respectively. Less than a dozen Subject Vehicles were coded with 17B25 in the transaction code field, and those few records were treated as though the repair was for 17N03.

In the third step, the individual records were reviewed and coded as to their relevance to the Subject Concern. If it was either ambiguous or uncertain as to whether a repair was related to the Subject Concern, it was coded as a relevant repair. In the report, if the analysis was performed with records not coded for relevance, it was referenced as “potentially relevant”. After coding for relevance, any repairs likely associated with the Subject Concern were referenced as “likely relevant”. Repair rates were calculated by dividing the counts of likely relevant repairs by the corresponding population of vehicles.

The counts and percentages of Subject Vehicles that were repaired using downturned exhaust tips were determined using a separate Excel file produced by Ford: *PERSAD_049427-7.24.19 Downturn Tips AWS.xlsx*. This file contains repairs for both Explorers and Police Interceptor Utility vehicles,

[144] Police Interceptor Utility vehicles were identified by characters “K8A” in positions 5-7 of the VIN.

where either the causal or any non-causal part had a base part number of 5230, and a prefix of either EB5Z or FB5Z.

All muffler repairs for non-police Explorers sold in the US were reviewed for relevance. The rates of unique vehicles with muffler repairs were calculated as Ford-paid muffler repairs likely related to the Subject Concern divided by the number of Subject Vehicles.

List of Keywords Used for Searching the Free-Form Text Fields for Potentially Relevant Repairs

Note that “%” is a wildcard character that represents any character or set of characters)

%fumes%
%gas smell%
%carbon mono%
%smell%
%smeel%
%sm ell%
%smel l%
% odor%
odor%
% oder %
oder%
%foul order%
%foul odour%
%exhaust order%
%exhaust odour%
%fuemes%
%fum es%
%fums%
%nausea%
%nauseous%
% vomit%
%headache%
%dizzy%
%dizziness%
%throw up%
%sulfur%
%sulfer%
%rotten egg%

List of TSB Search Strings

TSB 12-12-4

%12-12-4%
%12-12-04%

%12 12 4%
%12 12 04%
%12-1204%
%12 1204%
%TSB 12/12/04%
%TSB 12/12/4 %

TSB 14-0130

%14-0130%
%14 0130%
%14-01-30%
%14-1-30%
%14/01/30%
%14/1/30%
%14 01 30%
%14 1 30%
%14 130%
%14-130%

TSB 16-0165, 16-0166

%16-0166%
%16-0165%
%16 0166%
%16 0165%
%160166%
%160165%

TSB 17-0044

%17-0044%
%17 0044%
%170044%

TSB 17-0029

%17-0029%
%170029%
%17 0029%

Causal Base Part Numbers

Causal Base Part Numbers

61280B62
54280B62
7829164
7829165
TA-2
TA2
08882
08883
5230
78442K03

Appendix E

Testing of Mr. [redacted] Explorer

Drive Test:

[redacted] Explorer

[redacted] v Ford

3/28/2019

GPS and Video Camera

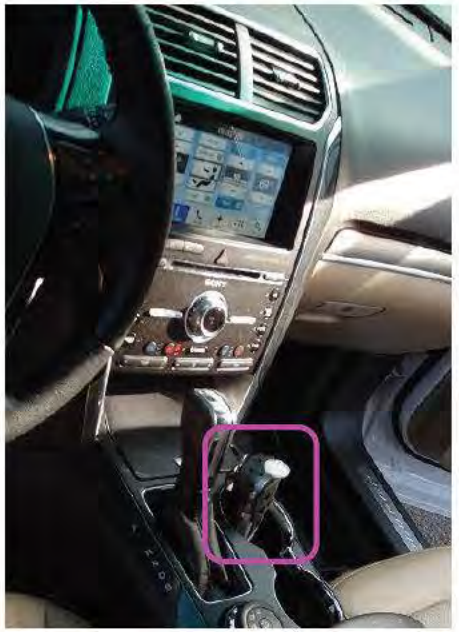
SAM_1163.JPG

CO Monitor Locations

Rear Seat

SAM_1159.JPG

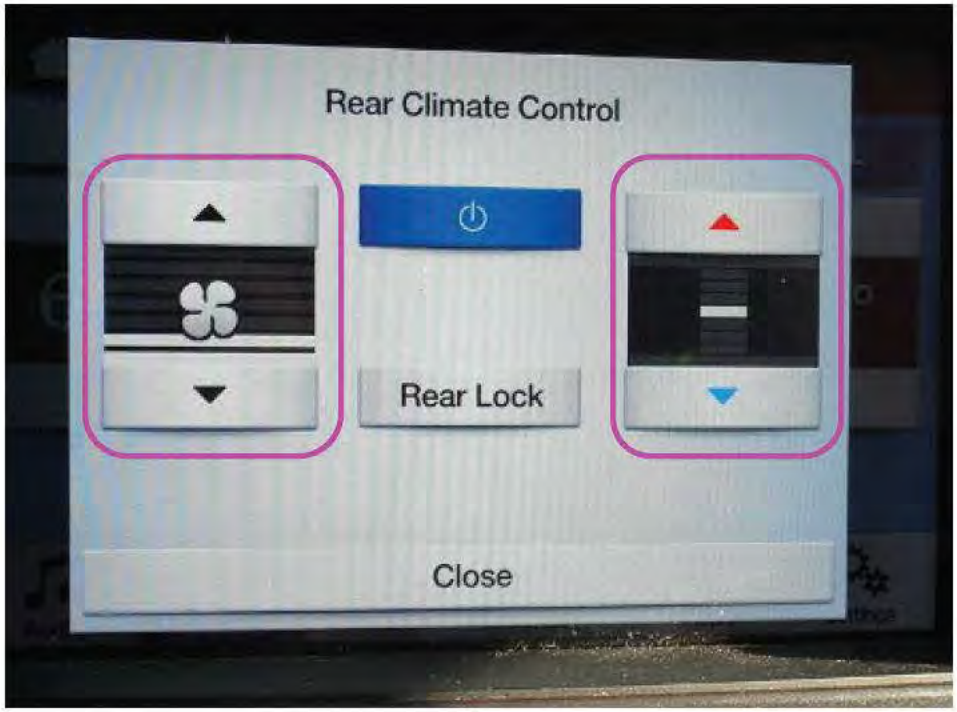
Front Seat



SAM_1160.JPG

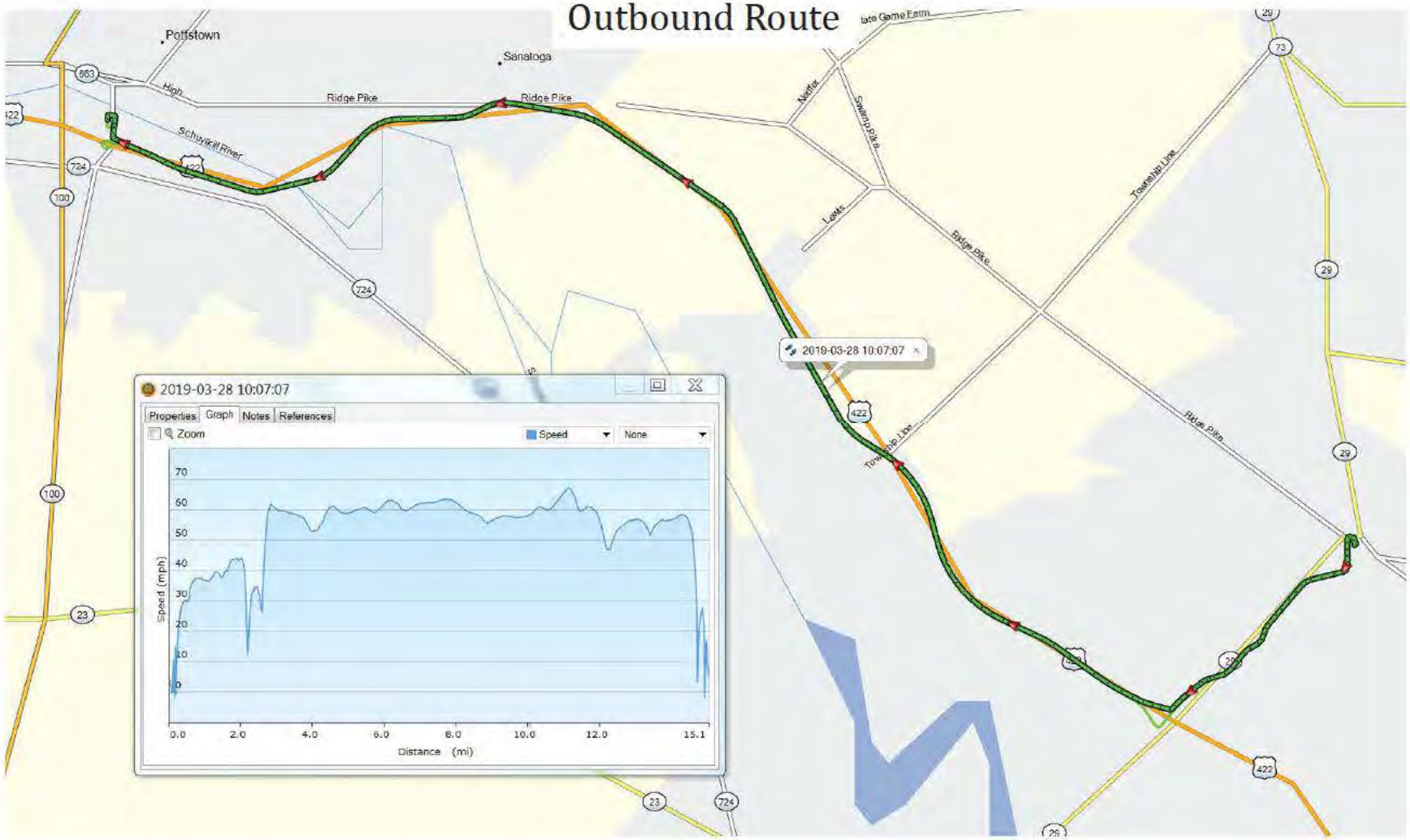
HVAC Settings: Outbound

SAM_1174.JPG



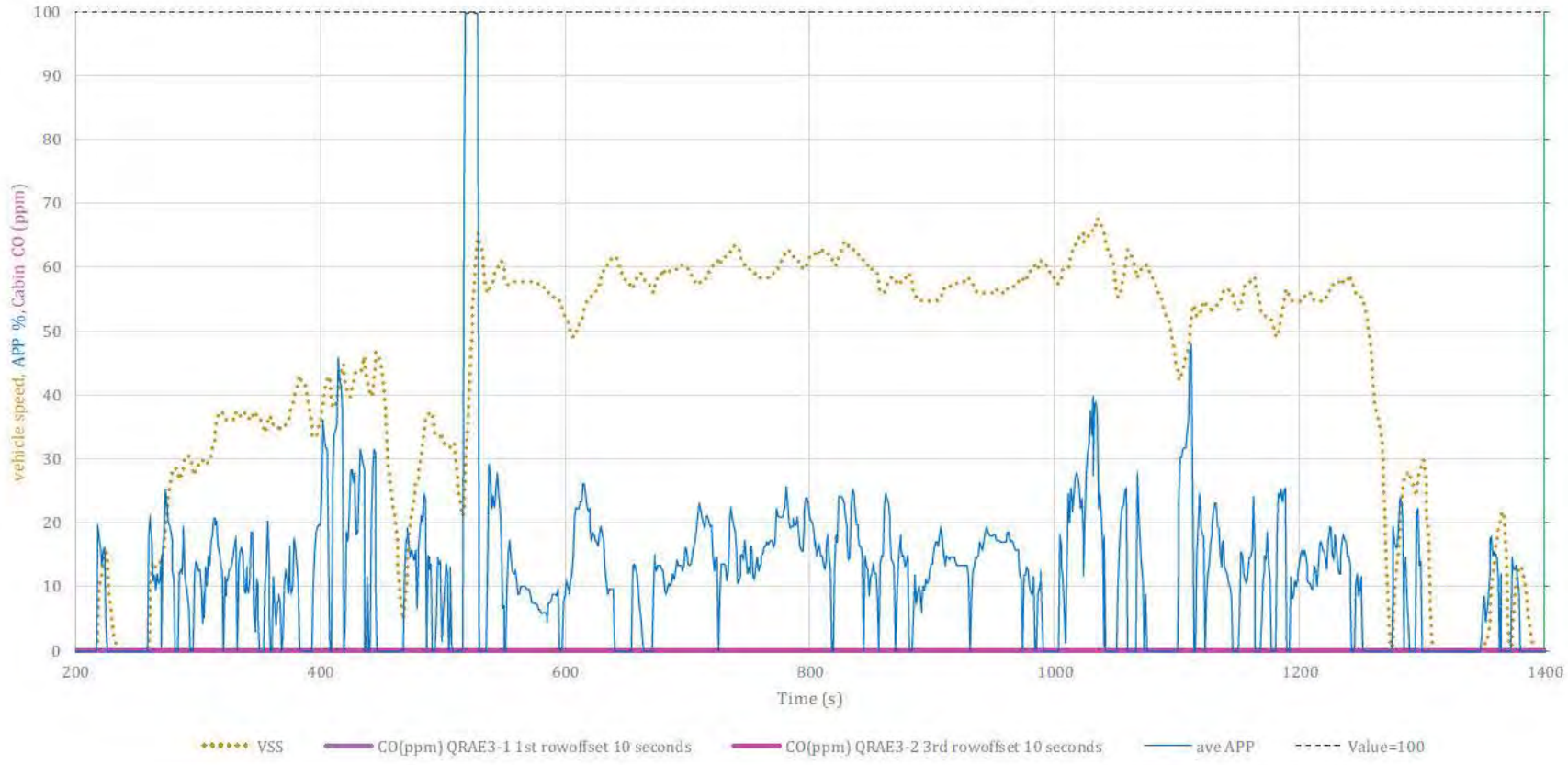
SAM_1175.JPG

Outbound Route

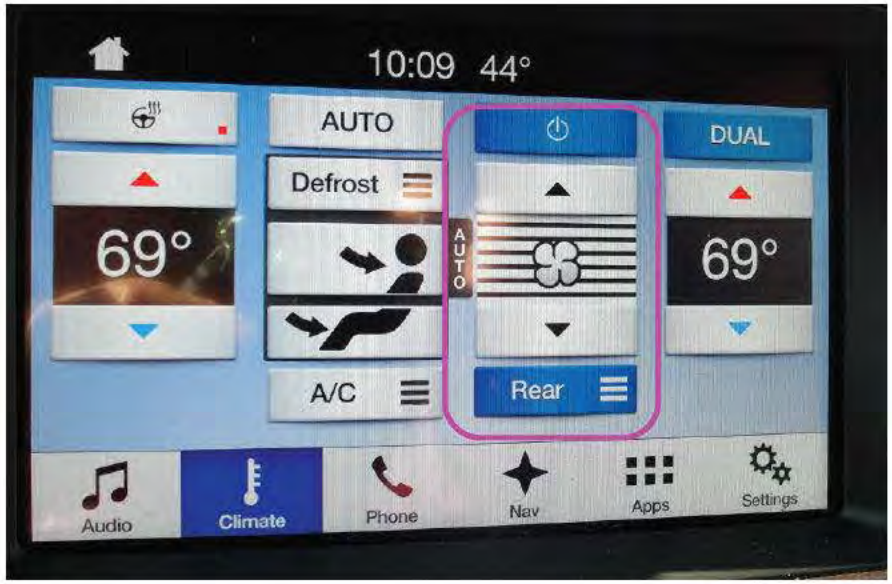


EA17-002 003104 TR

[redacted] Explorer: Outbound Drive: Customer HVAC settings:
Front fan @ 2 bars, 69degF; Rear fan @ 1 bar, midpoint temp setting, Recirc OFF
Max CO measured in cabin = 0 ppm



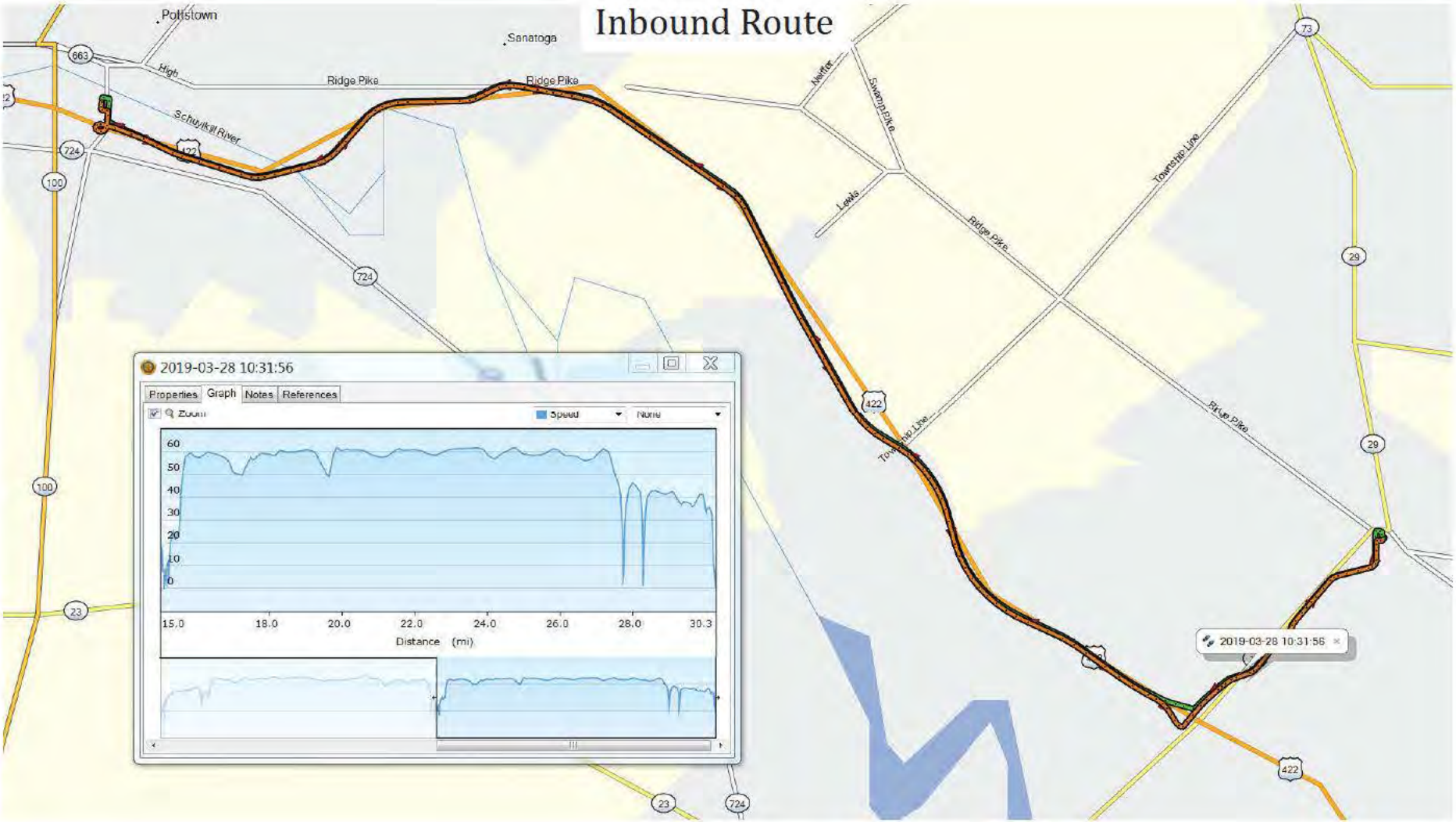
HVAC Settings: Inbound
Fan on Max Front and Rear, Recirc=ON



SAM_1178.JPG

SAM_1179.JPG

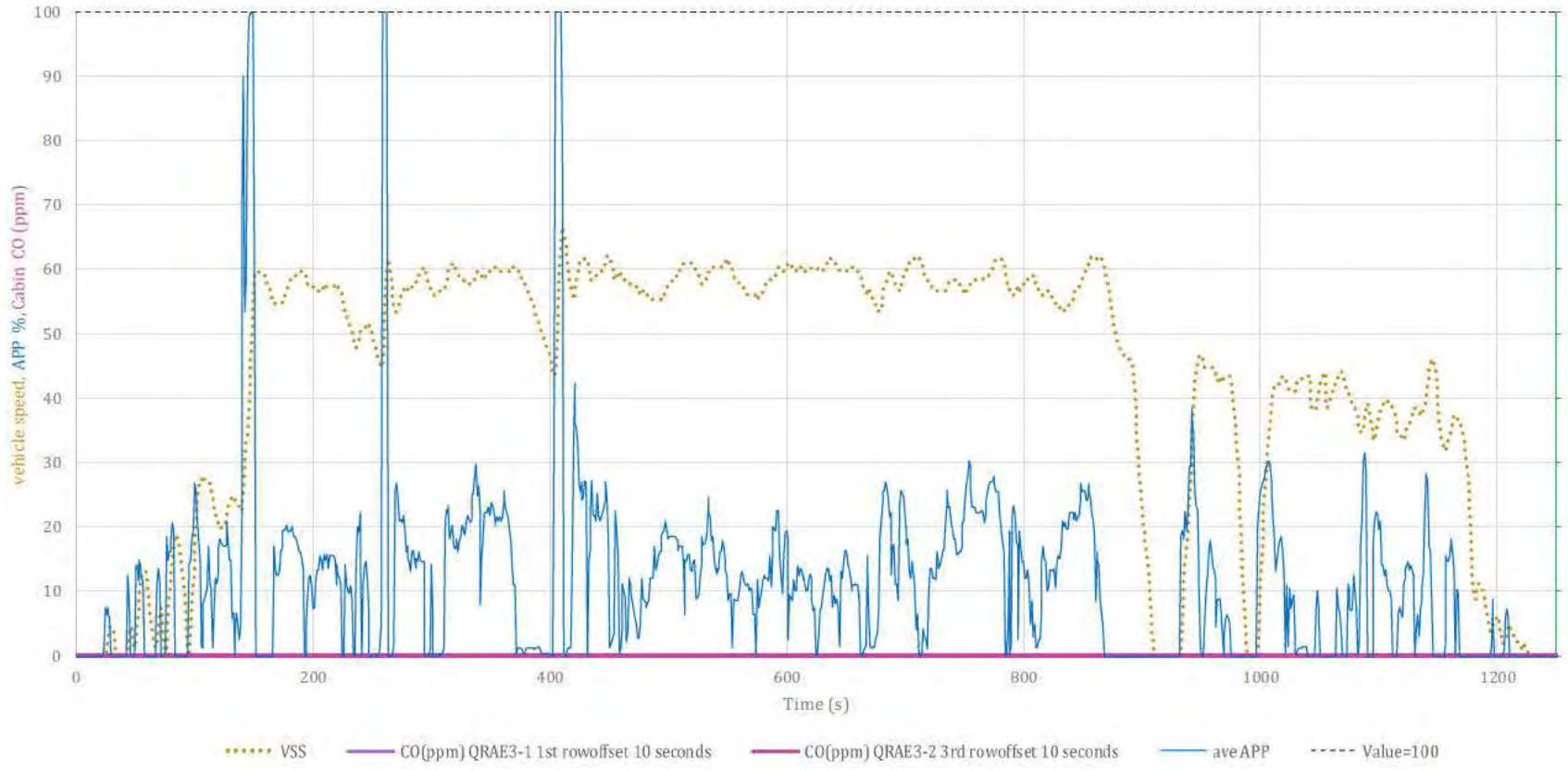
SAM_1180.JPG



EA17-002 003107 TR

Drummond Explorer: Inbound Drive: Maximum HVAC Settings:
Maximum fan speed front & rear; Recirc ON

Max CO measured in cabin = 0 ppm



Appendix F

Testing of [redacted] Explorer

Drive Test:
Wright Explorer

[redacted] v Ford

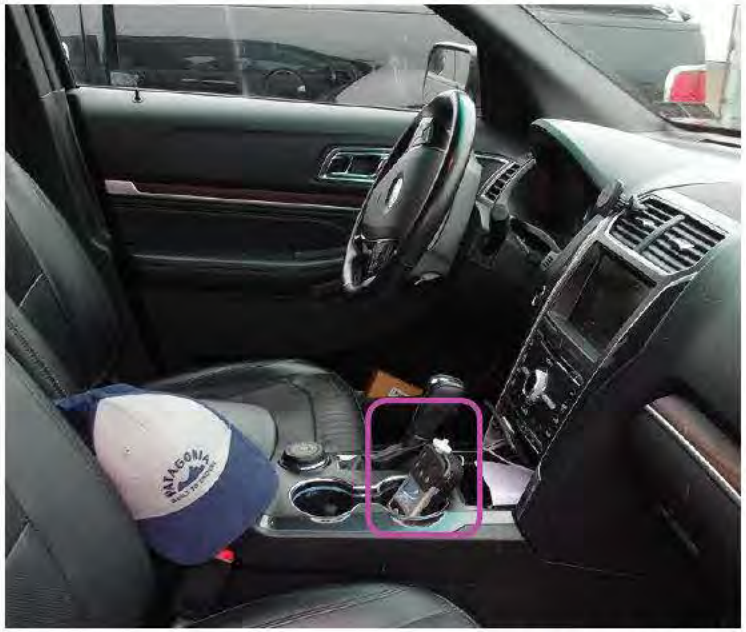
3/29/2019

CO Monitor Locations

Middle Seat

SAM_1542.JPG

Front Seat

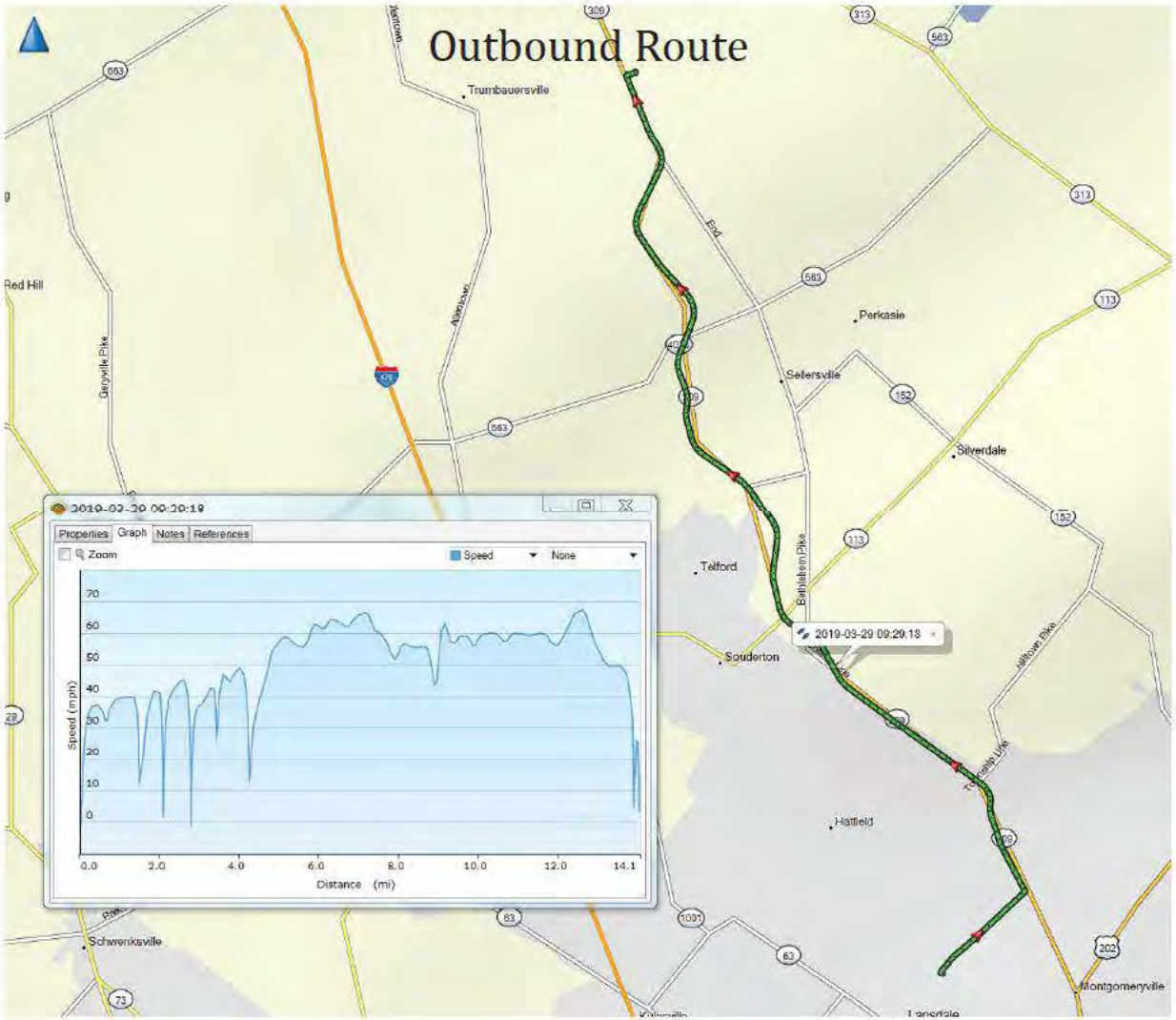


SAM_1540.JPG

HVAC Settings: Outbound

SAM_1353.JPG

SAM_1355.JPG



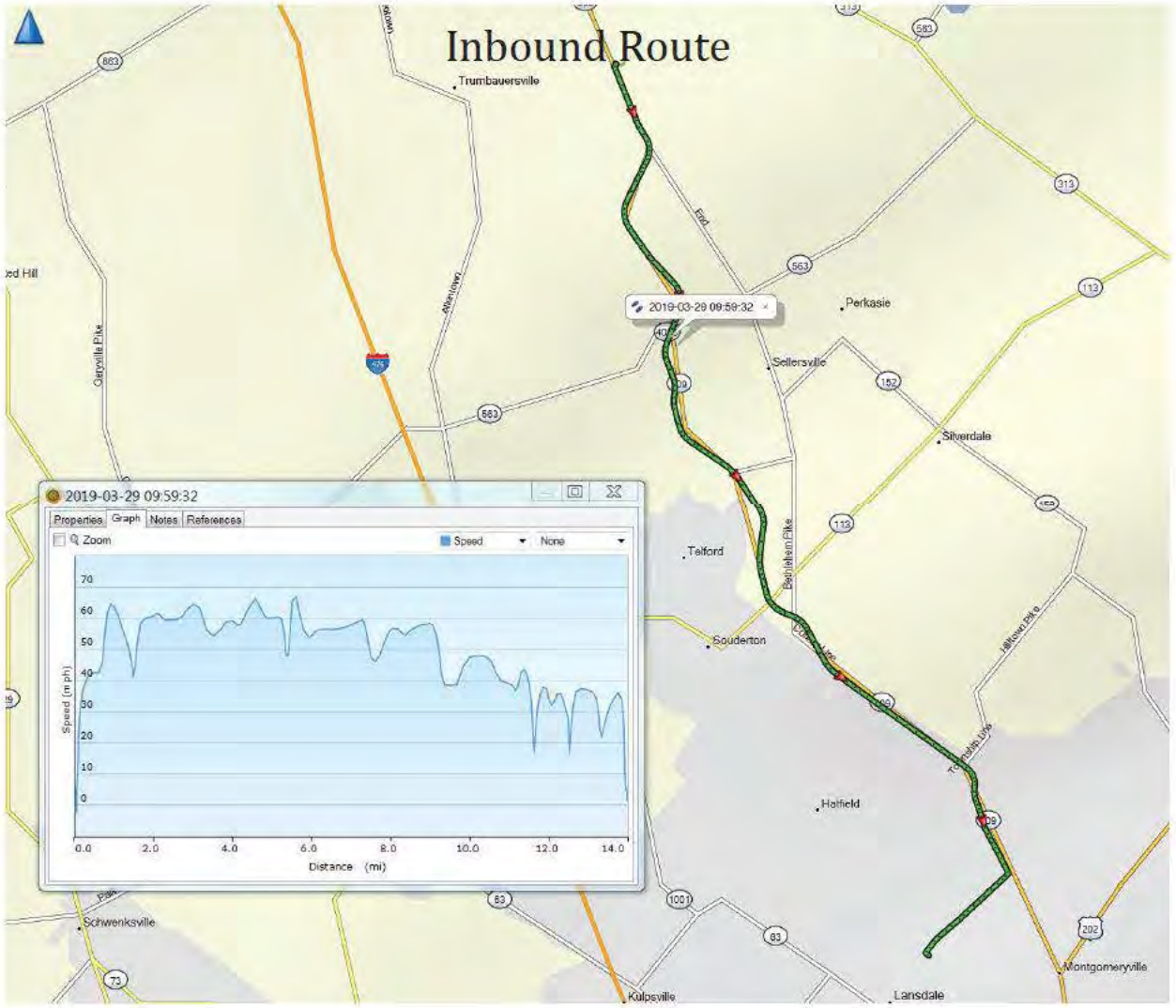
EA17-002 003113 TR


Wright Explorer: Owner HVAC settings.
Max CO measured in Cabin = 0 ppm
APP %, Cabin CO (ppm)
100
90
80
70
60
50
40
30
20
10
0
0
200
400
600
800
1000
1200
Time (s)
VSS
CO(ppm) QRAE3-1 1st row offset 24 seconds
CO(ppm) QRAE3-2 2nd row offset 24 seconds
ave APP
Set to 100

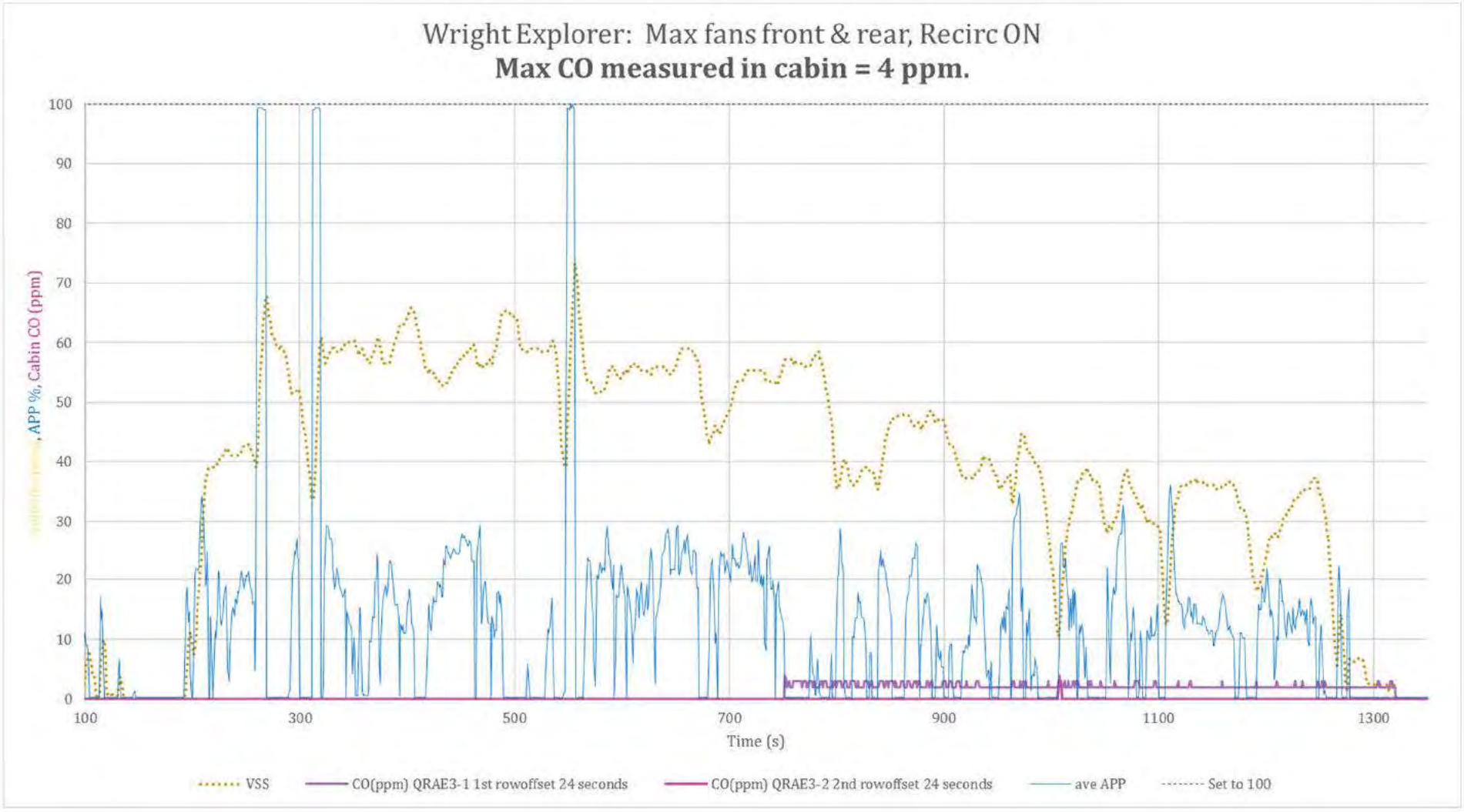
HVAC Settings: Inbound

SAM_1549.JPG

SAM_1361.JPG



EA17-002 003116 TR


Wright Explorer: Max fans front & rear, Recirc ON
Max CO measured in cabin = 4 ppm.
APP %, Cabin CO (ppm)
100
90
80
70
60
50
40
30
20
10
0
100
300
500
700
900
1100
1300
Time (s)
VSS
CO(ppm) QRAE3-1 1st rowoffset 24 seconds
CO(ppm) QRAE3-2 2nd rowoffset 24 seconds
ave APP
Set to 100

Return drive

- Last Wide Open Throttle (WOT) in video:
  - 9:20 mins
- CO reading max = 4 PPM in Front Meter
  - 3:20 mins after last WOT

Appendix G

Testing of Mr. [redacted] Explorer

Drive Test:
[redacted] Explorer
[redacted] v Ford
5/23/19

GPS and Video Camera

DSC_0181.JPG

CO Monitor Locations

Rear Seat

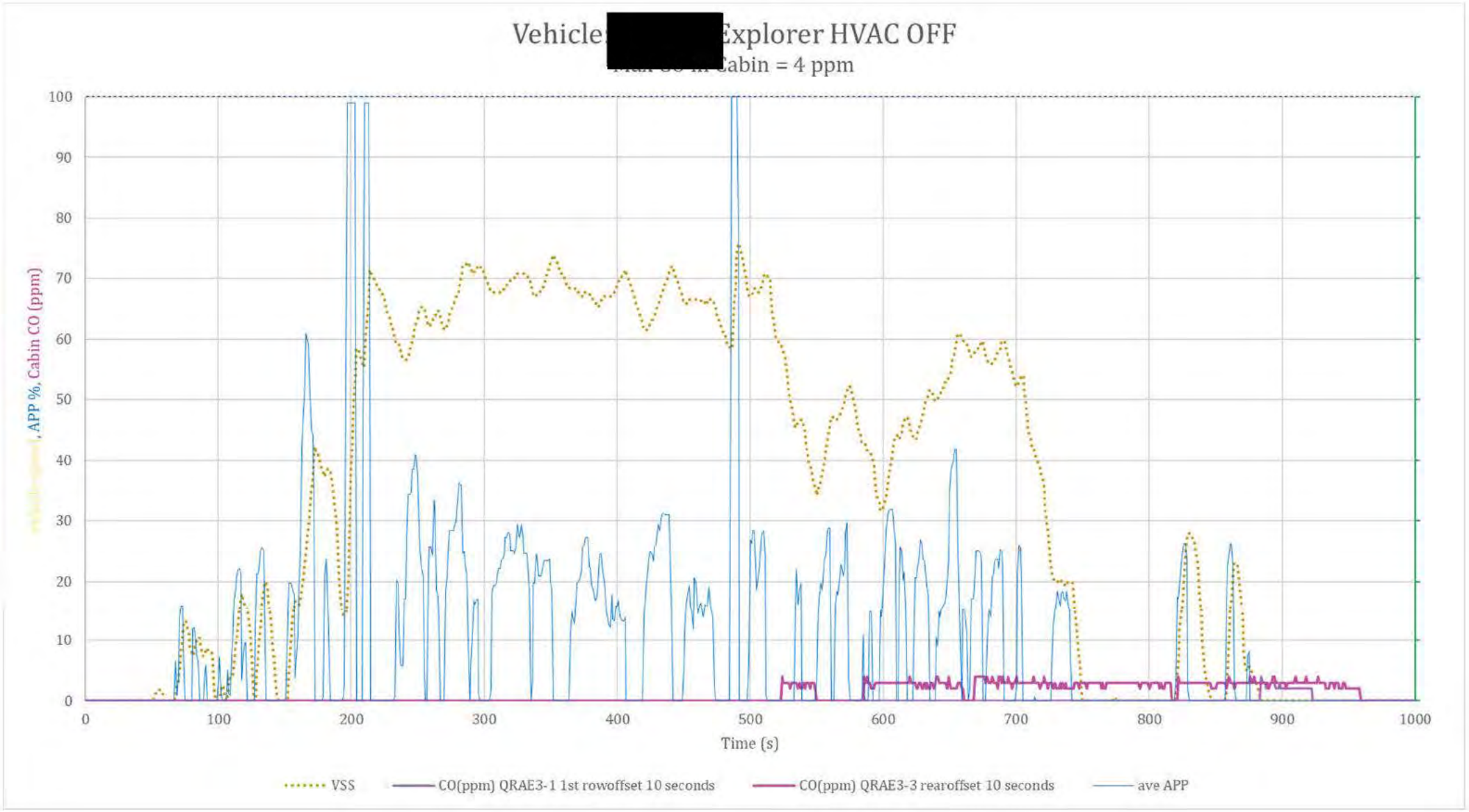
DSC_0176.JPG

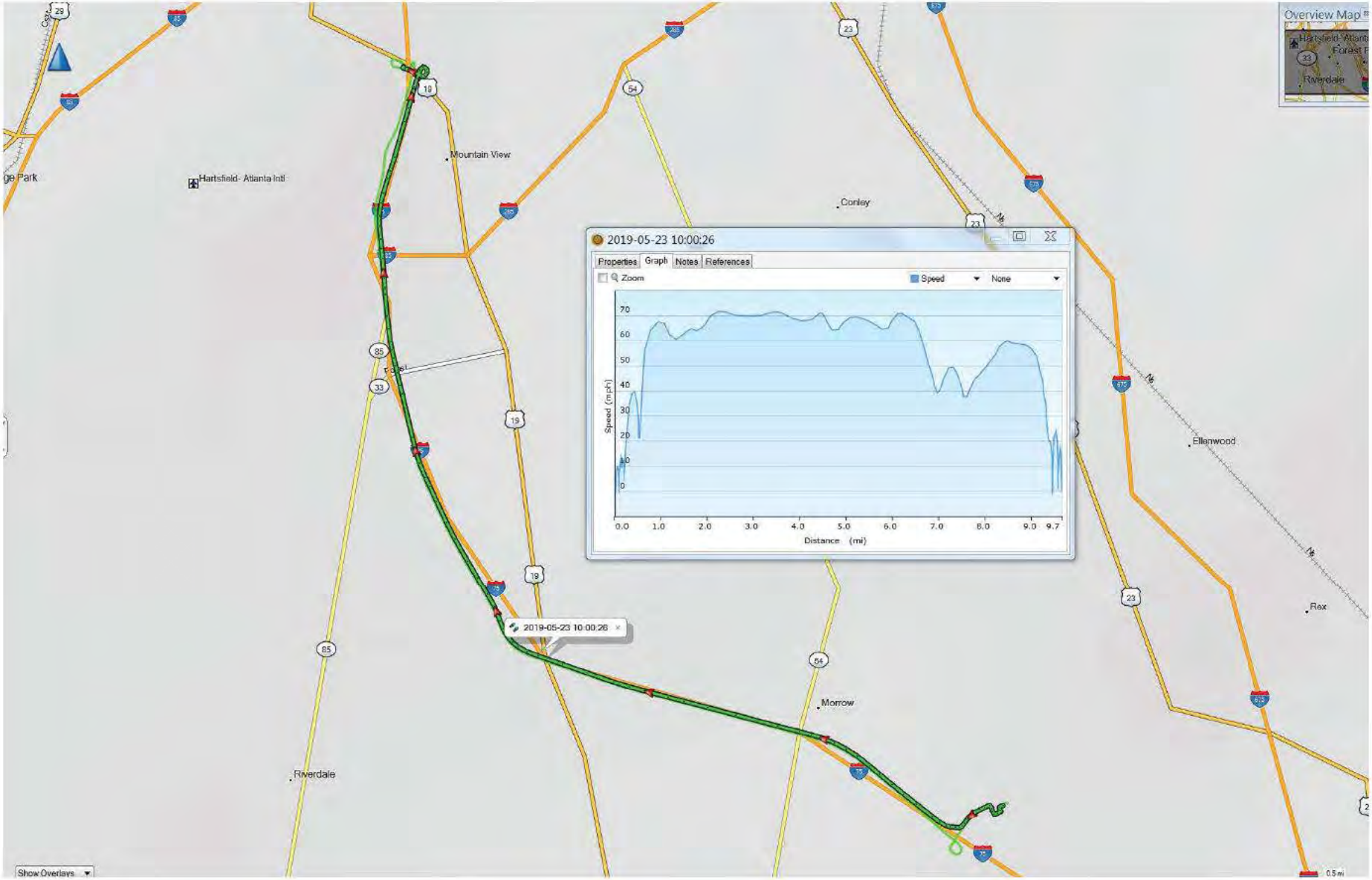
Front Seat

DSC_0180.JPG

HVAC Settings: Outbound

DSC_0185.JPG

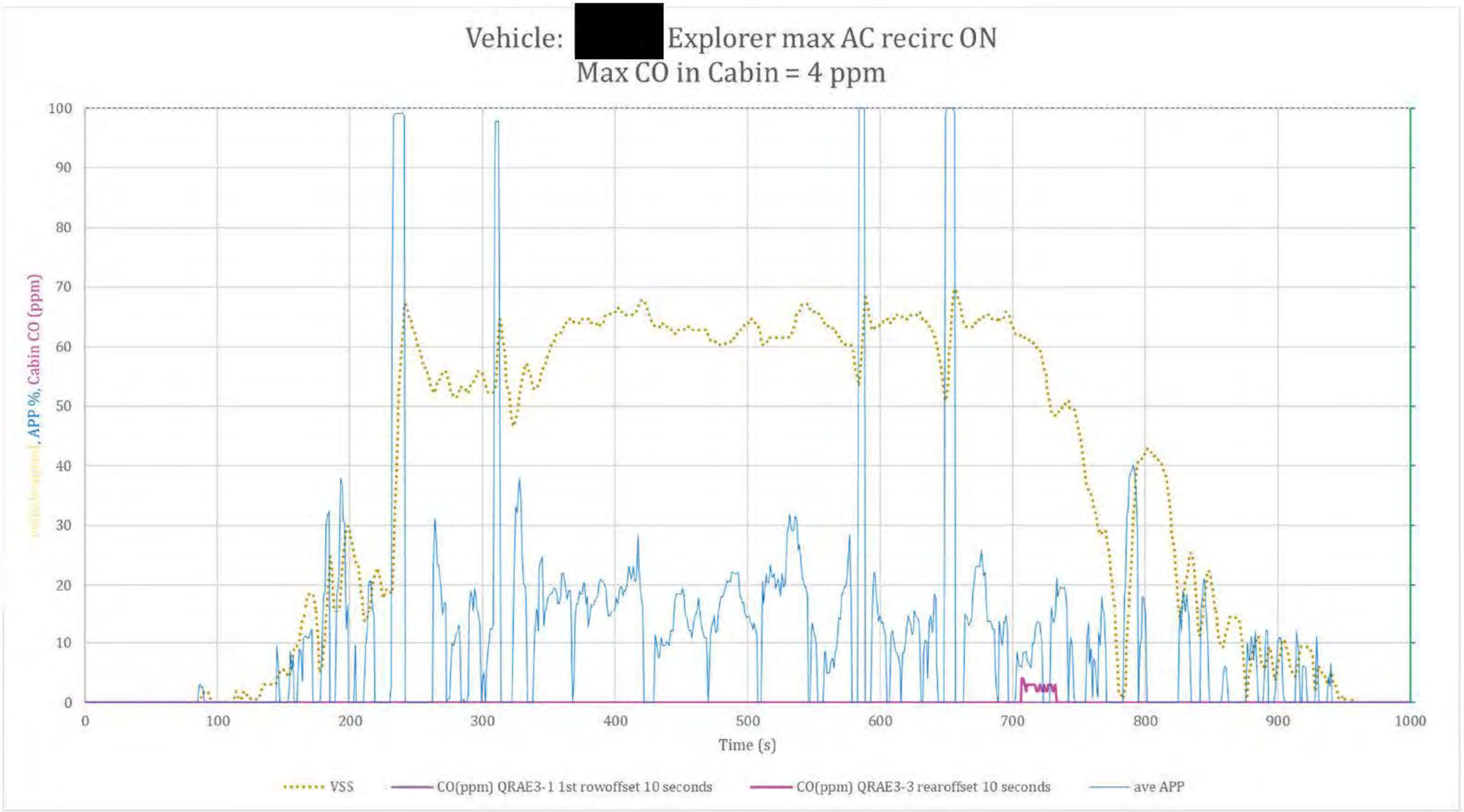

Vehicle [redacted] Explorer HVAC OFF
Cabin = 4 ppm
APP %, Cabin CO (ppm)
100
90
80
70
60
50
40
30
20
10
0
0
100
200
300
400
500
600
700
800
900
1000
Time (s)
VSS
CO(ppm) QRAE3-1 1st rowoffset 10 seconds
CO(ppm) QRAE3-3 rearoffset 10 seconds
ave APP



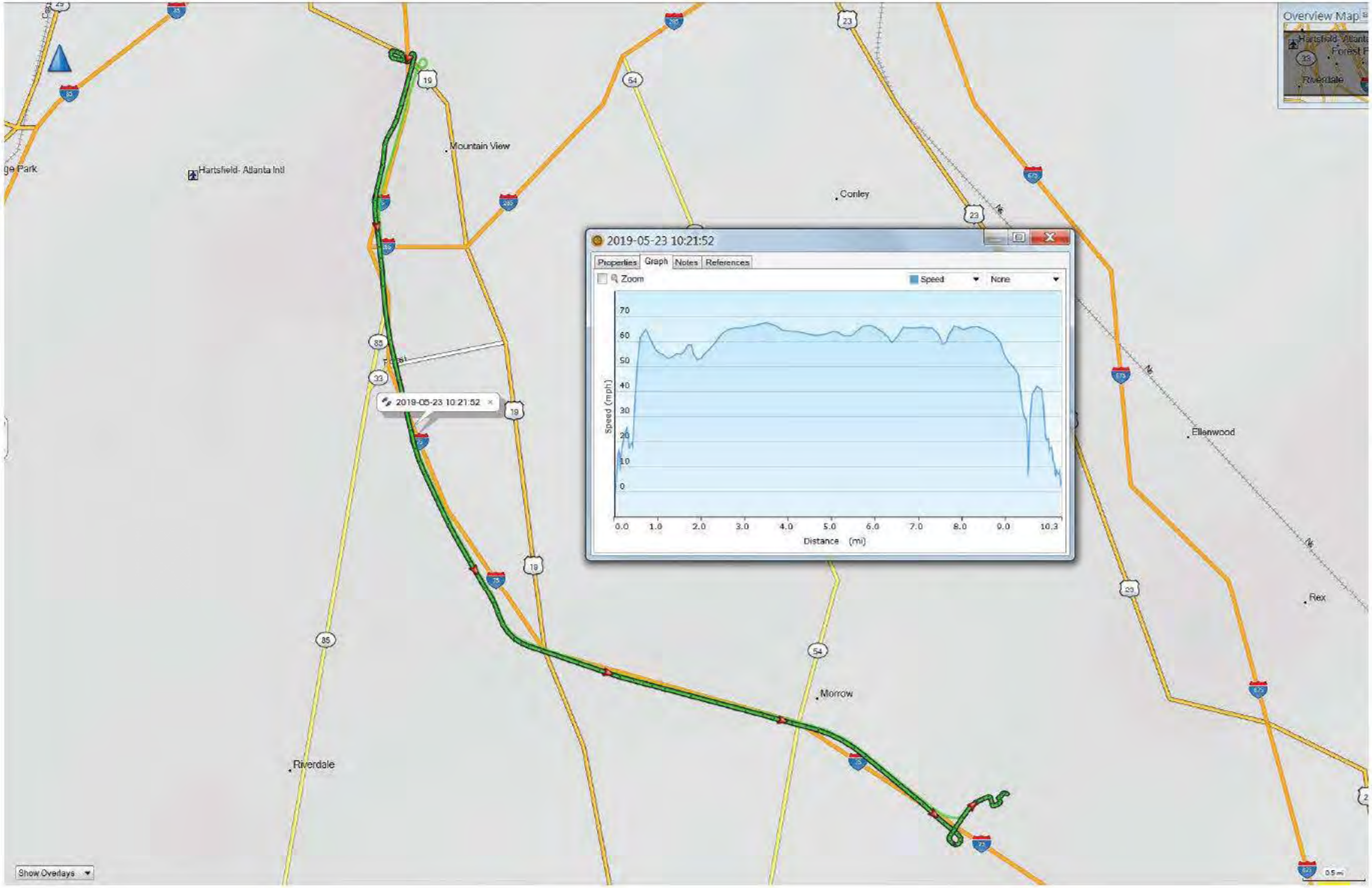
EA17-002 003125 TR

HVAC Settings: Inbound
Fan on Max Front and Rear, Recirc=ON

DSC_0187.JPG



EA17-002 003127 TR



EA17-002 003128 TR