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Comparative Emissions Testing of Vehicles Aged on E0, E15 and E20 Fuels

Keith Vertin, Gerard Glinsky, and Aaron Reek
SGS Environmental Testing Corporation
Aurora, Colorado

NREL Technical Monitor: Aaron Williams

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Prepared under Subcontract Nos. JEV-7-77439-01, JCG-9-99141-01, and JXH-1-11668-01

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Abbreviations and Acronyms

Cert_E0	Test fuel with no ethanol, meeting EPA specification for certification gasoline for altitudes >4,000 feet
Cert_E15	Test fuel containing 15%vol ethanol splash blended into Cert_E0 certification gasoline
Cert_E20	Test fuel containing 20%vol ethanol splash blended into Cert_E0 certification gasoline
CO	Carbon monoxide
CO_2	Carbon dioxide
CRC	Coordinating Research Council
DOE	US Department of Energy
DTC	Diagnostic Trouble Code
E0	Ethanol-free gasoline
E20	20%vol ethanol blended into ethanol-free gasoline
EPA	US Environmental Protection Agency
FID	Flame Ionization Detector
FTP75	Federal Test Procedure consisting of a 3-Phase drive cycle also known as the CVS80
GC	Gas Chromatograph
HC	Hydrocarbons
I/M	Inspection and Maintenance for vehicle test readiness, as determined from OBD scan
LA4	2-Phase drive cycle also known as the FTP72 or Urban Dynamometer Driving Schedule
LFT	Long Term Fuel Trim
MAD	Mileage Accumulation Dynamometer
MIL	Malfunction Indicator Lamp
NLEV	EPA emissions standard for National Low Emissions Vehicle
NMHC	Non Methane Hydrocarbons
NOx	Oxides of nitrogen
NREL	National Renewable Energy Laboratory
OBD	On Board Diagnostics
OEM	Original Equipment Manufacturer
ORNL	Oak Ridge National Laboratory
ppm	Parts per million
RE0	Road aging gasoline containing <0.1%vol ethanol
RE15	Road aging fuel containing 15%vol ethanol blended into RE0
RE20	Road aging fuel containing 20%vol ethanol blended into RE0
RVP	Reid Vapor Pressure
SGS	SGS Environmental Testing Corporation
SHED	Sealed Housing for Evaporative Determination
SRC	EPA Standard Road Cycle
THC	Total Hydrocarbons as measured by FID
WOT	Wide Open Throttle, commonly referring to a WOT test procedure in this report

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1.0 Executive Summary

The Energy Independence and Security Act passed into law in December 2007 mandates the use of 36 billion ethanol equivalent gallons per year of renewable fuel by 2022. A primary pathway to achieve this national goal is to increase the amount of ethanol blended into gasoline.

In 2007, DOE initiated a test program to evaluate the potential impacts of intermediate ethanol blends on the legacy vehicle fleet. There was concern in the automotive community that increasing the ethanol content in gasoline may cause higher catalyst temperatures and lead to catalyst performance deterioration over time. The interaction of the engine emissions control system, the 3-way catalyst, and fuel properties is complex, and a large scale study was needed to evaluate higher ethanol-containing fuels for a variety of vehicle technologies.

The present study is part of a multi-laboratory test program coordinated by DOE to evaluate the effect of higher ethanol blends, up to 20% by volume, on vehicle exhaust emissions over the lifetime of the vehicle. Six different vehicle models were chosen for testing at SGS Environmental Testing Corporation. Four types of vehicles from the 2009 model year were aged to 120,000 miles, and two types of vehicles from the 2000 model year were aged for an additional 50,000 miles over the starting odometer. The vehicles were aged under very consistent and controlled conditions by running them on mileage accumulation dynamometers using the Standard Road Cycle.

The fuels used to age the vehicles, or “aging fuels,” were designated as RE0, RE15, and RE20 to indicate the ethanol content. Emissions tests were performed using fuels designated as Cert_E0, Cert_E15, and Cert_E20 to indicate the amount of ethanol splash-blended into certification gasoline.

For each vehicle model chosen for testing, three closely matched vehicles were recruited. The three vehicles in the set all had the same engine family and evaporative emissions family. One vehicle was aged on ethanol-free fuel (RE0), one aged on 15 vol% ethanol splash blended into gasoline (RE15), and one on 20 vol% ethanol splash blended into gasoline (RE20). The test plan was designed to establish baseline (pre-aging) exhaust emissions, and then to periodically retest the eighteen vehicles in the study following mileage accumulation to quantify the change of exhaust emissions as the vehicles aged. For each vehicle model, the test results for the vehicles aged on RE0, RE15, and RE20 fuels were directly compared to assess the impact of ethanol content on exhaust emissions deterioration.

The conclusions drawn here apply to the six vehicle models tested. The reader is referred to the DOE V4 Program Report [Ref 3] for a comprehensive statistical analysis of 82 vehicles, including 14 vehicles from this study.

- The vehicles aged on 15% and 20% ethanol-containing fuels did not produce higher exhaust emissions compared to control vehicles aged on ethanol-free fuel, for all six models tested in the study.
- Fuel economy was lower for vehicles tested on blends of 15% to 20% ethanol into certification gasoline, and was in proportion to the lower energy density of these oxygenated fuels.
- Blends of 15% to 20% ethanol into certification gasoline either produced no change or lowered NMHC and CO emissions for each vehicle tested, relative to the same vehicle tested on ethanol-free certification gasoline. NOx emissions were not statistically different for each vehicle tested on ethanol-containing certification fuels, compared to the same vehicle tested on ethanol-free certification gasoline.

- The mean NOx emissions increased over the aging period for 17 of the 18 vehicles in the study. Of these vehicles, five were aged using RE0 fuel, six were aged using RE15 fuel, and six were aged using RE20 fuel.
- For four of the six models tested, the vehicle aged on RE0 fuel had higher exhaust emissions compared to the matched vehicles aged on RE15 or RE20 fuel. This finding contradicted the concern that higher ethanol content in gasoline may accelerate catalyst deterioration.
- The 2009 Honda Odyssey aged using RE0 fuel had higher NMHC, CO and NOx emissions at 120,000 miles compared to the vehicles aged on RE15 and RE20 with 95% confidence. The catalyst conversion efficiency for the HC, CO and NOx species was poorer for Odyssey RE0 as it aged compared to the other vehicles.
- NOx emissions from the 2009 Ford Focus aged using RE0 fuel were higher than Focus RE15 at 90,000 miles and higher than Focus RE20 at 120,000 miles with statistical confidence. All three vehicles in this set had significant deterioration of NOx emissions over the 120,000 mile aging period.
- There was no statistical difference in NMHC, CO and NOx emissions for the 2009 Toyota Camrys aged on RE15 and RE20 fuels compared to Camry RE0 after 120,000 miles of aging.
- NMHC, CO and NOx emissions were higher for 2009 Saturn Outlook RE0 compared to the vehicles aged on RE15 and RE20 fuels after 120,000 miles, with statistical confidence.
- The effect of the aging fuel on NMHC and NOx emissions was not statistically significant for the model year 2000 Honda Accords. CO emissions from Accord RE0 were higher compared to Accords RE15 and RE20 at 120,000 miles with statistical confidence.
- There was no statistical evidence that the ethanol-containing aging fuels impacted the exhaust emissions from the model year 2000 Ford Focus cars.
- There was no evidence of a cylinder compression problem with any of the vehicles over the course of the study, based on periodic compression and leak-down tests performed.
- Evaporative emissions were measured for the 2009 Odyssey, Camry, Focus, and Outlook as they aged to 120,000 miles on the mileage accumulation dynamometer. The limited data from this testing suggested the evaporative emissions were very similar for these vehicle models as they aged on RE0 and RE15 fuels. Supplemental 2-day evaporative emissions results for all tests were under the 2009 Tier 2 evaporative emissions standards, for both Cert_E0 and Cert_E15 test fuels. It is acknowledged that these vehicles aged on the MADs experienced far fewer refuel, diurnal, and canister purge events compared to real-world operation, and also had a shorter duration of fuel exposure.
- Emissions testing performed before and after the WOT catalyst sulfur purge cycle confirmed the sulfur purging produced a significant reduction in NOx emissions for two of the four vehicles tested. NOx emissions were reduced by 31% on average for the 2009 Ford Focus RE0, and by 25% on average for the 2009 Saturn Outlook RE0 following the catalyst sulfur purge.

2.0 Introduction

The Energy Independence and Security Act passed into law in December 2007 mandates the use of 36 billion ethanol equivalent gallons per year of renewable fuel by 2022. A primary pathway to achieve this national goal is to increase the amount of ethanol blended into gasoline. In 2007, DOE initiated a test program to evaluate the potential impacts of intermediate ethanol blends on the legacy vehicle fleet.

Earlier research has shown that higher ethanol concentrations in gasoline may lead to less fuel enrichment during accelerations where the engine control system reverts to an open-loop fueling strategy for catalyst protection (CRC E-87 Program [Ref 1], DOE V1 Program [Ref 2]). Leaner combustion results in higher exhaust

and catalyst temperatures at higher engine loads, for vehicles that do not employ long term fuel trim (LFT) adaptation under open-loop conditions. There was concern in the automotive community that increasing the ethanol content in gasoline for these vehicles may cause higher catalyst temperatures and lead to catalyst performance deterioration over time.

The present study is part of a multi-laboratory test program coordinated by the DOE to evaluate the effect of higher ethanol blends, up to 20% by volume, on vehicle exhaust emissions over the lifetime of the vehicle. Six different vehicle models were chosen for testing at SGS Environmental Testing Corporation. Four types of vehicles from the 2009 model year were aged to 120,000 miles, and two types of vehicles from the 2000 model year were aged for an additional 50,000 miles over the starting odometer. The vehicles were aged under very consistent and controlled conditions by running them on mileage accumulation dynamometers using the Standard Road Cycle.

The fuels used to age the vehicles, or "aging fuels," were designated as RE0, RE15, and RE20 to indicate the ethanol content. Emissions tests were performed using fuels designated as Cert_E0, Cert_E15, and Cert_E20 to indicate the amount of ethanol splash-blended into certification gasoline.

For each vehicle make and model chosen for testing, three closely matched vehicles were recruited. The three vehicles in the set all had the same engine family and evaporative emissions family. One vehicle was aged on ethanol-free fuel (RE0), one aged on 15 vol% ethanol splash blended into gasoline (RE15), and one on 20 vol% ethanol splash blended into gasoline (RE20). The test plan was designed to establish baseline (pre-aging) exhaust emissions, and then to periodically retest the eighteen vehicles in the study following mileage accumulation to quantify the change of exhaust emissions as the vehicles aged. For each vehicle model, the test results for the vehicles aged on RE0, RE15, and RE20 fuels were directly compared to assess the impact of ethanol content on exhaust emissions deterioration.

The overall results from this present study have been reported and published along with the results from other test labs participating in the DOE program (DOE V4 Program Report [Ref 3]). This broader report produced by the ORNL and NREL national laboratories included a comprehensive statistical analysis for the 82 vehicles that participated in the DOE V4 Program.

The present report includes more details regarding the test methodology, vehicle operation history, and emissions data. Catalyst conversion efficiency data is presented for each phase of the FTP75 emissions test cycle. The effect of catalyst sulfur purge on the exhaust emissions is discussed. In addition, some cursory data is presented comparing the evaporative emissions of vehicles aged on RE0 and RE15 fuels.

Based largely on DOE V4 test dataset, on October 13, 2010 the Environmental Protection Agency granted a partial waiver to allow fuel and fuel additive manufacturers to introduce E15 into commerce for use in model year 2007 and newer light-duty motor vehicles [Ref 4]. On January 21, 2011, EPA took further action to allow the introduction of E15 into commerce for use in model year 2001 and newer light-duty motor vehicles if the waiver conditions were met [Ref 5].

3.0 Approach and Test Procedures

3.1 Vehicle Models and Test Matrix

The DOE and EPA chose the six vehicle makes and models to be tested at SGS-ETC [Ref 3]. Vehicle selection criteria included manufacturer, model year, sales/registration volumes, and whether a vehicle model did or

did not apply long-term fuel trim at WOT. Several previous studies also factored into the vehicles selected for testing, including the DOE's previous 16-vehicle screening study (known as "V1," [Ref 2]), DOE's EPAct vehicle study (known as "V2"), and CRC's E-87 study [Ref 1].

For each vehicle make and model chosen for testing, three closely matched vehicles were recruited. The three vehicles in the set all had the same engine family and evaporative emissions family. One vehicle was aged on RE0, one aged on RE15 fuel, and one on RE20 fuel. The vehicles are summarized in Table 1. The cars were given unique 6-digit ID numbers and had large color-coded labeling to ensure positive identification and proper refueling.

Table 1. Vehicle Specification and Odometer at Start and End of Testing

Make and Model	Engine	Advertised Horse Power	Engine Family	Federal Emission Certification Standard	Evap Family	Test ID Number	VIN	Aging Fuel	Emissions Test	Date	Odometer (Miles)
2009 Honda Odyssey	3.5L V6	244	9HNXT03.5J29	Tier 2 Bin 5	9HNXR01562EA	128414	5FNRL38229B024871	RE0	End	5/14/2010	120147
									Start	7/6/2009	4039
						128415	5FNRL38229B024876	RE15	End	6/29/2010	120397
									Start	7/6/2009	4040
						128424	5FNRL38289B033459	RE20	End	10/20/2011	120156
									Start	5/13/2011	19618
2009 Ford Focus	2.0L I4	140	9FMXV02.0VDX	Tier 2 Bin 4	9FMXR0125NAA	128416	1FAHP35N29W172017	RE0	End	5/19/2010	120145
									Start	7/11/2009	4033
						128417	1FAHP35NX9W178664	RE15	End	6/24/2010	120259
									Start	7/11/2009	4032
						128422	1FAHP36N89W168617	RE20	End	10/28/2011	120140
									Start	4/27/2011	16235
2009 Toyota Camry	2.4L I4	158	9TYXV02.4BEA	Tier 2 Bin 5	9TYXR0130A12	128418	4T1BE46K89U375470	RE0	End	5/7/2010	120131
									Start	7/6/2009	4044
						128419	4T1BE46K79U892484	RE15	End	6/15/2010	120273
									Start	7/6/2009	4029
						128423	4T1BE46K79U288823	RE20	End	10/31/2011	120111
									Start	5/4/2011	12294
2009 Saturn Outlook	3.6L V6	281	9GMXT03.6151	Tier 2 Bin 5	9GMXR0197972	128420	5GZER13D59J180937	RE0	End	5/25/2010	120192
									Start	7/11/2009	4033
						128421	5GZER13D49J181741	RE15	End	6/17/2010	120246
									Start	7/12/2009	4037
						128425	5GZER13D39J197980	RE20	End	11/10/2011	120102
									Start	5/13/2011	11716
2000 Honda Accord	2.3L I4	135	YHNXV02.3PF3	NLEV	YHNXR0130AAA	101021	1HGCG5649YA027642	RE0	End	12/28/2010	141628
									Start	9/8/2010	91525
						101015	1HGCG5647YA153420	RE15	End	12/2/2010	146186
									Start	6/22/2010	95340
						101022	1HGCG5649YA049592	RE20	End	2/4/2011	139898
									Start	10/16/2010	89550
2000 Ford Focus	2.0 I4	110	YFMXV02.0VF2	NLEV	YFMXR0080BBE	102001	1FAFP34P3YW412653	RE0	End	12/2/2010	153194
									Start	7/5/2010	103069
						102015	1FAFP34P9YW400216	RE15	End	12/2/2010	135788
									Start	7/13/2010	85481
						102021	1FAFP34P4YW422950	RE20	End	2/1/2011	120226
									Start	8/26/2010	69965

The test plan was designed to establish baseline (pre-aging) exhaust emissions, and then to periodically retest the vehicles following mileage accumulation to quantify the change of exhaust emissions as the vehicles aged. Four vehicle makes/models were tested from the 2009 model year. The Odyssey, Camry, and Outlook were certified to EPA Tier 2 Bin 5 standards, and the Focus was Tier 2 Bin 4. The cars to be aged on RE0 and RE15 fuels were purchased new and conditioned to 4000 miles (Section 3.2) before performing baseline emissions tests. The RE20 vehicle testing was authorized in the spring of 2011, and therefore it was not possible to purchase new vehicles. SGS-ETC recruited the vehicles to be aged on RE20 fuel from the public fleet, with emphasis on obtaining low mileage vehicles. The RE20 vehicles were inspected prior to

purchase, had no pending or active MILs or DTCs, and had trouble-free history per Carfax checks. The vehicles were confirmed to have no exhaust leaks, no evaporative emissions system leaks, and no aftermarket modifications. The baseline emissions tests for the RE20 vehicles were performed with less than 20,000 odometer miles per Table 1.

The 2009 vehicles were aged on mileage accumulation dynamometers (Section 3.3) and emissions tests were performed at approximately 60,000, 90,000, and 120,000 miles on the odometer (Table 2). The control vehicles were exposed only to RE0 and Cert_E0 ethanol-free fuels throughout the aging period and test process (fuels defined in Section 4). The RE15 vehicles were aged on RE15 fuel, and emissions tests were performed using Cert_E15 fuel, and then Cert_E0 fuel at each mileage interval. Likewise, the RE20 vehicles were aged on RE20 fuel, and emissions tests were performed using Cert_E20 fuel, and then Cert_E0 fuel at each mileage interval.

Two makes and models were tested from the 2000 model year. Both the 2000 Accord and 2000 Focus were certified to EPA NLEV standards. The cars were recruited from the public fleet by others and provided to SGS-ETC for testing. Significant operational problems and failures were encountered with some of the model year 2000 cars provided (Section 5), and testing was restarted with spare vehicles to complete the test matrix. Only the vehicles that completed the test matrix are included in Table 1 and in the results sections. The starting odometers were within 6,000 miles of each other for the 2000 Accord cars aged on RE0, RE15 and RE20 fuels. The starting odometers for the 2000 Focus cars were significantly different, with the Focus RE0 having the highest starting mileage of 103,069 miles, about 33,000 miles higher than Focus RE20. The model year 2000 vehicles were aged on mileage accumulation dynamometers (Section 3.3). Emissions tests were performed at the starting mileage, and following approximately 25,000 and 50,000 miles of aging (Table 2).

The emissions tests were performed in triplicate for each vehicle and fuel combination, at each mileage interval. Occasionally, additional emissions tests were performed if the results had high variability. Triplicates were performed to allow calculation of 95% confidence intervals while maintaining a reasonable budget. Confidence intervals were calculated using the Student-T distribution for small sample sizes.

The test matrix was constructed so one can determine the effect of the aging fuel on vehicle exhaust emissions. It was of interest to determine if the addition of ethanol in gasoline impacts the vehicle emissions as the vehicle ages. In addition, the matrix allowed a comparison of exhaust emissions for the same vehicle fueled on ethanol-containing and ethanol-free fuels, by performing back-to-back tests at each mileage interval.

In this report, “Model RExx” refers to a vehicle model that was aged on RExx fuel. For example, “Odyssey RE20” refers to a Honda Odyssey that was aged on RE20 fuel, but emissions tested on either Cert_E20 or Cert_E0 fuels.

Table 2. Vehicle Test Matrix and Fuels

			Emissions Test Mileage and Emissions Test Fuel			
Model Year	Vehicle Number	Aging Fuel	Baseline Test (<20,000 Miles)	60,000 Miles	90,000 Miles	120,000 Miles
2009 Model Year Vehicles	Vehicle #1	RE0	Cert_E0	Cert_E0	Cert_E0	Cert_E0
	Vehicle #2	RE15	Cert_E0 Cert_E15	Cert_E15 Cert_E0	Cert_E15 Cert_E0	Cert_E15 Cert_E0
	Vehicle #3	RE20	Cert_E0 Cert_E20	Cert_E20 Cert_E0	Cert_E20 Cert_E0	Cert_E20 Cert_E0

			Emissions Test Mileage and Emissions Test Fuel		
Model Year	Vehicle Number	Aging Fuel	Baseline Test (Starting Odometer)	Starting Odometer + 25,000 miles	Starting Odometer + 50,000 miles
2000 Model Year Vehicles	Vehicle #1	RE0	Cert_E0	Cert_E0	Cert_E0
	Vehicle #2	RE15	Cert_E0 Cert_E15	Cert_E15 Cert_E0	Cert_E15 Cert_E0
	Vehicle #3	RE20	Cert_E0 Cert_E20	Cert_E20 Cert_E0	Cert_E20 Cert_E0

3.2 Vehicle Preparation

The vehicles were modified for testing, including the following:

- An ignition key switch relay was added to allow automated vehicle shutdown on the mileage accumulation dynamometer.
- K-type thermocouples were added in the exhaust stream, at the engine-out and between catalyst locations.
- K-type thermocouple was affixed to the upper radiator hose to measure coolant outlet temperature.
- K-type thermocouple was added to measure engine oil temperature, in the oil dipstick tube.
- K-type thermocouple was added to measure transmission oil temperature.
- A quick-disconnect fitting was added for oil pressure measurement.
- A fuel drain hose with Schrader fitting was added to the engine fuel supply line to facilitate rapid fuel drains. Note that this drain hose was found to be permeable and not used for SHED tests.
- Pipe thread fittings (“bungs”) were added to the exhaust system pipes and stainless steel tubes were run to the side of the car to allow for raw exhaust emissions sampling.
- The gas pedal was modified to allow attachment of throttle actuator for driverless mileage accumulation.

- The vehicle traction control was defeated to allow for “rolls mode” testing on the chassis dynamometer.
- Wheel rims were color-coded to designate which wheels were to be used for mileage accumulation (YELLOW) and which wheels were to be used for emissions testing (RED). The intention was to use the same tires for all emissions tests to minimize any rolling resistance differences.
- Labels were affixed to each car to clearly designate the vehicle ID, thermocouple locations, emission sample lines, and refueling requirements.

Log books were placed in each vehicle, to record each refueling and maintenance event and record mileage accumulation progress.

The new vehicles were degreened under controlled conditions in the chassis dynamometer laboratory. The cars were run to 4000 miles, which is the mileage at which the engine-catalyst system combination is considered stabilized for emission data testing per EPA 40CFR86.095-26(b)(4)(ii)(A). The degreening was performed using ethanol-free fuel over the EPA Standard Road Cycle (Section 3.3).

3.3 Aging on Mileage Accumulation Dynamometers

The vehicles were aged using eight eddy-current mileage accumulation dynamometers (also known as “MADs,” Figure 1) using the EPA Standard Road Cycle (SRC). The SRC is a geometric cycle that has series of prescribed accelerations, cruises and decelerations. The cycle has an average speed of 46.3 mph and a peak cruise speed of 75 mph (Figure 2).

The vehicles were aged in a very consistent and controlled manner on the MADs. The laboratory is fully automated and eliminates many of the risks and intangibles associated with on-road and on-track aging.

The vehicles were aged in a driverless manner, using a throttle (gas pedal) actuator and braking action provided by the eddy-current power absorber. Independent closed loop controllers were used for the dynamometer and the vehicle throttle actuator. During accelerations and cruises, the dynamometer controller determined the roll torque setpoint using a model for inertia simulation and road load, and the vehicle throttle controller was used to achieve the target vehicle speed. During decelerations, the vehicle throttle was completely released and the dynamometer braked the vehicle in the speed control mode of operation.

Figure 1. Test Vehicles Operating on the Mileage Accumulation Dynamometers
Photos by SGS Environmental Testing Corporation

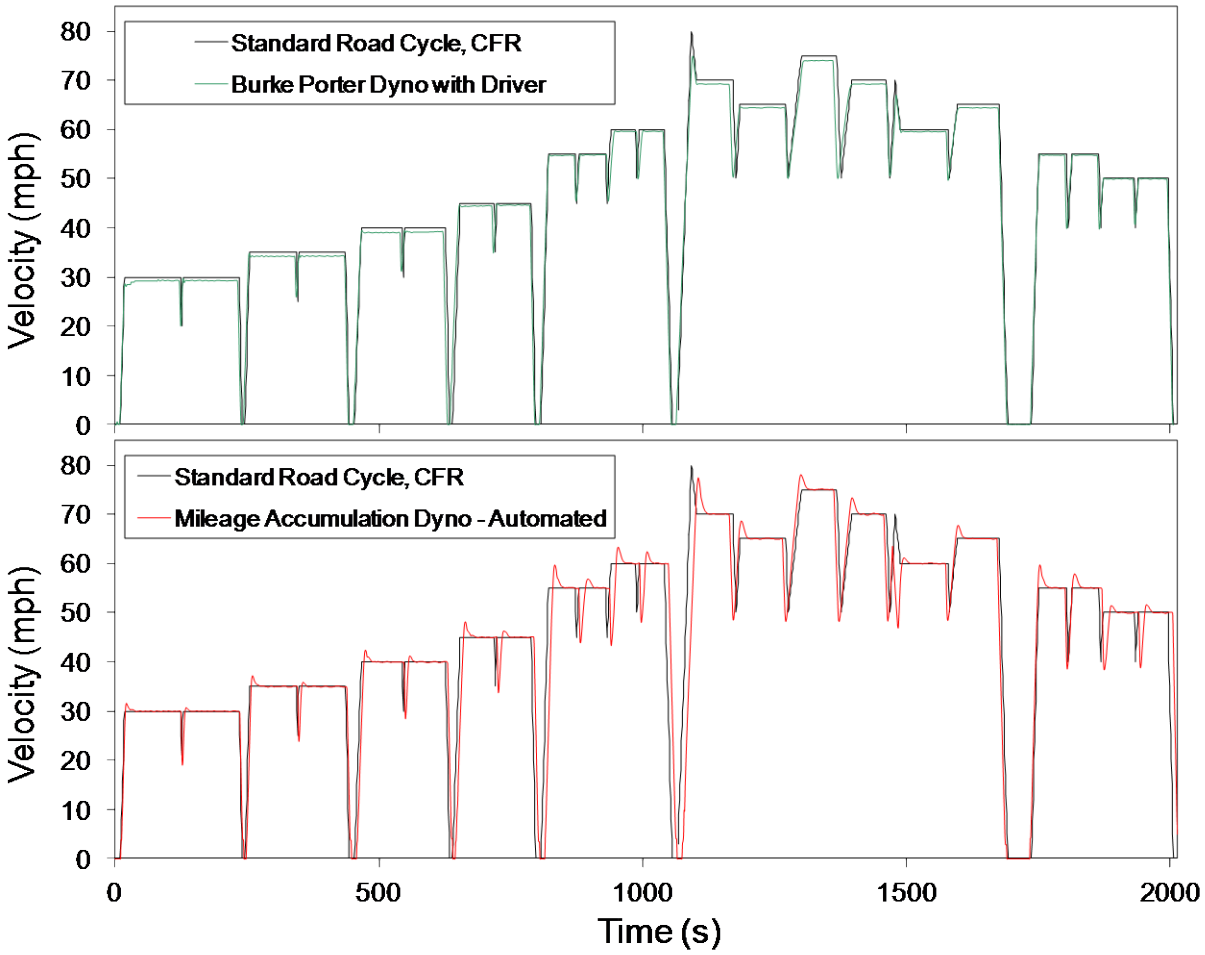

Figure 2. Typical Vehicle Speed Compared to SRC, for Emissions Dyno Lab with Driver (upper) and Mileage Accumulation Dyno without Driver (lower), 2009 Toyota Camry RE0

Great care was taken to ensure realistic vehicle operation on the MADs. Road load derivations were first performed on the Burke Porter dynamometers used in the emissions labs, per SAE J2264. The vehicle was driven on the Burke Porter dyno to accurately determine wheel power over the SRC and over steady state cruise events. The vehicle was then moved to the MAD and the road load model was adjusted to match the power absorption measured on the Burke Porter dyno system and energy over the SRC. This process was performed for each vehicle model to ensure the vehicle was being loaded properly during the aging process.

The throttle actuator controllers were tuned to find the best compromise between meeting the SRC prescribed acceleration rates while minimizing vehicle speed overshoot. A typical example of automated control of the vehicle over the SRC is shown in Figure 2, lower. Whereas small speed overshoots are evident for this particular vehicle on the MADs, detuning the throttle controller would have resulted in acceleration rates below the SRC rates.

The automation system continuously monitored engine and transmission fluid temperatures, exhaust temperatures, oil pressure and vehicle speed. Warnings or alarms were triggered to protect the vehicle from

overheating or catastrophic failure in the event of a vehicle or laboratory malfunction. These signals were recorded at 1Hz, providing a record of the aging process.

The vehicles were shut down for periodic refueling. The vehicles remained strapped to the dynamometer during the fueling process. During each refueling event, a technician checked oil level, inspected the car, and checked for MILs prior to restarting the aging cycle.

A mileage accumulation rate of about 1050 miles per day per vehicle was achieved on days with no interruptions. Over 1.63 million miles were accumulated for the study. Up to eight vehicles were aged simultaneously over a 24 hour / 7 days per week operation, with an attendant on site to perform refueling and inspection tasks.

3.4 Preparation for Emission Testing

Each vehicle was operated on its emissions test fuel (Cert_Ex) for the last 500 miles on the mileage accumulation dynamometer prior to emissions testing. The vehicle was therefore completely purged of the aging fuel and conditioned on the test fuel at the start of the test sequence. Prior to emissions testing at each mileage interval, the following preparations were made:

- The vehicle was washed without soap.
- Front and rear wheels were switched, so the same tires were used for all emissions tests.
- Basic maintenance items were checked (fluids, hoses, belts, tires).
- An OBD scan was performed to verify the vehicle was in a state of I/M readiness.
- The vehicle exhaust system was leak checked.
- A pressure decay check was performed for the vehicle evaporative emissions system. For the car at soak conditions, the evaporative emissions system was pressurized with shop air to 13" H_2O through the canister vent. Pressure should not decay over 5 minutes.
- Vehicle was stored in temperature and humidity controlled soak area for the duration of testing.
- A dynamometer road load derivation was performed at each mileage interval, as is best practice for vehicles accumulating this amount of miles.

The dyno set / vehicle loss ABC road load coefficients were very similar for all three vehicles within the vehicle model group, and did not change significantly as the cars aged. Typical variation in road load derivation result is shown as a function of speed in Figure 3.

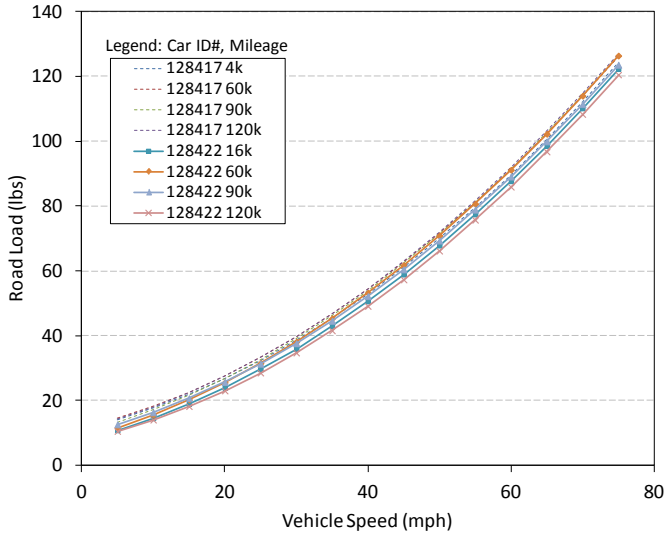

Figure 3. Road Load Derivation Results for 2009 Ford Focus #128417 (RE0) and #128422 (RE20) at each Mileage Interval

3.5 Emissions Test Procedure

For vehicles returning from aging on the MADs, a WOT catalyst sulfur purge test was run before emissions tests were performed. The WOT test, also known as the EPEFE cycle and further described in the CRC E-87 study [Ref 1], consists of a series of 10 WOT accelerations that significantly elevated the exhaust temperatures to promote sulfur purge from the catalyst. During this cycle, exhaust temperatures, lambda and OBD fuel trim data were logged to compare vehicle behavior for different fuels. Lambda was measured at the engine-out location and is defined as the actual air-to-fuel ratio divided by the stoichiometric air-to-fuel ratio. The results were analyzed to determine if each vehicle model used adaptive controls to further enrich fueling during open loop WOT accelerations, when fueled with ethanol-containing fuels (Table 3).

Table 3. Adaptive Controls During WOT Accelerations

For Vehicles Tested on Both Ethanol-Free and Ethanol-Containing Fuels →	Did Adaptive Controls Further Enrich Fueling for Ethanol-Containing Fuels During WOT Accelerations?
2009 Odyssey	No
2009 Focus	Yes
2009 Camry	Yes
2009 Outlook	Yes
2000 Accord	No
2000 Focus	No

All exhaust emissions results presented are for tests following the sulfur purge, unless otherwise indicated. Early in the study, a few tests were run before and after the sulfur purge, to quantify the effect on exhaust emissions (Section 6.7).

A sequence identical to the federal supplemental certification test was then performed per 40CFR86 Subpart B. In summary this sequence included:

a) Fuel drain and 40% fill
b) Soak 6-36 hours
c) LA4 dynamometer prep cycle
d) Fuel drain and 40% fill within 1 hour of prep cycle completion
e) Canister load with nitrogen/butane to 2g breakthrough
f) Soak 12-36 hours
g) Cold Start FTP75 3 bag dynamometer emissions test

Steps c) to g) were then repeated twice, to collect triplicate emissions data.

For select vehicles, SHED tests were then performed per Section 3.6 and included these additional steps:

h) 1 hour hot soak SHED test started within 7 minutes following emissions test
i) Soak 6-36 hours
j) 2-day diurnal SHED test, 72-96-72°F

Vehicles aged on RE15 and RE20 fuels also required additional emissions testing using Cert_E0 fuels, per the Test Matrix, Table 2. For these vehicles, the following steps were performed for the fuel changeover and to complete the emissions testing:

k) Fuel drain and 40% fill with Cert_E0
l) Start and idle for 2 minutes
m) Fuel drain
n) Key on for 30 seconds to confirm tank empty using fuel gage
o) 40% fill with Cert_E0
p) Four LA4 dynamometer prep cycles
q) WOT sulfur purge cycle
r) Soak 6-36 hours
s) LA4 dynamometer prep cycle
t) Fuel drain and 40% fill with Cert_E0 within 1 hour of prep cycle completion
u) Canister load with nitrogen/butane to 2g breakthrough
v) Soak 12-36 hours
w) Cold Start FTP75 3 bag dynamometer emissions test

Steps s) to w) were then repeated twice, to collect triplicate emissions data for Cert_E0 fuel.

Emissions tests were performed in certification-compliant emissions laboratories at SGS Environmental Testing Corporation (Figure 4). The SGS-ETC laboratories feature Burke Porter 48” rolls in a temperature and humidity controlled environment. All SGS laboratories feature constant volume sampling system (CVS), raw modal and dilute bag gas sampling and analysis. Regulated emissions measurement included CO, CO_2, NOx, total HC, and methane. The following equipment and methods were used to ensure accurate measurement of the very low emission concentrations from these vehicles:

- Bag samples were simultaneously collected from the diluted vehicle exhaust and from the ambient, to ensure quantification of the background, and accurate calculation of cycle average exhaust mass emissions.

- Continuous engine-out and tailpipe raw emissions measurements were made to provide information on catalyst conversion efficiency.

- Non methane hydrocarbons (NMHC) were equal to the FID total hydrocarbons minus the response factor-corrected methane. Methane measurement was by GC FID.

- Low range gas analyzers and low concentration span gas bottles were used to ensure appropriate analyzer response and resolution, per SGS-ETC normal operating practice.

- Fuel consumption was calculated using the carbon balance method, accounting for actual mass fractions of carbon, hydrogen and oxygen in the fuel (Section 4). Fuel economy was calculated using the "uncorrected method". The older EPA corrected calculation for MPG, per 40CFR600.113-08(h)(1), was not applicable for oxygenated fuels.

Tests were performed by multiple drivers on multiple dynamometer test sites.

Figure 4. Saturn Outlook RE20 Installed in Chassis Dynamometer Emissions Laboratory
Photo by SGS Environmental Testing Corporation

The emissions test sequence was conducted like a certification test sequence, with the following deviations:

- EPA certification fuel is ethanol-free, whereas Cert_E15 and Cert_E20 fuels were splash blended with ethanol and did not conform to a certification fuel standard.
- Raw exhaust measurements were made to determine catalyst efficiency.

- An Innova photoacoustic analyzer was used to draw sample from the ambient and sample bags, with the intention of measuring ethanol concentration.

Attempts were made to use an Innova photoacoustic analyzer to measure ethanol concentration from ambient and bag samples. The method was not successful as a correlation between ethanol and total hydrocarbon mass was not established for the vehicles tested with ethanol-containing fuels. The authors believe that ethanol hang-up in the sample stream, the very short time available for sample reads from the bags, and the very small ethanol concentrations were all contributors to measurement error. The authors endorse the impinger and gas chromatograph analysis method for alcohol measurement in vehicle exhaust, per [Ref 6].

3.6 SHED Test Procedure

Whereas vehicle evaporative emissions testing was beyond the scope of work in the subcontracts, SGS-ETC contributed SHED testing to the project. The objective of the tests was to gain some early comparative information about the evaporative emissions from 2009 vehicle models aged on RE0 and RE15 fuels.

2-day diurnal evaporative emissions tests were performed following the FTP75 exhaust emissions tests, at start (4,000-5,500), 60,000, 90,000 and 120,000 mileage events.

Four vehicles were aged on RE0 fuel and four aged on RE15 fuel using mileage accumulation dynamometers. Since the vehicles accumulated about 1,000 miles per day during 24hour/7day per week aging on the MADs, the evaporative emissions systems were not exercised as would be under real-world driving. On the MADs, the vehicles experienced far fewer refuel, diurnal, and canister purge events compared to real-world operation, and also had a shorter duration of fuel exposure. Nevertheless, the test approach provided some timely, comparative data on evaporative emissions from vehicles aged on RE0 and RE15 fuels. The authors have subsequently performed a more rigorous study comparing the durability of automotive evaporative emissions systems exposed to E0 and E20 fuels (CRC E-91, [Ref 7]).

For the present study, evaporative emissions tests were run per Federal Test Procedure Supplemental Evaporative Test (“2-Day Diurnal” sequence) using a SHED test fixture (Figure 5). The tests were performed using both Cert_E0 and Cert_E15 test fuels.

In preparation for testing:

- The windshield washer bottles were drained and flushed with water. There was no need to refill the washer fluid throughout the duration of the program since the vehicles were captive.
- The vehicles were washed without soap.
- The “aftermarket” fuel drain hose used to aid fuel drain and fills was removed prior to the prep cycle for all SHED testing as these hoses were determined to be permeable. The fuel supply hose connection was returned to stock configuration prior to each prep cycle.
- The vehicles did not have service ports, so canisters were butane-loaded through a modified gas cap. The stock gas cap was reinstalled after the completion of the canister load, during the soak period.
- Note that there was no attempt made to soak the vehicle at elevated temperatures to “off-gas” or “bake-off” residual hydrocarbons prior to the initial tests, and the vehicles had newer tires.

Baseline Evaporative Emissions Tests

All vehicles were SHED tested after approximately 4,000 miles of run-in, on high altitude Cert_E0 fuel (conforming to 40CFR86.113-04).

One vehicle from each 2009 model group was then refueled on Cert_E15 fuel. Fuel conditioning after the initial fuel change included:

- Approximately 1,000 miles of vehicle operation using the Standard Road Cycle
- Exposure to Cert_E15 fuel, in the fuel tank for approximately 2 months before exhaust emissions and SHED testing was performed (September to November/December 2009).

The RE15 vehicles were then retested in SHED, using Cert_E15 fuel, at approximately 5,400 miles.

Evaporative Emissions Tests at 60000, 90000 and 120000 Mile Events

Control vehicles aged using RE0 fuel were retested at 60,000, 90,000 and 120,000 miles. These vehicles were switched to Cert_E0 fuel for last 500 miles of each aging interval. SHED testing was performed using Cert_E0 fuel after the triplicate exhaust emissions tests were completed.

The vehicles aged using RE15 fuel were retested at 60,000, 90,000 and 120,000 miles. These vehicles were switched to Cert_E15 fuel for last 500 miles of each aging interval. SHED testing was performed using Cert_E15 fuel after the triplicate exhaust emissions tests were completed.

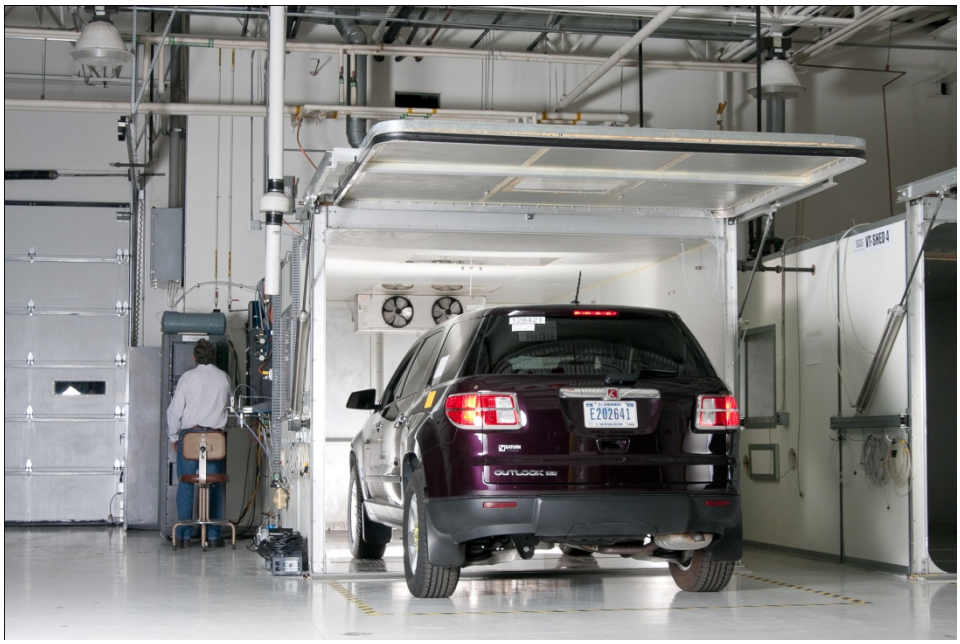

Figure 5. Saturn Outlook RE15 Following Completion of a 2-Day Diurnal SHED Test
Photo by SGS Environmental Testing Corporation

4.0 Fuels

Different fuels were used for aging the vehicles and for emissions testing, in order to economically complete the test plan. Fuel descriptions and properties are shown in Table 4. Each row in this table represents a different batch of fuel used over the duration of the study.

The fuels used for aging had an "R" prefix, designating them as "Road Fuels." RE0 is ethanol-free gasoline that was purchased in bulk directly from a local fuel terminal. RE0 is a finished market fuel, an ethanol-free gasoline that had nominal 85 octane rating (R+M)/2, the standard octane for regular unleaded fuel in the Denver area. The RE0 fuel was purchased from the same terminal, Suncor, for the duration of the model year 2009 RE0 and RE15 vehicles tests. In September 2010, a switch was made to a different terminal, Magellan. The RVP of the road fuels varied seasonally (Table 4), and this was desirable since the cars were aged outdoors. Due to the length of the study it was not possible to maintain a common batch of fuel used for vehicle aging.

This same ethanol-free base fuel was splash blended with fuel-grade ethanol to produce the RE15 and RE20 fuels. The fuel grade ethanol was denatured with about 3% isopentane. Ethanol is known to boost the octane rating of gasoline. Therefore the octane rating of the road aging fuel increased in proportion to the ethanol content.

Fuel "Cert_E0" was an ethanol-free high altitude certification gasoline conforming to 40CFR86.113-04. This certification fuel was splash blended with fuel grade ethanol to produce the Cert_E15 and Cert_E20 fuels. Fuels with the "Cert" prefix were used for all emissions tests in the study.

For both aging fuels and emissions fuels, blending was done volumetrically and the ethanol blend concentration was verified on site using a Wilks infrared spectrometer and also by the ethanol water extraction method. Blend concentration was held to within ±1% tolerance by volume.

Samples of the fuels were collected periodically and sent to an outside laboratory for analysis. Results from the laboratory analysis and from the Certificate of Analysis are combined in Table 4. Fuel property analysis confirmed the ethanol-free fuels contained <0.1% ethanol.

Table 4. Fuel Batches and Fuel Property Summary

														Distillation		
Fuel Description	Sample Name / Date	%-EtOH Spec	%-EtOH (vol%)	RVP (psi)	LHV (BTU/lbm)	SG	S (ppm)	Ttl Arom (wt%)	C (wt frac)	H (wt frac)	O (wt frac)	H:C	O:C	T10 (°F)	T50 (°F)	T90 (°F)
	ASTM Method →	-	D5599	D5191	D240N	D4052	D5453	D5580 or D1319	D5291	D5291	D5599	-	-	D86	D86	D86
RE0	RE0 7/17/09	0%	0.0%	7.2	18132	0.7494	36	-	0.8634	0.1313	-	1.812	-	137	220	333
	RE0 1/19/10	0%	0.0%	12.4	18707	0.7311	33	-	0.8656	0.1379	0.0000	1.898	0.000	105	204	327
	RE0 3/9/10	0%	0.0%	13.3	18652	0.7028	17	-	0.8665	0.1368	0.0000	1.881	0.000	104	200	313
	RE0 4/21/10	0%	0.0%	8.9	18609	0.7407	15	-	0.8676	0.1346	0.0000	1.849	0.000	125	207	308
	RE0 5/13/10	0%	0.0%	7.6	18480	0.7481	18	42	0.8708	0.1296	0.0000	1.773	0.000	132	201	304
	RE0 6/15/10	0%	0.0%	6.8	18582	0.7423	50	34	0.8639	0.1359	0.0000	1.875	0.000	137	205	316
	RE0 9/02/10	0%	0.0%	7.4	18581	0.7511	31	37	0.8642	0.1311	0.0000	1.808	0.000	138	222	329
RE15	RE15 8/19/09	15%	15.0%	8.5	17404	0.7568	37	-	0.8077	0.1308	0.0547	1.930	0.051	131	163	324
	RE15 1/19/10	15%	17.7%*	-	17223	0.7571	17	31	0.8121	0.1328	0.0646	1.949	0.060	132	165	326
	RE15 3/9/10	15%	15.4%	-	17500	0.7374	21	-	0.8094	0.1350	0.0576	1.987	0.053	107	158	304
	RE15 4/21/10	15%	14.2%	10.1	17483	0.7458	17	29	0.8132	0.1349	0.0526	1.977	0.049	122	159	305
	RE15 5/13/10	15%	14.0%	9.3	17475	0.7500	16	30	0.8151	0.1309	0.0513	1.914	0.047	128	160	307
	RE15 6/15/10	15%	14.4%	8.1	17479	0.7546	32	30	0.8129	0.1335	0.0526	1.957	0.049	131	164	322
	RE15 7/01/10	15%	14.0%	8.8	17507	0.7473	28	30	0.8142	0.1359	0.0518	1.989	0.048	126	163	305
	RE15 9/02/10	15%	15.1%	8.1	17246	0.7570	26	31	0.8079	0.1313	0.0551	1.937	0.051	131	163	323
RE20	RE20 7/01/10	20%	19.4%	8.5	17006	0.7525	21	29	0.7927	0.1342	0.0709	2.017	0.067	129	164	296
	RE20 9/02/10	20%	20.3%	8.0	17013	0.7584	18	29	0.7877	0.1309	0.0737	1.980	0.070	133	164	318
	RE20 6/14/11	20%	20.1%	-	-	-	-	-	-	-	0.0744	-	-	-	-	-
	RE20 7/12/11	20%	20.5%	-	-	-	-	-	-	-	0.0761	-	-	-	-	-
	RE20 8/26/11	20%	20.5%	-	-	-	-	-	-	-	0.0761	-	-	-	-	-
Cert E0	Cert E0 7/1/09	0%	0.0%	7.7	18360	0.7378	32	27	0.8641	0.1349	-	1.860	-	132	218	318
	Cert E0 3/31/10	0%	0.0%	7.9	18614	0.7416	24	30	0.8641	0.1359	0.0000	1.874	0.000	129	215	311
	Cert E0 4/21/10	0%	0.0%	7.8	18559	0.7437	26	-	0.8670	0.1335	0.0000	1.835	0.000	128	215	311
	Cert E0 8/9/10	0%	0.0%	8.1	18590	0.7382	42	27	0.8639	0.1361	0.0000	1.878	0.000	129	212	302
	Cert E0 9/02/10	0%	0.0%	7.9	18614	0.7385	48	35	0.8761	0.1358	0.0000	1.847	0.000	127	213	299
	Cert E0 12/20/10	0%	0.0%	8.0	18609	0.7388	40	29	0.8629	0.1371	0.0000	1.894	0.000	129	215	300
	Cert E0 4/22/11	0%	0.0%	7.9	18549	0.7420	18	30	0.8649	0.1351	0.0000	1.861	0.000	127	218	300
	Cert E0 6/8/11	0%	0.0%	7.9	18585	0.7397	18	28	0.8597	0.1403	0.0000	1.945	0.000	124	217	303
Cert E15	Cert E15 (SS-56020-17) 9/28/09	15%	14.7%	8.4	17525	0.7501	15	-	0.8113	0.1351	0.0541	1.984	0.050	128	162	311
	Cert E15 (SS-56020-18) 9/28/09	15%	14.8%	8.5	17462	0.7502	15	-	0.8116	0.1336	0.0544	1.962	0.050	128	164	310
	Cert E15 4/21/10	15%	15.0%	8.7	17408	0.7488	20	-	0.8118	0.1344	0.0553	1.973	0.051	125	163	298
	Cert E15 9/02/10	15%	14.8%	8.6	17449	0.7492	22	30	0.8133	0.1327	0.0546	1.944	0.050	126	164	296
Cert E20	Cert E20 9/02/10	20%	20.3%	8.3	17030	0.7525	20	29	0.7864	0.1316	0.0744	1.994	0.071	128	164	294
	Cert E20 (SS-56020-17) 5/20/11	20%	19.8%	-	-	0.7515	15	-	0.7969	0.1350	0.0725	2.019	0.068	-	-	-
	Cert E20 (SS-56020-18) 5/20/11	20%	19.7%	-	-	0.7516	14	-	0.7959	0.1338	0.0724	2.003	0.068	-	-	-
	Cert E20 9/15/11	20%	20.1%	-	-	0.7489	14	-	0.7928	0.1335	0.0738	2.007	0.070	-	-	-

* Alternative measurements using water extraction method and IR spectrometer confirmed ethanol content was within 15 ±1% by volume, contradicting this result

5.0 Vehicle Maintenance and Operational Issues

Engine oil and filter changes were performed at 5,000 mile intervals throughout the mileage accumulation period. The same brand and viscosity of oil were used for each make and model for the duration of the testing. Emissions tests were always performed with aged engine oil. Manufacturer scheduled maintenance pertaining to the engine and powertrain was performed.

Cylinder compression and leak-down checks were performed following completion of the emissions testing at each aging interval, to determine if there were any significant durability issues arising from the RE15 and RE20 fuel exposure. The technician used standard mechanic-grade equipment to determine compression pressure and leak-down on a percentage basis. Small amounts of leakage were recorded as 0% in the logs. The intention of logging this data was to monitor for changes in compression pressure or leak-down over time, which could be an indicator of a piston ring, valve guide, and valve seat problems. The results from these checks are provided in Appendix 10.2. There was no compelling evidence of a compression problem with any of the vehicles over the course of the study.

The 2009 Honda Odyssey aged on RE0 fuel (#128414) had a MIL and DTC set during mileage accumulation starting at about 80,000 miles. The P0420 fault code (Catalyst System Efficiency Below Threshold - Bank 1) was reset and illuminated twice more leading up to 90,000 mile emissions test interval. The fault code re-appeared during the prep cycle for the first emissions test. A decision was made to not clear the MIL/DTC for emissions testing due to possible impact on adaptive controls. Following completion of the 90,000 mile emissions tests, further investigation revealed the Bank 1/Sensor 2 oxygen sensor had excessive signal noise. The sensor was replaced and the DTC did not reappear. The vehicle was driven on LA4 cycles until in a state of I/M readiness. Then the 90,000 mile emissions tests were repeated with the new sensor installed. Exhaust mass emissions were comparable before and after sensor replacement at 90,000 miles (Section 6.1).

The 2009 Ford Focus aged on RE15 (#128417) experienced a transmission failure at 70,300 miles. Failure was related to excessive wear of the band for a planetary gear set. The transmission was replaced and mileage accumulation resumed. The 2009 Ford Focus aged on RE20 (#128422) experienced a similar transmission failure at 90,285 miles. The transmission was replaced and mileage accumulation was resumed. In both cases, the transmission could have been repaired rather than replacing the complete transmission. However, in the interest of time and in consideration of the cost differential, a decision was made to replace the complete transmission.

Six 2000 Honda Accords were provided, in anticipation that these older vehicles may experience operational problems during the aging process. Several problems were encountered with the Accords:

- The original vehicle selected for aging on RE0 fuel (#101000) set a MIL (DTC P0420) after about 25,000 miles of aging (~130,000 miles on odometer). The emission test performed just prior to failure showed elevated levels of CO and NOx. Following the WOT and emissions tests, the vehicle was returned to mileage accumulation. After 1,000 additional miles, high catalyst outlet temperature (> 1550°F) triggered test shutdown. The catalyst monolith was found to be fractured and the front face partially melted. The vehicle was removed from study and a spare RE0 Honda Accord was used as replacement.

- A second RE0 Accord (#101001) experienced a transmission failure within the first 1,000 miles of aging. The transmission was replaced and mileage accumulation was resumed. Following the 25,000 mile WOT and emissions tests (~116,000 miles on odometer), the vehicle was returned to mileage

accumulation. After about 3,200 additional miles of aging, a MIL was set (P0420) and the vehicle was manually shutdown for inspection. The catalyst monolith was found to be fractured and front face partially melted, with catalyst failure mode nearly identical to first RE0 vehicle failure. Data logged up to the time of failure showed the thermocouples upstream and downstream of the catalyst did not exceed 1,500°F during the WOTs that preceded the failure, and did not exceed 1,400°F on the MADs prior to failure. The vehicle was removed from the study. A third Honda Accord (#101021) was used as a replacement and completed 50,000 miles of aging without further incident.

- The car selected for aging on RE15 fuel (#101015) experienced two MIL illuminations at 40,000 accumulated miles (135,000 miles on odometer): a P0420 (catalyst efficiency) and a P1381 (cylinder position sensor interruption). There was no evidence of a catalyst temperature excursion when this fault occurred and the vehicle was shut down for inspection. The ignition coil, position sensor, and ignition module were replaced, and mileage accumulation was resumed. No further issues were observed.

- The original vehicle (#101020) selected for aging on RE20 fuel experienced an engine coolant boil-over within the first 1,000 miles of mileage accumulation. The MAD temperature alarm was triggered and interrupted testing immediately but a boil-over still occurred. Inspection showed excessive engine oil contaminated the coolant, appearing as a sludgy substance. A head gasket failure was suspected but not verified. A spare vehicle was used as a replacement.

Five model year 2000 Ford Focus cars were provided, in anticipation that these older vehicles may experience operational problems during the aging process. The original Focus selected for aging on RE0 fuel (#102000) experienced a misfire on cylinders 2 and 3 (MIL set, and DTC P0302 and P0303) at about 8,000 accumulated miles (~95,000 miles on odometer). The fault was due to a failed plug wire which caused subsequent failure of ignition coil. The engine misfires resulted in high temperature catalyst exposure and deactivation of the catalyst coating. Catalyst deactivation was confirmed by emissions tests. The vehicle was removed from the program. A spare vehicle (#102001) was used as replacement.

6.0 Exhaust Emissions Results

The exhaust mass emissions data presented in this section were determined from the ambient and diluted exhaust bag measurements, and represent phase-weighted (“composite”) results over the FTP75 emissions test. Tabular data is presented in Appendix 10.1. For each vehicle, one set of results shows the minimum and maximum measurements made for the triplicate tests. Another set of results shows the 95% confidence intervals for the data, noting that three or more tests were performed for each event in the test matrix.

Statistical analysis of this dataset was performed by others [Ref 3] and therefore not included in this report.

Catalyst conversion efficiency information is provided as a means for determining if emissions changes were caused by a change in catalyst performance, and quantifies the catalyst performance change over the three phases of the FTP75 test. Catalyst conversion efficiency data is accompanied by normalized engine-out emissions, for vehicles tested on Cert_E0 fuel. For each graph, there are three data points representing each mileage interval. The data points are in chronological order from left to right.

6.1 2009 Honda Odyssey

All three Honda Odysseys had comparable baseline exhaust emissions and fuel economy at the start of the study (Figure 7). The emissions deterioration rate was considerably different for the vehicles and was affected by the ethanol content of the aging fuel. The vehicle aged with RE0 fuel had higher mean NMHC, CO and NOx emissions at 120,000 miles compared to its baseline emissions. The Odyssey aged using RE0 fuel also had higher NMHC, CO and NOx emissions at 120,000 miles compared to the vehicles aged on RE15 and RE20 with 95% confidence (Figure 8).

The higher emissions deterioration rate for the Odyssey RE0 does not appear to be related to the Bank 1/Sensor 2 oxygen sensor replacement that was made at approximately 90,000 miles (described in Section 5). After sensor replacement and conditioning to ensure I/M test readiness, the emissions were found to be comparable to the tests performed before the sensor change (Figure 6). Moreover, the emissions deterioration rate was higher for Odyssey RE0 even at 60,000 miles, well before the sensor fault had first occurred.

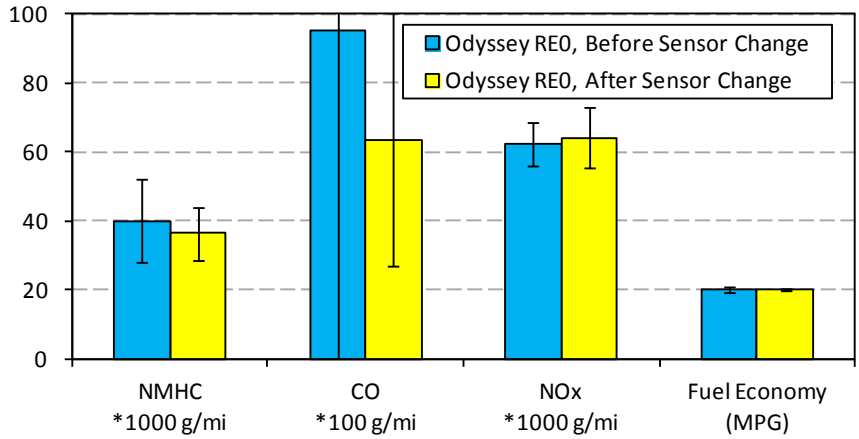

Figure 6. 2009 Honda Odyssey RE0 Emissions Before and After Sensor Change – Cert_E0 Fuel Bars Represent 95% Confidence Intervals

Both RE15 and RE20 fueled vehicles trended towards higher NOx emissions as the vehicles aged.

Exhaust emissions were nearly identical for the Odyssey RE15 tested using Cert_E15 and Cert_E0 fuels. Likewise, there was no statistical difference in exhaust emissions for Odyssey RE20 tested using Cert_E20 and Cert_E0 fuels (Figure 8). The lower fuel economy was expected for the vehicles tested on Cert_E15 and Cert_E20 fuels, and was in proportion to the lower energy density of these oxygenated fuels.

The Odysseys produced very repeatable results and were insensitive to different drivers relative to other vehicles in the study. The minimum and maximum measurements (Figure 7) had a small spread for most tests performed.

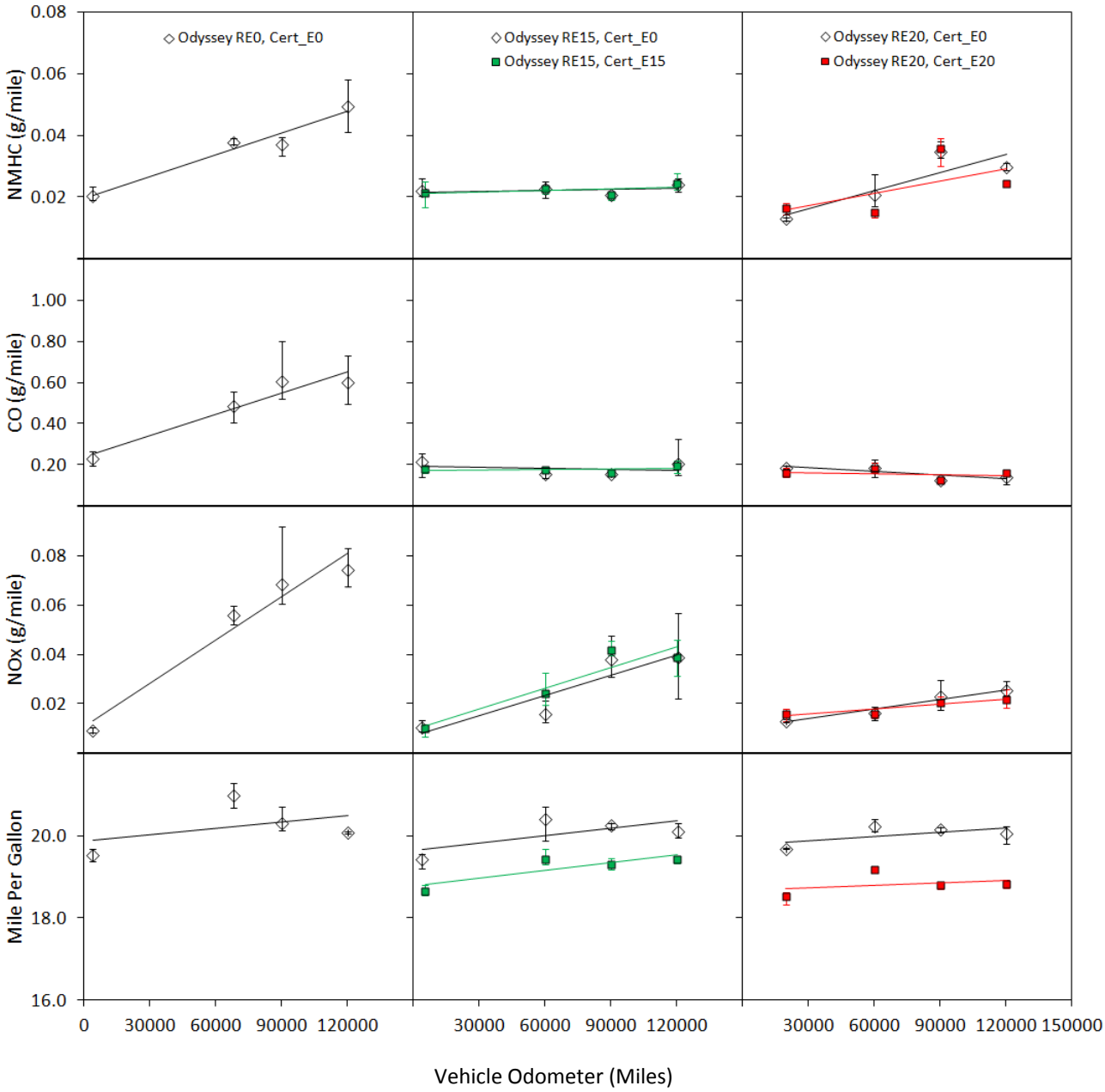

Figure 7. 2009 Honda Odyssey – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

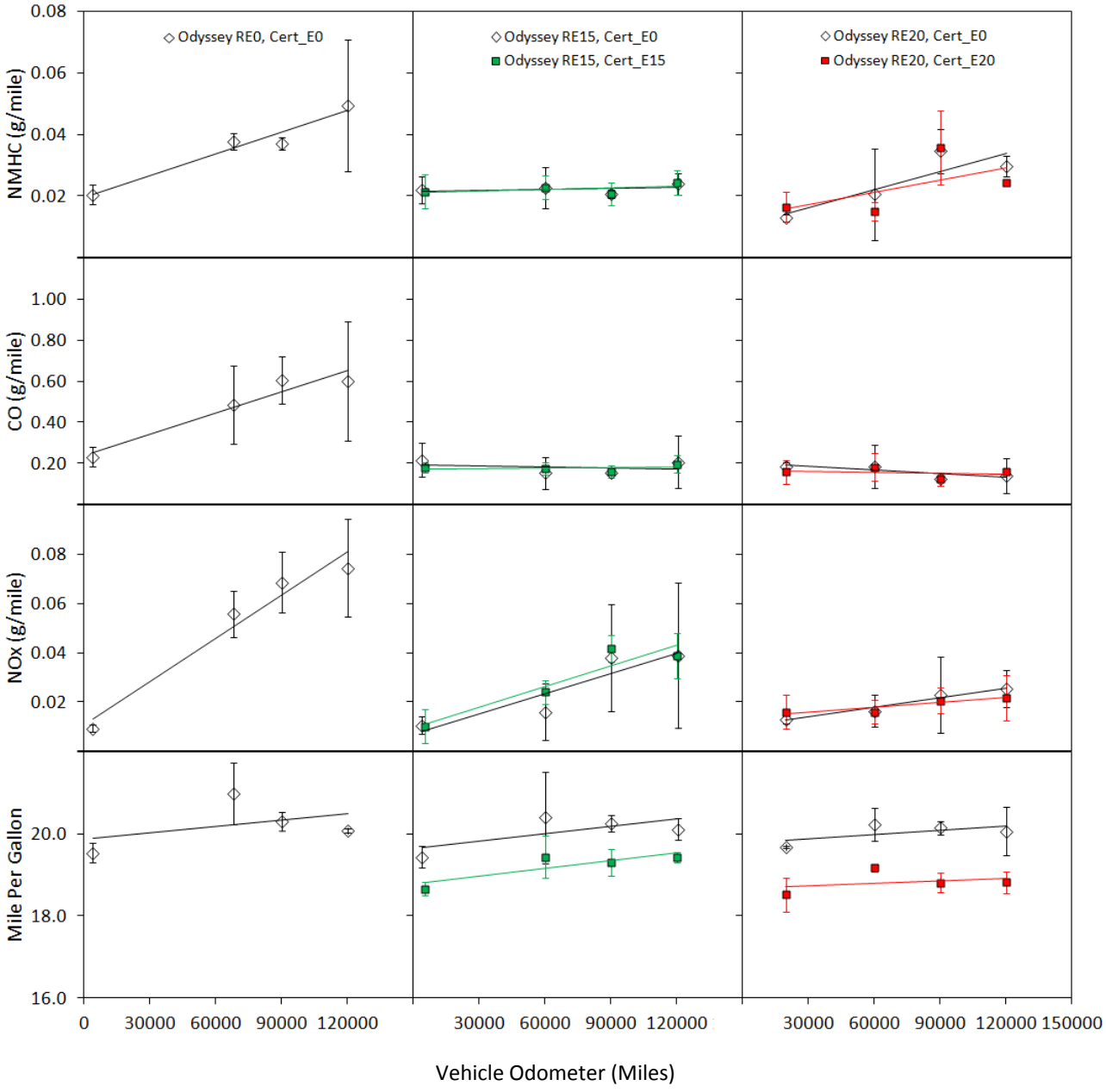

Figure 8. 2009 Honda Odyssey – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

Catalyst conversion efficiency data provided some information about the cause of higher emissions deterioration rates for Odyssey RE0 (Figure 9). Clearly, for the Phase 1 "505" cold start, the HC, CO and NOx catalyst conversion efficiency is poorer for Odyssey RE0 as it aged compared to the other vehicles. The engine-out CO remained relatively constant throughout the aging period. Engine-out NOx increased for Odyssey RE0 and RE15 from 60,000 to 120,000 miles, and therefore the engine-out emissions were also a factor in the higher NOx deterioration rates for those vehicles. Phase 1 engine-out NOx emissions increased by about 21% for Odyssey RE0 over the aging period.

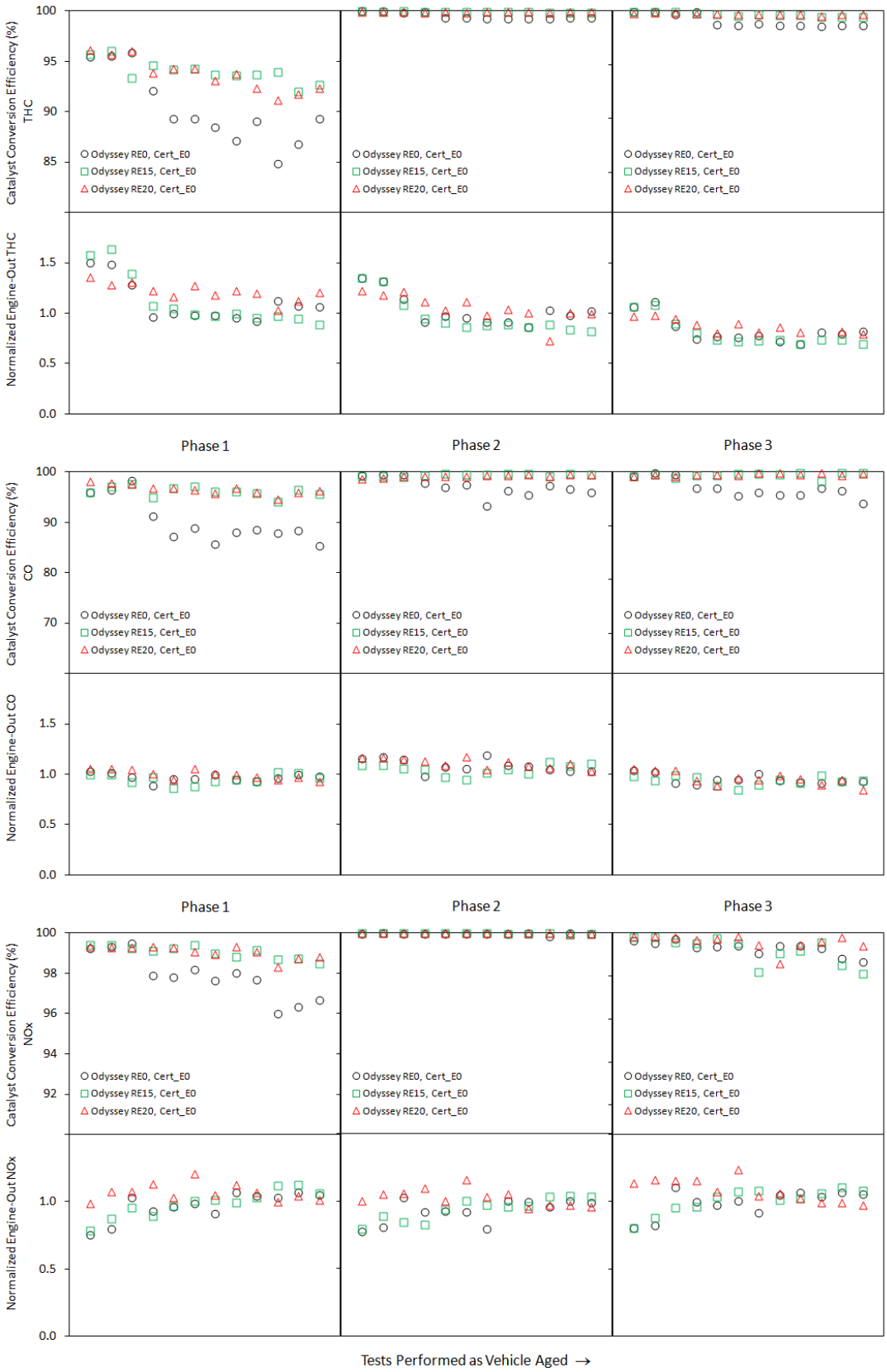

Figure 9. 2009 Honda Odyssey Catalyst Conversion Efficiency over FTP75 Cycle

6.2 2009 Ford Focus

All three 2009 Ford Focus cars had comparable baseline exhaust emissions and fuel economy at the start of the study (Figure 10). All three vehicles tested had NOx emissions deterioration at 120,000 miles using Cert_E0 fuel, and the increase was shown to be statistically greater than the baseline starting emissions (Figure 11).

The 2009 Focus aged on RE0 fuel had NOx deterioration rates which on average trended considerably higher than the cars aged on RE15 and RE20 fuels. The NOx for Focus RE0 was statistically higher than Focus RE15 at 90,000 miles and statistically higher than Focus RE20 at 120,000 miles.

CO emissions were statistically higher for Focus RE0 compared to Focus RE15 and RE20 at 120,000 miles. NMHC emissions were not statistically different for the three vehicles over the aging period. NMHC (estimated NMOG) and CO emissions were well within Full Useful Life standards over the aging period.

Blending 15% to 20% ethanol into certification gasoline produced lower NMHC and CO emissions on average, relative to the same vehicles tested on ethanol-free certification gasoline. Fuel economy was 3.9% lower and 6.5% lower on average for vehicles tested using Cert_E15 and Cert_E20 fuels respectively, consistent with the lower energy density of the oxygenated fuel.

Raw modal emissions data showed CO and NOx conversion efficiency was lower for the Focus RE0 compared to the vehicles aged on RE15 and RE20 fuels at 120,000 miles (Figure 12). Phase 1 engine-out NOx emissions increased by about 18% for Focus RE0 over the aging period. The data suggests that both the engine-out NOx emissions and reduced catalyst conversion efficiency were contributors to the higher NOx emissions measured for Focus RE0.

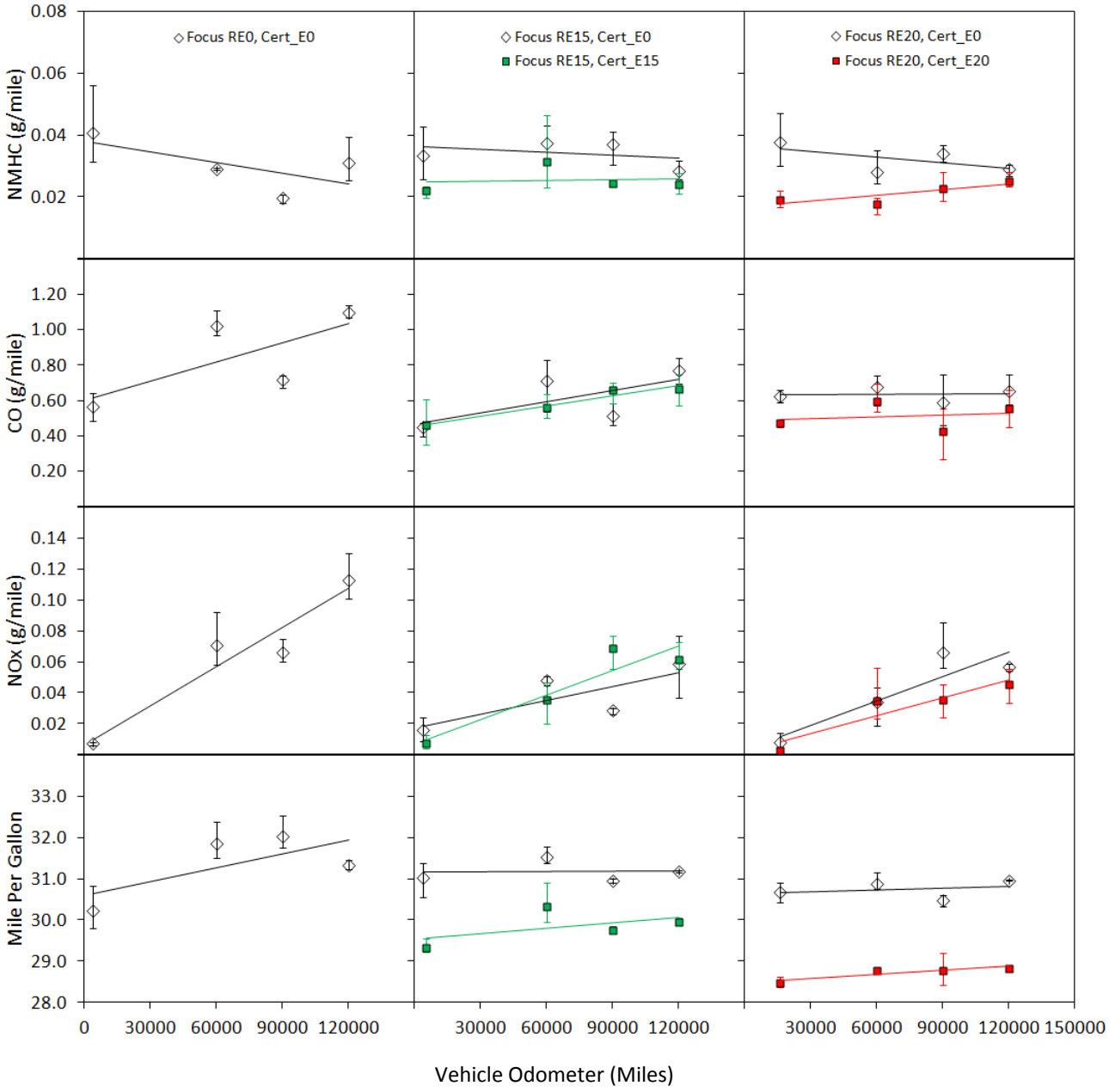

Figure 10. 2009 Ford Focus – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

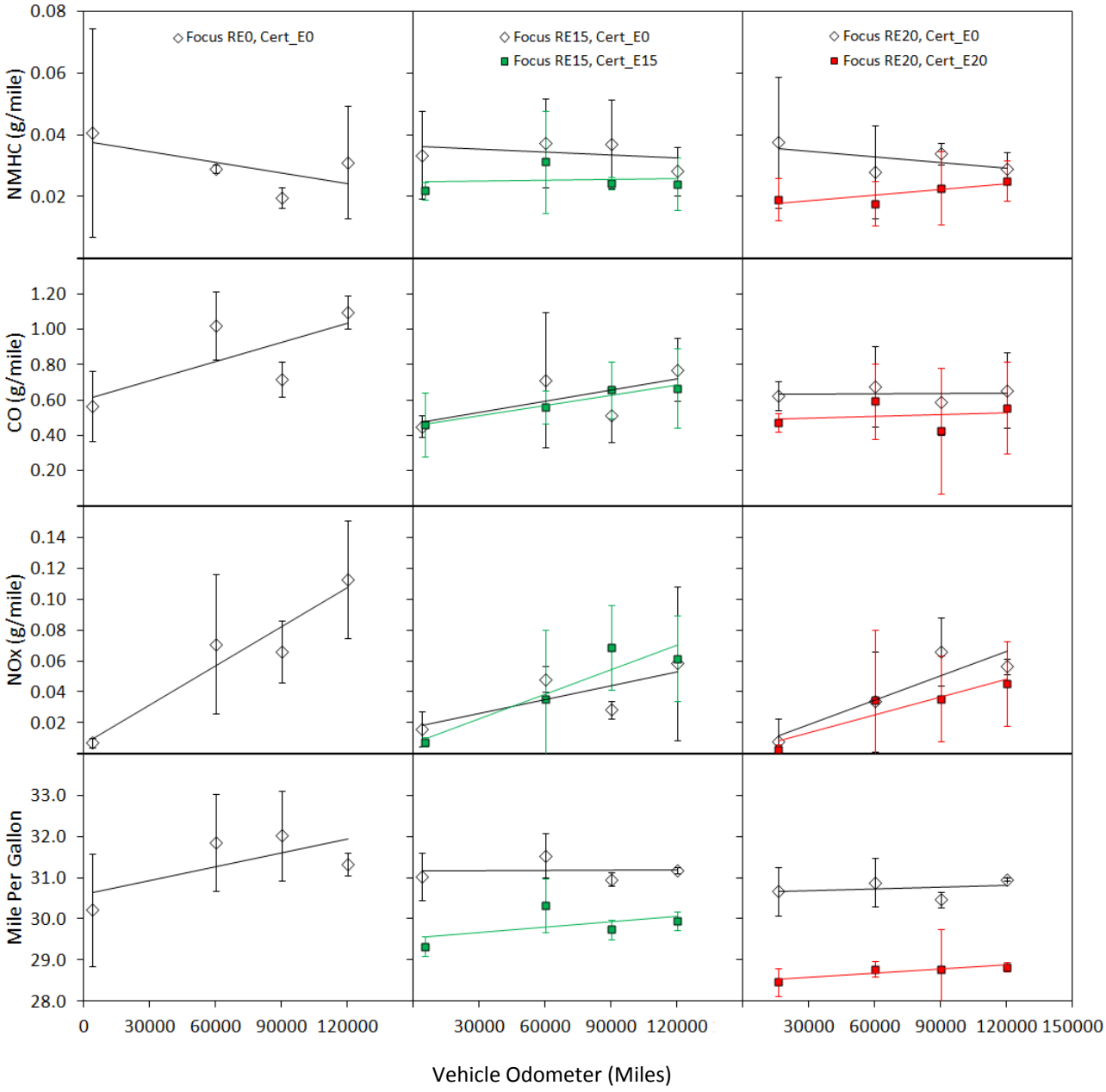

Figure 11. 2009 Ford Focus – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

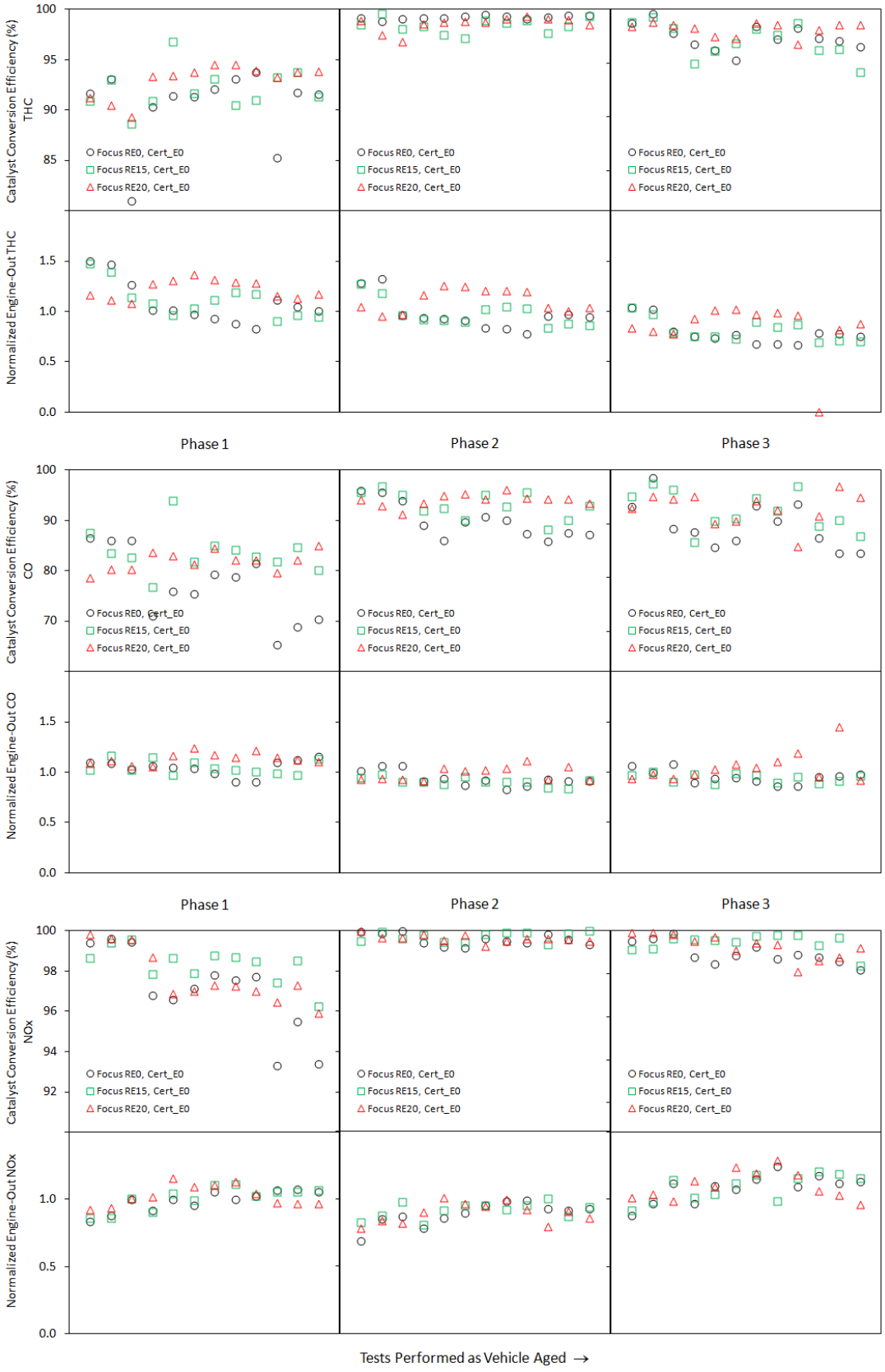

Figure 12. 2009 Ford Focus Catalyst Conversion Efficiency over FTP75 Cycle

6.3 2009 Toyota Camry

All three Toyota Camrys had comparable baseline exhaust emissions and fuel economy at the start of the study (Figure 13). All three vehicles showed a general upward trend in NMHC, CO and NOx emissions over the aging period. The exhaust emissions at 120,000 miles were mostly higher, with statistical significance, for Camry RE0 and Camry RE20 compared to their baseline emissions (Figure 14).

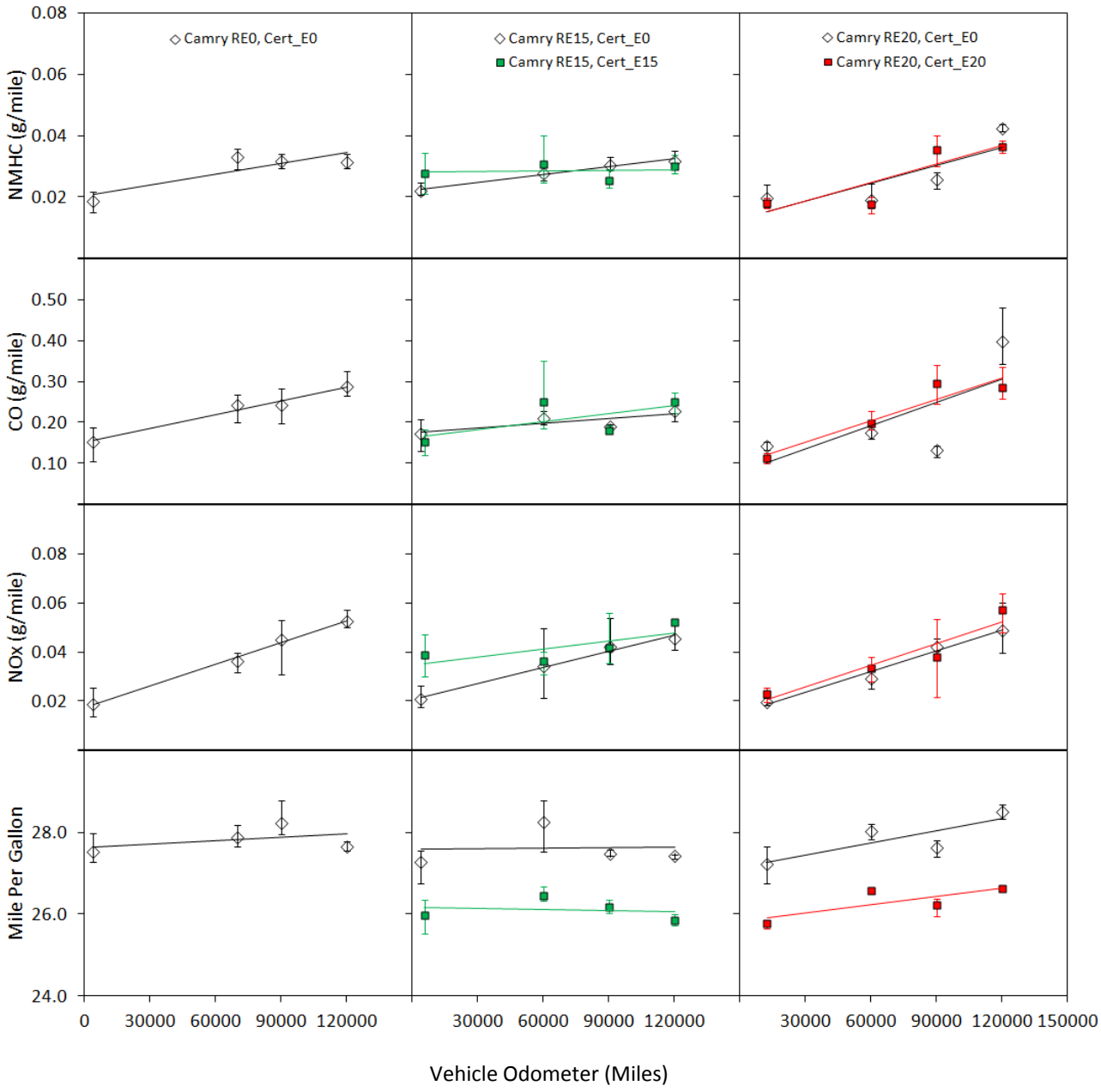

Figure 13. 2009 Toyota Camry – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

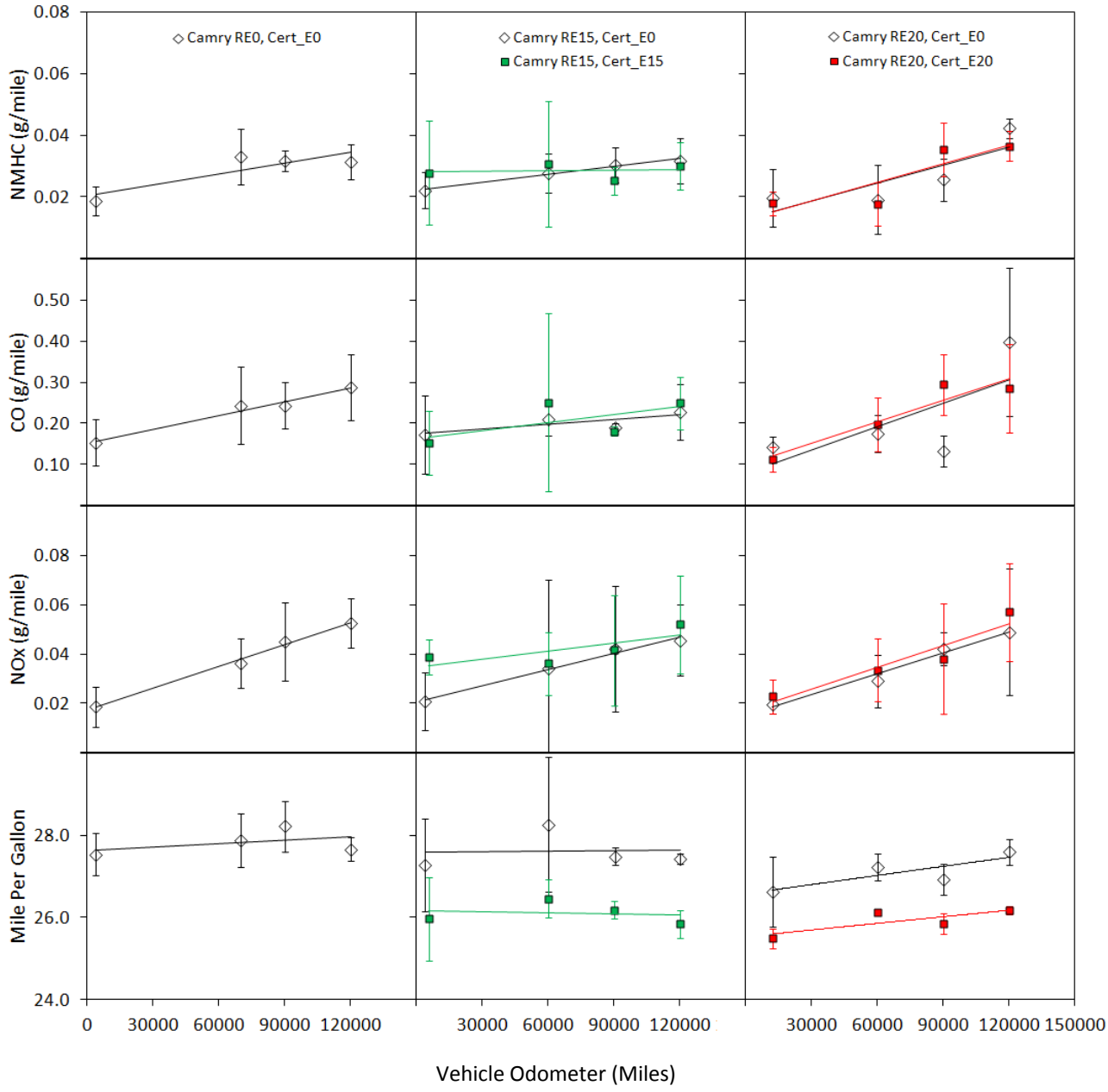

Figure 14. 2009 Toyota Camry – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

After 120,000 miles of aging, the NMHC, CO and NOx emissions for Camry RE0 were statistically indistinguishable compared to the vehicles aged on RE15 and RE20 fuels. Exhaust emissions were nearly identical for the Camry RE15 tested using Cert_E15 and Cert_E0 fuels. Likewise, there was no statistical difference in exhaust emissions for Camry RE20 tested using Cert_E20 and Cert_E0 fuels (Figure 14).

The Camrys had very high NOx conversion efficiencies across the catalyst, at or above 97% even for the Phase 1 cold start (Figure 15, disregarding the outliers).

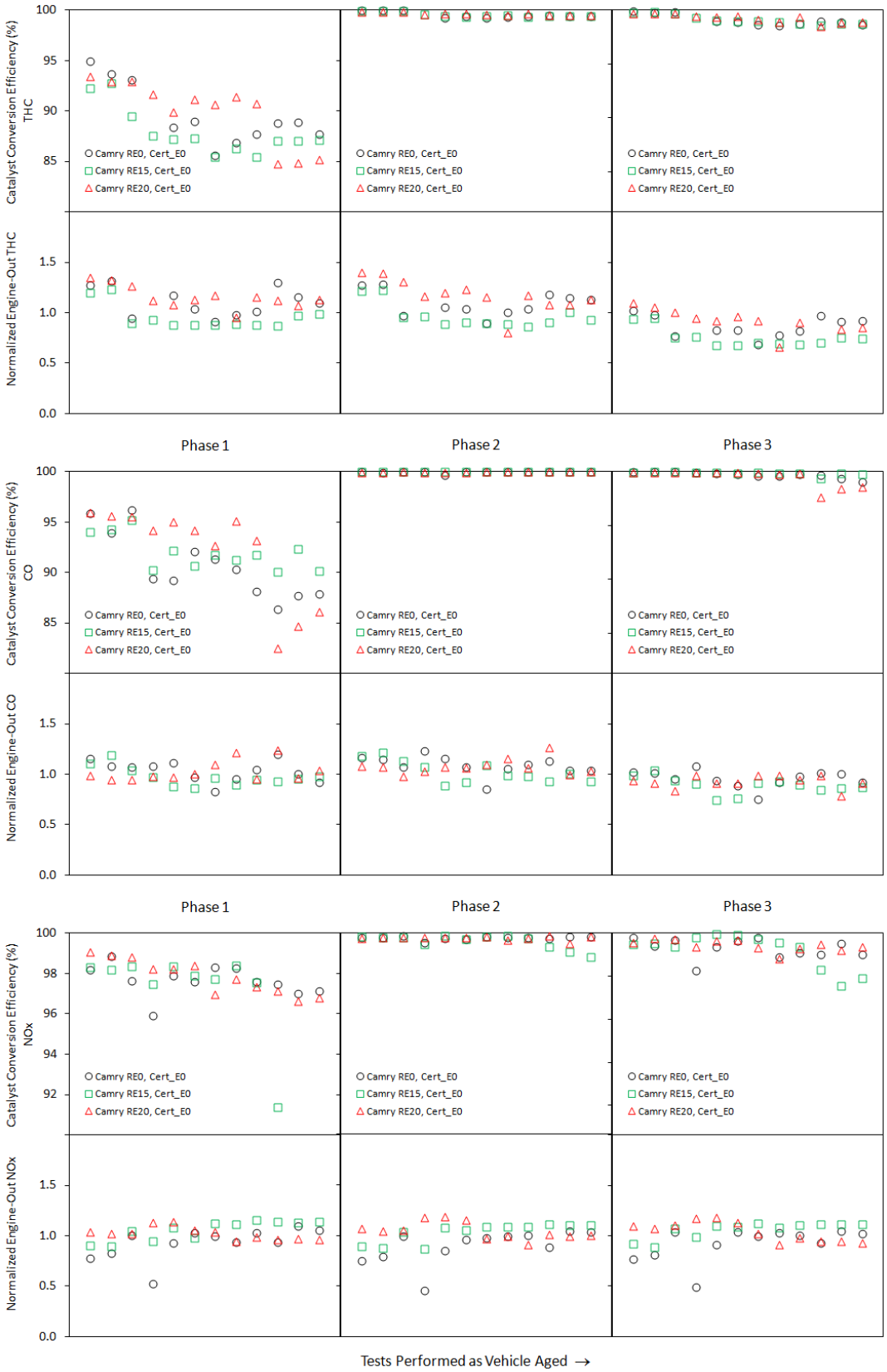

Figure 15. 2009 Toyota Camry Catalyst Conversion Efficiency over FTP75 Cycle

6.4 2009 Saturn Outlook

All three Outlooks had comparable baseline exhaust emissions and fuel economy at the start of the study (Figure 16). Only Outlook RE0 had higher NMHC, CO and NOx emissions at 120,000 miles, compared to the baseline emissions measured at the start of the program. NMHC, CO and NOx emissions were higher for Outlook RE0 compared to the vehicles aged on RE15 and RE20 fuels after 120,000 miles of aging, with statistical confidence (Figure 17, and [Ref 3]).

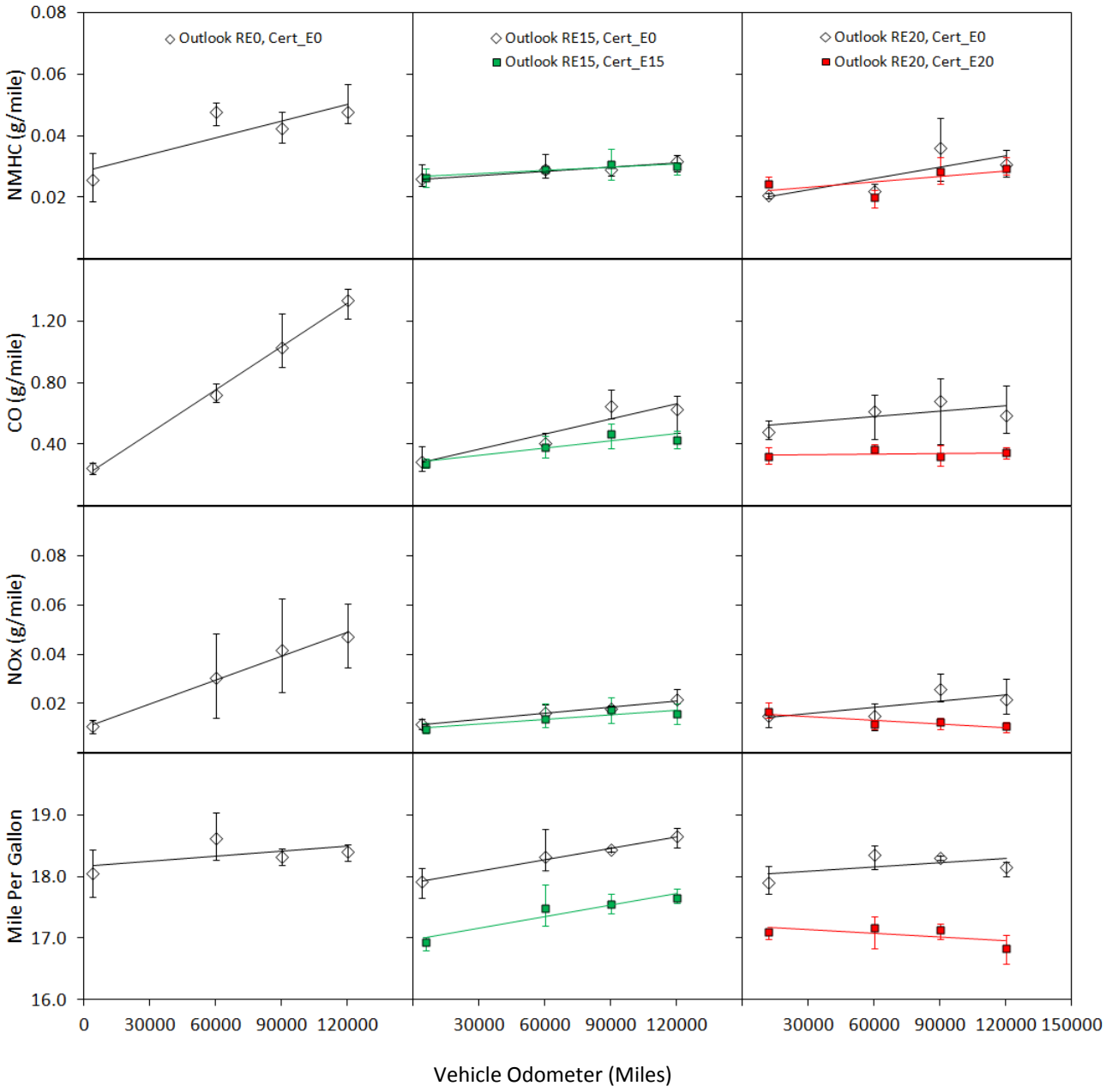

Figure 16. 2009 Saturn Outlook – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

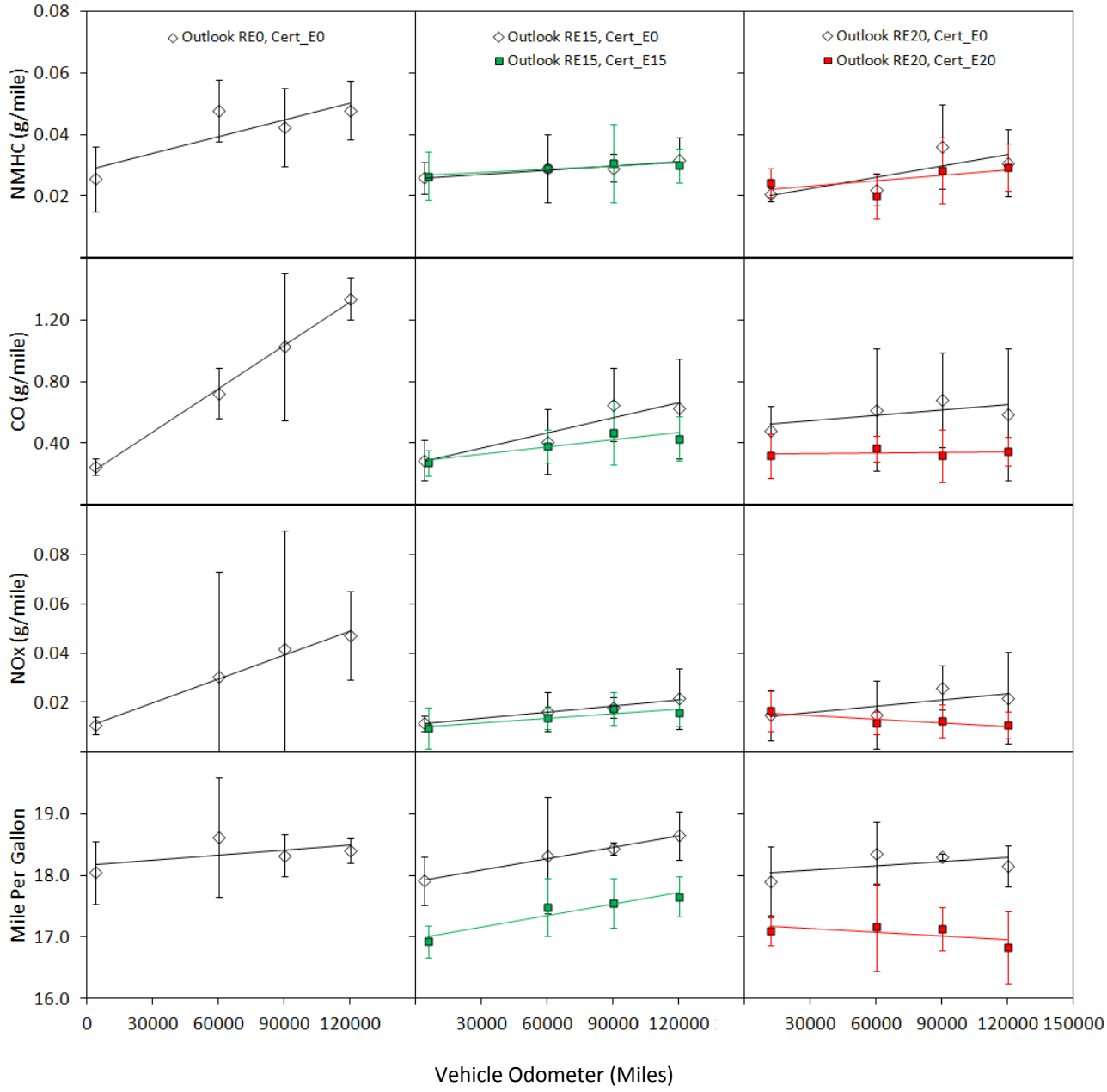

Figure 17. 2009 Saturn Outlook – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

The mean NMHC, CO and NOx levels trended lower over time for the Outlook RE20 tested using Cert_E20 fuel, relative to the same vehicle tested on Cert_E0 fuel (Figure 17). Outlook RE15 also had lower CO emissions on Cert_E15 fuel relative to Cert_E0 fuel over time. Fuel economy was 4.9% lower and 6.6% lower on average for vehicles tested using Cert_E15 and Cert_E20 fuels respectively, consistent with the lower energy density of the oxygenated fuel.

Outlook RE0 had lower catalyst conversion efficiencies at the start of testing and throughout the study (Figure 18), and also trended towards having higher engine-out emissions relative to the other vehicles.

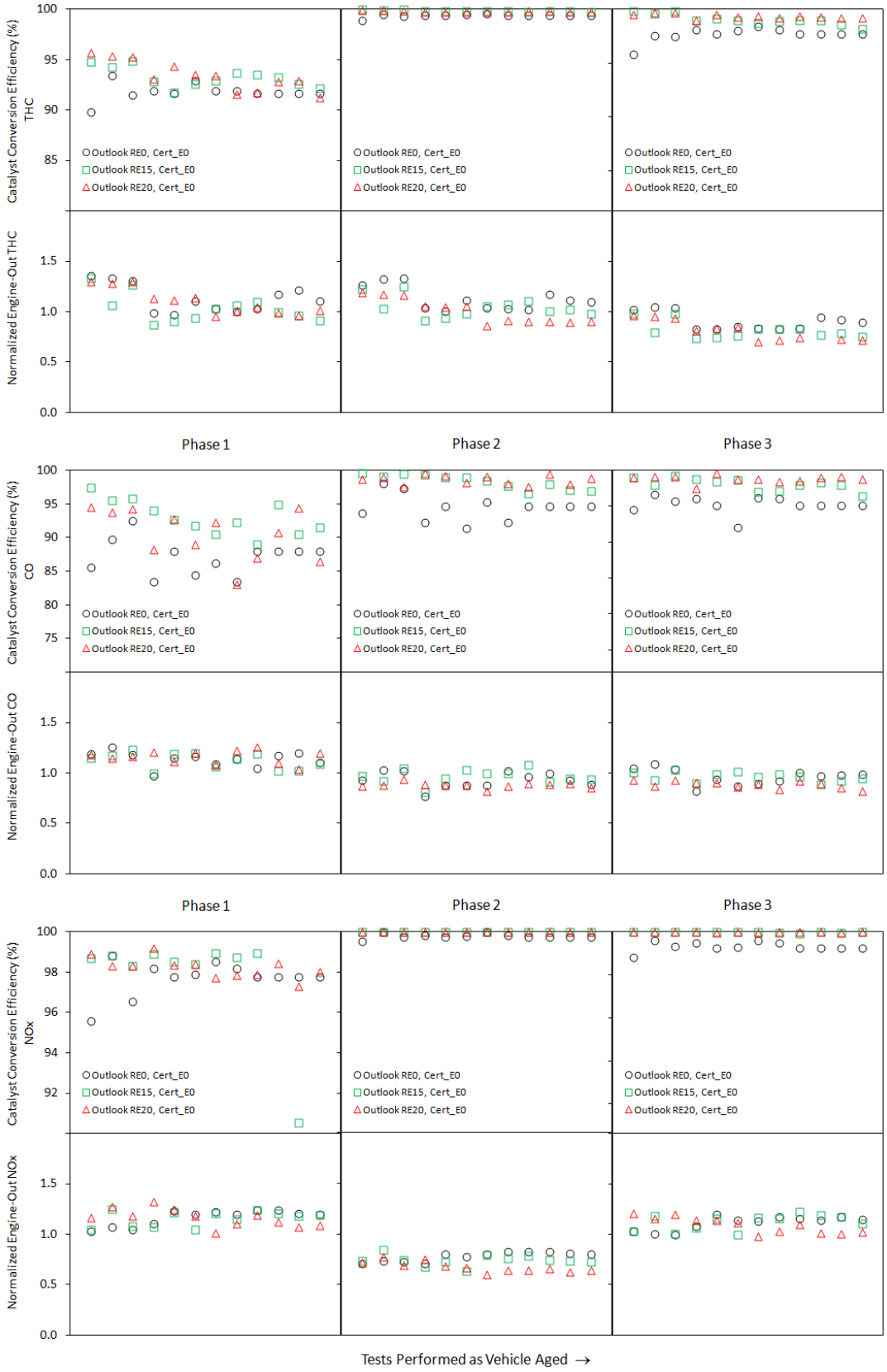

Figure 18. 2009 Saturn Outlook Catalyst Conversion Efficiency over FTP75 Cycle

6.5 2000 Honda Accord

The Accords aged on RE0 and RE15 fuels had comparable baseline exhaust emissions and fuel economy at the start of the study (Figure 19). Accord RE20 had lower NMHC, CO and fuel economy when tested with Cert_E0 fuel at the start of the study. Accord RE0 and RE15 showed general deteriorations in NMHC, CO and NOx emissions over the aging period. The 120,000 mile NMHC and CO exhaust emissions were higher, with statistical significance, for Accord RE0 and RE15 compared to their baseline emissions (Figure 20). In contrast, the emissions for Accord RE20 did not change significantly during the 50,000 mile aging period.

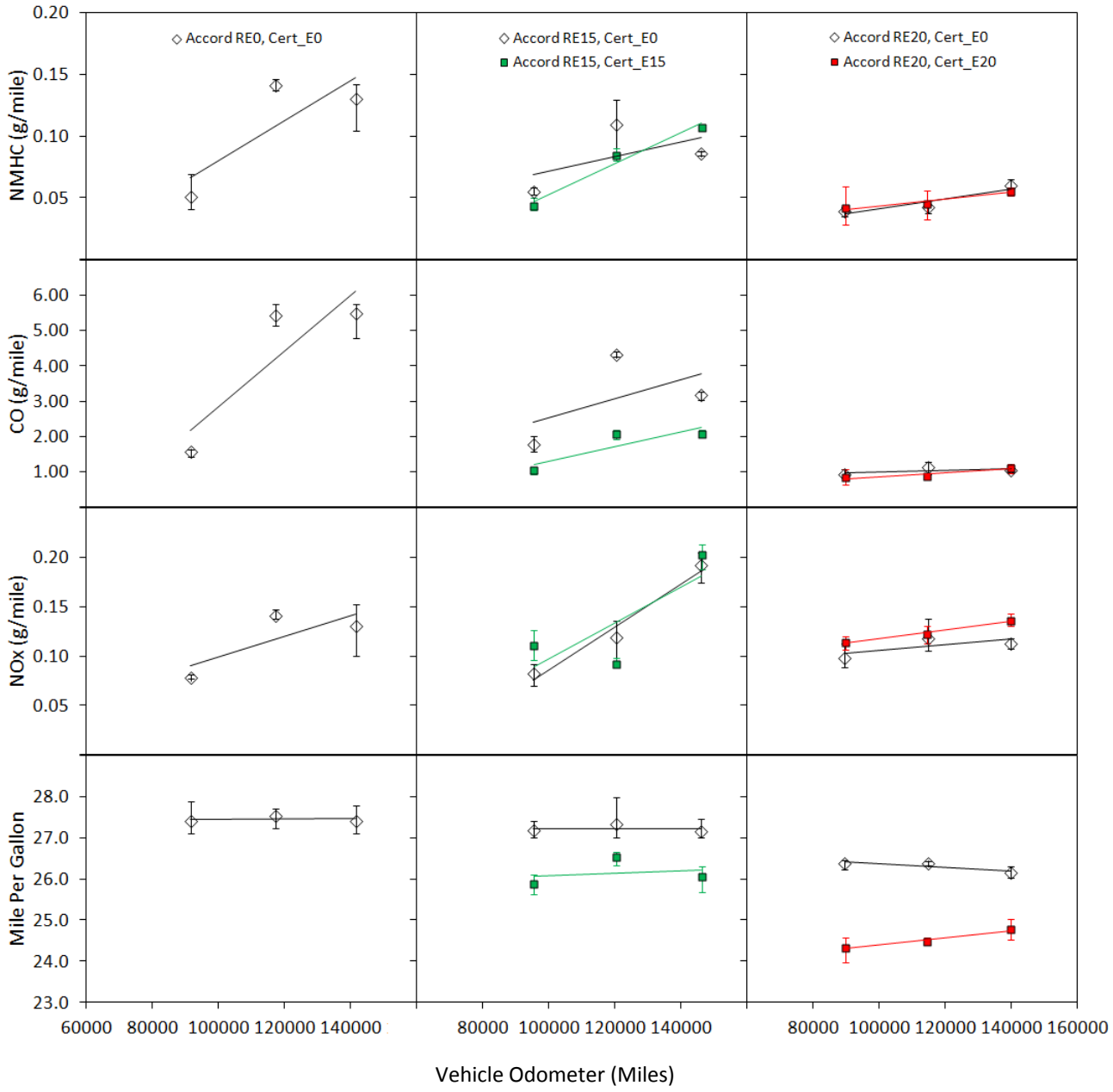

Figure 19. 2000 Honda Accord – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

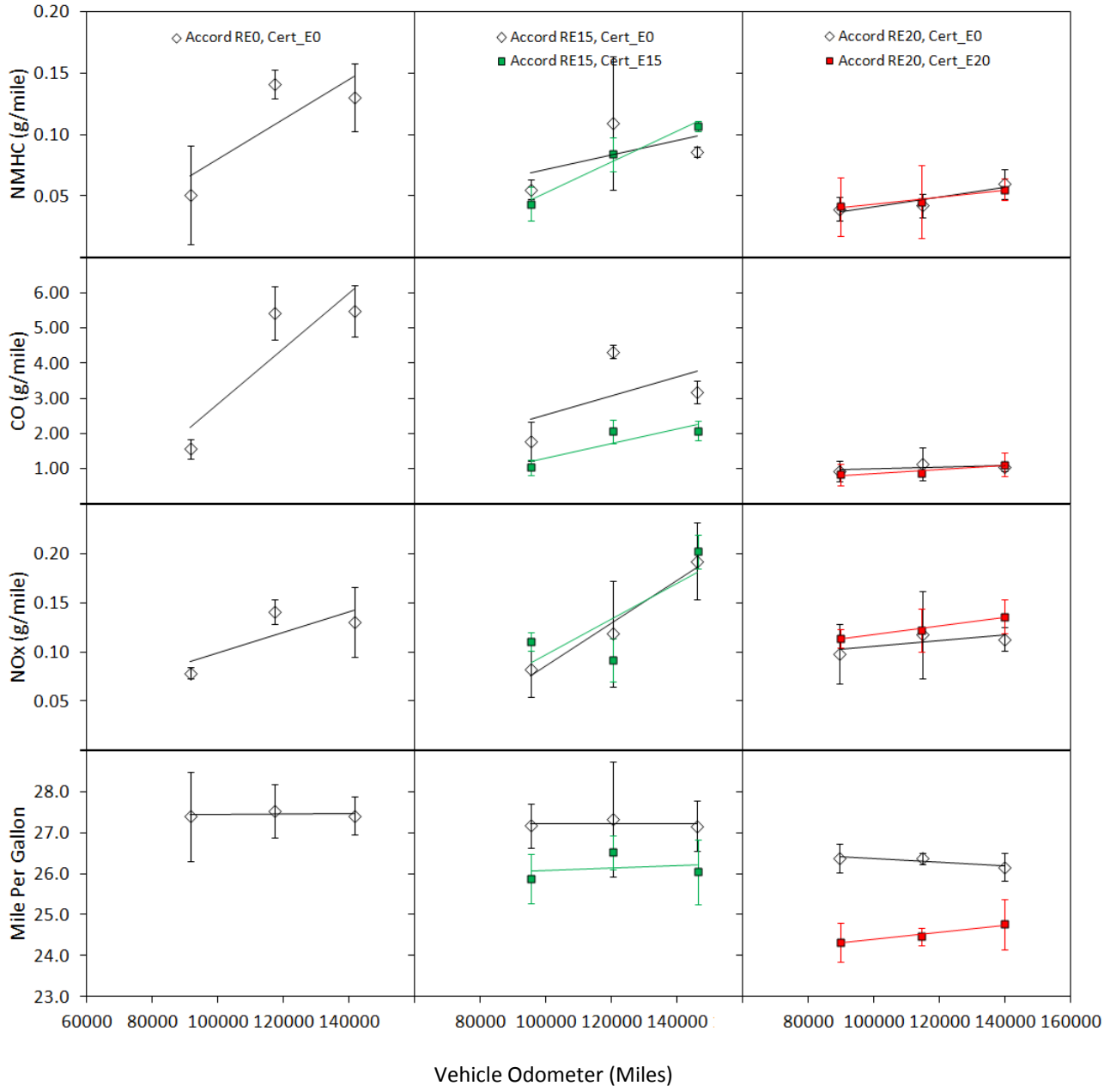

Figure 20. 2000 Honda Accord – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

The effect of the aging fuel on NMHC and NOx emissions was not statistically significant for the Accords as they aged. CO emissions from Accord RE0 were higher compared to Accords RE15 and RE20 at 120,000 miles with statistical confidence. The CO emission trends were not fully explained by the catalyst conversion efficiency data collected (Figure 21).

NMHC and NOx emissions were similar for the Accord RE15 tested using Cert_E15 and Cert_E0 fuels, and CO emissions were lower with Cert_E15 fuel. The exhaust emissions for Accord RE20 tested using Cert_E20 were statistically indistinguishable from emissions using Cert_E0 fuel (Figure 20).

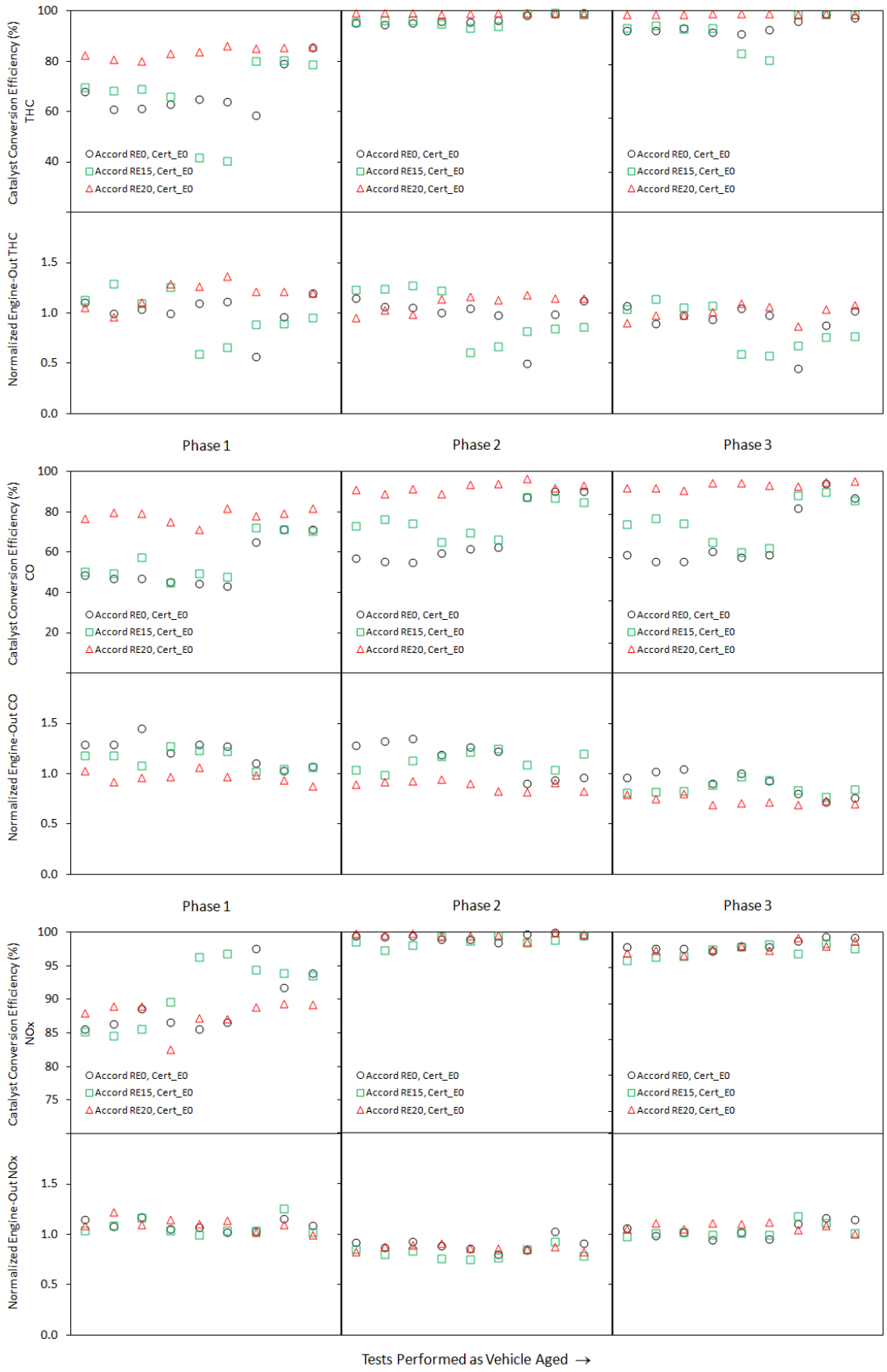

Figure 21. 2000 Honda Accord Catalyst Conversion Efficiency over FTP75 Cycle

6.6 2000 Ford Focus

The 2000 Ford Focus cars were not as closely matched as other models tested in this study. The Focus aged on RE0 fuel started the program with about 103,000 miles, over 33,000 more miles than Focus RE20 (Table 1). The cars had somewhat comparable CO, NOx and fuel economy at the start of the aging period, but Focus RE0 had much higher NMHC emissions (Figure 22).

These cars had much greater variation during testing than any other models in the study. Note in particular the large shifts in NMHC emissions that occurred at the 25,000 mile interval (midpoint) for Focus RE0 and RE15. Focus RE15 trended differently than the other vehicles.

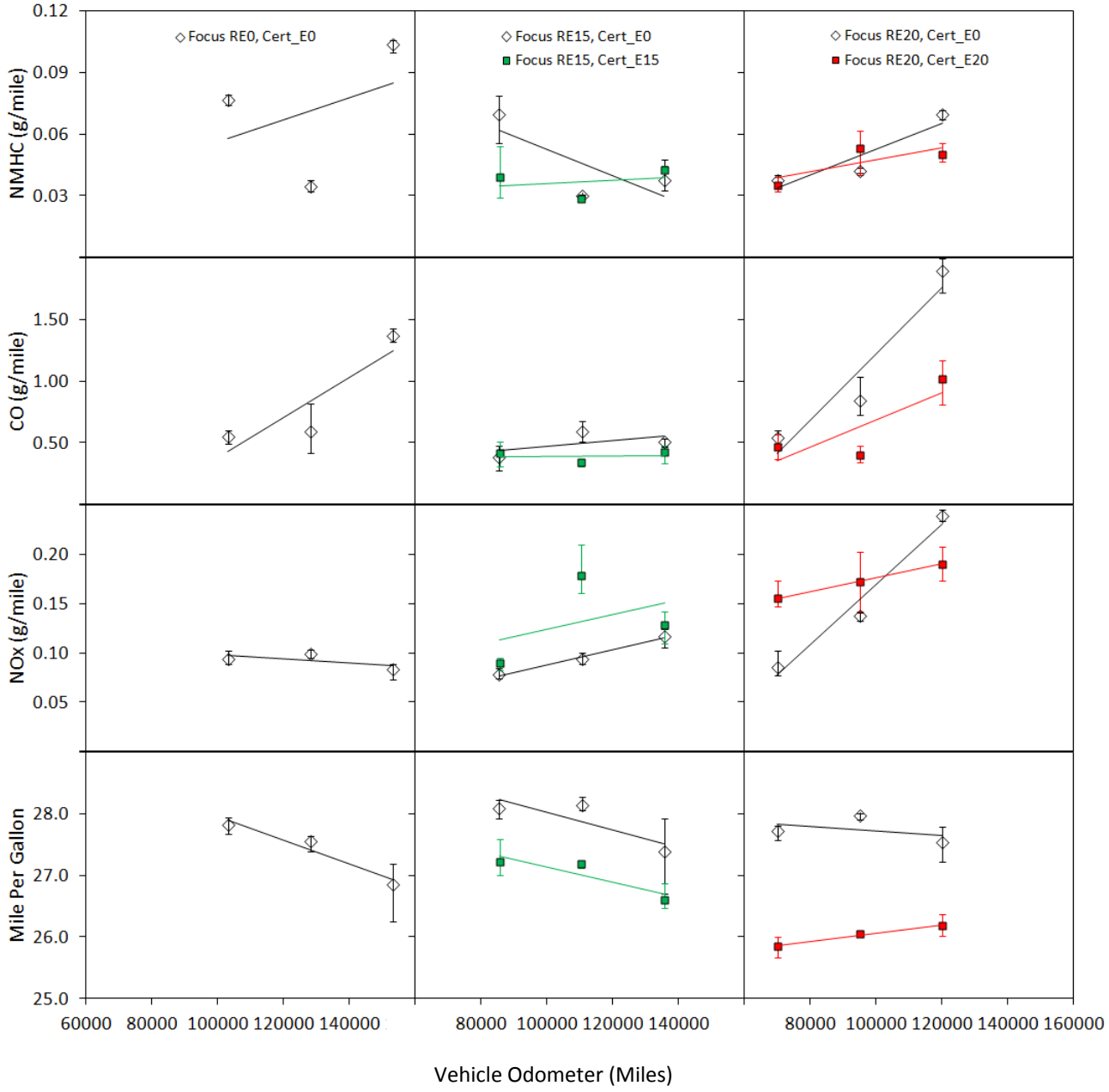

Figure 22. 2000 Ford Focus – Weighted FTP75 Exhaust Emissions Results
Bars Represent Minimum and Maximum Data

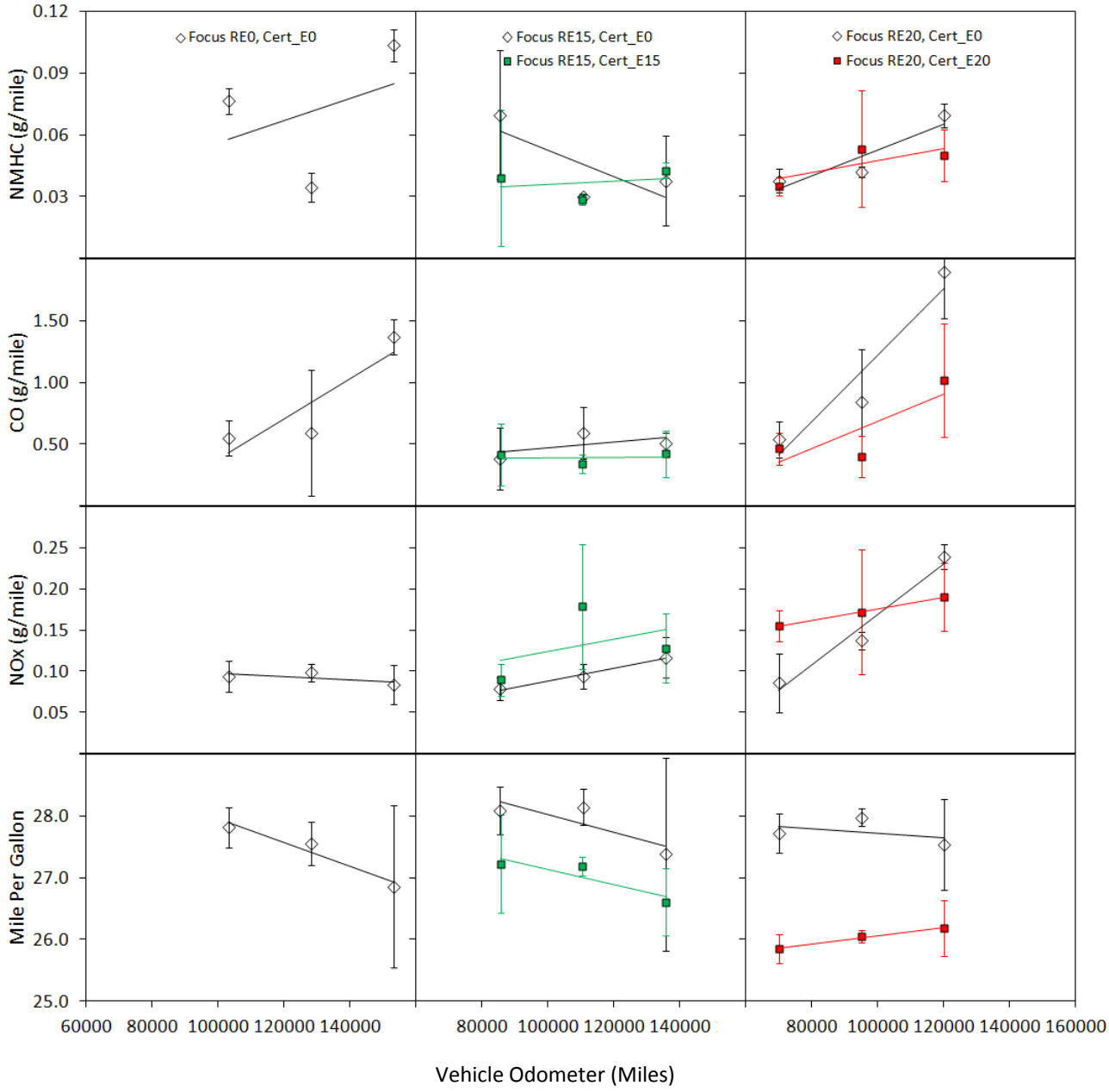

Figure 23. 2000 Ford Focus – Weighted FTP75 Exhaust Emissions Results
Bars Represent 95% Confidence Intervals

There was no statistical evidence that the ethanol-containing aging fuels impacted the emissions from these vehicles (Figure 23).

Similarly, there is no statistical evidence that the vehicle emissions were significantly different when tested using Cert_E0, Cert_E15 and Cert_E20 fuels, owing to the very different trends that were observed at different mileage intervals. Fuel economy was 3.0% lower and 6.2% lower on average for vehicles tested using Cert_E15 and Cert_E20 fuels respectively, consistent with the lower energy density of the oxygenated fuel.

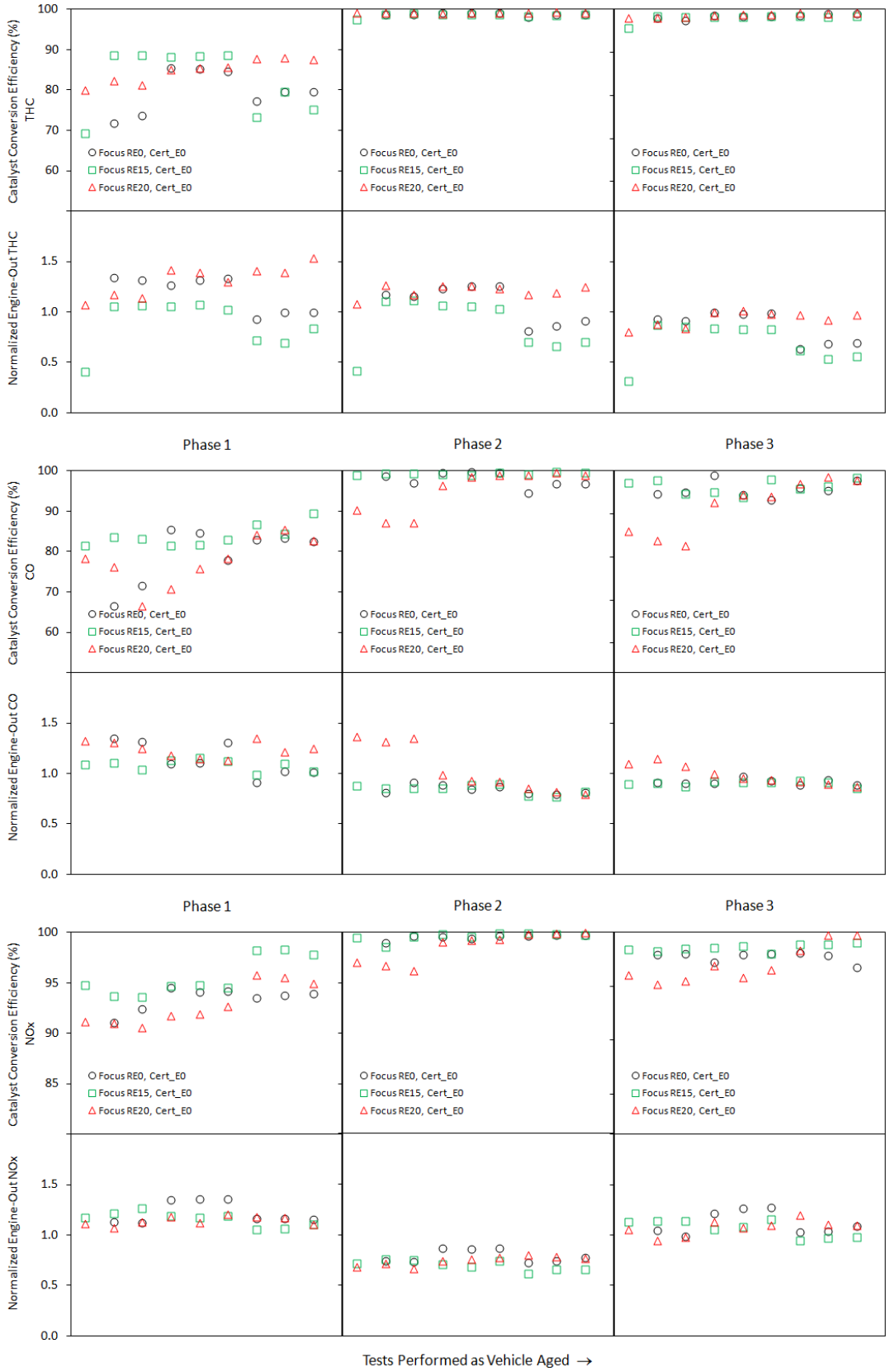

Figure 24. 2000 Ford Focus Catalyst Conversion Efficiency over FTP75 Cycle

6.7 Catalyst Sulfur Purge Effects on Exhaust Emissions

Some data was collected to investigate the effect the WOT catalyst sulfur purge cycle had on the exhaust emissions. Whereas this was not a rigorously designed experiment and was beyond the assigned scope of work, the data demonstrates the sulfur poisoning effect on the catalyst during the aging process, and quantifies the effectiveness of the WOT sulfur purge cycle.

Tests were performed on the 2009 vehicles aged on RE0 fuel, at 60,000 miles. Emissions tests were run in triplicate before and after the sulfur purge. A few individual tests were also performed before the sulfur purge, at 90,000 and 120,000 miles. The aging fuel RE0 averaged about 24ppm during the period these tests were performed, and the Cert_E0 fuel used for emissions tests and WOT tests averaged about 27ppm.

The sulfur purge did not have an effect on lowering the Odyssey emissions (Figure 25). The sulfur purge did have an effect on the 2009 Focus mean CO and NOx emissions. Focus RE0 CO emissions were reduced by 14% on average, and NOx emissions were reduced by 31% on average following the WOT sulfur purge cycle.

The sulfur purge lowered the THC and NOx emissions from the Camry at 120,000 miles (Figure 26). The sulfur purge also effected the mean exhaust emissions from the Outlook. CO emissions from Outlook RE0 were reduced by 15% on average, and NOx emissions were reduced by 25% on average following the WOT sulfur purge cycle.

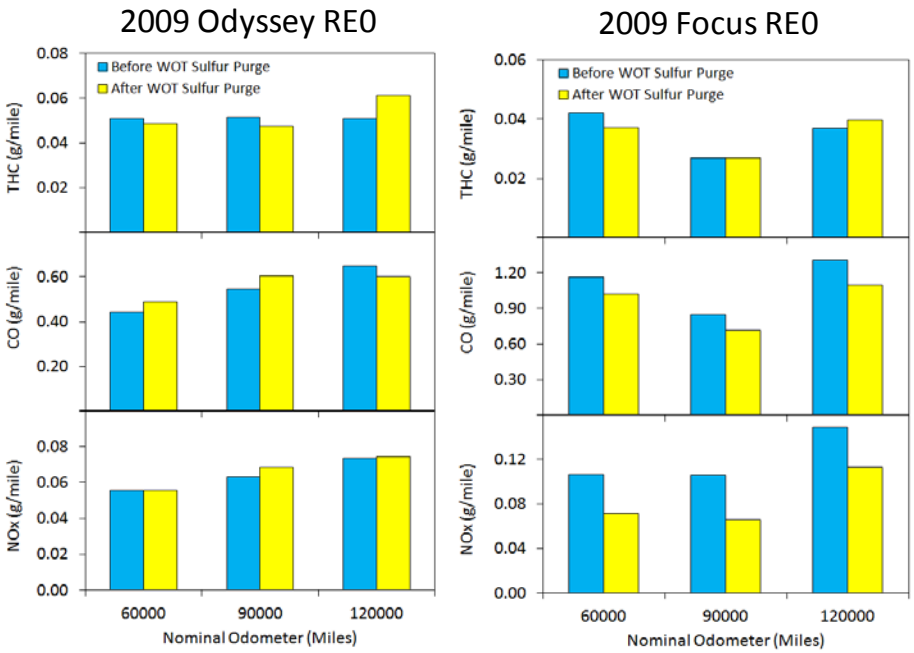

Figure 25. Catalyst Sulfur Purge Effect on Emissions, Odyssey RE0 and Focus RE0

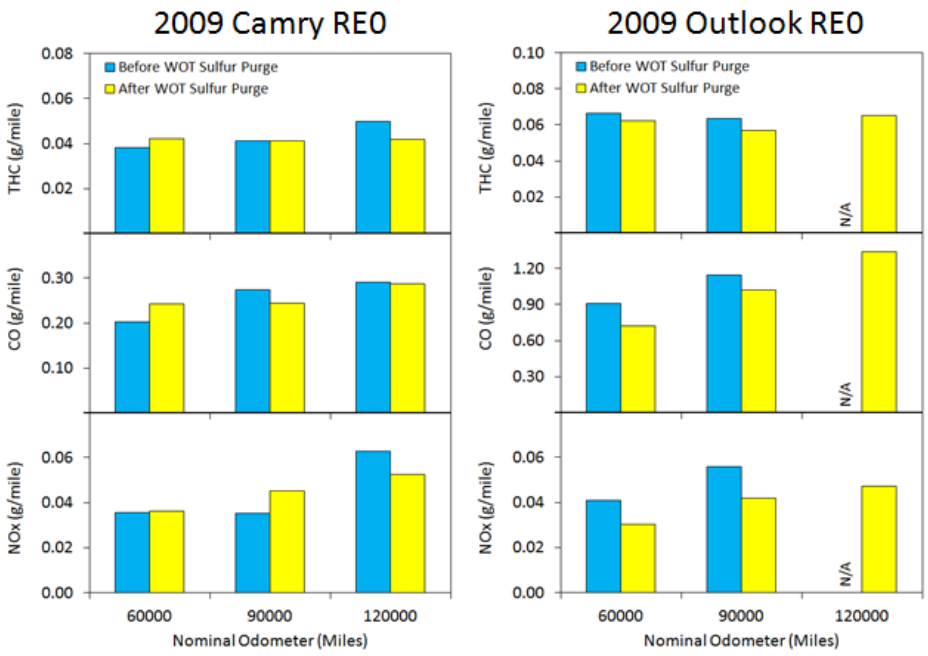

Figure 26. Catalyst Sulfur Purge Effect on Emissions, Camry RE0 and Outlook RE0

7.0 Evaporative Emissions Results – Tier 2 Vehicles

Whereas vehicle evaporative emissions testing was beyond the scope of work in the subcontracts, tests were performed to gain some early comparative information about the evaporative emissions from 2009 vehicle models aged on RE0 and RE15 fuels.

A summary of evaporative emission results are provided in Table 5. Some tests were performed using Cert_E0 fuel and others on Cert_E15 fuel as noted in the table. Note that the RVP of the Cert_E0 and Cert_E15 fuels are different (Table 4), as ethanol is known to increase the RVP of gasoline. The Cert_E15 RVP was about 0.7 psi higher than Cert_E0 on average over the duration of this testing. The fuel RVP difference is a consideration when comparing the SHED results, as vehicles tested with Cert_E15 fuel having higher RVP may have more potential for canister venting during the 2-day diurnal.

The SHED test results are compared with the 2009 EPA Federal Evaporative Emissions Standard in Figure 27. The relevant test metric for comparison is equal to the highest daily hydrocarbon mass plus the 1 hour hot soak hydrocarbon mass, as measured by the FID. This metric is compared to the 2009 EPA standard of 0.65 g/test for light duty vehicles (LDVs), and 0.85 g/test for light duty trucks (LDTs). Supplemental evaporative emissions results for all tests were under the 2009 Tier 2 evaporative emissions standards, for both Cert_E0 and Cert_E15 fuels.

It is acknowledged that these vehicles aged on the MADs experienced far fewer refuel, diurnal, and canister purge events compared to real-world operation, and also had a shorter duration of fuel exposure. Nevertheless, the test approach provides some comparative data that suggests the evaporative emissions were not significantly different for the vehicles aged on RE0 and RE15 fuels. The authors have subsequently performed a more rigorous study comparing the durability of automotive evaporative emissions systems exposed to E0 and E20 fuels (CRC E-91, [Ref 7]).

Table 5. Evaporative Emissions for 2009 Model Year Vehicles Aged on RE0 and RE15 Fuels

Vehicle ID#	Test ID #, 1Hr Hot Soak	Date, 1Hr Hot Soak	Test ID #, 2-Day Diurnal	Date, 2-Day Diurnal	Nominal Mileage Interval	Odometer (miles)	Fuel	1 Hour Hot Soak (g)	Day 1 Diurnal (g)	Day 2 Diurnal (g)	Total Diurnal (g)
2009 Honda Odyssey RE0											
128414	S3_1440	7/27/2009	S3_1443	7/30/2009	4k	4099	Cert_E0	0.099	0.291	0.287	0.578
128414	S1_1331	2/15/2010	S1_1332	2/17/2010	60k	60212	Cert_E0	0.013	0.194	0.162	0.356
128414	S1_1380	3/30/2010	S1_1381	4/1/2010	90k	90138	Cert_E0	0.007	0.221	0.223	0.444
128414	S5_1789	5/14/2010	S5_1790	5/17/2010	120k	120158	Cert_E0	0.041	0.456	0.427	0.883
2009 Honda Odyssey RE15											
128415	S5_1660	7/28/2009	S5_1662	7/31/2009	4k	4128	Cert_E0	0.041	0.355	0.314	0.669
128415	S1_1290	12/15/2009	S1_1292	12/17/2009	4k	5516	Cert_E15	0.022	0.232	0.273	0.505
128415*	S3_1646	8/9/2010	S3_1647	8/12/2010	120k	120255	Cert_E0	0.026	0.311	0.352	0.663
2009 Ford Focus RE0											
128416	S3_1444	7/30/2009	S3_1445	8/1/2009	4k	4209	Cert_E0	0.017	0.214	0.208	0.422
128416	S4_1511	2/24/2010	S4_1512	2/27/2010	60k	60105	Cert_E0	0.043	0.212	0.191	0.403
128416	S3_1582	4/9/2010	S3_1583	4/11/2010	90k	90164	Cert_E0	0.016	0.158	0.177	0.335
128416	S3_1612	5/19/2010	S3_1613	5/21/2010	120k	120156	Cert_E0	0.021	0.202	0.228	0.43
2009 Ford Focus RE15											
128417	S4_1402	7/27/2009	S4_1405	7/30/2009	4k	4111	Cert_E0	0.029	0.428	0.429	0.857
128417	S3_1478	12/14/2009	S3_1479	12/17/2009	4k	5451	Cert_E15	0.035	0.292	0.281	0.573
128417	S1_1375	3/15/2010	S1_1376	3/17/2010	60k	60145	Cert_E15	0.024	0.324	0.355	0.679
128417	S3_1626	6/18/2010	S3_1627	6/21/2010	120k	120150	Cert_E15	0.015	0.196	0.227	0.423
2009 Toyota Camry RE0											
128418	S1_1265	7/30/2009	S1_1266	8/1/2009	4k	4198	Cert_E0	0.027	0.274	0.257	0.531
128418	S1_1328	2/12/2010	S1_1329	2/15/2010	60k	60075	Cert_E0	0.015	0.167	0.128	0.295
128418	S1_1378	3/26/2010	S1_1379	3/29/2010	90k	90124	Cert_E0	0.017	0.205	0.175	0.38
128418	S5_1780	5/3/2010	S5_1781	5/6/2010	120k	120131	Cert_E0	0.015	0.285	0.321	0.606
2009 Toyota Camry RE15											
128419	S1_1259	7/24/2009	S1_1260	7/27/2009	4k	4134	Cert_E0	0.046	0.178	0.25	0.428
128419	S3_1480	12/18/2009	S3_1481	12/21/2009	4k	5647	Cert_E15	0.021	0.184	0.182	0.366
128419	S3_1586	4/20/2010	S3_1587	4/22/2010	90k	90198	Cert_E15	0.018	0.2	0.229	0.429
128419	S5_1802	6/2/2010	S5_1803	6/4/2010	120k	120085	Cert_E15	0.021	0.333	0.399	0.732
2009 Saturn Outlook RE0											
128420	S4_1406	7/31/2009	S4_1407	8/3/2009	4k	4155	Cert_E0	0.037	0.339	0.586	0.925
128420	S4_1509	2/22/2010	S4_1510	2/24/2010	60k	60109	Cert_E0	0.032	0.319	0.501	0.82
128420	S3_1578	4/3/2010	S3_1579	4/6/2010	90k	90167	Cert_E0	0.026	0.246	0.419	0.665
128420	S5_1797	5/25/2010	S5_1798	5/28/2010	120k	120192	Cert_E0	0.03	0.374	0.521	0.895
2009 Saturn Outlook RE15											
128421	S4_1408	8/4/2009	S4_1409	8/6/2009	4k	4226	Cert_E0	0.053	0.492	0.786	1.278
128421	S1_1293	12/18/2009	S1_1294	12/20/2009	4k	5629	Cert_E15	0.012	0.264	0.46	0.724
128421	S5_1755	3/14/2010	S5_1756	3/17/2010	60k	60186	Cert_E15	0.021	0.33	0.538	0.868
128421	S5_1778	4/28/2010	S5_1779	4/30/2010	90k	90193	Cert_E15	0.028	0.463	0.623	1.086
128421	S3_1619	6/9/2010	S3_1620	6/11/2010	120k	120069	Cert_E15	0.031	0.275	0.448	0.723

*Testing after fuel tank filler hose replacement and 2 days aging on Cert_E0 certification fuel

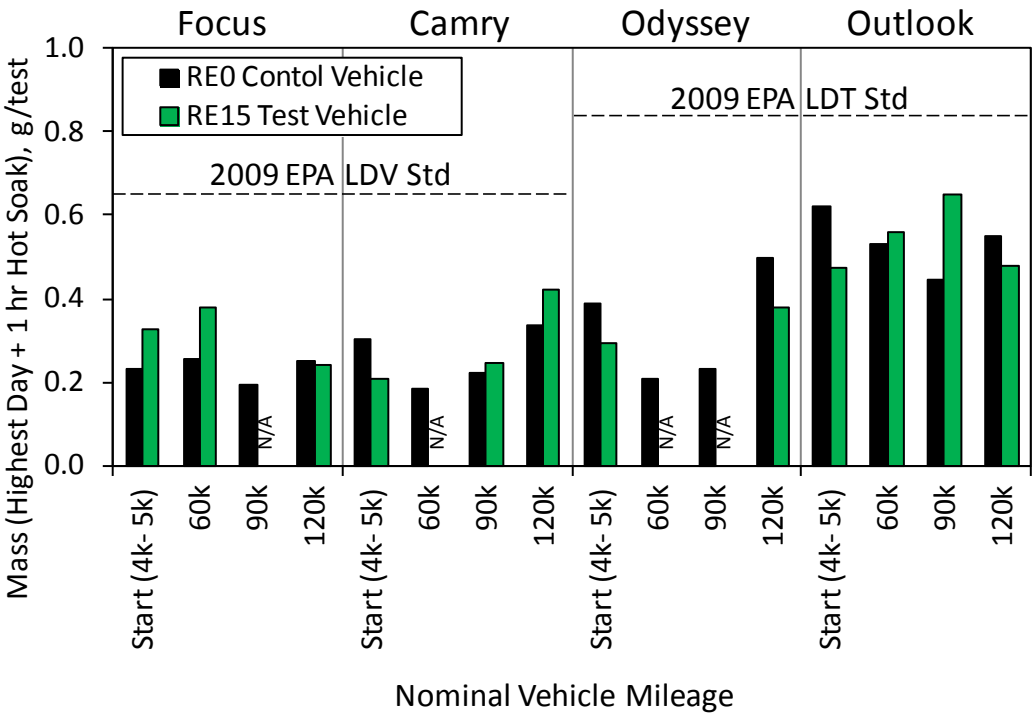

Figure 27. Evaporative Emissions Results for 2009 Model Year Vehicles, on Cert_E0 and Cert_E15 Fuels

8.0 Conclusions

The conclusions drawn here apply to the six vehicle models tested. These findings are not sufficient to make conclusions about the use of higher ethanol blends in the nation's legacy vehicle fleet. The reader is referred to the DOE V4 Program Report [Ref 3] for a comprehensive statistical analysis of 82 vehicles, including 14 vehicles from this study.

- The vehicles aged on 15% and 20% ethanol-containing fuels did not produce higher exhaust emissions compared to control vehicles aged on ethanol-free fuel, for all six models tested in the study.

- Fuel economy was lower for vehicles tested on Cert_E15 and Cert_E20 fuels, and was in proportion to the lower energy density of these oxygenated fuels.

- Blends of 15% to 20% ethanol into certification gasoline either produced no change or lowered NMHC and CO emissions for each vehicle tested, relative to the same vehicle tested on ethanol-free certification gasoline. NOx emissions were not statistically different for each vehicle tested on ethanol-containing certification fuels, compared to the same vehicle tested on ethanol-free certification gasoline.

- The mean NOx emissions increased over the aging period for 17 of the 18 vehicles in the study. Of these vehicles, five were aged using RE0 fuel, six were aged using RE15 fuel, and six were aged using RE20 fuel.

- For four of the six models tested, the vehicle aged on RE0 fuel had higher exhaust emissions compared to the matched vehicles aged on RE15 or RE20 fuel. This finding contradicted the concern that higher ethanol content in gasoline may accelerate catalyst deterioration.

- The 2009 Honda Odyssey aged using RE0 fuel had higher NMHC, CO and NOx emissions at 120,000 miles compared to the vehicles aged on RE15 and RE20 with 95% confidence. The catalyst conversion efficiency for the HC, CO and NOx species was poorer for Odyssey RE0 as it aged compared to the other vehicles.

- NOx emissions from the 2009 Ford Focus aged using RE0 fuel were higher than Focus RE15 at 90,000 miles and higher than Focus RE20 at 120,000 miles with statistical confidence. All three vehicles in this set had significant deterioration of NOx emissions over the 120,000 mile aging period.

- There was no statistical difference in NMHC, CO and NOx emissions for the 2009 Toyota Camrys aged on RE15 and RE20 fuels compared to Camry RE0 after 120,000 miles of aging.

- NMHC, CO and NOx emissions were higher for 2009 Saturn Outlook RE0 compared to the vehicles aged on RE15 and RE20 fuels after 120,000 miles, with statistical confidence.

- The effect of the aging fuel on NMHC and NOx emissions was not statistically significant for the model year 2000 Honda Accords. CO emissions from Accord RE0 were higher compared to Accords RE15 and RE20 at 120,000 miles with statistical confidence.

- There was no statistical evidence that the ethanol-containing aging fuels impacted the exhaust emissions from the model year 2000 Ford Focus cars.

- There was no evidence of a cylinder compression problem with any of the vehicles over the course of the study, based on periodic compression and leak-down tests performed.

- Evaporative emissions were measured for the 2009 Odyssey, Camry, Focus and Outlook as they aged to 120,000 miles on the mileage accumulation dynamometer. The limited data from this testing suggested the evaporative emissions were very similar for these vehicle models as they aged on RE0 and RE15 fuels. Supplemental 2-day evaporative emissions results for all tests were under the 2009 Tier 2 evaporative emissions standards, for both Cert_E0 and Cert_E15 test fuels. It is acknowledged that these vehicles aged on the MADs experienced far fewer refuel, diurnal, and canister purge events compared to real-world operation, and also had a shorter duration of fuel exposure.

- Emissions testing performed before and after the WOT catalyst sulfur purge cycle confirmed the sulfur purging produced a significant reduction in NOx emissions for two of the four vehicles tested. NOx emissions were reduced by 31% on average for the 2009 Ford Focus RE0, and by 25% on average for the 2009 Saturn Outlook RE0 following the catalyst sulfur purge.

9.0 References

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3. West, B., Sluder, S., Knoll, K., Orban, J., Feng, J., “Intermediate Ethanol Blends Catalyst Durability Program,” Oak Ridge National Laboratory Report ORNL/TM-2011/234, Feb. 2012.

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6. “California Non-Methane Organic Gas Test Procedures,” Mobile Source Division, Monitoring and Laboratory Division, Southern Laboratory Branch, July 2002.

7. Vertin, K., Glinsky, G., Mickelsen, J., Morgan, C., St. Denis, M., Roeschen, J., “CRC E-91 Evaporative Emissions Durability Testing,” Coordinating Research Council, August 2012.

10.0 Appendices

10.1 Exhaust Emissions Data Table

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
Odyssey RE0, Cert_E0	5/14/10	128414	116320	120147	0.0527	0.0408	0.0121	0.7284	0.0677	440.4	20.09	0.1891	0.1720	0.0198	1.7254	0.2604	466.7	18.89	0.0152	0.0072	0.0091	0.4077	0.0044	456.0	19.44	0.0198	0.0095	0.0118	0.5755	0.0404	391.6	22.61
Odyssey RE0, Cert_E0	5/13/10	128414	116312	120128	0.0603	0.0491	0.0115	0.5746	0.0724	441.4	20.06	0.2345	0.2183	0.0188	1.3871	0.2951	463.1	19.05	0.0131	0.0055	0.0088	0.3339	0.0026	457.3	19.39	0.0176	0.0081	0.0110	0.4147	0.0360	395.2	22.42
Odyssey RE0, Cert_E0	5/12/10	128414	116303	120109	0.0702	0.0580	0.0125	0.4970	0.0831	441.5	20.06	0.2768	0.2609	0.0183	1.3613	0.3305	465.0	18.97	0.0143	0.0051	0.0106	0.2358	0.0150	457.3	19.39	0.0194	0.0092	0.0117	0.3353	0.0243	394.2	22.49
Odyssey RE0, Cert_E0	4/8/10	128414	116120	90297	0.0438	0.0333	0.0108	0.5847	0.0602	436.7	20.28	0.1633	0.1486	0.0170	1.2881	0.2509	457.3	19.30	0.0100	0.0030	0.0081	0.4010	0.0022	455.1	19.48	0.0172	0.0077	0.0110	0.4000	0.0256	386.5	22.93
Odyssey RE0, Cert_E0	4/7/10	128414	116114	90279	0.0490	0.0393	0.0107	0.5186	0.0662	434.2	20.40	0.1989	0.1834	0.0179	1.2960	0.2774	454.0	19.44	0.0062	-0.0006	0.0078	0.2856	0.0008	450.7	19.68	0.0165	0.0073	0.0106	0.3713	0.0302	388.3	22.82
Odyssey RE0, Cert_E0	4/3/10	128414	116095	90210	0.0481	0.0365	0.0119	0.8011	0.0664	438.4	20.18	0.1813	0.1649	0.0190	1.8133	0.2822	457.9	19.24	0.0110	0.0029	0.0093	0.5595	0.0000	455.0	19.47	0.0178	0.0080	0.0114	0.4938	0.0289	392.4	22.57
Odyssey RE0, Cert_E0	4/2/10	128414	116084	90146	0.0482	0.0377	0.0108	0.6578	0.0653	427.7	20.70	0.1841	0.1690	0.0174	1.3697	0.2723	447.4	19.72	0.0102	0.0031	0.0082	0.5119	0.0000	444.0	19.96	0.0175	0.0084	0.0106	0.3966	0.0328	381.9	23.20
Odyssey RE0, Cert_E0	3/28/10	128414	116049	90109	0.0480	0.0371	0.0111	0.5201	0.0617	436.7	20.18	0.1691	0.1538	0.0176	1.3731	0.2422	460.0	19.09	0.0114	0.0039	0.0087	0.2782	0.0000	452.8	19.48	0.0256	0.0163	0.0108	0.3330	0.0418	388.5	22.69
Odyssey RE0, Cert_E0	3/27/10	128414	116047	90090	0.0486	0.0378	0.0111	0.5500	0.0916	438.0	20.11	0.1815	0.1655	0.0186	1.4785	0.2710	457.3	19.19	0.0096	0.0026	0.0081	0.2817	0.0023	455.3	19.38	0.0219	0.0122	0.0112	0.3551	0.1245	390.9	22.56
Odyssey RE0, Cert_E0	3/4/10	128414	115910	67929	0.0479	0.0371	0.0111	0.5013	0.0553	426.0	20.69	0.1750	0.1592	0.0182	1.3320	0.2254	448.0	19.59	0.0133	0.0063	0.0081	0.2067	0.0012	443.2	19.91	0.0173	0.0074	0.0115	0.4297	0.0290	376.8	23.39
Odyssey RE0, Cert_E0	3/3/10	128414	115902	67910	0.0500	0.0390	0.0113	0.5545	0.0596	420.3	20.96	0.1832	0.1670	0.0187	1.6405	0.2529	439.9	19.93	0.0139	0.0064	0.0087	0.2677	0.0000	437.2	20.18	0.0173	0.0081	0.0106	0.2742	0.0259	373.5	23.61
Odyssey RE0, Cert_E0	3/2/10	128414	115894	67892	0.0480	0.0373	0.0110	0.4039	0.0522	414.0	21.29	0.1721	0.1573	0.0171	1.0653	0.2105	432.7	20.30	0.0143	0.0070	0.0085	0.2018	0.0034	430.5	20.50	0.0182	0.0087	0.0110	0.2891	0.0255	368.7	23.92
Odyssey RE0, Cert_E0	7/27/09	128414	115169	4088	0.0255	0.0233	0.0026	0.1936	0.0102	453.6	19.45	0.0877	0.0813	0.0074	0.5163	0.0282	476.8	18.48	0.0142	0.0129	0.0015	0.1194	0.0020	475.8	18.55	0.0000	-0.0010	0.0012	0.0894	0.0122	394.3	22.39
Odyssey RE0, Cert_E0	7/14/09	128414	410686	4069	0.0226	0.0203	0.0024	0.2258	0.0089	448.6	19.67	0.0971	0.0902	0.0079	0.6470	0.0290	470.9	18.70	0.0029	0.0023	0.0007	0.1447	0.0000	464.3	19.01	0.0036	0.0021	0.0017	0.0612	0.0108	402.1	21.96
Odyssey RE0, Cert_E0	7/7/09	128414	410661	4050	0.0212	0.0189	0.0025	0.2659	0.0100	455.4	19.37	0.0901	0.0829	0.0083	0.7323	0.0274	473.2	18.61	0.0032	0.0026	0.0007	0.1485	0.0020	474.8	18.59	0.0035	0.0020	0.0017	0.1361	0.0120	405.3	21.78
Odyssey RE0, Cert_E0	7/6/09	128414	410657	4039	0.0215	0.0192	0.0025	0.2418	0.0082	448.9	19.66	0.0896	0.0830	0.0077	0.6496	0.0227	468.5	18.80	0.0037	0.0029	0.0009	0.1590	0.0000	469.7	18.79	0.0039	0.0024	0.0016	0.0903	0.0128	394.8	22.36
Odyssey RE15, Cert_E15	6/15/10	128415	116416	120211	0.0280	0.0224	0.0058	0.2170	0.0404	434.0	19.39	0.1047	0.0938	0.0126	0.8024	0.0979	452.4	18.55	0.0072	0.0049	0.0026	0.0449	0.0033	449.5	18.73	0.0093	0.0037	0.0066	0.0994	0.0670	390.7	21.54
Odyssey RE15, Cert_E15	6/9/10	128415	116397	120192	0.0282	0.0222	0.0062	0.1882	0.0314	432.2	19.47	0.1045	0.0938	0.0124	0.7062	0.0935	452.0	18.57	0.0071	0.0043	0.0032	0.0480	0.0064	446.7	18.85	0.0105	0.0045	0.0070	0.0622	0.0317	390.0	21.58
Odyssey RE15, Cert_E15	6/8/10	128415	116395	120173	0.0287	0.0249	0.0039	0.2174	0.0460	435.3	19.33	0.1141	0.1049	0.0106	0.7677	0.0924	457.9	18.33	0.0045	0.0040	0.0006	0.0706	0.0018	451.0	18.67	0.0101	0.0057	0.0051	0.0808	0.0950	388.2	21.69
Odyssey RE15, Cert_E15	6/7/10	128415	116388	120154	0.0336	0.0275	0.0062	0.1612	0.0371	431.4	19.50	0.1295	0.1193	0.0118	0.5577	0.0986	448.1	18.74	0.0081	0.0047	0.0039	0.0600	0.0031	448.9	18.76	0.0093	0.0038	0.0064	0.0524	0.0547	386.1	21.80
Odyssey RE15, Cert_E15	4/22/10	128415	116174	90154	0.0260	0.0212	0.0049	0.1443	0.0402	439.1	19.19	0.1013	0.0912	0.0117	0.5643	0.0707	474.6	17.72	0.0058	0.0041	0.0019	0.0462	0.0092	452.7	18.62	0.0074	0.0026	0.0056	0.0127	0.0759	386.5	21.81
Odyssey RE15, Cert_E15	4/21/10	128415	116170	90135	0.0269	0.0218	0.0052	0.1675	0.0394	437.1	19.27	0.1048	0.0952	0.0111	0.6275	0.0714	456.7	18.41	0.0061	0.0038	0.0026	0.0480	0.0055	455.5	18.51	0.0078	0.0028	0.0057	0.0481	0.0798	387.3	21.76
Odyssey RE15, Cert_E15	4/20/10	128415	116167	90117	0.0244	0.0189	0.0059	0.1631	0.0456	433.2	19.45	0.0988	0.0887	0.0117	0.5832	0.0668	455.1	18.47	0.0035	0.0000	0.0041	0.0631	0.0036	448.8	18.78	0.0077	0.0035	0.0049	0.0355	0.1091	387.0	21.78
Odyssey RE15, Cert_E15	3/11/10	128415	115949	60126	0.0239	0.0209	0.0040	0.1820	0.0197	428.2	19.67	0.1087	0.1000	0.0101	0.6043	0.0739	444.7	18.90	0.0000	-0.0016	0.0018	0.0729	0.0011	445.6	18.91	0.0052	0.0021	0.0036	0.0697	0.0141	382.7	22.02
Odyssey RE15, Cert_E15	3/10/10	128415	115944	60107	0.0283	0.0235	0.0049	0.1595	0.0327	435.8	19.33	0.1105	0.1020	0.0098	0.5526	0.0685	451.4	18.63	0.0066	0.0039	0.0031	0.0519	0.0062	453.8	18.57	0.0074	0.0034	0.0046	0.0666	0.0558	390.0	21.61
Odyssey RE15, Cert_E15	3/9/10	128415	115931	60088	0.0278	0.0237	0.0042	0.1797	0.0200	436.2	19.31	0.1127	0.1040	0.0100	0.5279	0.0701	449.8	18.69	0.0048	0.0027	0.0024	0.1019	0.0000	455.5	18.50	0.0071	0.0042	0.0033	0.0628	0.0196	389.7	21.63
Odyssey RE15, Cert_E15	12/14/09	128415	9115103	5523	0.0198	0.0168	0.0031	0.1577	0.0117	452.5	18.62	0.0867	0.0792	0.0086	0.5086	0.0272	469.7	17.91	0.0019	0.0008	0.0013	0.0633	0.0009	470.1	17.93	0.0031	0.0011	0.0023	0.0707	0.0204	406.4	20.74
Odyssey RE15, Cert_E15	12/11/09	128415	9115096	5504	0.0282	0.0250	0.0034	0.1932	0.0112	451.1	18.67	0.1061	0.0981	0.0092	0.5578	0.0374	473.7	17.75	0.0091	0.0074	0.0019	0.1138	0.0007	467.3	18.03	0.0059	0.0044	0.0018	0.0685	0.0114	403.1	20.91
Odyssey RE15, Cert_E15	12/4/09	128415	9410968	5486	0.0256	0.0231	0.0027	0.1846	0.0108	447.8	18.81	0.1072	0.0998	0.0086	0.4790	0.0308	484.5	17.36	0.0041	0.0036	0.0006	0.1306	0.0022	459.6	18.33	0.0045	0.0026	0.0022	0.0640	0.0119	397.6	21.20
Odyssey RE15, Cert_E15	11/3/09	128415	115403	5467	0.0240	0.0209	0.0032	0.1820	0.0069	454.1	18.55	0.0940	0.0867	0.0085	0.4639	0.0195	473.2	17.78	0.0058	0.0046	0.0014	0.1261	0.0007	473.9	17.78	0.0058	0.0036	0.0026	0.0752	0.0091	402.1	20.96
Odyssey RE15, Cert_E0	6/29/10	128415	116483	120397	0.0313	0.0252	0.0063	0.1945	0.0565	442.9	20.02	0.1122	0.1019	0.0120	0.6450	0.1050	457.0	19.36	0.0093	0.0061	0.0036	0.0912	0.0016	463.7	19.14	0.0116	0.0054	0.0071	0.0493	0.1235	393.1	22.58
Odyssey RE15, Cert_E0	6/23/10	128415	116464	120364	0.0311	0.0261	0.0053	0.1498	0.0531	444.6	19.95	0.1245	0.1154	0.0105	0.4935	0.1088	477.6	18.54	0.0061	0.0037	0.0028	0.0649	0.0067	458.3	19.36	0.0080	0.0029	0.0059	0.0506	0.0986	393.7	22.54
Odyssey RE15, Cert_E0	6/21/10	128415	116450	120326	0.0277	0.0225	0.0054	0.1605	0.0240	439.8	20.17	0.1151	0.1052	0.0115	0.5831	0.0893	460.1	19.24	0.0033	0.0011	0.0026	0.0225	0.0041	453.6	19.57	0.0076	0.0024	0.0060	0.1016	0.0121	398.3	22.28
Odyssey RE15, Cert_E0	6/18/10	128415	116441	120252	0.0268	0.0216	0.0054	0.3231	0.0219	436.5	20.31	0.1008	0.0909	0.0115	0.8992	0.0860	463.1	19.10	0.0062	0.0041	0.0024	0.1413	0.0000	450.4	19.70	0.0099	0.0044	0.0063	0.2329	0.0150	390.2	22.73
Odyssey RE15, Cert_E0	4/29/10	128415	116224	90315	0.0235	0.0209	0.0040	0.1524	0.0310	437.2	20.29	0.0988	0.0902	0.0099	0.5286	0.0624	456.3	19.41	0.0059	0.0048	0.0012	0.0540	0.0059	452.9	19.60	0.0000	-0.0040	0.0047	0.0541	0.0547	392.8	22.59
Odyssey RE15, Cert_E0	4/27/10	128415	116214	90289	0.0255	0.0209	0.0047	0.1578	0.0348	436.9	20.30	0.1018	0.0933	0.0098	0.5198	0.0873	455.1	19.46	0.0051	0.0028	0.0027	0.0601	0.0041	452.9	19.59	0.0066	0.0026	0.0046	0.0694	0.0535	392.6	22.60
Odyssey RE15, Cert_E0	4/26/10	128415	116208	90242	0.0236	0.0200	0.0037	0.1553	0.0477	440.0	20.16	0.0966	0.0883	0.0096	0.4921	0.0659	455.3	19.45	0.0031	0.0020	0.0012	0.0696	0.0012	454.4	19.53	0.0073	0.0039	0.0039	0.0636	0.1224	400.8	22.14
Odyssey RE15, Cert_E0	3/17/10	128415	115986	60301	0.0278	0.0249	0.0030	0.1383	0.0212	426.5	20.69	0.1073	0.0999	0.0086	0.4579	0.0398	448.0	19.66	0.0045	0.0041	0.0005	0.0577	0.0009	439.8	20.07	0.0124	0.0091	0.0038	0.0510	0.0458	385.1	22.93
Odyssey RE15, Cert_E0	3/16/10	128415	115981	60283	0.0268	0.0236	0.0034	0.1337	0.0124	428.2	20.61	0.0987	0.0914	0.0084	0.4324	0.0502	448.5	19.65	0.0078	0.0065	0.0015	0.0412	0.0016	441.9	19.98	0.0088	0.0061	0.0030	0.0841	0.0044	386.7	22.83
Odyssey RE15, Cert_E0	3/15/10	128415	115963	60167	0.0236	0.0196	0.0041	0.1892	0.0144	443.9	19.88	0.0891	0.0813	0.0090	0.5659	0.0516	457.1	19.27	0.0063	0.0043	0.0023	0.0842	0.0000	461.7	19.12	0.0069	0.0035	0.0039	0.1026	0.0136	400.4	22.05
Odyssey RE15, Cert_E0	7/28/09	128415	115170	4089	0.0279	0.0259	0.0024	0.1410	0.0132	459.9	19.19	0.1270	0.1206	0.0075	0.2708	0.0409	492.7	17.89	0.0029	0.0021	0.0008	0.1100	0.0024	479.0	18.43	0.0004	-0.0010	0.0016	0.1014	0.0127	399.1	22.12
Odyssey RE15, Cert_E0	7/14/09	128415	410690	4070	0.0223	0.0203	0.0021	0.2185	0.0087	452.2	19.51	0.0962	0.0901	0.0071	0.5939	0.0321	481.5	18.30	0.0023	0.0020	0.0004	0.1437	0.0000	470.9	18.75	0.0040	0.0027	0.0015	0.0763	0.0073	395.1	22.35
Odyssey RE15, Cert_E0	7/7/09	128415	410662	4052	0.0232	0.0210	0.0024	0.2530	0.0086	453.1	19.47	0.0990	0.0919	0.0083	0.7364	0.0248	475.8	18.51	0.0033	0.0029	0.0005	0.1342	0.0031	472.4	18.69	0.0036	0.0023	0.0015	0.1131	0.0068	399.4	22.10
Odyssey RE15, Cert_E0	7/6/09	128415	410658	4040	0.0225	0.0202	0.0025	0.2510	0.0119	451.4	19.55	0.0944	0.0875	0.0080	0.6822	0.0324	472.9	18.62	0.0036	0.0031	0.0006	0.1495	0.0016	470.5	18.76	0.0039	0.0023	0.0019	0.1177	0.0159	398.9	22.13
Odyssey RE20, Cert_E20	10/20/11	128424	1102519	120156	0.0289	0.0242	0.0049	0.1594	0.0257	434.0	18.94	0.1215	0.1117	0.0102	0.6694	0.1026	454.9	18.02	0.0036	0.0005	0.0032	0.0260	0.0033	450.7	18.25	0.0067	0.0029	0.0040	0.0267	0.0099	387.0	21.25
Odyssey RE20, Cert_E20	10/19/11	128424	1102501	120137	0.0285	0.0239	0.0048	0.1540	0.0214	438.9	18.73	0.1187	0.1091	0.0100	0.6042	0.0810	451.1	18.18	0.0042	0.0009	0.0034	0.0239	0.0029	460.2	17.87	0.0066	0.0031	0.0036	0.0607	0.0114	389.2	21.13
Odyssey RE20, Cert_E20	10/18/11	128424	1102480	120118	0.0288	0.0245	0.0044	0.1655	0.0183	437.6	18.78	0.1175	0.1084	0.0095	0.5835	0.0716	453.5	18.08	0.0048	0.0023	0.0026	0.0522	0.0004	457.5	17.97	0.0070	0.0031	0.0041	0.0640	0.0119	388.1	21.19
Odyssey RE20, Cert_E20	9/2/11	128424	1101641	90108	0.0351	0.0300	0.0053	0.1347	0.0230	443.1	18.70	0.1347	0.1239	0.0113	0.5910	0.0784	469.4	17.62	0.0096	0.0067	0.0030	0.0170	0.0029	459.1	18.06	0.0081	0.0032	0.0051	0.0116	0.0189	393.3	21.08
Odyssey RE20, Cert_E20	9/1/11	128424	1101625	90090	0.0421	0.0378	0.0044	0.1278	0.0197	439.3	18.86	0.1658	0.1561	0.0100	0.5246	0.0729	465.3	17.77	0.0098	0.0075	0.0023	0.0307	0.0002	453.7	18.27	0.0095	0.0054	0.0042	0.0109	0.0163	392.3	21.14
Odyssey RE20, Cert_E20	8/31/11	128424	1101598	90071	0.0427	0.0389	0.0040	0.1087	0.0190	439.3	18.86	0.1722	0.1625	0.0101	0.4941	0.0771	463.1	17.86	0.0085	0.0070	0.0016	0.0047	0.0017	453.6	18.28	0.0094	0.0057	0.0038	0.0132	0.0076	394.5	21.01
Odyssey RE20, Cert_E20	7/20/11	128424	2100864	60123	0.0176	0.0155	0.0033	0.1618	0.0142	432.5	19.16	0.0822	0.0750	0.0076	0.5299	0.0483	442.2	18.70	0.0000	0.0000	0.0015	0.0879	0.0015	454.4	18.24	0.0021	0.0000	0.0035	0.0232	0.0124	383.8	21.60
Odyssey RE20, Cert_E20	7/19/11	128424	2100845	60105	0.0157	0.0135	0.0031	0.2121	0.0181	432.9	19.14	0.0721	0.0643	0.0083	0.6971	0.0619	448.9	18.42	0.0000	0.0000	0.0015	0.1057	0.0011	452.8	18.31	0.0027	0.0005	0.0022	0.0459	0.0170	383.4	21.62
Odyssey RE20, Cert_E20	7/18/11	128424	2100819	60086	0.0179	0.0157	0.0032	0.1726	0.0157	431.6	19.20	0.0838	0.0754	0.0089	0.5723	0.0523	447.5	18.48	0.0000	0.0000	0.0011	0.0831	0.0014	450.1	18.42	0.0017	0.0000	0.0028	0.0390	0.0153	384.5	21.56
Odyssey RE20, Cert_E20	5/25/11	128424	117031	19730	0.0165	0.0143	0.0033	0.1394	0.0127	445.4	18.60	0.0768	0.0698	0.0080	0.5786	0.0430	456.0	18.14	0.0000	-0.0014	0.0017	0.0237	0.0000	462.0	17.95	0.0024	-0.0002	0.0030	0.0273	0.0140	405.9	20.42
Odyssey RE20, Cert_E20	5/24/11	128424	117025	19711	0.0191	0.0167	0.0034	0.1510	0.0177	444.9	18.63	0.0883	0.0808	0.0086	0.6129	0.0588	461.3	17.93	0.0000	-0.0016	0.0019	0.0470	0.0040	459.9	18.03	0.0030	0.0010	0.0024	0.0000	0.0130	403.9	20.53
Odyssey RE20, Cert_E20	5/23/11	128424	213637	19693	0.0211	0.0181	0.0032	0.1847	0.0172	452.1	18.33	0.0804	0.0729	0.0088	0.6273	0.0490	469.3	17.62	0.0051	0.0037	0.0016	0.0811	0.0072	467.5	17.73	0.0066	0.0049	0.0019	0.0459	0.0120	410.0	20.22
Odyssey RE20, Cert_E0	10/28/11	128424	1102655	120270	0.0323	0.0286	0.0039	0.1048	0.0234	435.3	20.23	0.1417	0.1329	0.0091	0.4630	0.0741	453.2	19.39	0.0029	0.0008	0.0021	0.0175	0.0054	453.5	19.42	0.0056	0.0025	0.0032	0.0000	0.0192	386.9	22.77
Odyssey RE20, Cert_E0	10/27/11	128424	1102626	120251	0.0352	0.0311	0.0042	0.1423	0.0243	436.4	20.17	0.1531	0.1451	0.0084	0.5686	0.0915	455.5	19.28	0.0034	0.0011	0.0023	0.0128	0.0045	452.3	19.48	0.0060	0.0016	0.0046	0.0643	0.0110	391.9	22.47
Odyssey RE20, Cert_E0	10/26/11	128424	1102594	120232	0.0330	0.0292	0.0040	0.1715	0.0290	444.7	19.79	0.1435	0.1344	0.0094	0.6701	0.1210	458.6	19.15	0.0031	0.0010	0.0022	0.0601	0.0001	465.4	18.92	0.0060	0.0029	0.0032	0.0051	0.0143	394.9	22.30
Odyssey RE20, Cert_E0	9/8/11	128424	1101759	90195	0.0378	0.0330	0.0049	0.1178	0.0175	442.6	20.07	0.1544	0.1441	0.0107	0.5078	0.0568	462.7	19.16	0.0048	0.0019	0.0031	0.0118	0.0019	461.1	19.28	0.0116	0.0077	0.0041	0.0228	0.0170	392.7	22.63
Odyssey RE20, Cert_E0	9/7/11	128424	1101715	90176	0.0422	0.0379	0.0045	0.1146	0.0296	441.0	20.15	0.1236	0.1150	0.0089	0.4645	0.0559	460.2	19.27	0.0233	0.0207	0.0027	0.0353	0.0016	460.4	19.31	0.0163	0.0121	0.0044	0.0000	0.0624	390.0	22.79
Odyssey RE20, Cert_E0	9/6/11	128424	1101685	90157	0.0363	0.0328	0.0037	0.1388	0.0217	439.6	20.21	0.1335	0.1249	0.0089	0.5765	0.0713	461.9	19.19	0.0114	0.0098	0.0016	0.0285	0.0020	453.5	19.60	0.0100	0.0066	0.0036	0.0160	0.0215	396.4	22.43
Odyssey RE20, Cert_E0	7/26/11	128424	2100956	60209	0.0198	0.0170	0.0041	0.2245	0.0188	442.0	20.09	0.0909	0.0816	0.0099	0.6544	0.0719	457.3	19.39	0.0000	0.0000	0.0023	0.1294	0.0013	462.0	19.23	0.0034	0.0002	0.0034	0.0796	0.0116	392.6	22.64
Odyssey RE20, Cert_E0	7/25/11	128424	1100938	60190	0.0309	0.0274	0.0036	0.1394	0.0135	435.4	20.40	0.1081	0.1001	0.0083	0.5023	0.0496	448.8	19.76	0.0122	0.0105	0.0018	0.0549	0.0013	457.9	19.41	0.0079	0.0045	0.0035	0.0254	0.0094	382.6	23.23
Odyssey RE20, Cert_E0	7/22/11	128424	2100897	60172	0.0194	0.0172	0.0031	0.1900	0.0169	440.3	20.17	0.0894	0.0824	0.0073	0.5600	0.0490	455.8	19.45	0.0000	0.0000	0.0014	0.1092	0.0016	460.9	19.28	0.0030	0.0002	0.0030	0.0633	0.0213	389.8	22.80
Odyssey RE20, Cert_E0	5/17/11	128424	213623	19655	0.0151	0.0124	0.0029	0.1877	0.0139	451.5	19.67	0.0666	0.0602	0.0074	0.5116	0.0464	468.5	18.93	0.0009	-0.0001	0.0012	0.0999	0.0012	466.5	19.05	0.0027	0.0003	0.0028	0.1085	0.0131	410.3	21.66
Odyssey RE20, Cert_E0	5/16/11	128424	213621	19637	0.0150	0.0133	0.0029	0.1796	0.0129	451.2	19.69	0.0706	0.0648	0.0067	0.4388	0.0480	466.7	19.01	0.0000	-0.0016	0.0018	0.1408	0.0003	467.5	19.01	0.0015	-0.0004	0.0022	0.0566	0.0103	408.5	21.76
Odyssey RE20, Cert_E0	5/13/11	128424	213617	19618	0.0152	0.0128	0.0030	0.1926	0.0125	451.2	19.69	0.0689	0.0624	0.0075	0.4295	0.0456	464.2	19.11	0.0004	-0.0006	0.0012	0.1523	0.0002	465.5	19.09	0.0024	0.0000	0.0028	0.0892	0.0107	414.4	21.44

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
Focus RE0, Cert_E0	5/19/10	128416	116332	120145	0.0351	0.0254	0.0099	1.1387	0.1301	281.5	31.33	0.0951	0.0797	0.0178	2.1373	0.3636	295.6	29.66	0.0127	0.0064	0.0072	0.7211	0.0394	286.3	30.88	0.0316	0.0240	0.0088	1.1675	0.1237	261.6	33.68
Focus RE0, Cert_E0	5/17/10	128416	116325	120119	0.0358	0.0283	0.0077	1.0880	0.1009	282.4	31.23	0.1021	0.0887	0.0154	2.1988	0.2763	299.8	29.24	0.0128	0.0089	0.0045	0.6674	0.0291	287.0	30.81	0.0290	0.0224	0.0077	1.0411	0.1036	260.7	33.83
Focus RE0, Cert_E0	5/14/10	128416	116319	120100	0.0476	0.0393	0.0086	1.0670	0.1074	280.4	31.45	0.1662	0.1520	0.0164	2.1763	0.3576	293.0	29.90	0.0111	0.0062	0.0057	0.7291	0.0152	285.2	30.99	0.0270	0.0201	0.0080	0.8667	0.0924	262.0	33.70
Focus RE0, Cert_E0	4/9/10	128416	116123	90153	0.0257	0.0181	0.0078	0.6716	0.0632	271.8	32.52	0.0652	0.0555	0.0113	1.1944	0.1212	286.9	30.72	0.0140	0.0083	0.0065	0.5762	0.0355	275.2	32.15	0.0182	0.0117	0.0075	0.4583	0.0722	254.1	34.83
Focus RE0, Cert_E0	4/8/10	128416	116122	90135	0.0273	0.0201	0.0075	0.7403	0.0750	278.0	31.79	0.0746	0.0646	0.0115	1.3686	0.1254	292.0	30.15	0.0091	0.0044	0.0055	0.5360	0.0331	281.5	31.44	0.0263	0.0192	0.0083	0.6545	0.1163	260.7	33.91
Focus RE0, Cert_E0	4/7/10	128416	116112	90116	0.0275	0.0208	0.0069	0.7418	0.0599	278.4	31.75	0.0878	0.0763	0.0134	1.5187	0.1517	293.8	29.94	0.0089	0.0050	0.0045	0.5310	0.0231	282.9	31.29	0.0169	0.0112	0.0066	0.5523	0.0597	258.2	34.25
Focus RE0, Cert_E0	3/5/10	128416	115913	60214	0.0373	0.0295	0.0080	0.9687	0.0629	271.0	32.39	0.0977	0.0854	0.0142	1.7640	0.1571	287.3	30.41	0.0143	0.0101	0.0049	0.5895	0.0294	275.8	31.91	0.0350	0.0271	0.0092	1.0863	0.0553	249.8	35.10
Focus RE0, Cert_E0	3/3/10	128416	115903	60195	0.0377	0.0290	0.0089	1.1091	0.0918	278.4	31.51	0.1075	0.0941	0.0154	1.8420	0.2345	293.2	29.80	0.0117	0.0062	0.0064	0.8176	0.0395	285.6	30.78	0.0338	0.0263	0.0086	1.1019	0.0820	253.9	34.54
Focus RE0, Cert_E0	3/2/10	128416	115897	60177	0.0367	0.0285	0.0084	0.9828	0.0581	277.5	31.64	0.1032	0.0896	0.0158	2.0125	0.1177	295.1	29.58	0.0132	0.0083	0.0056	0.6445	0.0291	282.5	31.15	0.0312	0.0241	0.0082	0.8473	0.0678	254.8	34.47
Focus RE0, Cert_E0	7/27/09	128416	115168	4100	0.0631	0.0562	0.0071	0.6435	0.0060	293.0	30.02	0.2494	0.2361	0.0154	1.0219	0.0213	308.9	28.37	0.0135	0.0101	0.0040	0.4089	0.0000	300.0	29.37	0.0162	0.0104	0.0067	0.8017	0.0057	267.8	32.81
Focus RE0, Cert_E0	7/12/09	128416	410679	4044	0.0359	0.0312	0.0051	0.4851	0.0082	295.5	29.79	0.1088	0.0987	0.0117	1.1952	0.0109	314.1	27.92	0.0224	0.0192	0.0037	0.3878	0.0067	303.1	29.08	0.0064	0.0040	0.0028	0.1331	0.0088	267.4	33.00
Focus RE0, Cert_E0	7/11/09	128416	410675	4033	0.0396	0.0346	0.0053	0.5660	0.0068	285.5	30.83	0.1273	0.1178	0.0109	1.0498	0.0139	303.3	28.92	0.0161	0.0134	0.0031	0.3340	0.0000	289.3	30.46	0.0176	0.0131	0.0052	0.6393	0.0144	264.7	33.24
Focus RE15, Cert_E15	6/21/10	128417	116452	120153	0.0390	0.0278	0.0116	0.7456	0.0724	280.5	29.88	0.0920	0.0768	0.0175	1.5368	0.2512	296.1	28.19	0.0191	0.0104	0.0100	0.4471	0.0190	285.1	29.46	0.0365	0.0277	0.0102	0.7103	0.0381	260.3	32.21
Focus RE15, Cert_E15	6/18/10	128417	116435	120134	0.0334	0.0234	0.0103	0.6883	0.0550	279.0	30.06	0.0790	0.0656	0.0155	1.4622	0.2096	294.5	28.36	0.0180	0.0103	0.0089	0.3857	0.0095	284.0	29.58	0.0280	0.0202	0.0090	0.6762	0.0245	257.8	32.53
Focus RE15, Cert_E15	6/17/10	128417	116433	120116	0.0291	0.0211	0.0082	0.5698	0.0574	280.3	29.94	0.0853	0.0733	0.0138	1.4046	0.1953	296.4	28.18	0.0111	0.0053	0.0066	0.3190	0.0006	286.9	29.30	0.0207	0.0145	0.0071	0.4125	0.0603	255.5	32.87
Focus RE15, Cert_E15	5/7/10	128417	116268	90127	0.0339	0.0245	0.0096	0.5833	0.0555	282.9	29.67	0.0847	0.0717	0.0150	1.2466	0.2260	299.7	27.89	0.0157	0.0092	0.0076	0.2683	0.0079	288.2	29.17	0.0299	0.0217	0.0095	0.6782	0.0168	260.0	32.25
Focus RE15, Cert_E15	5/6/10	128417	116266	90109	0.0305	0.0234	0.0073	0.6937	0.0741	282.4	29.70	0.0887	0.0747	0.0162	1.6268	0.3069	293.6	28.40	0.0053	0.0031	0.0026	0.1662	0.0017	289.2	29.09	0.0340	0.0258	0.0095	0.9801	0.0346	261.0	32.06
Focus RE15, Cert_E15	5/5/10	128417	116261	90090	0.0335	0.0250	0.0087	0.6981	0.0765	280.9	29.85	0.1029	0.0869	0.0184	1.9159	0.3568	294.7	28.26	0.0099	0.0054	0.0052	0.2663	0.0000	286.8	29.32	0.0257	0.0189	0.0079	0.5950	0.0096	259.5	32.32
Focus RE15, Cert_E15	3/15/10	128417	115961	60145	0.0553	0.0464	0.0091	0.5598	0.0380	280.5	29.94	0.1766	0.1636	0.0150	1.2707	0.1337	294.2	28.41	0.0216	0.0152	0.0074	0.3593	0.0085	286.0	29.41	0.0272	0.0204	0.0079	0.4013	0.0216	259.8	32.36
Focus RE15, Cert_E15	3/13/10	128417	115957	60126	0.0353	0.0266	0.0089	0.5325	0.0202	278.2	30.21	0.0600	0.0495	0.0121	0.8563	0.0652	293.7	28.55	0.0310	0.0240	0.0081	0.4365	0.0092	283.3	29.67	0.0247	0.0177	0.0081	0.4718	0.0074	256.5	32.76
Focus RE15, Cert_E15	3/12/10	128417	115953	60107	0.0304	0.0230	0.0076	0.6379	0.0466	277.3	30.28	0.0807	0.0693	0.0132	1.0527	0.2022	289.2	28.96	0.0116	0.0073	0.0049	0.4390	0.0029	282.8	29.73	0.0280	0.0207	0.0083	0.7003	0.0120	257.9	32.54
Focus RE15, Cert_E15	3/11/10	128417	115947	60082	0.0347	0.0289	0.0060	0.5000	0.0355	271.9	30.91	0.1199	0.1084	0.0133	1.2595	0.1701	287.1	29.13	0.0066	0.0038	0.0032	0.2327	0.0000	276.7	30.42	0.0239	0.0189	0.0058	0.4335	0.0011	251.1	33.47
Focus RE15, Cert_E15	12/14/09	128417	9115101	5452	0.0245	0.0196	0.0050	0.4911	0.0080	287.7	29.22	0.0840	0.0739	0.0118	1.3273	0.0353	301.4	27.75	0.0079	0.0057	0.0025	0.2799	0.0000	293.0	28.73	0.0108	0.0067	0.0047	0.2576	0.0023	267.4	31.48
Focus RE15, Cert_E15	12/11/09	128417	9115097	5433	0.0273	0.0232	0.0041	0.4018	0.0037	287.0	29.30	0.1046	0.0951	0.0110	0.9952	0.0146	300.3	27.90	0.0068	0.0052	0.0018	0.2499	0.0000	292.5	28.78	0.0076	0.0047	0.0034	0.2411	0.0023	266.4	31.59
Focus RE15, Cert_E15	12/4/09	128417	9410969	5415	0.0273	0.0234	0.0042	0.6081	0.0126	284.3	29.54	0.1031	0.0923	0.0125	1.6950	0.0524	310.2	26.92	0.0081	0.0069	0.0014	0.3650	0.0027	284.6	29.56	0.0063	0.0037	0.0030	0.2476	0.0012	264.3	31.85
Focus RE15, Cert_E15	11/2/09	128417	115401	5377	0.0252	0.0215	0.0038	0.3477	0.0057	287.6	29.25	0.0992	0.0894	0.0113	1.0153	0.0230	296.3	28.27	0.0064	0.0052	0.0013	0.1936	0.0006	294.1	28.63	0.0048	0.0024	0.0028	0.1342	0.0020	268.7	31.35
Focus RE15, Cert_E0	6/24/10	128417	116473	120259	0.0359	0.0272	0.0090	0.8391	0.0766	283.2	31.19	0.0986	0.0851	0.0156	1.6136	0.2841	298.2	29.49	0.0082	0.0035	0.0055	0.4266	0.0009	288.8	30.66	0.0408	0.0314	0.0109	1.0297	0.0621	261.3	33.75
Focus RE15, Cert_E0	6/23/10	128417	116467	120240	0.0349	0.0256	0.0096	0.6967	0.0368	283.8	31.15	0.0762	0.0657	0.0121	1.0989	0.1422	301.1	29.29	0.0201	0.0123	0.0090	0.5624	0.0062	287.0	30.82	0.0317	0.0240	0.0089	0.6457	0.0148	264.6	33.41
Focus RE15, Cert_E0	6/22/10	128417	116458	120194	0.0414	0.0317	0.0102	0.7788	0.0618	283.2	31.20	0.0780	0.0663	0.0135	1.2468	0.1709	299.6	29.41	0.0306	0.0226	0.0093	0.6772	0.0329	287.4	30.76	0.0342	0.0263	0.0092	0.6172	0.0340	262.8	33.64
Focus RE15, Cert_E0	5/12/10	128417	116301	90298	0.0477	0.0396	0.0083	0.4637	0.0289	286.5	30.89	0.1329	0.1200	0.0149	1.2183	0.0948	300.5	29.31	0.0321	0.0268	0.0061	0.2747	0.0100	291.7	30.37	0.0128	0.0063	0.0075	0.2501	0.0148	266.0	33.32
Focus RE15, Cert_E0	5/11/10	128417	116292	90280	0.0494	0.0411	0.0086	0.5846	0.0259	285.3	31.00	0.1414	0.1309	0.0122	1.1209	0.0785	307.5	28.67	0.0239	0.0181	0.0068	0.4363	0.0087	288.6	30.68	0.0282	0.0202	0.0092	0.4606	0.0188	262.4	33.73
Focus RE15, Cert_E0	5/10/10	128417	116286	90233	0.0381	0.0304	0.0080	0.4973	0.0303	285.5	31.00	0.0942	0.0831	0.0129	1.1061	0.0946	304.2	28.99	0.0232	0.0182	0.0059	0.3127	0.0114	289.1	30.64	0.0239	0.0168	0.0082	0.3858	0.0173	264.4	33.49
Focus RE15, Cert_E0	3/21/10	128417	116012	60277	0.0531	0.0430	0.0104	0.7711	0.0496	280.0	31.38	0.1066	0.0937	0.0150	1.4322	0.1126	294.8	29.70	0.0430	0.0350	0.0093	0.5837	0.0328	283.1	31.08	0.0317	0.0241	0.0088	0.6271	0.0338	263.2	33.42
Focus RE15, Cert_E0	3/20/10	128417	116007	60259	0.0404	0.0314	0.0092	0.5381	0.0444	276.9	31.78	0.0439	0.0353	0.0099	0.4012	0.1022	285.1	30.90	0.0392	0.0318	0.0085	0.5370	0.0344	283.7	31.02	0.0401	0.0316	0.0099	0.6436	0.0196	257.8	34.11
Focus RE15, Cert_E0	3/19/10	128417	116004	60240	0.0479	0.0377	0.0105	0.8297	0.0510	279.4	31.44	0.1075	0.0946	0.0149	1.5812	0.1864	293.7	29.79	0.0286	0.0211	0.0086	0.4949	0.0105	284.9	30.91	0.0394	0.0303	0.0105	0.8954	0.0253	258.4	33.97
Focus RE15, Cert_E0	7/27/09	128417	115166	4099	0.0461	0.0396	0.0067	0.4702	0.0192	288.2	30.55	0.1335	0.1220	0.0133	1.3166	0.0182	300.1	29.18	0.0272	0.0230	0.0050	0.2619	0.0188	296.0	29.79	0.0157	0.0116	0.0048	0.2257	0.0208	264.3	33.36
Focus RE15, Cert_E0	7/21/09	128417	410719	4080	0.0300	0.0259	0.0044	0.4736	0.0118	284.4	30.96	0.1091	0.0992	0.0115	1.3760	0.0195	299.3	29.26	0.0084	0.0067	0.0019	0.2526	0.0000	287.7	30.65	0.0112	0.0079	0.0038	0.2101	0.0281	266.9	33.04
Focus RE15, Cert_E0	7/12/09	128417	410678	4043	0.0476	0.0428	0.0052	0.4684	0.0241	280.5	31.39	0.1379	0.1286	0.0107	0.8874	0.0357	293.4	29.91	0.0278	0.0248	0.0034	0.3476	0.0186	285.8	30.83	0.0171	0.0133	0.0045	0.3809	0.0257	260.7	33.79
Focus RE15, Cert_E0	7/11/09	128417	410674	4032	0.0301	0.0257	0.0047	0.3941	0.0087	282.2	31.22	0.0789	0.0709	0.0093	0.9407	0.0131	298.6	29.41	0.0220	0.0190	0.0035	0.2841	0.0082	287.6	30.66	0.0084	0.0052	0.0037	0.1901	0.0064	259.6	33.98
Focus RE20, Cert_E20	10/28/11	128422	1102653	120140	0.0301	0.0239	0.0064	0.4498	0.0469	284.6	28.82	0.0929	0.0789	0.0145	1.3467	0.1663	301.6	27.06	0.0131	0.0086	0.0047	0.2134	0.0071	291.0	28.23	0.0146	0.0110	0.0037	0.2178	0.0317	259.9	31.60
Focus RE20, Cert_E20	10/25/11	128422	1102569	120084	0.0305	0.0233	0.0075	0.5588	0.0555	283.7	28.89	0.0996	0.0844	0.0158	1.9106	0.2041	300.7	27.06	0.0096	0.0049	0.0049	0.1822	0.0070	288.5	28.48	0.0179	0.0117	0.0064	0.2479	0.0349	261.9	31.35
Focus RE20, Cert_E20	10/21/11	128422	1102536	120065	0.0341	0.0280	0.0063	0.6602	0.0336	284.5	28.80	0.1380	0.1194	0.0193	2.6659	0.1381	301.9	26.84	0.0049	0.0021	0.0029	0.1440	0.0000	288.1	28.53	0.0112	0.0084	0.0029	0.1277	0.0185	264.5	31.07
Focus RE20, Cert_E20	9/2/11	128422	1101643	90140	0.0374	0.0281	0.0097	0.5528	0.0455	290.8	28.42	0.0981	0.0829	0.0157	1.4701	0.1476	307.0	26.78	0.0197	0.0120	0.0080	0.2313	0.0121	295.9	27.98	0.0248	0.0168	0.0083	0.4655	0.0314	269.0	30.74
Focus RE20, Cert_E20	8/31/11	128422	1101594	90084	0.0287	0.0217	0.0073	0.4555	0.0374	283.2	29.20	0.0744	0.0625	0.0123	1.3489	0.1385	296.9	27.71	0.0156	0.0102	0.0055	0.1621	0.0038	288.4	28.72	0.0191	0.0126	0.0067	0.3344	0.0246	263.1	31.44
Focus RE20, Cert_E20	8/30/11	128422	1101561	90065	0.0242	0.0186	0.0058	0.2704	0.0236	288.2	28.73	0.0775	0.0653	0.0127	1.0222	0.0499	302.0	27.29	0.0087	0.0052	0.0037	0.0794	0.0055	293.5	28.24	0.0134	0.0088	0.0047	0.0644	0.0381	267.7	30.96
Focus RE20, Cert_E20	7/22/11	128422	2100902	60117	0.0266	0.0196	0.0074	0.5382	0.0255	286.4	28.86	0.0701	0.0569	0.0139	1.4827	0.0435	303.0	27.14	0.0160	0.0100	0.0063	0.3138	0.0144	291.2	28.42	0.0138	0.0094	0.0047	0.2469	0.0330	264.8	31.26
Focus RE20, Cert_E20	7/21/11	128422	2100882	60105	0.0261	0.0192	0.0073	0.6924	0.0558	287.0	28.78	0.0760	0.0631	0.0136	1.6698	0.2393	298.9	27.47	0.0082	0.0037	0.0047	0.2704	0.0038	293.0	28.26	0.0222	0.0151	0.0075	0.7485	0.0150	266.6	30.95
Focus RE20, Cert_E20	7/19/11	128422	2100838	60068	0.0194	0.0144	0.0059	0.5473	0.0236	287.9	28.71	0.0696	0.0576	0.0128	1.4929	0.0826	299.4	27.46	0.0015	0.0000	0.0028	0.1728	0.0001	294.5	28.13	0.0152	0.0090	0.0065	0.5372	0.0233	266.7	30.99
Focus RE20, Cert_E20	5/25/11	128422	117029	16329	0.0296	0.0220	0.0079	0.4792	0.0041	291.0	28.42	0.1066	0.0946	0.0139	1.5405	0.0063	305.2	26.92	0.0068	0.0012	0.0065	0.1971	0.0018	296.9	27.90	0.0144	0.0092	0.0060	0.2104	0.0066	269.0	30.78
Focus RE20, Cert_E20	5/24/11	128422	117023	16310	0.0250	0.0188	0.0068	0.4881	0.0018	288.9	28.62	0.0952	0.0847	0.0122	1.5800	0.0089	299.6	27.42	0.0046	0.0000	0.0053	0.1896	0.0000	296.6	27.93	0.0104	0.0057	0.0054	0.2248	0.0000	266.2	31.10
Focus RE20, Cert_E20	5/23/11	128422	213635	16291	0.0204	0.0166	0.0040	0.4490	0.0023	291.6	28.36	0.0783	0.0686	0.0112	1.4564	0.0092	306.2	26.86	0.0042	0.0028	0.0017	0.2015	0.0000	298.2	27.77	0.0073	0.0046	0.0030	0.1575	0.0014	268.0	30.91
Focus RE20, Cert_E0	11/2/11	128422	1102745	120227	0.0379	0.0304	0.0079	0.5755	0.0585	283.6	30.95	0.0933	0.0792	0.0147	1.2257	0.2094	303.5	28.81	0.0256	0.0182	0.0077	0.4379	0.0187	288.5	30.45	0.0196	0.0167	0.0030	0.3466	0.0205	259.5	33.87
Focus RE20, Cert_E0	11/1/11	128422	1102709	120208	0.0342	0.0267	0.0079	0.6479	0.0563	283.4	30.96	0.0949	0.0819	0.0135	1.6211	0.1677	298.5	29.23	0.0173	0.0111	0.0064	0.4233	0.0202	289.9	30.32	0.0203	0.0143	0.0063	0.3373	0.0404	260.0	33.80
Focus RE20, Cert_E0	10/31/11	128422	1102698	120189	0.0373	0.0302	0.0073	0.7457	0.0543	283.1	30.98	0.1038	0.0909	0.0134	1.7769	0.1701	295.4	29.51	0.0167	0.0115	0.0053	0.3981	0.0155	289.4	30.37	0.0259	0.0196	0.0065	0.6218	0.0397	262.0	33.48
Focus RE20, Cert_E0	9/9/11	128422	1101774	90245	0.0411	0.0338	0.0076	0.7479	0.0854	289.2	30.60	0.0958	0.0824	0.0139	1.3993	0.2250	299.7	29.42	0.0207	0.0164	0.0045	0.3284	0.0154	296.5	29.92	0.0384	0.0301	0.0086	1.0488	0.1122	267.6	33.00
Focus RE20, Cert_E0	9/8/11	128422	1101751	90226	0.0400	0.0312	0.0092	0.5940	0.0661	290.6	30.48	0.0946	0.0813	0.0138	1.4677	0.2065	301.0	29.28	0.0262	0.0189	0.0076	0.2789	0.0293	296.1	29.97	0.0249	0.0165	0.0088	0.5279	0.0295	272.6	32.50
Focus RE20, Cert_E0	9/7/11	128422	1101717	90207	0.0449	0.0367	0.0085	0.5630	0.0561	292.2	30.32	0.0923	0.0802	0.0126	1.2968	0.1547	310.1	28.45	0.0368	0.0301	0.0070	0.3354	0.0336	297.5	29.81	0.0245	0.0164	0.0083	0.4377	0.0241	268.7	33.00
Focus RE20, Cert_E0	9/6/11	128422	1101687	90189	0.0412	0.0339	0.0076	0.4632	0.0562	290.8	30.48	0.0957	0.0840	0.0122	0.9972	0.1683	304.9	28.98	0.0296	0.0234	0.0065	0.3333	0.0226	295.5	30.02	0.0218	0.0158	0.0063	0.3050	0.0348	271.3	32.70
Focus RE20, Cert_E0	7/27/11	128422	2100970	60238	0.0322	0.0242	0.0084	0.7127	0.0389	287.9	30.75	0.0814	0.0668	0.0154	1.5865	0.1309	304.0	28.98	0.0150	0.0097	0.0056	0.3249	0.0079	294.0	30.18	0.0275	0.0196	0.0084	0.7843	0.0279	264.4	33.46
Focus RE20, Cert_E0	7/26/11	128422	2100948	60219	0.0331	0.0247	0.0089	0.7439	0.0436	287.9	30.74	0.0832	0.0699	0.0141	1.5663	0.1536	304.0	28.98	0.0157	0.0091	0.0070	0.3641	0.0181	295.1	30.06	0.0283	0.0201	0.0086	0.8405	0.0085	262.2	33.73
Focus RE20, Cert_E0	7/25/11	128422	1100935	60200	0.0432	0.0349	0.0086	0.5715	0.0189	284.3	31.15	0.1033	0.0909	0.0128	1.2871	0.0564	300.6	29.35	0.0264	0.0193	0.0074	0.3777	0.0065	288.0	30.80	0.0295	0.0221	0.0076	0.3989	0.0142	265.2	33.43
Focus RE20, Cert_E0	4/29/11	128422	116995	16272	0.0558	0.0470	0.0092	0.6578	0.0139	286.6	30.89	0.1413	0.1283	0.0151	1.5801	0.0137	303.3	29.03	0.0429	0.0356	0.0084	0.4759	0.0188	291.7	30.39	0.0157	0.0102	0.0064	0.3047	0.0050	264.4	33.56
Focus RE20, Cert_E0	4/28/11	128422	116989	16254	0.0428	0.0355	0.0076	0.6204	0.0086	291.1	30.42	0.1255	0.1140	0.0133	1.6499	0.0119	308.7	28.52	0.0255	0.0197	0.0067	0.3711	0.0113	295.4	30.03	0.0134	0.0090	0.0051	0.3150	0.0010	269.8	32.89
Focus RE20, Cert_E0	4/27/11	128422	116985	16235	0.0360	0.0302	0.0061	0.5909	0.0021	288.6	30.70	0.1213	0.1114	0.0115	1.6147	0.0047	304.7	28.90	0.0117	0.0078	0.0046	0.2662	0.0004	293.7	30.22	0.0178	0.0135	0.0050	0.4340	0.0035	266.6	33.25

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
Camry RE0, Cert_E0	5/7/10	128418	116270	120131	0.0423	0.0309	0.0117	0.2647	0.0572	320.2	27.68	0.1487	0.1339	0.0171	1.0777	0.1791	341.6	25.82	0.0131	0.0046	0.0098	0.0046	0.0083	329.8	26.92	0.0177	0.0079	0.0114	0.1453	0.0582	285.9	31.02
Camry RE0, Cert_E0	5/3/10	128418	116249	120112	0.0402	0.0295	0.0110	0.2744	0.0499	319.1	27.77	0.1439	0.1292	0.0170	1.1032	0.1892	339.1	26.01	0.0105	0.0026	0.0091	0.0158	0.0075	329.0	26.98	0.0178	0.0093	0.0099	0.1369	0.0247	285.6	31.06
Camry RE0, Cert_E0	5/1/10	128418	116231	120075	0.0432	0.0339	0.0095	0.3246	0.0505	321.7	27.54	0.1607	0.1459	0.0171	1.3901	0.1368	344.0	25.60	0.0085	0.0028	0.0066	0.0145	0.0077	330.5	26.85	0.0204	0.0123	0.0093	0.1089	0.0664	288.0	30.80
Camry RE0, Cert_E0	3/30/10	128418	116053	90132	0.0409	0.0307	0.0104	0.2830	0.0517	315.0	27.99	0.1493	0.1335	0.0162	1.2601	0.1762	333.0	26.33	0.0106	0.0027	0.0081	0.0076	0.0051	325.5	27.13	0.0166	0.0064	0.0105	0.0689	0.0462	281.3	31.38
Camry RE0, Cert_E0	3/26/10	128418	116038	90095	0.0433	0.0341	0.0094	0.2389	0.0447	312.9	28.18	0.1554	0.1430	0.0144	1.0343	0.1253	328.4	26.72	0.0123	0.0059	0.0074	0.0159	0.0081	323.4	27.31	0.0175	0.0091	0.0096	0.0613	0.0534	281.3	31.38
Camry RE0, Cert_E0	3/26/10	128418	116040	90113	0.0389	0.0293	0.0098	0.2528	0.0528	315.5	27.95	0.1383	0.1255	0.0148	1.1279	0.1486	338.9	25.89	0.0120	0.0047	0.0084	0.0079	0.0233	325.2	27.15	0.0147	0.0071	0.0087	0.0542	0.0360	279.6	31.57
Camry RE0, Cert_E0	3/25/10	128418	116035	90076	0.0416	0.0327	0.0091	0.1984	0.0310	306.4	28.78	0.1565	0.1431	0.0155	0.8473	0.1232	326.8	26.87	0.0105	0.0041	0.0074	0.0097	0.0049	316.2	27.93	0.0138	0.0072	0.0076	0.0662	0.0107	272.5	32.40
Camry RE0, Cert_E0	3/3/10	128418	115905	69987	0.0385	0.0289	0.0098	0.1998	0.0395	313.0	28.17	0.1415	0.1288	0.0147	0.8585	0.1401	335.9	26.15	0.0100	0.0026	0.0085	0.0113	0.0119	321.6	27.46	0.0146	0.0071	0.0086	0.0585	0.0156	279.7	31.56
Camry RE0, Cert_E0	3/2/10	128418	115898	69968	0.0439	0.0345	0.0097	0.2615	0.0375	317.1	27.80	0.1569	0.1424	0.0167	1.1438	0.1248	338.9	25.88	0.0142	0.0075	0.0077	0.0259	0.0128	327.1	27.00	0.0149	0.0078	0.0081	0.0412	0.0183	282.0	31.30
Camry RE0, Cert_E0	3/1/10	128418	115891	69950	0.0438	0.0357	0.0083	0.2681	0.0318	318.7	27.66	0.1656	0.1519	0.0159	1.1910	0.0941	344.1	25.49	0.0107	0.0056	0.0059	0.0183	0.0081	327.6	26.95	0.0141	0.0080	0.0071	0.0423	0.0293	282.8	31.22
Camry RE0, Cert_E0	7/30/09	128418	115175	4141	0.0199	0.0174	0.0025	0.1040	0.0256	323.7	27.26	0.0866	0.0808	0.0068	0.4855	0.0894	343.7	25.62	0.0026	0.0013	0.0014	0.0000	0.0052	335.5	26.33	0.0022	0.0011	0.0013	0.0132	0.0160	286.4	30.84
Camry RE0, Cert_E0	7/15/09	128418	410695	4085	0.0226	0.0205	0.0022	0.1666	0.0191	320.4	27.54	0.0968	0.0910	0.0067	0.6641	0.0367	345.8	25.44	0.0028	0.0022	0.0008	0.0413	0.0094	329.4	26.80	0.0039	0.0024	0.0017	0.0277	0.0241	284.2	31.07
Camry RE0, Cert_E0	7/8/09	128418	410665	4065	0.0169	0.0150	0.0021	0.1529	0.0164	322.7	27.35	0.0707	0.0658	0.0056	0.6123	0.0520	349.7	25.17	0.0029	0.0019	0.0012	0.0373	0.0072	331.3	26.65	0.0028	0.0017	0.0012	0.0238	0.0067	286.0	30.88
Camry RE0, Cert_E0	7/6/09	128418	410659	4044	0.0236	0.0216	0.0022	0.1879	0.0136	315.3	27.98	0.1023	0.0962	0.0070	0.7793	0.0397	339.2	25.92	0.0029	0.0024	0.0006	0.0344	0.0070	324.6	27.20	0.0034	0.0022	0.0015	0.0308	0.0064	279.5	31.59
Camry RE15, Cert_E15	6/9/10	128419	116398	120167	0.0400	0.0290	0.0113	0.2551	0.0513	323.5	25.99	0.1481	0.1325	0.0181	1.0629	0.1789	345.2	24.25	0.0101	0.0021	0.0092	0.0164	0.0120	335.0	25.14	0.0153	0.0065	0.0102	0.0977	0.0296	285.4	29.49
Camry RE15, Cert_E15	6/7/10	128419	116389	120129	0.0380	0.0277	0.0106	0.2215	0.0530	326.1	25.79	0.1366	0.1225	0.0163	0.9842	0.1647	341.9	24.49	0.0100	0.0023	0.0088	0.0056	0.0169	341.8	24.64	0.0167	0.0084	0.0096	0.0553	0.0369	284.4	29.60
Camry RE15, Cert_E15	5/28/10	128419	116357	120074	0.0391	0.0335	0.0070	0.2714	0.0518	326.7	25.74	0.1404	0.1259	0.0167	1.0306	0.1661	337.1	24.84	0.0111	0.0052	0.0068	0.0173	0.0131	338.6	24.87	0.0155	0.0155	0.0000	0.1783	0.0387	296.5	28.37
Camry RE15, Cert_E15	4/20/10	128419	116166	90187	0.0341	0.0258	0.0087	0.1750	0.0355	323.5	26.03	0.1347	0.1207	0.0162	0.7582	0.1256	340.0	24.68	0.0055	0.0003	0.0061	0.0202	0.0071	336.4	25.06	0.0119	0.0051	0.0079	0.0259	0.0211	286.8	29.38
Camry RE15, Cert_E15	4/19/10	128419	116161	90141	0.0303	0.0230	0.0075	0.1798	0.0560	319.5	26.35	0.1137	0.1024	0.0131	0.7760	0.1774	335.3	25.03	0.0066	0.0020	0.0053	0.0156	0.0263	331.6	25.42	0.0121	0.0058	0.0074	0.0394	0.0205	284.8	29.59
Camry RE15, Cert_E15	4/18/10	128419	116155	90122	0.0308	0.0231	0.0079	0.1923	0.0383	321.1	26.22	0.1126	0.1018	0.0124	0.8706	0.1391	335.4	25.00	0.0077	0.0019	0.0067	0.0092	0.0176	335.4	25.13	0.0126	0.0067	0.0068	0.0247	0.0011	283.4	29.74
Camry RE15, Cert_E15	4/17/10	128419	116152	90075	0.0373	0.0289	0.0086	0.1777	0.0361	322.0	26.15	0.1131	0.1005	0.0146	0.7370	0.1286	342.1	24.53	0.0181	0.0122	0.0068	0.0233	0.0102	333.4	25.27	0.0166	0.0101	0.0076	0.0481	0.0154	285.3	29.53
Camry RE15, Cert_E15	3/11/10	128419	115950	60146	0.0325	0.0246	0.0081	0.1850	0.0373	320.0	26.31	0.1170	0.1043	0.0147	0.8074	0.1225	335.4	25.01	0.0096	0.0045	0.0059	0.0231	0.0095	332.4	25.35	0.0119	0.0056	0.0073	0.0209	0.0254	284.9	29.58
Camry RE15, Cert_E15	3/11/10	128419	115945	60128	0.0346	0.0272	0.0076	0.2171	0.0400	319.0	26.39	0.1250	0.1141	0.0126	0.9479	0.1182	337.3	24.86	0.0106	0.0050	0.0065	0.0191	0.0095	330.4	25.51	0.0118	0.0067	0.0058	0.0400	0.0388	283.6	29.72
Camry RE15, Cert_E15	3/9/10	128419	115937	60109	0.0474	0.0399	0.0076	0.3496	0.0310	315.4	26.67	0.1936	0.1772	0.0189	1.5930	0.1241	339.2	24.63	0.0080	0.0044	0.0041	0.0168	0.0084	323.8	26.03	0.0119	0.0068	0.0059	0.0426	0.0037	281.4	29.95
Camry RE15, Cert_E15	12/18/09	128419	9115107	5691	0.0246	0.0209	0.0038	0.1199	0.0387	329.9	25.54	0.1040	0.0961	0.0092	0.5702	0.1122	349.4	24.04	0.0028	0.0014	0.0017	0.0000	0.0112	340.9	24.73	0.0061	0.0028	0.0039	0.0074	0.0354	294.2	28.65
Camry RE15, Cert_E15	12/4/09	128419	9410967	5654	0.0321	0.0280	0.0045	0.1561	0.0472	319.6	26.35	0.1336	0.1224	0.0129	0.5916	0.0873	343.2	24.47	0.0050	0.0037	0.0016	0.0485	0.0313	328.2	25.68	0.0068	0.0036	0.0036	0.0303	0.0470	285.7	29.50
Camry RE15, Cert_E15	11/3/09	128419	115404	5624	0.0380	0.0344	0.0036	0.1823	0.0301	323.5	26.03	0.1614	0.1502	0.0130	0.8009	0.0684	343.5	24.42	0.0055	0.0055	0.0001	0.0235	0.0130	333.6	25.27	0.0062	0.0033	0.0033	0.0158	0.0338	289.3	29.14
Camry RE15, Cert_E0	6/15/10	128418	116418	120273	0.0399	0.0305	0.0096	0.2204	0.0519	322.9	27.45	0.1543	0.1385	0.0183	0.9765	0.1747	344.3	25.63	0.0069	0.0009	0.0069	0.0042	0.0183	333.0	26.65	0.0158	0.0087	0.0082	0.0589	0.0229	287.6	30.85
Camry RE15, Cert_E0	6/14/10	128418	116414	120254	0.0440	0.0351	0.0091	0.2033	0.0408	324.0	27.36	0.1683	0.1558	0.0144	0.8836	0.1301	341.9	25.82	0.0096	0.0034	0.0071	0.0193	0.0120	335.4	26.47	0.0151	0.0075	0.0088	0.0370	0.0278	288.8	30.72
Camry RE15, Cert_E0	6/11/10	128418	116404	120208	0.0395	0.0296	0.0101	0.2564	0.0438	322.8	27.46	0.1388	0.1240	0.0170	1.0956	0.1647	339.9	25.95	0.0120	0.0055	0.0075	0.0068	0.0067	334.2	26.56	0.0162	0.0077	0.0098	0.0923	0.0221	288.5	30.75
Camry RE15, Cert_E0	4/28/10	128419	116218	90393	0.0413	0.0329	0.0086	0.1949	0.0537	323.0	27.45	0.1505	0.1370	0.0157	0.8604	0.1816	343.1	25.73	0.0120	0.0069	0.0059	0.0101	0.0125	334.5	26.54	0.0140	0.0069	0.0082	0.0407	0.0347	286.2	31.01
Camry RE15, Cert_E0	4/27/10	128419	116213	90374	0.0377	0.0293	0.0086	0.1880	0.0348	321.5	27.58	0.1479	0.1351	0.0148	0.8445	0.1235	333.9	26.44	0.0070	0.0011	0.0068	0.0050	0.0053	334.6	26.53	0.0126	0.0063	0.0073	0.0384	0.0239	287.2	30.89
Camry RE15, Cert_E0	4/26/10	128419	116206	90328	0.0378	0.0287	0.0093	0.1906	0.0372	323.3	27.42	0.1439	0.1309	0.0151	0.8430	0.1421	337.2	26.19	0.0093	0.0026	0.0077	0.0210	0.0070	334.7	26.52	0.0114	0.0044	0.0081	0.0181	0.0151	291.5	30.44
Camry RE15, Cert_E0	3/18/10	128419	115991	60271	0.0333	0.0252	0.0083	0.2110	0.0319	306.5	28.77	0.1266	0.1143	0.0143	0.9115	0.1206	325.9	26.95	0.0076	0.0017	0.0069	0.0138	0.0113	317.1	27.84	0.0119	0.0062	0.0066	0.0576	0.0040	271.5	32.51
Camry RE15, Cert_E0	3/17/10	128419	115988	60253	0.0380	0.0303	0.0079	0.1948	0.0212	309.5	28.50	0.1409	0.1289	0.0138	0.8947	0.0910	329.3	26.67	0.0113	0.0058	0.0063	0.0020	0.0037	319.7	27.62	0.0113	0.0057	0.0064	0.0331	0.0020	275.0	32.10
Camry RE15, Cert_E0	3/15/10	128419	115962	60187	0.0356	0.0276	0.0082	0.2271	0.0498	320.5	27.52	0.1329	0.1198	0.0151	0.9984	0.1317	339.5	25.86	0.0097	0.0044	0.0061	0.0132	0.0340	331.4	26.65	0.0108	0.0048	0.0069	0.0472	0.0176	285.6	30.91
Camry RE15, Cert_E0	7/24/09	128419	115163	4077	0.0273	0.0247	0.0026	0.1311	0.0262	329.8	26.76	0.1221	0.1161	0.0070	0.5962	0.0656	348.2	25.27	0.0023	0.0014	0.0011	0.0082	0.0091	343.7	25.69	0.0028	0.0009	0.0022	0.0119	0.0287	289.5	30.50
Camry RE15, Cert_E0	7/7/09	128419	410664	4040	0.0231	0.0207	0.0026	0.2064	0.0175	320.4	27.53	0.0986	0.0919	0.0077	0.8655	0.0525	343.4	25.59	0.0030	0.0022	0.0009	0.0370	0.0037	330.1	26.75	0.0040	0.0024	0.0019	0.0287	0.0172	284.7	31.02
Camry RE15, Cert_E0	7/6/09	128419	410660	4029	0.0230	0.0207	0.0025	0.1820	0.0186	320.2	27.55	0.0993	0.0930	0.0073	0.7494	0.0602	340.6	25.81	0.0027	0.0019	0.0010	0.0352	0.0036	330.4	26.72	0.0038	0.0023	0.0018	0.0306	0.0156	285.7	30.91
Camry RE20, Cert_E20	10/31/11	128423	1102684	120111	0.0479	0.0382	0.0100	0.3342	0.0481	308.0	26.64	0.1843	0.1668	0.0181	1.3802	0.1541	315.8	25.82	0.0090	0.0023	0.0069	0.0000	0.0121	322.0	25.54	0.0181	0.0087	0.0098	0.1737	0.0359	275.8	29.79
Camry RE20, Cert_E20	10/28/11	128423	1102647	120093	0.0454	0.0369	0.0088	0.2586	0.0637	308.9	26.58	0.1785	0.1608	0.0184	1.1596	0.1762	320.5	25.48	0.0084	0.0025	0.0060	0.0000	0.0183	323.4	25.43	0.0149	0.0084	0.0067	0.0677	0.0645	272.9	30.12
Camry RE20, Cert_E20	10/27/11	128423	1102621	120074	0.0425	0.0344	0.0084	0.2599	0.0589	307.7	26.69	0.1653	0.1481	0.0178	1.2066	0.1740	321.9	25.36	0.0082	0.0029	0.0055	0.0000	0.0173	319.8	25.72	0.0146	0.0082	0.0067	0.0377	0.0508	274.1	30.00
Camry RE20, Cert_E20	9/10/11	128423	1101807	90131	0.0396	0.0314	0.0085	0.3279	0.0532	314.8	26.29	0.1508	0.1365	0.0149	1.4676	0.1193	327.3	25.12	0.0085	0.0021	0.0066	0.0000	0.0420	327.7	25.30	0.0142	0.0071	0.0073	0.0849	0.0243	281.2	29.46
Camry RE20, Cert_E20	9/9/11	128423	1101776	90112	0.0481	0.0399	0.0086	0.2652	0.0454	313.7	26.39	0.1622	0.1472	0.0156	1.2425	0.1249	331.1	24.86	0.0181	0.0123	0.0061	0.0000	0.0220	324.2	25.57	0.0188	0.0111	0.0080	0.0301	0.0298	280.3	29.57
Camry RE20, Cert_E20	9/8/11	128423	1101762	90094	0.0375	0.0299	0.0079	0.2460	0.0323	314.9	26.29	0.1419	0.1276	0.0149	1.1657	0.1025	328.1	25.10	0.0084	0.0029	0.0057	0.0000	0.0069	327.0	25.36	0.0136	0.0069	0.0069	0.0135	0.0271	282.3	29.36
Camry RE20, Cert_E20	9/7/11	128423	1101720	90075	0.0486	0.0400	0.0090	0.3404	0.0215	318.8	25.95	0.1659	0.1475	0.0192	1.6436	0.0729	340.2	24.15	0.0176	0.0117	0.0062	0.0000	0.0069	328.3	25.25	0.0187	0.0125	0.0065	0.0000	0.0102	284.8	29.11
Camry RE20, Cert_E20	7/22/11	128423	2100899	60093	0.0247	0.0200	0.0060	0.1835	0.0346	312.0	26.54	0.1038	0.0939	0.0104	0.8350	0.1039	329.2	25.07	0.0025	0.0000	0.0046	0.0125	0.0122	322.0	25.75	0.0069	0.0020	0.0052	0.0148	0.0248	280.2	29.59
Camry RE20, Cert_E20	7/21/11	128423	2100886	60075	0.0192	0.0146	0.0063	0.1831	0.0378	311.7	26.58	0.0780	0.0684	0.0101	0.8361	0.0908	329.4	25.06	0.0020	0.0000	0.0048	0.0119	0.0176	322.8	25.69	0.0074	0.0016	0.0062	0.0134	0.0361	277.3	29.90
Camry RE20, Cert_E20	7/20/11	128423	2100860	60056	0.0233	0.0184	0.0060	0.2287	0.0278	311.0	26.62	0.0984	0.0862	0.0129	1.0255	0.0640	322.9	25.53	0.0019	0.0000	0.0036	0.0127	0.0111	323.1	25.66	0.0070	0.0021	0.0052	0.0345	0.0320	279.3	29.68
Camry RE20, Cert_E20	5/25/11	128423	117027	12387	0.0207	0.0175	0.0034	0.1242	0.0231	320.6	25.85	0.0903	0.0833	0.0081	0.6001	0.0506	335.3	24.64	0.0016	0.0000	0.0018	0.0000	0.0094	332.6	24.93	0.0042	0.0019	0.0027	0.0000	0.0282	286.5	28.94
Camry RE20, Cert_E20	5/24/11	128423	117022	12368	0.0224	0.0196	0.0032	0.1138	0.0197	320.6	25.84	0.0994	0.0931	0.0073	0.5475	0.0470	336.8	24.54	0.0013	-0.0003	0.0019	0.0000	0.0102	332.4	24.95	0.0041	0.0017	0.0028	0.0000	0.0171	286.3	28.96
Camry RE20, Cert_E20	5/23/11	128423	213634	12350	0.0189	0.0164	0.0026	0.1006	0.0254	323.2	25.64	0.0751	0.0688	0.0073	0.4512	0.0750	344.0	24.04	0.0032	0.0027	0.0006	0.0093	0.0116	334.3	24.80	0.0061	0.0037	0.0027	0.0092	0.0142	286.2	28.97
Camry RE20, Cert_E0	11/4/11	128423	1102797	120225	0.0499	0.0413	0.0089	0.3698	0.0474	308.3	28.51	0.2000	0.1833	0.0173	1.5457	0.1580	323.3	26.99	0.0087	0.0023	0.0067	0.0104	0.0110	321.4	27.40	0.0140	0.0075	0.0068	0.1585	0.0326	272.0	32.35
Camry RE20, Cert_E0	11/3/11	128423	1102773	120207	0.0488	0.0416	0.0075	0.3432	0.0599	306.4	28.68	0.1938	0.1777	0.0167	1.5025	0.1682	321.2	27.17	0.0083	0.0028	0.0057	0.0000	0.0222	321.2	27.42	0.0154	0.0117	0.0038	0.1120	0.0490	267.6	32.89
Camry RE20, Cert_E0	11/1/11	128423	1102712	120159	0.0518	0.0437	0.0084	0.4800	0.0395	310.0	28.33	0.2039	0.1856	0.0190	1.9706	0.1399	324.2	26.86	0.0078	0.0033	0.0047	0.0000	0.0073	325.1	27.09	0.0197	0.0127	0.0073	0.2590	0.0246	270.7	32.49
Camry RE20, Cert_E0	9/19/11	128423	1102030	90244	0.0328	0.0261	0.0070	0.1401	0.0452	316.5	27.81	0.1298	0.1191	0.0111	0.6720	0.1316	332.6	26.37	0.0057	0.0002	0.0058	0.0000	0.0131	327.5	26.89	0.0110	0.0051	0.0061	0.0045	0.0410	283.4	31.08
Camry RE20, Cert_E0	9/16/11	128423	1101997	90225	0.0285	0.0226	0.0062	0.1147	0.0403	321.1	27.41	0.0993	0.0886	0.0111	0.5318	0.0942	339.9	25.83	0.0087	0.0049	0.0040	0.0000	0.0154	331.6	26.56	0.0124	0.0061	0.0066	0.0164	0.0466	287.1	30.67
Camry RE20, Cert_E0	9/14/11	128423	1101941	90207	0.0341	0.0279	0.0065	0.1420	0.0409	318.2	27.66	0.1256	0.1167	0.0093	0.6860	0.1488	330.0	26.57	0.0097	0.0044	0.0055	0.0000	0.0066	329.5	26.73	0.0113	0.0052	0.0062	0.0000	0.0245	288.0	30.59
Camry RE20, Cert_E0	7/29/11	128423	2101012	60274	0.0199	0.0163	0.0052	0.1690	0.0248	314.9	28.20	0.0842	0.0754	0.0093	0.7680	0.0749	335.9	26.35	0.0009	0.0000	0.0037	0.0123	0.0105	324.4	27.40	0.0074	0.0026	0.0051	0.0142	0.0142	281.2	31.61
Camry RE20, Cert_E0	7/28/11	128423	2100992	60227	0.0295	0.0243	0.0055	0.1609	0.0286	316.7	28.04	0.1183	0.1099	0.0089	0.7297	0.0898	336.1	26.33	0.0049	0.0012	0.0040	0.0122	0.0104	327.0	27.19	0.0088	0.0033	0.0058	0.0126	0.0170	282.9	31.42
Camry RE20, Cert_E0	7/26/11	128423	2100944	60190	0.0227	0.0168	0.0064	0.1959	0.0335	319.0	27.84	0.0865	0.0762	0.0108	0.8847	0.0844	339.3	26.07	0.0045	0.0000	0.0052	0.0171	0.0118	328.9	27.03	0.0088	0.0036	0.0055	0.0126	0.0358	284.9	31.20
Camry RE20, Cert_E0	5/6/11	128423	213597	12331	0.0195	0.0168	0.0028	0.1513	0.0182	321.2	27.66	0.0755	0.0705	0.0057	0.6942	0.0512	341.4	25.94	0.0042	0.0024	0.0020	0.0085	0.0087	331.3	26.83	0.0059	0.0041	0.0021	0.0095	0.0109	286.9	30.98
Camry RE20, Cert_E0	5/5/11	128423	213592	12312	0.0202	0.0183	0.0020	0.1448	0.0195	325.7	27.27	0.0816	0.0760	0.0065	0.6673	0.0531	342.3	25.88	0.0032	0.0027	0.0006	0.0077	0.0101	337.3	26.35	0.0060	0.0048	0.0014	0.0092	0.0117	291.2	30.53
Camry RE20, Cert_E0	5/4/11	128423	213589	12294	0.0267	0.0239	0.0030	0.1319	0.0211	331.9	26.76	0.0851	0.0789	0.0072	0.6027	0.0435	351.4	25.21	0.0119	0.0108	0.0012	0.0091	0.0116	342.4	25.96	0.0106	0.0080	0.0030	0.0081	0.0222	297.3	29.90

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
Outlook RE0, Cert_E0	5/25/10	128420	116346	120192	0.0613	0.0455	0.0163	1.3663	0.0346	478.0	18.48	0.1800	0.1486	0.0364	3.4888	0.1068	499.7	17.55	0.0244	0.0170	0.0086	0.8005	0.0071	490.9	18.03	0.0415	0.0280	0.0156	0.8311	0.0321	437.2	20.24
Outlook RE0, Cert_E0	5/12/10	128420	116302	120174	0.0762	0.0567	0.0200	1.3558	0.0605	484.2	18.24	0.2527	0.2115	0.0476	3.5630	0.2072	518.6	16.91	0.0226	0.0138	0.0102	0.6669	0.0116	496.6	17.83	0.0440	0.0287	0.0177	0.9876	0.0418	434.7	20.34
Outlook RE0, Cert_E0	5/11/10	128420	116293	120155	0.0614	0.0447	0.0172	1.2135	0.0420	477.2	18.52	0.1989	0.1650	0.0392	3.1958	0.1234	504.7	17.39	0.0198	0.0119	0.0092	0.8136	0.0072	488.5	18.12	0.0359	0.0226	0.0155	0.4684	0.0458	434.9	20.37
Outlook RE0, Cert_E0	5/10/10	128420	116288	120108	0.0613	0.0441	0.0176	1.4105	0.0514	480.8	18.37	0.1821	0.1491	0.0382	2.7502	0.1421	509.3	17.26	0.0238	0.0157	0.0094	1.1091	0.0140	492.5	17.96	0.0408	0.0256	0.0176	0.9678	0.0535	437.3	20.22
Outlook RE0, Cert_E0	4/3/10	128420	116094	90174	0.0624	0.0478	0.0150	0.9270	0.0625	486.7	18.18	0.1872	0.1591	0.0325	1.9255	0.1792	514.0	17.15	0.0228	0.0160	0.0078	0.6112	0.0214	498.9	17.75	0.0431	0.0298	0.0153	0.7690	0.0519	442.8	19.99
Outlook RE0, Cert_E0	4/2/10	128420	116091	90155	0.0538	0.0378	0.0164	1.2462	0.0384	481.7	18.35	0.1674	0.1352	0.0372	2.7942	0.1141	498.4	17.64	0.0187	0.0110	0.0089	1.0104	0.0088	499.7	17.71	0.0346	0.0216	0.0150	0.5250	0.0373	435.0	20.36
Outlook RE0, Cert_E0	4/2/10	128420	116079	90136	0.0548	0.0411	0.0140	0.8987	0.0246	479.7	18.45	0.1792	0.1509	0.0328	2.2388	0.0826	511.8	17.21	0.0176	0.0121	0.0064	0.5634	0.0001	491.9	18.01	0.0313	0.0188	0.0144	0.5211	0.0272	432.1	20.50
Outlook RE0, Cert_E0	2/28/10	128420	115884	60266	0.0636	0.0493	0.0146	0.7961	0.0283	474.7	18.55	0.1917	0.1602	0.0364	2.3162	0.1065	507.9	17.24	0.0282	0.0227	0.0063	0.4295	0.0027	487.8	18.07	0.0337	0.0218	0.0138	0.3397	0.0174	424.9	20.75
Outlook RE0, Cert_E0	2/27/10	128420	115877	60247	0.0661	0.0508	0.0156	0.7021	0.0485	482.0	18.27	0.1963	0.1672	0.0336	1.7221	0.1849	512.2	17.13	0.0252	0.0179	0.0085	0.3405	0.0040	496.1	17.78	0.0447	0.0313	0.0155	0.6125	0.0292	432.7	20.36
Outlook RE0, Cert_E0	2/26/10	128420	115872	60229	0.0565	0.0432	0.0137	0.6705	0.0143	462.6	19.04	0.1633	0.1390	0.0281	2.0423	0.0534	482.8	18.15	0.0226	0.0159	0.0078	0.2407	0.0000	477.7	18.47	0.0402	0.0282	0.0139	0.4500	0.0118	418.9	21.04
Outlook RE0, Cert_E0	7/31/09	128420	410738	4088	0.0292	0.0234	0.0063	0.2617	0.0116	490.8	17.98	0.1256	0.1078	0.0206	0.9201	0.0543	516.9	17.02	0.0026	0.0011	0.0018	0.0902	0.0000	503.9	17.52	0.0068	0.0033	0.0040	0.0889	0.0013	446.4	19.78
Outlook RE0, Cert_E0	7/22/09	128420	410722	4068	0.0319	0.0258	0.0065	0.2804	0.0100	499.5	17.66	0.1343	0.1154	0.0218	0.8113	0.0481	533.0	16.52	0.0040	0.0025	0.0018	0.1248	0.0000	512.3	17.23	0.0070	0.0035	0.0040	0.1724	0.0000	450.3	19.60
Outlook RE0, Cert_E0	7/12/09	128420	410680	4044	0.0235	0.0188	0.0051	0.2069	0.0081	478.8	18.43	0.0977	0.0824	0.0177	0.6516	0.0374	507.1	17.37	0.0032	0.0022	0.0011	0.0890	0.0000	487.8	18.10	0.0060	0.0033	0.0031	0.0940	0.0012	440.2	20.05
Outlook RE0, Cert_E0	7/11/09	128420	410676	4033	0.0398	0.0345	0.0058	0.2336	0.0131	487.1	18.11	0.1770	0.1580	0.0219	0.7081	0.0632	517.7	17.00	0.0030	0.0023	0.0008	0.0850	0.0000	497.5	17.75	0.0057	0.0031	0.0030	0.1552	0.0000	444.3	19.86
Outlook RE15, Cert_E15	6/9/10	128421	116396	120140	0.0430	0.0308	0.0129	0.4886	0.0159	472.0	17.81	0.1654	0.1358	0.0342	1.5687	0.0745	498.2	16.81	0.0032	-0.0002	0.0040	0.1341	0.0000	484.6	17.37	0.0254	0.0138	0.0134	0.3415	0.0016	428.6	19.62
Outlook RE15, Cert_E15	6/8/10	128421	116394	120121	0.0437	0.0314	0.0125	0.4263	0.0198	477.6	17.60	0.1586	0.1314	0.0314	1.1590	0.0931	508.6	16.48	0.0085	0.0043	0.0048	0.1615	0.0000	491.1	17.14	0.0228	0.0118	0.0128	0.3696	0.0017	429.0	19.60
Outlook RE15, Cert_E15	6/7/10	128421	116386	120102	0.0395	0.0273	0.0125	0.3721	0.0116	478.8	17.56	0.1431	0.1184	0.0286	1.2339	0.0523	496.0	16.90	0.0088	0.0035	0.0062	0.1028	0.0000	496.6	16.95	0.0192	0.0086	0.0122	0.2294	0.0029	432.2	19.47
Outlook RE15, Cert_E15	4/28/10	128421	116219	90193	0.0491	0.0358	0.0136	0.4980	0.0182	474.7	17.72	0.1774	0.1458	0.0365	1.7192	0.0868	512.1	16.36	0.0115	0.0070	0.0053	0.1160	0.0001	487.0	17.30	0.0232	0.0126	0.0122	0.2973	0.0004	423.4	19.89
Outlook RE15, Cert_E15	4/27/10	128421	116215	90174	0.0371	0.0255	0.0121	0.3734	0.0226	480.4	17.52	0.1439	0.1180	0.0299	1.2478	0.1030	511.1	16.42	0.0052	0.0002	0.0058	0.1372	0.0023	493.7	17.07	0.0166	0.0076	0.0104	0.1593	0.0004	432.2	19.49
Outlook RE15, Cert_E15	4/26/10	128421	116210	90155	0.0430	0.0306	0.0127	0.5303	0.0120	483.5	17.40	0.1561	0.1298	0.0304	1.9970	0.0572	508.4	16.47	0.0087	0.0037	0.0058	0.1322	0.0000	501.1	16.82	0.0224	0.0117	0.0124	0.1763	0.0007	431.4	19.52
Outlook RE15, Cert_E15	3/14/10	128421	115960	60175	0.0390	0.0289	0.0104	0.3397	0.0148	489.6	17.19	0.1499	0.1274	0.0261	1.3467	0.0703	513.1	16.35	0.0073	0.0032	0.0047	0.0470	0.0000	508.3	16.58	0.0151	0.0071	0.0092	0.1306	0.0006	436.9	19.28
Outlook RE15, Cert_E15	3/12/10	128421	115954	60157	0.0377	0.0291	0.0087	0.3114	0.0104	485.4	17.34	0.1284	0.1098	0.0215	1.2685	0.0403	500.9	16.75	0.0130	0.0099	0.0036	0.0666	0.0012	504.5	16.71	0.0158	0.0081	0.0088	0.0506	0.0052	438.0	19.24
Outlook RE15, Cert_E15	3/11/10	128421	115946	60138	0.0395	0.0297	0.0100	0.4216	0.0200	480.0	17.54	0.1413	0.1160	0.0292	1.3935	0.0894	508.7	16.49	0.0125	0.0098	0.0031	0.1787	0.0016	491.7	17.14	0.0134	0.0060	0.0086	0.1448	0.0021	436.3	19.31
Outlook RE15, Cert_E15	3/10/10	128421	115940	60119	0.0390	0.0288	0.0104	0.4526	0.0102	470.8	17.87	0.1537	0.1284	0.0293	1.4996	0.0464	490.5	17.09	0.0044	0.0016	0.0033	0.1580	0.0012	484.8	17.38	0.0175	0.0092	0.0096	0.2181	0.0000	429.6	19.61
Outlook RE15, Cert_E15	12/18/09	128421	9115105	5617	0.0340	0.0268	0.0073	0.2454	0.0078	495.1	17.01	0.1303	0.1109	0.0225	0.8393	0.0363	519.1	16.19	0.0084	0.0065	0.0022	0.0671	0.0005	508.9	16.56	0.0095	0.0048	0.0055	0.1343	0.0001	451.2	18.67
Outlook RE15, Cert_E15	12/14/09	128421	9115099	5598	0.0366	0.0294	0.0073	0.3092	0.0119	496.3	16.96	0.1401	0.1196	0.0237	0.7957	0.0561	515.9	16.29	0.0068	0.0056	0.0014	0.0916	0.0000	515.0	16.36	0.0142	0.0090	0.0061	0.3506	0.0009	446.4	18.86
Outlook RE15, Cert_E15	11/2/09	128421	115400	5545	0.0292	0.0232	0.0062	0.2577	0.0094	501.1	16.81	0.1172	0.0991	0.0210	0.8824	0.0430	519.0	16.19	0.0057	0.0041	0.0019	0.0650	0.0008	520.9	16.18	0.0071	0.0043	0.0032	0.1487	0.0000	450.3	18.71
Outlook RE15, Cert_E0	6/17/10	128421	116431	120246	0.0468	0.0336	0.0135	0.7102	0.0257	471.5	18.78	0.1593	0.1324	0.0311	1.7194	0.1191	499.3	17.66	0.0119	0.0061	0.0067	0.4158	0.0000	483.6	18.33	0.0268	0.0156	0.0129	0.4977	0.0030	427.9	20.71
Outlook RE15, Cert_E0	6/16/10	128421	116428	120228	0.0447	0.0329	0.0121	0.6869	0.0160	473.6	18.69	0.1631	0.1390	0.0279	1.7621	0.0753	498.2	17.70	0.0065	0.0018	0.0055	0.4426	0.0000	487.3	18.19	0.0264	0.0156	0.0125	0.3305	0.0012	429.7	20.63
Outlook RE15, Cert_E0	6/15/10	128421	116419	120181	0.0396	0.0282	0.0118	0.4741	0.0228	479.8	18.47	0.1491	0.1263	0.0264	1.1143	0.1044	508.9	17.37	0.0057	0.0008	0.0057	0.3162	0.0000	493.0	17.99	0.0206	0.0101	0.0122	0.2869	0.0041	433.1	20.47
Outlook RE15, Cert_E0	5/3/10	128421	116250	90320	0.0422	0.0301	0.0124	0.7542	0.0194	481.3	18.39	0.1503	0.1218	0.0330	1.9594	0.0839	508.8	17.33	0.0099	0.0051	0.0055	0.5232	0.0000	494.7	17.91	0.0217	0.0131	0.0100	0.2819	0.0073	435.0	20.38
Outlook RE15, Cert_E0	5/3/10	128421	116247	90301	0.0375	0.0270	0.0128	0.6234	0.0161	479.5	18.47	0.1426	0.1159	0.0309	1.5565	0.0775	506.2	17.44	0.0020	-0.0031	0.0058	0.3342	0.0000	492.8	18.00	0.0250	0.0145	0.0121	0.4636	0.0000	434.3	20.40
Outlook RE15, Cert_E0	5/1/10	128421	116232	90236	0.0414	0.0302	0.0115	0.5700	0.0180	480.5	18.43	0.1498	0.1258	0.0278	1.6391	0.0848	504.0	17.51	0.0070	0.0023	0.0054	0.2572	0.0000	499.2	17.77	0.0241	0.0148	0.0107	0.3507	0.0013	427.9	20.71
Outlook RE15, Cert_E0	3/21/10	128421	116011	60346	0.0387	0.0265	0.0125	0.4722	0.0167	486.7	18.11	0.1423	0.1163	0.0301	1.5095	0.0802	510.0	17.22	0.0065	0.0015	0.0059	0.1708	0.0000	499.2	17.68	0.0208	0.0108	0.0116	0.2557	0.0001	445.5	19.80
Outlook RE15, Cert_E0	3/20/10	128421	116005	60327	0.0438	0.0342	0.0099	0.4431	0.0194	487.3	18.09	0.1624	0.1381	0.0282	1.4365	0.0905	514.1	17.09	0.0102	0.0077	0.0029	0.1500	0.0005	501.3	17.61	0.0174	0.0095	0.0092	0.2449	0.0012	440.6	20.03
Outlook RE15, Cert_E0	3/19/10	128421	116001	60280	0.0348	0.0263	0.0087	0.3143	0.0130	470.2	18.76	0.1369	0.1176	0.0223	1.0017	0.0627	494.0	17.81	0.0038	0.0010	0.0032	0.0918	0.0000	482.7	18.29	0.0165	0.0088	0.0089	0.2158	0.0000	428.5	20.59
Outlook RE15, Cert_E0	8/4/09	128421	410742	4087	0.0298	0.0239	0.0063	0.3179	0.0139	499.8	17.65	0.1266	0.1072	0.0224	0.9619	0.0672	536.5	16.40	0.0037	0.0023	0.0015	0.1372	0.0000	513.5	17.19	0.0061	0.0033	0.0032	0.1735	0.0000	446.4	19.77
Outlook RE15, Cert_E0	7/24/09	128421	115164	4068	0.0308	0.0237	0.0073	0.3897	0.0121	496.8	17.75	0.1237	0.1026	0.0244	1.0817	0.0552	520.9	16.89	0.0052	0.0038	0.0016	0.1530	0.0013	518.0	17.04	0.0091	0.0045	0.0053	0.3128	0.0000	438.7	20.11
Outlook RE15, Cert_E0	7/12/09	128421	410681	4048	0.0300	0.0252	0.0052	0.2242	0.0097	486.4	18.14	0.1290	0.1127	0.0189	0.5827	0.0468	509.9	17.27	0.0034	0.0026	0.0009	0.0917	0.0000	501.1	17.62	0.0054	0.0028	0.0031	0.2030	0.0000	440.9	20.01
Outlook RE15, Cert_E0	7/12/09	128421	410677	4037	0.0353	0.0306	0.0051	0.2241	0.0101	487.4	18.10	0.1525	0.1365	0.0185	0.6601	0.0476	515.4	17.09	0.0041	0.0032	0.0010	0.0988	0.0006	500.8	17.63	0.0061	0.0037	0.0028	0.1321	0.0000	441.0	20.02
Outlook RE20, Cert_E20	11/10/11	128425	1102863	120102	0.0386	0.0275	0.0115	0.3510	0.0112	486.4	16.89	0.1495	0.1212	0.0294	1.2153	0.0537	511.0	16.02	0.0067	0.0017	0.0052	0.1210	0.0000	499.3	16.46	0.0148	0.0055	0.0097	0.1326	0.0002	443.4	18.54
Outlook RE20, Cert_E20	11/9/11	128425	1102851	120083	0.0389	0.0277	0.0115	0.3829	0.0083	481.8	17.04	0.1524	0.1218	0.0318	1.4408	0.0396	502.3	16.29	0.0062	0.0017	0.0046	0.0829	0.0000	495.4	16.60	0.0150	0.0060	0.0093	0.1523	0.0005	440.8	18.65
Outlook RE20, Cert_E20	11/8/11	128425	1102842	120065	0.0434	0.0329	0.0110	0.3076	0.0126	495.4	16.58	0.1656	0.1379	0.0288	1.0272	0.0589	542.2	15.11	0.0087	0.0048	0.0040	0.0907	0.0000	506.0	16.25	0.0165	0.0063	0.0106	0.1717	0.0014	440.2	18.67
Outlook RE20, Cert_E20	9/22/11	128425	1102079	90155	0.0435	0.0328	0.0111	0.3934	0.0094	476.3	17.24	0.1556	0.1235	0.0334	1.6639	0.0429	502.5	16.27	0.0130	0.0091	0.0041	0.0172	0.0002	492.6	16.69	0.0162	0.0090	0.0075	0.1411	0.0012	426.0	19.29
Outlook RE20, Cert_E20	9/21/11	128425	1102065	90136	0.0381	0.0284	0.0102	0.2962	0.0142	477.9	17.19	0.1416	0.1138	0.0289	1.0416	0.0656	508.0	16.12	0.0076	0.0029	0.0049	0.0436	0.0000	491.4	16.73	0.0177	0.0120	0.0060	0.2105	0.0021	429.6	19.13
Outlook RE20, Cert_E20	9/16/11	128425	1101999	90080	0.0328	0.0242	0.0100	0.2614	0.0138	484.0	16.98	0.1381	0.1109	0.0283	1.1777	0.0593	519.4	15.77	0.0018	0.0000	0.0039	0.0201	0.0030	497.6	16.53	0.0124	0.0051	0.0076	0.0309	0.0001	432.1	19.03
Outlook RE20, Cert_E20	7/29/11	128425	2101008	60122	0.0259	0.0167	0.0104	0.3370	0.0125	477.3	17.35	0.1018	0.0756	0.0277	1.2405	0.0602	513.8	16.07	0.0032	0.0000	0.0045	0.0808	0.0000	489.0	16.95	0.0116	0.0036	0.0084	0.1383	0.0000	427.9	19.37
Outlook RE20, Cert_E20	7/28/11	128425	2100993	60103	0.0300	0.0206	0.0099	0.3536	0.0129	478.6	17.30	0.1175	0.0913	0.0277	1.4028	0.0616	505.2	16.33	0.0052	0.0013	0.0041	0.0805	0.0000	493.6	16.80	0.0105	0.0037	0.0072	0.0752	0.0004	430.5	19.25
Outlook RE20, Cert_E20	7/27/11	128425	2100982	60084	0.0314	0.0223	0.0102	0.4001	0.0095	492.0	16.83	0.1293	0.1019	0.0290	1.5778	0.0447	524.1	15.73	0.0024	0.0000	0.0037	0.0538	0.0000	508.5	16.30	0.0123	0.0044	0.0084	0.1656	0.0008	436.7	18.98
Outlook RE20, Cert_E20	5/25/11	128425	117030	11829	0.0297	0.0232	0.0079	0.2971	0.0140	483.2	17.14	0.1319	0.1107	0.0246	1.1563	0.0645	513.4	16.08	0.0000	-0.0020	0.0023	0.0195	0.0013	498.3	16.64	0.0086	0.0035	0.0058	0.1735	0.0000	432.1	19.18
Outlook RE20, Cert_E20	5/24/11	128425	117024	11810	0.0343	0.0266	0.0086	0.2735	0.0203	483.0	17.15	0.1484	0.1270	0.0248	1.1563	0.0980	516.0	16.00	0.0025	-0.0007	0.0037	0.0052	0.0000	495.2	16.75	0.0083	0.0035	0.0055	0.1149	0.0000	435.1	19.05
Outlook RE20, Cert_E20	5/23/11	128425	213636	11791	0.0315	0.0234	0.0086	0.3826	0.0152	487.4	16.99	0.1213	0.0998	0.0249	1.2040	0.0733	521.5	15.83	0.0045	0.0018	0.0031	0.0957	0.0000	497.7	16.66	0.0148	0.0092	0.0065	0.3037	0.0000	442.2	18.73
Outlook RE20, Cert_E0	11/16/11	128425	1102976	120208	0.0468	0.0353	0.0120	0.7821	0.0194	482.0	18.22	0.1866	0.1533	0.0346	2.9661	0.0926	517.5	16.85	0.0081	0.0033	0.0050	0.2183	0.0000	498.0	17.68	0.0142	0.0065	0.0080	0.1945	0.0006	425.3	20.70
Outlook RE20, Cert_E0	11/15/11	128425	1102932	120189	0.0407	0.0304	0.0107	0.4706	0.0301	482.1	18.24	0.1543	0.1292	0.0261	1.1604	0.1428	516.4	16.98	0.0086	0.0028	0.0060	0.3572	0.0000	496.3	17.73	0.0150	0.0075	0.0078	0.1620	0.0015	429.5	20.49
Outlook RE20, Cert_E0	11/11/11	128425	1102880	120151	0.0354	0.0266	0.0108	0.5000	0.0159	488.5	18.00	0.1490	0.1204	0.0297	1.8010	0.0762	513.4	17.05	0.0015	0.0000	0.0048	0.1347	0.0000	506.7	17.38	0.0136	0.0061	0.0078	0.2080	0.0003	435.1	20.23
Outlook RE20, Cert_E0	10/5/11	128425	1102289	90528	0.0482	0.0395	0.0090	0.7650	0.0210	480.8	18.27	0.1844	0.1562	0.0293	2.7410	0.1002	518.1	16.84	0.0126	0.0093	0.0035	0.2688	0.0001	491.8	17.89	0.0129	0.0087	0.0043	0.2155	0.0008	431.9	20.38
Outlook RE20, Cert_E0	9/27/11	128425	1102147	90242	0.0427	0.0336	0.0106	0.8248	0.0292	479.1	18.33	0.1796	0.1476	0.0333	3.1726	0.1355	515.2	16.92	0.0025	0.0000	0.0049	0.2364	0.0016	492.9	17.86	0.0149	0.0107	0.0043	0.1560	0.0009	426.0	20.67
Outlook RE20, Cert_E0	9/26/11	128425	1102131	90223	0.0547	0.0455	0.0095	0.7276	0.0321	480.9	18.27	0.2223	0.1972	0.0261	1.9053	0.1521	504.8	17.32	0.0075	0.0034	0.0042	0.5393	0.0000	499.4	17.61	0.0169	0.0101	0.0071	0.1924	0.0021	428.0	20.56
Outlook RE20, Cert_E0	9/23/11	128425	1102101	90204	0.0335	0.0254	0.0093	0.3970	0.0212	480.1	18.32	0.1369	0.1119	0.0259	1.4957	0.0978	510.2	17.17	0.0033	0.0000	0.0051	0.0875	0.0010	492.8	17.87	0.0124	0.0081	0.0045	0.1519	0.0017	433.5	20.31
Outlook RE20, Cert_E0	8/3/11	128425	2101099	60208	0.0327	0.0220	0.0115	0.7213	0.0158	479.1	18.51	0.1306	0.0994	0.0330	2.4606	0.0748	507.4	17.38	0.0040	0.0000	0.0044	0.3001	0.0000	494.0	17.98	0.0132	0.0051	0.0086	0.2056	0.0011	429.4	20.69
Outlook RE20, Cert_E0	8/2/11	128425	2101087	60189	0.0289	0.0202	0.0100	0.4329	0.0201	481.5	18.43	0.1177	0.0929	0.0262	1.6222	0.0945	509.7	17.34	0.0032	0.0000	0.0049	0.1446	0.0000	495.7	17.92	0.0103	0.0033	0.0074	0.0790	0.0020	433.5	20.50
Outlook RE20, Cert_E0	8/1/11	128425	2101060	60171	0.0343	0.0243	0.0117	0.6945	0.0090	489.4	18.12	0.1365	0.1054	0.0328	2.6587	0.0431	514.9	17.11	0.0021	0.0000	0.0042	0.0762	0.0001	509.5	17.44	0.0180	0.0087	0.0098	0.3770	0.0003	432.1	20.54
Outlook RE20, Cert_E0	5/17/11	128425	213624	11754	0.0265	0.0204	0.0072	0.5527	0.0163	488.6	18.16	0.1161	0.0963	0.0230	1.4439	0.0781	518.1	17.07	0.0011	-0.0012	0.0027	0.4030	0.0002	500.7	17.73	0.0068	0.0035	0.0038	0.1626	0.0002	443.5	20.03
Outlook RE20, Cert_E0	5/16/11	128425	213622	11735	0.0272	0.0215	0.0069	0.4569	0.0179	500.9	17.72	0.1216	0.1021	0.0225	1.5887	0.0864	527.2	16.77	0.0000	-0.0014	0.0017	0.1731	0.0000	515.7	17.23	0.0074	0.0030	0.0050	0.1393	0.0001	453.2	19.61
Outlook RE20, Cert_E0	5/13/11	128425	213618	11716	0.0265	0.0198	0.0072	0.4353	0.0102	497.5	17.84	0.1127	0.0904	0.0258	1.3665	0.0493	518.2	17.07	0.0009	-0.0002	0.0013	0.1997	0.0000	509.8	17.43	0.0096	0.0058	0.0044	0.1764	0.0000	458.5	19.37

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
2000 Accord RE0, Cert_E0	12/28/10	101021	213246	141628	0.1371	0.1045	0.0344	5.7415	0.1423	312.3	27.45	0.3481	0.3149	0.0384	7.3958	0.5594	332.7	25.56	0.0722	0.0402	0.0370	6.1026	0.0174	318.1	26.93	0.0998	0.0768	0.0266	3.8113	0.0626	286.0	30.21
2000 Accord RE0, Cert_E0	12/23/10	101021	116828	141590	0.1860	0.1416	0.0353	5.7052	0.1517	313.6	27.33	0.5624	0.4974	0.0386	7.4170	0.5967	337.9	25.14	0.0803	0.0425	0.0385	5.9604	0.0227	320.5	26.75	0.1016	0.0728	0.0267	3.9311	0.0592	282.3	30.58
2000 Accord RE0, Cert_E0	12/22/10	101021	116821	141570	0.1803	0.1358	0.0357	5.6795	0.1270	316.4	27.10	0.5849	0.5166	0.0410	8.1460	0.4943	338.6	25.00	0.0656	0.0287	0.0384	5.7104	0.0160	323.4	26.55	0.0922	0.0641	0.0265	3.7560	0.0601	286.2	30.21
2000 Accord RE0, Cert_E0	12/21/10	101021	116820	141550	0.1779	0.1377	0.0313	4.7867	0.1002	309.7	27.79	0.5772	0.5122	0.0377	7.6718	0.4046	335.2	25.30	0.0507	0.0199	0.0324	4.4091	0.0063	313.3	27.56	0.1181	0.0903	0.0245	3.3235	0.0486	283.7	30.53
2000 Accord RE0, Cert_E0	11/16/10	101021	116731	117316	0.1695	0.1401	0.0305	5.4125	0.1465	310.4	27.66	0.5230	0.4894	0.0388	7.6696	0.4914	331.4	25.59	0.0663	0.0398	0.0306	5.6194	0.0363	316.9	27.10	0.0987	0.0781	0.0238	3.3121	0.0958	282.0	30.73
2000 Accord RE0, Cert_E0	11/15/10	101021	116730	117297	0.1769	0.1458	0.0323	5.7369	0.1370	314.8	27.23	0.5268	0.4928	0.0393	8.2156	0.5206	334.9	25.28	0.0712	0.0422	0.0336	5.7354	0.0267	322.3	26.64	0.1121	0.0909	0.0245	3.8677	0.0557	285.5	30.26
2000 Accord RE0, Cert_E0	11/12/10	101021	116723	117277	0.1666	0.1365	0.0313	5.1270	0.1390	310.3	27.70	0.5655	0.5294	0.0417	8.3460	0.4884	330.0	25.61	0.0488	0.0219	0.0312	4.7793	0.0434	316.5	27.25	0.0896	0.0692	0.0237	3.3617	0.0570	283.6	30.54
2000 Accord RE0, Cert_E0	9/29/10	101021	116638	91564	0.0846	0.0692	0.0111	1.6472	0.0768	323.2	27.09	0.3309	0.2930	0.0223	4.6076	0.3270	340.3	25.34	0.0191	0.0117	0.0073	0.8984	0.0032	332.3	26.47	0.0219	0.0123	0.0097	0.8181	0.0260	293.3	29.98
2000 Accord RE0, Cert_E0	9/9/10	101021	212915	91545	0.0467	0.0414	0.0083	1.4354	0.0780	322.5	27.19	0.2078	0.1913	0.0191	3.9712	0.3493	342.4	25.29	0.0000	0.0000	0.0052	0.9692	0.0006	331.2	26.55	0.0138	0.0086	0.0060	0.4062	0.0202	291.0	30.29
2000 Accord RE0, Cert_E0	9/8/10	101021	212901	91525	0.0489	0.0410	0.0089	1.6094	0.0811	314.1	27.89	0.1848	0.1685	0.0188	3.9902	0.3466	332.2	26.05	0.0036	0.0000	0.0050	0.9881	0.0081	321.1	27.38	0.0319	0.0243	0.0087	0.9870	0.0186	287.0	30.61
2000 Accord RE15, Cert_E15	12/2/10	101015	116789	146186	0.1405	0.1071	0.0265	2.1819	0.2131	317.2	26.29	0.4583	0.4033	0.0338	3.7798	0.6558	333.9	24.73	0.0469	0.0222	0.0255	1.9730	0.0697	323.3	25.85	0.0785	0.0542	0.0230	1.3735	0.1514	293.1	28.57
2000 Accord RE15, Cert_E15	11/23/10	101015	116760	146166	0.1352	0.1088	0.0274	2.1038	0.2058	324.9	25.69	0.4440	0.4141	0.0346	3.7310	0.6814	342.8	24.12	0.0460	0.0226	0.0271	1.8629	0.0484	332.9	25.12	0.0712	0.0517	0.0225	1.3336	0.1453	296.3	28.27
2000 Accord RE15, Cert_E15	11/22/10	101015	116756	146135	0.1293	0.1054	0.0248	1.9690	0.1873	319.4	26.14	0.4364	0.4085	0.0323	3.4630	0.6341	337.6	24.51	0.0400	0.0198	0.0234	1.8189	0.0375	324.8	25.75	0.0667	0.0477	0.0219	1.1224	0.1337	295.1	28.41
2000 Accord RE15, Cert_E15	8/4/10	101015	116561	120397	0.1106	0.0902	0.0212	1.9225	0.0897	313.3	26.66	0.4169	0.3882	0.0333	4.2162	0.4016	333.6	24.72	0.0254	0.0090	0.0190	1.4474	0.0000	318.5	26.31	0.0405	0.0265	0.0162	1.0898	0.0239	288.0	29.13
2000 Accord RE15, Cert_E15	8/3/10	101015	116560	120378	0.1009	0.0818	0.0198	2.1929	0.0881	316.8	26.33	0.3795	0.3548	0.0286	3.8178	0.3977	336.1	24.59	0.0217	0.0062	0.0179	1.8857	0.0039	324.1	25.80	0.0404	0.0259	0.0167	1.5464	0.0136	288.5	29.00
2000 Accord RE15, Cert_E15	8/2/10	101015	116555	120359	0.0992	0.0799	0.0201	2.0682	0.0976	314.3	26.56	0.3567	0.3307	0.0301	3.6674	0.4345	333.5	24.80	0.0218	0.0062	0.0180	1.8848	0.0029	321.2	26.03	0.0514	0.0372	0.0164	1.2071	0.0226	286.7	29.23
2000 Accord RE15, Cert_E15	6/30/10	101015	116487	95507	0.0487	0.0416	0.0074	1.0747	0.1259	320.9	26.10	0.2036	0.1892	0.0167	2.2000	0.3568	342.6	24.29	0.0054	0.0019	0.0040	0.8586	0.0762	326.6	25.68	0.0141	0.0082	0.0068	0.6347	0.0457	293.7	28.58
2000 Accord RE15, Cert_E15	6/29/10	101015	116484	95488	0.0478	0.0396	0.0086	1.0956	0.0954	323.3	25.90	0.1961	0.1821	0.0161	2.0517	0.3641	343.3	24.26	0.0060	0.0014	0.0053	0.9259	0.0152	329.7	25.43	0.0146	0.0068	0.0091	0.6927	0.0435	296.3	28.32
2000 Accord RE15, Cert_E15	6/25/10	101015	116477	95450	0.0571	0.0499	0.0074	0.9401	0.1101	327.1	25.62	0.2391	0.2237	0.0178	2.3291	0.3910	348.0	23.90	0.0077	0.0049	0.0032	0.6088	0.0299	333.7	25.16	0.0129	0.0065	0.0074	0.5168	0.0496	298.9	28.10
2000 Accord RE15, Cert_E0	10/13/10	101015	212989	146039	0.1114	0.0851	0.0278	3.2377	0.1742	321.2	27.04	0.3384	0.3060	0.0375	6.5805	0.5381	347.4	24.62	0.0401	0.0172	0.0265	2.5810	0.0407	327.8	26.61	0.0750	0.0551	0.0230	1.9546	0.1521	288.9	30.23
2000 Accord RE15, Cert_E0	10/12/10	101015	212984	146020	0.1133	0.0874	0.0274	3.0230	0.2045	316.7	27.45	0.3564	0.3237	0.0377	6.3307	0.5994	337.2	25.36	0.0371	0.0143	0.0264	2.2731	0.0857	323.8	26.97	0.0733	0.0547	0.0216	1.9372	0.1303	287.8	30.34
2000 Accord RE15, Cert_E0	10/11/10	101015	212983	146000	0.1100	0.0841	0.0274	3.2560	0.1973	321.8	27.00	0.3328	0.3048	0.0324	5.4667	0.6030	343.2	25.04	0.0392	0.0147	0.0284	2.9635	0.0709	328.9	26.47	0.0756	0.0569	0.0217	2.1392	0.1300	292.1	29.88
2000 Accord RE15, Cert_E0	8/13/10	101015	212797	120524	0.1163	0.0858	0.0323	4.4102	0.1259	308.5	27.97	0.3438	0.3085	0.0409	7.8116	0.4466	331.2	25.63	0.0494	0.0204	0.0336	3.8739	0.0205	315.4	27.46	0.0714	0.0513	0.0232	2.8586	0.0837	278.1	31.23
2000 Accord RE15, Cert_E0	8/10/10	101015	116578	120497	0.1409	0.1128	0.0292	4.2608	0.1351	320.1	26.99	0.4127	0.3815	0.0361	6.5952	0.4480	337.9	25.27	0.0517	0.0262	0.0295	3.7453	0.0455	328.2	26.43	0.1047	0.0844	0.0235	3.4767	0.0689	291.6	29.71
2000 Accord RE15, Cert_E0	8/6/10	101015	116565	120459	0.1585	0.1292	0.0304	4.3272	0.0938	321.4	27.01	0.4894	0.4560	0.0387	6.9741	0.3609	337.8	25.34	0.0497	0.0223	0.0317	3.9913	0.0151	330.7	26.33	0.1132	0.0944	0.0218	2.9583	0.0399	291.3	29.96
2000 Accord RE15, Cert_E0	6/24/10	101015	116471	95378	0.0685	0.0587	0.0102	1.7537	0.0918	325.7	27.01	0.2786	0.2628	0.0182	3.7650	0.1947	340.6	25.55	0.0133	0.0058	0.0087	1.4813	0.0327	334.1	26.38	0.0137	0.0077	0.0069	0.7455	0.1255	298.5	29.62
2000 Accord RE15, Cert_E0	6/23/10	101015	116466	95359	0.0635	0.0545	0.0094	1.5622	0.0840	325.2	27.08	0.2705	0.2542	0.0188	3.7503	0.2841	343.7	25.33	0.0077	0.0014	0.0073	1.2245	0.0336	333.5	26.47	0.0128	0.0073	0.0064	0.5467	0.0281	295.4	29.96
2000 Accord RE15, Cert_E0	6/22/10	101015	116462	95340	0.0644	0.0527	0.0122	2.0085	0.0696	320.5	27.41	0.2616	0.2445	0.0198	3.6516	0.2254	332.7	26.16	0.0126	0.0020	0.0123	1.9554	0.0149	329.7	26.67	0.0135	0.0079	0.0065	0.8665	0.0553	293.7	30.08
2000 Accord RE20, Cert_E20	1/27/11	101022	116865	139759	0.0713	0.0555	0.0123	1.1499	0.1432	332.1	24.53	0.2857	0.2505	0.0222	2.3721	0.5553	351.0	23.05	0.0124	0.0047	0.0081	0.9733	0.0086	339.5	24.04	0.0210	0.0089	0.0126	0.5616	0.0872	303.9	26.89
2000 Accord RE20, Cert_E20	1/25/11	101022	116857	139740	0.0740	0.0586	0.0117	0.9721	0.1299	325.8	25.03	0.3053	0.2685	0.0227	2.0632	0.5185	348.7	23.23	0.0124	0.0046	0.0082	0.9196	0.0092	333.6	24.46	0.0156	0.0063	0.0098	0.2479	0.0642	293.9	27.85
2000 Accord RE20, Cert_E20	1/21/11	101022	116852	139721	0.0662	0.0516	0.0113	1.2293	0.1334	329.3	24.73	0.2681	0.2363	0.0194	2.0004	0.5062	352.6	22.99	0.0119	0.0036	0.0088	1.4129	0.0090	336.8	24.18	0.0165	0.0070	0.0099	0.2979	0.0871	297.5	27.51
2000 Accord RE20, Cert_E20	12/3/10	101022	213162	114592	0.0409	0.0326	0.0088	0.8851	0.1229	332.2	24.57	0.1588	0.1449	0.0161	1.5175	0.5191	358.4	22.69	0.0063	0.0005	0.0068	0.9310	0.0020	336.3	24.27	0.0167	0.0106	0.0071	0.3204	0.0508	304.4	26.88
2000 Accord RE20, Cert_E20	12/2/10	101022	116785	114570	0.0661	0.0557	0.0094	0.9091	0.1304	333.9	24.43	0.3024	0.2678	0.0203	1.8876	0.5094	357.1	22.71	0.0009	-0.0040	0.0057	0.8631	0.0016	341.1	23.94	0.0108	0.0030	0.0083	0.2555	0.0875	302.9	27.02
2000 Accord RE20, Cert_E20	12/1/10	101022	116782	114550	0.0606	0.0479	0.0109	0.8707	0.1127	334.3	24.41	0.2643	0.2313	0.0209	1.9975	0.4803	360.0	22.53	0.0060	-0.0013	0.0080	0.7445	0.0058	341.0	23.96	0.0107	0.0026	0.0087	0.2596	0.0382	302.1	27.10
2000 Accord RE20, Cert_E20	10/25/10	101022	116683	89687	0.0602	0.0482	0.0125	1.0823	0.1108	339.9	23.98	0.2325	0.2167	0.0183	1.6429	0.4480	367.3	22.12	0.0153	0.0057	0.0112	1.2929	0.0046	344.8	23.63	0.0149	0.0058	0.0105	0.2591	0.0570	309.9	26.42
2000 Accord RE20, Cert_E20	10/22/10	101022	116678	89669	0.0687	0.0591	0.0100	0.8688	0.1200	337.5	24.18	0.2880	0.2724	0.0181	1.5513	0.4817	356.9	22.76	0.0097	0.0036	0.0071	0.9062	0.0035	343.7	23.75	0.0146	0.0066	0.0093	0.2842	0.0668	310.9	26.32
2000 Accord RE20, Cert_E20	10/21/10	101022	213032	89649	0.0381	0.0300	0.0090	0.6339	0.1065	332.4	24.58	0.1495	0.1352	0.0165	1.3777	0.4366	353.3	23.03	0.0046	0.0000	0.0057	0.4350	0.0001	336.9	24.28	0.0174	0.0092	0.0095	0.4499	0.0593	307.9	26.56
2000 Accord RE20, Cert_E20	10/20/10	101022	213024	89630	0.0351	0.0284	0.0073	0.7615	0.1170	332.2	24.58	0.1433	0.1294	0.0160	1.7300	0.4611	356.8	22.77	0.0035	0.0000	0.0042	0.6637	0.0036	335.9	24.33	0.0130	0.0073	0.0066	0.2138	0.0718	306.7	26.70
2000 Accord RE20, Cert_E0	2/4/11	101022	116889	139898	0.0692	0.0563	0.0114	1.0765	0.1173	335.9	26.14	0.3018	0.2676	0.0200	2.8975	0.4863	355.1	24.48	0.0046	-0.0030	0.0085	0.7138	0.0025	344.0	25.59	0.0155	0.0057	0.0104	0.3864	0.0556	306.2	28.78
2000 Accord RE20, Cert_E0	2/3/11	101022	116887	139879	0.0705	0.0574	0.0111	1.0783	0.1134	333.8	26.31	0.3053	0.2719	0.0187	2.6475	0.4516	356.2	24.44	0.0053	-0.0022	0.0083	0.8396	0.0062	340.4	25.84	0.0175	0.0073	0.0106	0.3505	0.0622	304.3	28.97
2000 Accord RE20, Cert_E0	2/2/11	101022	116884	139860	0.0803	0.0654	0.0108	0.9961	0.1077	337.4	26.03	0.3352	0.2981	0.0211	2.6449	0.4417	351.3	24.77	0.0128	0.0062	0.0068	0.6378	0.0036	346.7	25.39	0.0155	0.0053	0.0107	0.4266	0.0525	309.0	28.52
2000 Accord RE20, Cert_E0	12/8/10	101022	213185	114673	0.0525	0.0446	0.0128	1.2793	0.1376	332.1	26.43	0.2254	0.2060	0.0224	2.9088	0.5885	359.3	24.23	0.0028	-0.0070	0.0114	1.1207	0.0087	337.1	26.07	0.0162	0.0091	0.0082	0.3493	0.0415	302.2	29.18
2000 Accord RE20, Cert_E0	12/7/10	101022	213175	114654	0.0523	0.0443	0.0096	1.2346	0.1047	333.3	26.34	0.2222	0.2026	0.0226	3.8245	0.4364	354.3	24.47	0.0029	-0.0017	0.0054	0.6604	0.0089	340.1	25.90	0.0174	0.0107	0.0077	0.3643	0.0355	304.5	28.95
2000 Accord RE20, Cert_E0	12/6/10	101022	213165	114634	0.0436	0.0377	0.0083	0.9341	0.1097	333.9	26.33	0.1852	0.1702	0.0173	2.4951	0.4574	358.1	24.36	0.0006	-0.0036	0.0048	0.5673	0.0056	338.5	26.03	0.0179	0.0107	0.0084	0.4491	0.0442	306.9	28.71
2000 Accord RE20, Cert_E0	10/19/10	101022	213020	89588	0.0408	0.0351	0.0075	0.8477	0.1120	332.4	26.46	0.1767	0.1602	0.0190	2.7381	0.3897	351.1	24.82	0.0000	0.0000	0.0029	0.2760	0.0512	339.9	25.96	0.0148	0.0083	0.0076	0.4950	0.0166	304.1	28.97
2000 Accord RE20, Cert_E0	10/18/10	101022	213013	89569	0.0497	0.0409	0.0094	1.0699	0.0941	335.1	26.21	0.2052	0.1870	0.0211	2.7572	0.4025	354.3	24.59	0.0054	0.0005	0.0056	0.7985	0.0000	341.8	25.75	0.0164	0.0098	0.0076	0.3102	0.0394	308.0	28.63
2000 Accord RE20, Cert_E0	10/16/10	101022	213007	89550	0.0519	0.0423	0.0101	0.8803	0.0886	332.5	26.44	0.1909	0.1720	0.0219	2.4575	0.3911	348.9	25.00	0.0125	0.0070	0.0064	0.5394	0.0013	340.3	25.89	0.0217	0.0146	0.0082	0.3364	0.0258	305.4	28.87

Vehicle Model, Aging Fuel, Emissions Fuel	Test Start Date	Vehicle No.	Test No.	Odometer (Miles)	WTD Bag THC (g/mi)	WTD Bag NMHC (g/mi)	WTD Bag CH4 (g/mi)	WTD Bag CO (g/mi)	WTD Bag NOx (g/mi)	WTD Bag CO2 (g/mi)	WTD Fuel Econ (mpg)	Bag PH1 THC (g/mi)	Bag PH1 NMHC (g/mi)	Bag PH1 CH4 (g/mi)	Bag PH1 CO (g/mi)	Bag PH1 NOx (g/mi)	Bag PH1 CO2 (g/mi)	PH1 Fuel Econ (mpg)	Bag PH2 THC (g/mi)	Bag PH2 NMHC (g/mi)	Bag PH2 CH4 (g/mi)	Bag PH2 CO (g/mi)	Bag PH2 NOx (g/mi)	Bag PH2 CO2 (g/mi)	PH2 Fuel Econ (mpg)	Bag PH3 THC (g/mi)	Bag PH3 NMHC (g/mi)	Bag PH3 CH4 (g/mi)	Bag PH3 CO (g/mi)	Bag PH3 NOx (g/mi)	Bag PH3 CO2 (g/mi)	PH3 Fuel Econ (mpg)
2000 Focus RE0, Cert_E0	12/2/10	102001	116787	153194	0.1257	0.1044	0.0148	1.3164	0.0890	334.1	26.25	0.4993	0.4401	0.0360	4.9539	0.2964	353.4	24.35	0.0245	0.0156	0.0087	0.2263	0.0227	340.6	25.90	0.0342	0.0234	0.0103	0.6225	0.0573	307.3	28.65
2000 Focus RE0, Cert_E0	11/30/10	102001	116777	153175	0.1275	0.1058	0.0151	1.4290	0.0889	322.3	27.18	0.5198	0.4556	0.0404	5.5403	0.2905	343.6	24.95	0.0231	0.0150	0.0079	0.2370	0.0211	326.3	27.04	0.0274	0.0176	0.0096	0.5646	0.0640	298.9	29.46
2000 Focus RE0, Cert_E0	11/29/10	102001	116774	153156	0.1205	0.0998	0.0145	1.3520	0.0725	323.0	27.14	0.4778	0.4211	0.0344	4.9247	0.2366	340.4	25.26	0.0261	0.0171	0.0087	0.4352	0.0158	328.5	26.83	0.0302	0.0195	0.0104	0.3971	0.0563	299.5	29.42
2000 Focus RE0, Cert_E0	8/24/10	102001	212837	128092	0.0376	0.0322	0.0057	0.4135	0.1031	321.7	27.39	0.1475	0.1368	0.0124	1.5368	0.3056	346.5	25.29	0.0056	0.0026	0.0034	0.1177	0.0112	325.1	27.16	0.0150	0.0108	0.0048	0.1236	0.1237	296.9	29.73
2000 Focus RE0, Cert_E0	8/23/10	102001	212835	128074	0.0390	0.0339	0.0054	0.5475	0.0949	318.7	27.63	0.1543	0.1424	0.0138	1.7186	0.3097	346.6	25.26	0.0037	0.0020	0.0019	0.0654	0.0090	318.0	27.77	0.0187	0.0138	0.0057	0.5726	0.0947	299.0	29.45
2000 Focus RE0, Cert_E0	8/20/10	102001	212831	128055	0.0427	0.0377	0.0053	0.8165	0.0974	318.3	27.63	0.1708	0.1579	0.0149	2.7871	0.3301	345.8	25.19	0.0034	0.0024	0.0012	0.0842	0.0094	318.8	27.69	0.0204	0.0153	0.0059	0.7146	0.0882	296.4	29.68
2000 Focus RE0, Cert_E0	7/7/10	102001	116514	103106	0.0886	0.0788	0.0101	0.6031	0.0916	316.6	27.93	0.3243	0.3081	0.0188	1.4863	0.2957	334.2	26.30	0.0311	0.0236	0.0086	0.4029	0.0171	322.3	27.48	0.0185	0.0130	0.0063	0.3123	0.0774	292.7	30.27
2000 Focus RE0, Cert_E0	7/6/10	102001	116510	103087	0.0810	0.0739	0.0075	0.5557	0.0881	317.8	27.84	0.3140	0.2995	0.0168	1.5513	0.2827	331.8	26.48	0.0215	0.0170	0.0051	0.2433	0.0122	323.3	27.42	0.0165	0.0123	0.0048	0.3876	0.0829	296.9	29.84
2000 Focus RE0, Cert_E0	7/5/10	102001	116506	103069	0.0833	0.0764	0.0072	0.4885	0.1026	319.8	27.67	0.3193	0.3054	0.0161	1.5642	0.2729	335.4	26.19	0.0220	0.0179	0.0048	0.2351	0.0112	326.7	27.13	0.0210	0.0168	0.0049	0.1563	0.1465	294.8	30.08
2000 Focus RE15, Cert_E15	12/2/10	102015	116788	135788	0.0618	0.0443	0.0146	0.4512	0.1334	317.9	26.47	0.2134	0.1822	0.0222	1.7295	0.3677	342.8	24.38	0.0181	0.0064	0.0123	0.0082	0.0418	320.8	26.30	0.0296	0.0166	0.0130	0.3204	0.1287	293.7	28.68
2000 Focus RE15, Cert_E15	11/30/10	102015	116779	135769	0.0614	0.0428	0.0157	0.4786	0.1414	317.7	26.49	0.2182	0.1827	0.0269	1.9103	0.3763	341.6	24.45	0.0163	0.0046	0.0125	0.0425	0.0260	320.9	26.29	0.0276	0.0144	0.0135	0.2172	0.1809	293.8	28.69
2000 Focus RE15, Cert_E15	11/29/10	102015	116772	135750	0.0595	0.0412	0.0155	0.3371	0.1092	313.6	26.86	0.2043	0.1744	0.0213	1.3636	0.3398	338.3	24.75	0.0177	0.0045	0.0141	0.0414	0.0290	315.6	26.73	0.0291	0.0154	0.0139	0.1212	0.0866	291.0	28.98
2000 Focus RE15, Cert_E15	9/7/10	102015	212896	110542	0.0385	0.0289	0.0101	0.3088	0.1645	309.4	27.23	0.1177	0.1034	0.0165	1.3188	0.6196	335.1	25.01	0.0157	0.0087	0.0081	0.0400	0.0238	312.5	27.00	0.0218	0.0139	0.0092	0.0543	0.0868	284.2	29.69
2000 Focus RE15, Cert_E15	9/3/10	102015	212887	110523	0.0378	0.0274	0.0110	0.3461	0.2098	309.5	27.21	0.1148	0.1011	0.0158	1.5150	0.3352	337.4	24.82	0.0143	0.0063	0.0092	0.0300	0.0634	309.6	27.26	0.0241	0.0149	0.0107	0.0610	0.3918	288.3	29.26
2000 Focus RE15, Cert_E15	8/31/10	102015	212869	110470	0.0439	0.0297	0.0149	0.3685	0.1609	310.5	27.12	0.1370	0.1110	0.0301	1.5448	0.3384	339.1	24.69	0.0170	0.0077	0.0107	0.0308	0.0879	309.5	27.26	0.0245	0.0146	0.0114	0.1199	0.1651	290.9	28.99
2000 Focus RE15, Cert_E15	7/28/10	102015	116542	85691	0.0643	0.0540	0.0108	0.3085	0.0944	311.9	27.00	0.2383	0.2250	0.0153	1.1255	0.2855	338.5	24.75	0.0173	0.0092	0.0094	0.0332	0.0287	313.3	26.93	0.0212	0.0127	0.0099	0.2083	0.0734	289.2	29.15
2000 Focus RE15, Cert_E15	7/26/10	102015	212721	85654	0.0393	0.0292	0.0103	0.5100	0.0824	309.8	27.07	0.1440	0.1227	0.0216	2.0658	0.2586	332.8	25.00	0.0082	0.0012	0.0071	0.0360	0.0295	313.4	26.84	0.0193	0.0116	0.0078	0.2327	0.0495	285.8	29.40
2000 Focus RE15, Cert_E15	7/23/10	102015	212717	85635	0.0436	0.0333	0.0104	0.4225	0.0917	305.2	27.59	0.1354	0.1205	0.0173	1.6806	0.2630	328.4	25.46	0.0170	0.0097	0.0084	0.0729	0.0221	307.6	27.43	0.0242	0.0164	0.0090	0.1296	0.0931	283.1	29.78
2000 Focus RE15, Cert_E0	10/25/10	102015	116685	135646	0.0599	0.0477	0.0126	0.4679	0.1242	330.0	26.69	0.1954	0.1799	0.0180	1.8133	0.3171	351.8	24.87	0.0215	0.0124	0.0105	0.0563	0.0365	334.6	26.39	0.0292	0.0184	0.0125	0.2206	0.1422	305.2	28.91
2000 Focus RE15, Cert_E0	10/21/10	102015	213033	135608	0.0443	0.0326	0.0124	0.5112	0.1207	315.5	27.92	0.1321	0.1168	0.0176	1.9915	0.3189	338.8	25.80	0.0190	0.0091	0.0114	0.0753	0.0587	317.9	27.77	0.0260	0.0171	0.0102	0.2210	0.0887	293.3	30.08
2000 Focus RE15, Cert_E0	10/20/10	102015	213027	135589	0.0433	0.0325	0.0114	0.5349	0.1057	320.0	27.52	0.1383	0.1227	0.0180	1.8788	0.3380	342.9	25.51	0.0139	0.0069	0.0081	0.0637	0.0265	322.9	27.35	0.0271	0.0162	0.0125	0.4096	0.0797	297.3	29.64
2000 Focus RE15, Cert_E0	9/15/10	102015	212928	110677	0.0422	0.0305	0.0124	0.5835	0.0913	311.4	28.28	0.1299	0.1119	0.0208	2.0598	0.2969	337.9	25.86	0.0150	0.0067	0.0096	0.0843	0.0150	313.0	28.21	0.0273	0.0176	0.0112	0.4092	0.0797	288.4	30.56
2000 Focus RE15, Cert_E0	9/14/10	102015	212925	110658	0.0407	0.0296	0.0117	0.6770	0.0889	313.8	28.04	0.1350	0.1185	0.0191	2.3587	0.2733	340.2	25.66	0.0118	0.0037	0.0094	0.1013	0.0294	316.1	27.93	0.0241	0.0150	0.0105	0.4980	0.0625	289.7	30.41
2000 Focus RE15, Cert_E0	9/13/10	102015	212923	110639	0.0405	0.0297	0.0114	0.5105	0.1003	313.4	28.10	0.1292	0.1133	0.0184	2.0525	0.3020	334.3	26.14	0.0132	0.0050	0.0094	0.0588	0.0148	316.4	27.91	0.0252	0.0168	0.0097	0.2042	0.1101	291.9	30.22
2000 Focus RE15, Cert_E0	7/15/10	102015	116533	85518	0.0855	0.0755	0.0103	0.4029	0.0737	313.7	28.22	0.3300	0.3171	0.0150	1.2058	0.2672	336.9	26.12	0.0215	0.0135	0.0092	0.0922	0.0122	316.6	28.02	0.0210	0.0133	0.0089	0.3813	0.0433	290.5	30.49
2000 Focus RE15, Cert_E0	7/14/10	102015	116529	85499	0.0645	0.0553	0.0096	0.4764	0.0769	314.7	28.13	0.2365	0.2212	0.0177	1.8266	0.2467	338.6	25.93	0.0190	0.0131	0.0068	0.0417	0.0144	317.6	27.94	0.0205	0.0128	0.0089	0.2749	0.0666	291.0	30.45
2000 Focus RE15, Cert_E0	7/13/10	102015	116524	85481	0.0866	0.0784	0.0085	0.2778	0.0846	317.3	27.92	0.3496	0.3360	0.0158	1.0183	0.2900	338.3	26.03	0.0158	0.0112	0.0053	0.0545	0.0147	321.3	27.62	0.0213	0.0135	0.0091	0.1389	0.0612	293.7	30.19
2000 Focus RE20, Cert_E20	1/21/11	102021	116853	120097	0.0719	0.0556	0.0127	1.1633	0.1735	313.1	26.01	0.2679	0.2341	0.0217	2.6246	0.5062	333.6	24.21	0.0172	0.0081	0.0094	0.6786	0.0340	317.7	25.71	0.0263	0.0145	0.0120	0.9701	0.1842	289.0	28.21
2000 Focus RE20, Cert_E20	1/19/11	102021	213328	120066	0.0589	0.0476	0.0120	1.0698	0.2070	311.6	26.16	0.1970	0.1773	0.0227	2.8533	0.5372	330.9	24.40	0.0184	0.0120	0.0074	0.4407	0.0646	314.5	26.00	0.0309	0.0200	0.0126	0.9065	0.2257	291.3	28.00
2000 Focus RE20, Cert_E20	1/18/11	102021	213324	120048	0.0576	0.0464	0.0119	0.8072	0.1901	309.4	26.37	0.1966	0.1756	0.0242	2.3262	0.5178	331.0	24.46	0.0167	0.0103	0.0074	0.2443	0.0570	312.5	26.19	0.0298	0.0203	0.0110	0.7202	0.1932	287.2	28.42
2000 Focus RE20, Cert_E20	12/3/10	102021	213163	95022	0.0473	0.0402	0.0075	0.3852	0.2024	313.4	26.09	0.1779	0.1633	0.0169	1.5425	0.3977	334.2	24.31	0.0078	0.0045	0.0038	0.0603	0.0227	316.3	25.91	0.0231	0.0169	0.0072	0.1248	0.3943	292.3	28.02
2000 Focus RE20, Cert_E20	12/1/10	102021	116783	94985	0.0691	0.0575	0.0080	0.3447	0.1713	314.4	26.01	0.2886	0.2555	0.0195	1.4211	0.3623	331.1	24.53	0.0071	0.0039	0.0033	0.0280	0.0215	318.6	25.73	0.0196	0.0114	0.0082	0.1262	0.3078	293.9	27.87
2000 Focus RE20, Cert_E20	11/30/10	102021	116776	94965	0.0743	0.0617	0.0087	0.4768	0.1418	313.5	26.07	0.3221	0.2843	0.0228	1.8507	0.4717	335.5	24.16	0.0054	0.0017	0.0039	0.0485	0.0337	316.3	25.91	0.0163	0.0091	0.0072	0.2424	0.0953	291.8	28.05
2000 Focus RE20, Cert_E20	10/15/10	102021	213000	70100	0.0451	0.0389	0.0067	0.4682	0.1729	314.3	26.01	0.1664	0.1509	0.0179	1.6318	0.3281	330.3	24.59	0.0090	0.0076	0.0015	0.0606	0.0249	319.9	25.62	0.0214	0.0147	0.0077	0.3534	0.3332	291.8	28.03
2000 Focus RE20, Cert_E20	10/14/10	102021	212991	70081	0.0401	0.0345	0.0071	0.5682	0.1468	315.6	25.89	0.1788	0.1620	0.0194	2.3385	0.2964	335.3	24.14	0.0000	0.0000	0.0023	0.0363	0.0182	319.0	25.69	0.0107	0.0048	0.0069	0.2309	0.2756	294.4	27.81
2000 Focus RE20, Cert_E20	10/13/10	102021	212988	70063	0.0400	0.0346	0.0067	0.3698	0.1514	316.6	25.83	0.1768	0.1618	0.0173	1.5129	0.3283	336.6	24.15	0.0000	0.0000	0.0018	0.0603	0.0247	321.3	25.51	0.0117	0.0050	0.0077	0.0862	0.2542	292.9	27.98
2000 Focus RE20, Cert_E20	10/12/10	102021	212985	70044	0.0378	0.0322	0.0060	0.4500	0.1494	318.6	25.66	0.1583	0.1442	0.0163	1.8174	0.3320	339.2	23.93	0.0017	0.0002	0.0018	0.0448	0.0164	322.5	25.41	0.0150	0.0096	0.0062	0.1815	0.2619	295.8	27.68
2000 Focus RE20, Cert_E0	2/1/11	102021	116882	120226	0.0849	0.0669	0.0137	1.7161	0.2331	321.6	27.21	0.3277	0.2884	0.0242	3.6378	0.5942	341.4	25.36	0.0178	0.0077	0.0105	1.1978	0.0874	326.1	26.92	0.0277	0.0160	0.0118	1.2398	0.2346	298.2	29.42
2000 Focus RE20, Cert_E0	1/28/11	102021	116873	120200	0.0873	0.0694	0.0135	1.9915	0.2387	316.6	27.60	0.3238	0.2864	0.0222	3.6642	0.5660	334.5	25.87	0.0208	0.0105	0.0105	1.6016	0.1202	321.0	27.29	0.0333	0.0206	0.0125	1.4570	0.2138	294.8	29.72
2000 Focus RE20, Cert_E0	1/27/11	102021	116866	120181	0.0891	0.0715	0.0131	1.9604	0.2453	314.5	27.79	0.3359	0.2965	0.0237	3.6734	0.5147	333.0	25.99	0.0198	0.0108	0.0090	1.5746	0.1430	319.0	27.47	0.0333	0.0205	0.0126	1.3936	0.2345	292.0	30.01
2000 Focus RE20, Cert_E0	12/9/10	102021	213190	95101	0.0530	0.0433	0.0115	1.0376	0.1384	314.8	27.91	0.2174	0.1944	0.0266	3.1772	0.3928	334.3	25.98	0.0038	-0.0018	0.0065	0.3887	0.0283	317.2	27.80	0.0215	0.0133	0.0095	0.6459	0.1539	295.4	29.79
2000 Focus RE20, Cert_E0	12/7/10	102021	213176	95084	0.0496	0.0418	0.0096	0.7622	0.1407	314.1	28.00	0.2069	0.1876	0.0223	2.5996	0.3764	333.6	26.11	0.0021	-0.0022	0.0050	0.1943	0.0249	317.9	27.77	0.0202	0.0126	0.0088	0.4430	0.1804	292.3	30.14
2000 Focus RE20, Cert_E0	12/6/10	102021	213166	95063	0.0494	0.0412	0.0087	0.7237	0.1326	314.1	28.01	0.1980	0.1794	0.0215	2.4602	0.3707	335.3	26.00	0.0038	0.0003	0.0040	0.1428	0.0232	317.2	27.83	0.0230	0.0163	0.0077	0.5039	0.1583	292.4	30.12
2000 Focus RE20, Cert_E0	8/30/10	102021	212858	70003	0.0398	0.0354	0.0061	0.5984	0.1022	319.4	27.57	0.1718	0.1584	0.0155	2.2179	0.3089	335.8	26.00	0.0000	0.0000	0.0028	0.0998	0.0127	322.5	27.38	0.0155	0.0111	0.0052	0.3185	0.1154	301.1	29.28
2000 Focus RE20, Cert_E0	8/27/10	102021	212855	69984	0.0413	0.0375	0.0050	0.4814	0.0774	317.1	27.78	0.1795	0.1675	0.0139	1.9474	0.3097	336.0	26.01	0.0000	0.0000	0.0019	0.0622	0.0063	320.5	27.55	0.0150	0.0114	0.0042	0.1661	0.0361	296.3	29.78
2000 Focus RE20, Cert_E0	8/26/10	102021	212850	69965	0.0455	0.0400	0.0058	0.5326	0.0778	316.8	27.80	0.1872	0.1726	0.0169	2.0764	0.3356	336.4	25.96	0.0048	0.0028	0.0023	0.0983	0.0028	320.3	27.57	0.0152	0.0117	0.0040	0.1843	0.0244	295.5	29.86

10.2 Cylinder Compression and Leak-Down Reports

128414-E0 Honda Odyssey (VIN: 5FNRL38229B024871)

COMPRESSION TEST AT 4126 MILES						CYLINDER LEAK DOWN TEST AT 4126 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	179 psi	1	180 psi	1	180 psi	1	0%	1	0%	1	0%
2	180 psi	2	180 psi	2	180 psi	2	0%	2	0%	2	0%
3	180 psi	3	180 psi	3	180 psi	3	0%	3	0%	3	0%
4	180 psi	4	180 psi	4	180 psi	4	0%	4	0%	4	0%
5	180 psi	5	180 psi	5	180 psi	5	0%	5	0%	5	0%
6	180 psi	6	180 psi	6	180 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 60286 MILES						CYLINDER LEAK DOWN TEST AT 60286 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	190 psi	1	190 psi	1	190 psi	1	0%	1	0%	1	0%
2	190 psi	2	190 psi	2	190 psi	2	0%	2	0%	2	0%
3	190 psi	3	190 psi	3	190 psi	3	0%	3	0%	3	0%
4	190 psi	4	190 psi	4	190 psi	4	0%	4	0%	4	0%
5	190 psi	5	190 psi	5	190 psi	5	0%	5	0%	5	0%
6	190 psi	6	190 psi	6	190 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 90309 MILES						CYLINDER LEAK DOWN TEST AT 90309 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	190 psi	1	190 psi	1	190 psi	1	0%	1	0%	1	0%
2	190 psi	2	190 psi	2	190 psi	2	0%	2	0%	2	0%
3	190 psi	3	190 psi	3	190 psi	3	0%	3	0%	3	0%
4	190 psi	4	190 psi	4	190 psi	4	0%	4	0%	4	0%
5	190 psi	5	190 psi	5	190 psi	5	0%	5	0%	5	0%
6	190 psi	6	190 psi	6	190 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 120158 MILES						CYLINDER LEAK DOWN TEST AT 120158 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	200 psi	1	205 psi	1	205 psi	1	0%	1	0%	1	0%
2	205 psi	2	205 psi	2	200 psi	2	0%	2	0%	2	0%
3	205 psi	3	205 psi	3	200 psi	3	0%	3	0%	3	0%
4	200 psi	4	200 psi	4	205 psi	4	0%	4	0%	4	0%
5	205 psi	5	200 psi	5	205 psi	5	0%	5	0%	5	0%
6	200 psi	6	205 psi	6	200 psi	6	0%	6	0%	6	0%

128415-E15 Honda Odyssey (VIN: 5FNRL38219B024876)

COMPRESSION TEST AT 5619 MILES						CYLINDER LEAK DOWN TEST AT 5619 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	180 psi	1	180 psi	1	180 psi	1	0%	1	0%	1	0%
2	180 psi	2	180 psi	2	180 psi	2	0%	2	0%	2	0%
3	180 psi	3	180 psi	3	180 psi	3	0%	3	0%	3	0%
4	180 psi	4	180 psi	4	180 psi	4	0%	4	0%	4	0%
5	180 psi	5	180 psi	5	180 psi	5	0%	5	0%	5	0%
6	180 psi	6	180 psi	6	180 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 60341 MILES						CYLINDER LEAK DOWN TEST AT 60341 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	190 psi	1	190 psi	1	190 psi	1	0%	1	0%	1	0%
2	190 psi	2	190 psi	2	190 psi	2	0%	2	0%	2	0%
3	190 psi	3	190 psi	3	190 psi	3	0%	3	0%	3	0%
4	190 psi	4	190 psi	4	190 psi	4	0%	4	0%	4	0%
5	190 psi	5	190 psi	5	190 psi	5	0%	5	0%	5	0%
6	190 psi	6	190 psi	6	190 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 90326 MILES						CYLINDER LEAK DOWN TEST AT 90326 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	190 psi	1	190 psi	1	190 psi	1	0%	1	0%	1	0%
2	190 psi	2	190 psi	2	190 psi	2	0%	2	0%	2	0%
3	190 psi	3	190 psi	3	190 psi	3	0%	3	0%	3	0%
4	190 psi	4	190 psi	4	190 psi	4	0%	4	0%	4	0%
5	190 psi	5	190 psi	5	190 psi	5	0%	5	0%	5	0%
6	190 psi	6	190 psi	6	190 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 120408 MILES						CYLINDER LEAK DOWN TEST AT 120408 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	190 psi	1	190 psi	1	190 psi	1	0%	1	0%	1	0%
2	185 psi	2	185 psi	2	185 psi	2	0%	2	0%	2	0%
3	185 psi	3	185 psi	3	185 psi	3	0%	3	0%	3	0%
4	190 psi	4	190 psi	4	190 psi	4	0%	4	0%	4	0%
5	185 psi	5	185 psi	5	185 psi	5	0%	5	0%	5	0%
6	185 psi	6	185 psi	6	185 psi	6	0%	6	0%	6	0%

128424-E20 Honda Odyssey (VIN: 5FNRL38289B033459)

COMPRESSION TEST AT 25144 MILES						CYLINDER LEAK DOWN TEST AT 25144 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170	1	170	1	170	1	5%	1	5%	1	5%
2	170	2	165	2	165	2	10%	2	10%	2	10%
3	170	3	165	3	170	3	5%	3	5%	3	5%
4	170	4	170	4	170	4	5%	4	5%	4	5%
5	165	5	165	5	170	5	10%	5	10%	5	10%
6	170	6	170	6	170	6	5%	6	5%	6	5%

COMPRESSION TEST AT 60249 MILES						CYLINDER LEAK DOWN TEST AT 60249 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	180	1	180	1	180	1	5%	1	5%	1	5%
2	180	2	180	2	180	2	5%	2	5%	2	5%
3	180	3	180	3	180	3	5%	3	5%	3	5%
4	180	4	180	4	180	4	5%	4	5%	4	5%
5	180	5	180	5	180	5	5%	5	5%	5	5%
6	180	6	180	6	180	6	5%	6	5%	6	5%

COMPRESSION TEST AT 90205 MILES						CYLINDER LEAK DOWN TEST AT 90205 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	175	1	170	1	170	1	5%	1	5%	1	5%
2	175	2	175	2	175	2	5%	2	5%	2	5%
3	175	3	170	3	175	3	10%	3	10%	3	10%
4	170	4	175	4	175	4	10%	4	10%	4	10%
5	175	5	175	5	170	5	5%	5	5%	5	5%
6	170	6	175	6	170	6	10%	6	10%	6	10%

COMPRESSION TEST AT 120309 MILES						CYLINDER LEAK DOWN TEST AT 120309 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	185	1	185	1	180	1	5%	1	5%	1	5%
2	180	2	180	2	180	2	5%	2	5%	2	5%
3	180	3	180	3	180	3	5%	3	5%	3	5%
4	180	4	185	4	185	4	10%	4	10%	4	10%
5	180	5	180	5	180	5	5%	5	5%	5	5%
6	185	6	185	6	180	6	5%	6	5%	6	5%

128416-E0 Ford Focus (VIN: 1FAHP35N29W172017)

COMPRESSION TEST AT 4129 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170 psi	1	170 psi	1	170 psi
2	170 psi	2	170 psi	2	170 psi
3	170 psi	3	170 psi	3	170 psi
4	170 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 4129 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 60225 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi
2	165 psi	2	165 psi	2	165 psi
3	165 psi	3	165 psi	3	165 psi
4	165 psi	4	165 psi	4	165 psi

CYLINDER LEAK DOWN TEST AT 60225 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 90233 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170 psi	1	170 psi	1	170 psi
2	170 psi	2	170 psi	2	170 psi
3	170 psi	3	170 psi	3	170 psi
4	170 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 90233 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 120142 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	175 psi	1	175 psi	1	175 psi
2	175 psi	2	175 psi	2	175 psi
3	175 psi	3	175 psi	3	175 psi
4	175 psi	4	175 psi	4	175 psi

CYLINDER LEAK DOWN TEST AT 120142 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	5%	4	5%	4	5%

128417-E15 Ford Focus (VIN: 1FAHP35NX9W178664)

COMPRESSION TEST AT 5548 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170 psi	1	170 psi	1	170 psi
2	170 psi	2	170 psi	2	170 psi
3	170 psi	3	170 psi	3	170 psi
4	170 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 5548 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 60288 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170 psi	1	170 psi	1	170 psi
2	170 psi	2	170 psi	2	170 psi
3	170 psi	3	170 psi	3	170 psi
4	170 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 60288 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 90309 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	170 psi	1	170 psi	1	170 psi
2	170 psi	2	170 psi	2	170 psi
3	170 psi	3	170 psi	3	170 psi
4	170 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 90309 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 120259					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	180 psi	1	170 psi	1	170 psi
2	180 psi	2	170 psi	2	170 psi
3	180 psi	3	170 psi	3	170 psi
4	180 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST 120259					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	0%	4	0%	4	0%

128422-E20 Ford Focus (VIN: 1FAHP36N89W168617)

COMPRESSION TEST AT 21837 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150	1	155	1	155
2	150	2	150	2	150
3	150	3	150	3	155
4	150	4	150	4	155

CYLINDER LEAK DOWN TEST AT 21837 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	10%	1	10%	1	10%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

COMPRESSION TEST AT 60277 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140	1	145	1	150
2	150	2	140	2	145
3	145	3	150	3	145
4	145	4	145	4	140

CYLINDER LEAK DOWN TEST AT 60277 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

COMPRESSION TEST AT 90286 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165	1	170	1	160
2	165	2	170	2	165
3	165	3	165	3	170
4	170	4	165	4	165

CYLINDER LEAK DOWN TEST AT 90286 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

COMPRESSION TEST AT 120266 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160	1	165	1	165
2	155	2	155	2	155
3	160	3	160	3	160
4	160	4	160	4	160

CYLINDER LEAK DOWN TEST AT 120266 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

128418-E0 Toyota Camry (VIN: 4T1BE46K89U375470)

COMPRESSION TEST AT 4200 MILES						CYLINDER LEAK DOWN TEST AT 4200 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 60166 MILES						CYLINDER LEAK DOWN TEST AT 60166 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 90143 MILES						CYLINDER LEAK DOWN TEST AT 90143 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 120142 MILES						CYLINDER LEAK DOWN TEST AT 120142 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	5%	1	5%	1	5%
2	155 psi	2	155 psi	2	155 psi	2	5%	2	5%	2	5%
3	155 psi	3	155 psi	3	155 psi	3	5%	3	5%	3	5%
4	155 psi	4	155 psi	4	155 psi	4	10%	4	10%	4	10%

128419-E15 Toyota Camry (VIN: 4T1BE46K79U892484)

COMPRESSION TEST AT 5810 MILES						CYLINDER LEAK DOWN TEST AT 5810 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 60283 MILES						CYLINDER LEAK DOWN TEST AT 60283 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 90404 MILES						CYLINDER LEAK DOWN TEST AT 90404 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	155 psi	3	155 psi	3	155 psi	3	0%	3	0%	3	0%
4	155 psi	4	155 psi	4	155 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 120284 MILES						CYLINDER LEAK DOWN TEST AT 120284 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150 psi	1	155 psi	1	155 psi	1	0%	1	0%	1	0%
2	155 psi	2	155 psi	2	155 psi	2	0%	2	0%	2	0%
3	160 psi	3	160 psi	3	160 psi	3	5%	3	5%	3	5%
4	130 psi	4	140 psi	4	150 psi	4	20%	4	20%	4	35%

128423-E20 Toyota Camry (VIN: 4T1BE46K79U288823)

COMPRESSION TEST AT 19040 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140	1	140	1	140
2	140	2	140	2	145
3	140	3	145	3	145
4	140	4	140	4	140

CYLINDER LEAK DOWN TEST AT 19040 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

COMPRESSION TEST AT 60285 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	145	1	140	1	145
2	140	2	140	2	140
3	140	3	140	3	140
4	140	4	145	4	145

CYLINDER LEAK DOWN TEST AT 60285 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	5%	4	5%	4	5%

COMPRESSION TEST AT 90301 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155	1	155	1	155
2	150	2	150	2	150
3	150	3	150	3	150
4	155	4	155	4	155

CYLINDER LEAK DOWN TEST AT 90301 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	10%	1	10%	1	10%
2	10%	2	10%	2	10%
3	10%	3	10%	3	10%
4	10%	4	10%	4	10%

COMPRESSION TEST AT 120263 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150	1	150	1	150
2	150	2	150	2	155
3	150	3	155	3	155
4	155	4	155	4	155

CYLINDER LEAK DOWN TEST AT 120263 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	10%	3	10%	3	10%
4	5%	4	5%	4	5%

128420-E0 Saturn Outlook (VIN: 5GZER13D59J180937)

COMPRESSION TEST AT 4126 MILES						CYLINDER LEAK DOWN TEST AT 4126 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi	1	0%	1	0%	1	0%
2	165 psi	2	165 psi	2	165 psi	2	0%	2	0%	2	0%
3	165 psi	3	165 psi	3	165 psi	3	0%	3	0%	3	0%
4	165 psi	4	165 psi	4	165 psi	4	0%	4	0%	4	0%
5	165 psi	5	165 psi	5	165 psi	5	0%	5	0%	5	0%
6	165 psi	6	165 psi	6	165 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 60277 MILES						CYLINDER LEAK DOWN TEST AT 60277 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi	1	0%	1	0%	1	0%
2	165 psi	2	165 psi	2	165 psi	2	0%	2	0%	2	0%
3	165 psi	3	165 psi	3	165 psi	3	0%	3	0%	3	0%
4	165 psi	4	165 psi	4	165 psi	4	0%	4	0%	4	0%
5	165 psi	5	165 psi	5	165 psi	5	0%	5	0%	5	0%
6	165 psi	6	165 psi	6	165 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 90233 MILES						CYLINDER LEAK DOWN TEST AT 90233 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi	1	0%	1	0%	1	0%
2	165 psi	2	165 psi	2	165 psi	2	0%	2	0%	2	0%
3	165 psi	3	165 psi	3	165 psi	3	0%	3	0%	3	0%
4	165 psi	4	165 psi	4	165 psi	4	0%	4	0%	4	0%
5	165 psi	5	165 psi	5	165 psi	5	0%	5	0%	5	0%
6	165 psi	6	165 psi	6	165 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 120204 MILES						CYLINDER LEAK DOWN TEST AT 120204 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	0%	1	0%	1	0%
2	160 psi	2	165 psi	2	160 psi	2	0%	2	0%	2	5%
3	165 psi	3	160 psi	3	165 psi	3	0%	3	0%	3	0%
4	160 psi	4	160 psi	4	160 psi	4	5%	4	0%	4	0%
5	165 psi	5	165 psi	5	165 psi	5	0%	5	5%	5	0%
6	160 psi	6	165 psi	6	160 psi	6	0%	6	0%	6	0%

128421-E15 Saturn Outlook (VIN: 5GZER13D49J181741)

COMPRESSION TEST AT 5717 MILES						CYLINDER LEAK DOWN TEST AT 5717 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi	1	0%	1	0%	1	0%
2	165 psi	2	165 psi	2	165 psi	2	0%	2	0%	2	0%
3	165 psi	3	165 psi	3	165 psi	3	0%	3	0%	3	0%
4	165 psi	4	165 psi	4	165 psi	4	0%	4	0%	4	0%
5	165 psi	5	165 psi	5	165 psi	5	0%	5	0%	5	0%
6	165 psi	6	165 psi	6	165 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 60357 MILES						CYLINDER LEAK DOWN TEST AT 60357 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	0%	1	0%	1	0%
2	160 psi	2	160 psi	2	160 psi	2	0%	2	0%	2	0%
3	160 psi	3	160 psi	3	160 psi	3	0%	3	0%	3	0%
4	160 psi	4	160 psi	4	160 psi	4	0%	4	0%	4	0%
5	160 psi	5	160 psi	5	160 psi	5	0%	5	0%	5	0%
6	160 psi	6	160 psi	6	160 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 90339 MILES						CYLINDER LEAK DOWN TEST AT 90339 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	0%	1	0%	1	0%
2	160 psi	2	160 psi	2	160 psi	2	0%	2	0%	2	0%
3	160 psi	3	160 psi	3	160 psi	3	0%	3	0%	3	0%
4	160 psi	4	160 psi	4	160 psi	4	0%	4	0%	4	0%
5	160 psi	5	160 psi	5	160 psi	5	0%	5	0%	5	0%
6	160 psi	6	160 psi	6	160 psi	6	0%	6	0%	6	0%

COMPRESSION TEST AT 120258 MILES						CYLINDER LEAK DOWN TEST AT 120258 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	0%	1	0%	1	0%
2	160 psi	2	165 psi	2	160 psi	2	0%	2	0%	2	0%
3	160 psi	3	160 psi	3	160 psi	3	0%	3	0%	3	0%
4	165 psi	4	160 psi	4	165 psi	4	0%	4	0%	4	0%
5	160 psi	5	160 psi	5	160 psi	5	0%	5	0%	5	0%
6	160 psi	6	165 psi	6	160 psi	6	0%	6	0%	6	0%

128425-E20 Saturn Outlook (VIN: 5GZER13D39J197980)

COMPRESSION TEST AT 17798 MILES						CYLINDER LEAK DOWN TEST AT 17798 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140	1	145	1	140	1	5%	1	5%	1	5%
2	145	2	145	2	145	2	5%	2	5%	2	5%
3	145	3	145	3	145	3	5%	3	5%	3	5%
4	145	4	145	4	145	4	5%	4	5%	4	5%
5	145	5	145	5	145	5	5%	5	5%	5	5%
6	145	6	145	6	145	6	5%	6	5%	6	5%

COMPRESSION TEST AT 60249 MILES						CYLINDER LEAK DOWN TEST AT 60249 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	145	1	145	1	145	1	5%	1	5%	1	5%
2	145	2	145	2	150	2	5%	2	5%	2	5%
3	145	3	145	3	140	3	5%	3	5%	3	5%
4	150	4	150	4	150	4	5%	4	5%	4	5%
5	140	5	145	5	140	5	5%	5	5%	5	5%
6	145	6	145	6	145	6	5%	6	5%	6	5%

COMPRESSION TEST AT 90566 MILES						CYLINDER LEAK DOWN TEST AT 90566 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140	1	145	1	145	1	5%	1	5%	1	5%
2	145	2	145	2	145	2	5%	2	5%	2	5%
3	140	3	145	3	145	3	5%	3	5%	3	5%
4	145	4	140	4	145	4	5%	4	5%	4	5%
5	145	5	145	5	145	5	5%	5	5%	5	5%
6	145	6	140	6	140	6	5%	6	5%	6	5%

COMPRESSION TEST AT 120283 MILES						CYLINDER LEAK DOWN TEST AT 120283 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155	1	150	1	150	1	5%	1	5%	1	5%
2	155	2	155	2	155	2	5%	2	5%	2	5%
3	150	3	150	3	150	3	5%	3	5%	3	5%
4	155	4	155	4	155	4	5%	4	5%	4	5%
5	150	5	150	5	150	5	5%	5	5%	5	5%
6	155	6	150	6	155	6	5%	6	5%	6	5%

101021-E0 Honda Accord (VIN: 1HGCG5649YA027642)

COMPRESSION TEST AT 91575 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi
2	160 psi	2	165 psi	2	160 psi
3	165 psi	3	160 psi	3	160 psi
4	165 psi	4	165 psi	4	160 psi

CYLINDER LEAK DOWN TEST AT 91575 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	10%	1	10%	1	10%
2	0%	2	0%	2	0%
3	0%	3	0%	3	0%
4	10%	4	10%	4	10%

COMPRESSION TEST AT 117327 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	165 psi	1	165 psi	1	165 psi
2	160 psi	2	165 psi	2	165 psi
3	165 psi	3	170 psi	3	170 psi
4	165 psi	4	170 psi	4	170 psi

CYLINDER LEAK DOWN TEST AT 117327 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	0%	1	0%	1	0%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	0%	4	0%	4	0%

COMPRESSION TEST AT 141670 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	160 psi	1	160 psi
2	160 psi	2	160 psi	2	160 psi
3	160 psi	3	160 psi	3	160 psi
4	160 psi	4	160 psi	4	160 psi

CYLINDER LEAK DOWN TEST AT 141670 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	5%	2	5%	2	5%
3	5%	3	5%	3	5%
4	0%	4	0%	4	0%

101015-E15 Honda Accord (VIN: 1HGCG5647YA153420)

COMPRESSION TEST AT 95584 MILES						CYLINDER LEAK DOWN TEST AT 95584 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	5%	1	5%	1	5%
2	160 psi	2	160 psi	2	160 psi	2	15%	2	15%	2	15%
3	165 psi	3	165 psi	3	165 psi	3	5%	3	5%	3	5%
4	160 psi	4	160 psi	4	160 psi	4	5%	4	5%	4	5%

COMPRESSION TEST AT 120565 MILES						CYLINDER LEAK DOWN TEST AT 120565 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi	1	0%	1	0%	1	0%
2	160 psi	2	160 psi	2	160 psi	2	15%	2	15%	2	15%
3	160 psi	3	160 psi	3	160 psi	3	5%	3	5%	3	5%
4	160 psi	4	160 psi	4	160 psi	4	0%	4	0%	4	0%

COMPRESSION TEST AT 146082 MILES						CYLINDER LEAK DOWN TEST AT 146082 MILES					
TEST #1		TEST #2		TEST #3		TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi	1	10%	1	10%	1	10%
2	155 psi	2	155 psi	2	155 psi	2	20%	2	15%	2	15%
3	160 psi	3	160 psi	3	160 psi	3	5%	3	5%	3	5%
4	160 psi	4	160 psi	4	160 psi	4	5%	4	5%	4	5%

101022-E20 Honda Accord (VIN: 1HGCG5649YA049592)

COMPRESSION TEST AT 89728 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	155 psi	1	155 psi	1	155 psi
2	155 psi	2	155 psi	2	155 psi
3	160 psi	3	160 psi	3	160 psi
4	160 psi	4	160 psi	4	160 psi

CYLINDER LEAK DOWN TEST AT 89728 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	10%	1	10%	1	10%
2	10%	2	10%	2	10%
3	10%	3	10%	3	10%
4	10%	4	10%	4	10%

COMPRESSION TEST AT 114715 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	160 psi	1	160 psi	1	160 psi
2	155 psi	2	160 psi	2	160 psi
3	160 psi	3	160 psi	3	160 psi
4	160 psi	4	160 psi	4	160 psi

CYLINDER LEAK DOWN TEST AT 114715 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	15%	1	15%	1	15%
2	10%	2	10%	2	10%
3	10%	3	10%	3	10%
4	15%	4	15%	4	15%

COMPRESSION TEST AT 139939 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150 psi	1	150 psi	1	155 psi
2	150 psi	2	155 psi	2	150 psi
3	160 psi	3	160 psi	3	160 psi
4	155 psi	4	160 psi	4	155 psi

CYLINDER LEAK DOWN TEST AT 139939 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	15%	1	15%	1	15%
2	10%	2	10%	2	10%
3	5%	3	5%	3	5%
4	10%	4	10%	4	10%

102001-E0 Ford Focus (VIN: 1FAFP34P3YW412653)

COMPRESSION TEST AT 103281 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150 psi	1	150 psi	1	150 psi
2	140 psi	2	145 psi	2	145 psi
3	150 psi	3	150 psi	3	150 psi
4	145 psi	4	145 psi	4	145 psi

CYLINDER LEAK DOWN TEST AT 103281 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	< 5%	1	< 5%	1	< 5%
2	< 5%	2	< 5%	2	< 5%
3	5%	3	5%	3	5%
4	< 5%	4	< 5%	4	< 5%

COMPRESSION TEST AT 128106 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	150 psi	1	150 psi	1	155 psi
2	150 psi	2	150 psi	2	150 psi
3	145 psi	3	145 psi	3	145 psi
4	150 psi	4	150 psi	4	150 psi

CYLINDER LEAK DOWN TEST AT 128106 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	< 5%	1	< 5%	1	< 5%
2	10%	2	10%	2	10%
3	15%	3	20%	3	20%
4	10%	4	10%	4	10%

COMPRESSION TEST AT 153141 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	145 psi	1	150 psi	1	150 psi
2	150 psi	2	150 psi	2	150 psi
3	150 psi	3	150 psi	3	150 psi
4	145 psi	4	150 psi	4	145 psi

CYLINDER LEAK DOWN TEST AT 153141 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	10%	1	10%	1	10%
2	10%	2	10%	2	10%
3	5%	3	5%	3	5%
4	15%	4	15%	4	15%

102015-E15 Ford Focus (VIN: 1FAFP34P9YW400216)

COMPRESSION TEST AT 85768 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140 psi	1	140 psi	1	140 psi
2	140 psi	2	140 psi	2	140 psi
3	140 psi	3	140 psi	3	140 psi
4	140 psi	4	140 psi	4	140 psi

CYLINDER LEAK DOWN TEST AT 85768 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	20%	1	20%	1	20%
2	15%	2	15%	2	15%
3	35%	3	35%	3	35%
4	20%	4	20%	4	20%

COMPRESSION TEST AT 110718 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140 psi	1	140 psi	1	140 psi
2	145 psi	2	145 psi	2	145 psi
3	140 psi	3	140 psi	3	140 psi
4	145 psi	4	145 psi	4	145 psi

CYLINDER LEAK DOWN TEST AT 110718 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	15%	1	15%	1	15%
2	25%	2	25%	2	25%
3	15%	3	15%	3	15%
4	10%	4	10%	4	10%

102021-E20 Ford Focus (VIN: 1FAFP34P4YW422950)

COMPRESSION TEST AT 70142 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140 psi	1	140 psi	1	140 psi
2	140 psi	2	140 psi	2	140 psi
3	140 psi	3	140 psi	3	140 psi
4	140 psi	4	140 psi	4	140 psi

CYLINDER LEAK DOWN TEST AT 70142 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	10%	2	10%	2	10%
3	5%	3	5%	3	5%
4	20%	4	20%	4	20%

COMPRESSION TEST AT 95144 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	145 psi	1	150 psi	1	150 psi
2	150 psi	2	150 psi	2	150 psi
3	150 psi	3	150 psi	3	150 psi
4	150 psi	4	150 psi	4	150 psi

CYLINDER LEAK DOWN TEST AT 95144 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	< 5%	1	< 5%	1	< 5%
2	10%	2	10%	2	10%
3	10%	3	10%	3	10%
4	< 5%	4	< 5%	4	< 5%

COMPRESSION TEST AT 120269 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	140 psi	1	145 psi	1	150 psi
2	150 psi	2	150 psi	2	145 psi
3	140 psi	3	140 psi	3	145 psi
4	150 psi	4	145 psi	4	145 psi

CYLINDER LEAK DOWN TEST AT 120269 MILES					
TEST #1		TEST #2		TEST #3	
CYLINDER	RESULTS	CYLINDER	RESULTS	CYLINDER	RESULTS
1	5%	1	5%	1	5%
2	10%	2	10%	2	10%
3	10%	3	10%	3	10%
4	5%	4	5%	4	5%