

March 26, 2015

Mr. Serge Monros
2530 South Birch Street
Santa Ana, CA 92707

Dear Mr. Monros:

RE: Enclosed Final Report

This brief letter is intended to provide you with some comments related to the recent hot start testing we conducted for your 2008 Toyota Highlander Vehicle.

As we discussed, if the vehicle testing cycle is started from cold start (instead of a stabilized hot start) the measured results for improvement with the SaviCorp modifications can result in a misleading data comparison. This issue is caused by the five minutes or so that it takes for the exhaust catalyst to warm up and operate efficiently.

The catalyst is not specifically controlled by the SaviCorp modification during this variable short interval of warm-up.

The exhaust emissions will be considerably higher during warm up than when the catalyst is totally stabilized and any comparison improvement for the data can be misleading.

For this reason, the baseline comparison of effectiveness caused by the SaviCorp modification should always be tested from a stabilized hot start to avoid wide variances in the total test data.

Please let us now if you have any questions.

Thank you for the vehicle testing business you have provided.

Sincerely,



Donel R. Olson
President

Chassis Dynamometer Testing
Using the NEDC Test Cycle

For
Light Duty Automobiles

For:
SaviCorp
2530 South Birch Street
Santa Ana, CA 92707

March, 2015

Conducted by
Olson-Ecologic Engine Testing Laboratories
Fullerton, CA



Introduction

This brief report provides exhaust emission and fuel economy results when testing a 2008 Toyota Highlander conventional vehicle. The NDEC official driving cycle with maximum speed of 120 KM/hour was used for all of the test data as measured from vehicle hot start.

The performance percent improvements as shown in Table 1 are compared to the baseline data when the vehicle was operated in its original configuration. The changes in the vehicle were installed by the client using modified part number 126-1-1260 controller number 30.

Figure 1 below illustrated the NDEC driving cycle followed by the driven vehicle for all tests from a hot start.

Figure 1
NDEC Official Test Cycle
With maximum speed of 120 KM/h

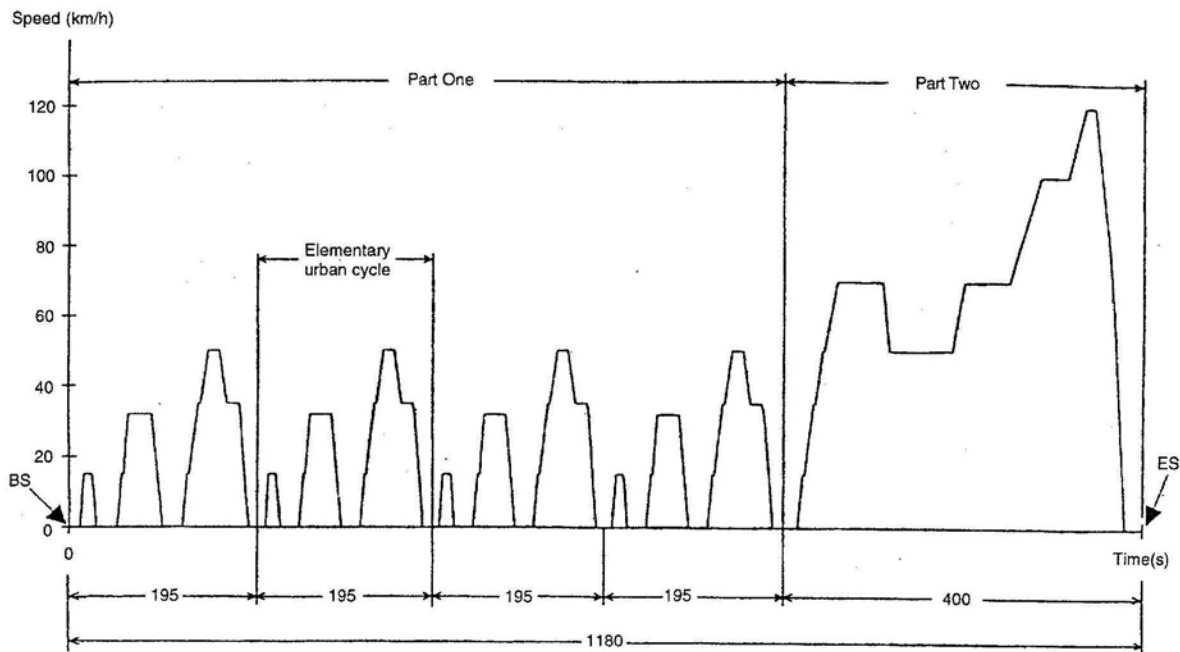




Table 1
2008 Model Year Toyota Highlander
V6 Gasoline VIN JTEDS43A682067887
for SaviCorp Using NEDC Test Cycle
Olson-EcoLogic Engine Testing Laboratory

Hot Start Baseline Vehicle in Original Configuration

TEST NO.	Grams/KM				L/100K	MPG
	THC	CO	NOx	CO2		
Test No. V5023779	0.069	0.919	0.033	290.83	12.45	18.89
Test No. V5023817	0.086	0.505	0.032	284.34	12.15	19.36
Baseline Test Averages	0.078	0.712	0.033	287.59	12.30	19.13

Hot Start with Customer Modified P/N 126-1-1260 Controller No. 30

TEST NO.	Grams/KM				L/100K	MPG
	THC	CO	NOx	CO2		
Test No. V5023821	0.007	0.043	0.004	257.26	10.95	21.48
Test No. V5023820	0.007	0.079	0.003	268.89	11.45	20.54
Hot Start Test Averages	0.007	0.061	0.004	263.08	11.20	21.01

Percent Improvement

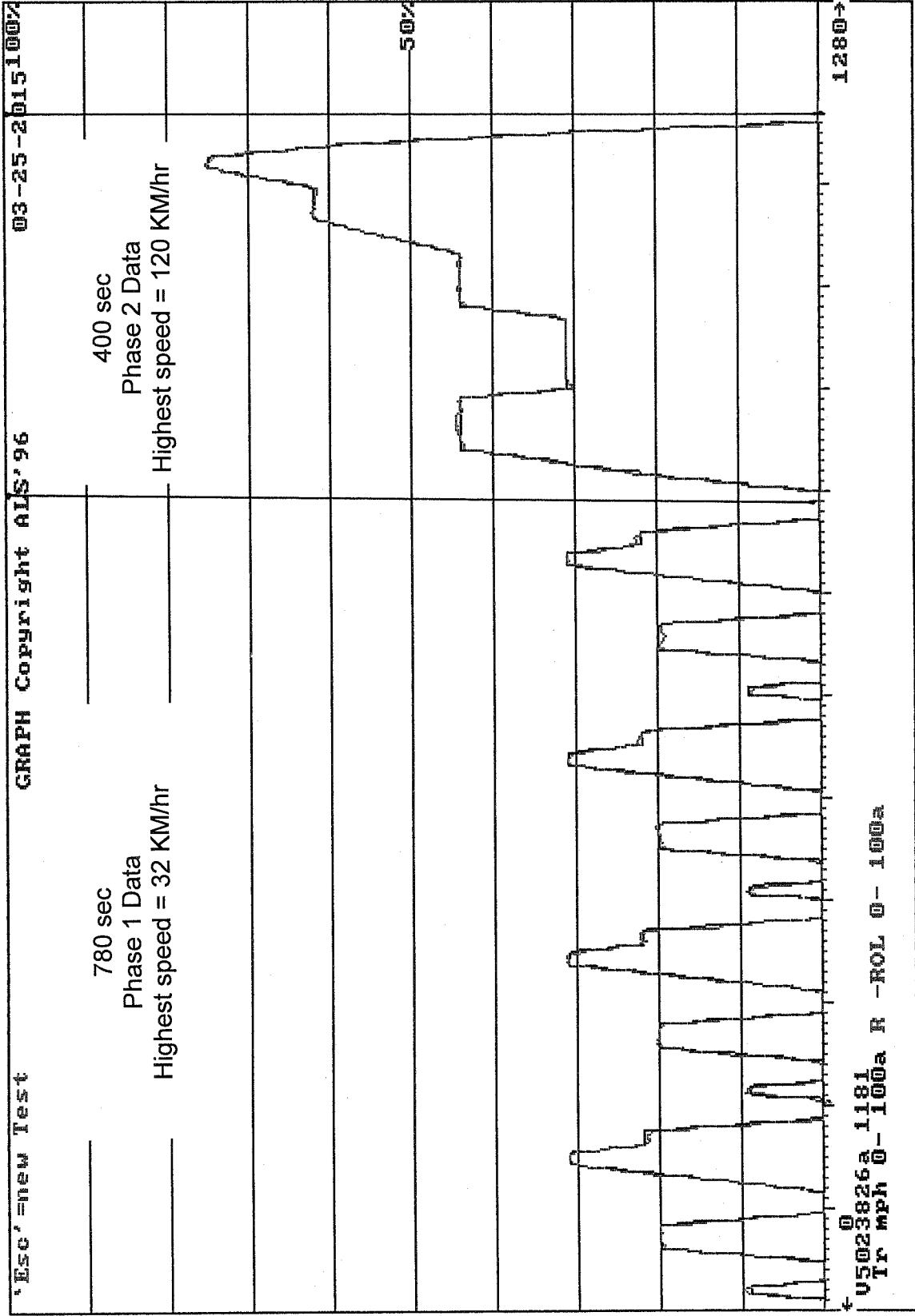
TEST DESCRIPTION	Grams/KM				L/100K	MPG
	THC	CO	NOx	CO2		
% Improvement	91.0%	91.4%	89.2%	8.5%	9.8%	9.8%

The detailed data for each test is provided in the Appendix. The first 780 seconds of driving is monitored and recorded in the first phase and the last 400 seconds at a higher speed is captured and recorded in the second phase.



Appendix

1. Official NEDC driven cycle
2. Dynamometer load data for all tests conducted
3. Detailed emission and fuel economy data for each test



REALTIME

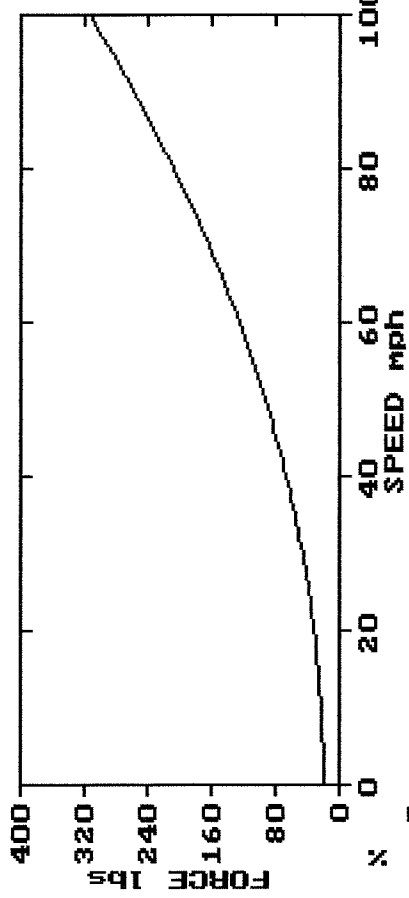
FEB 11-15 Printing

ROAD SIMULATION

08:39:32

SPEED	-0.00 mph	-0.00 kph
FORCE	0.0 lbs	0.0 N
POWER	0.0 hp	0.0 kW

DYND SETTING COEFFICIENTS	
A:	20.14
B:	-0.0273
C:	0.02969



VEHICLE	SAVICORP TOY HLAM
TEST NUMBER	U5023779
OPERATOR	A.HERRERA
ROBOT DRIVER	NO
BRAKE ASSIST	ON
DATA LOGGING	OFF
ENERGY TO VEH	6990. hp-s
ENERGY FROM VEH	12638 hp-s
AUG SIM ERROR	-0.02 %
DISTANCE	6.817 miles

INERTIA	6000 lbs
WEIGHT	5911 lbs
GRADE	0.00 %
F3 BRAKE	OFF
F4 LIFTS	DOWN
CLUTCH	N/A
PL RECORD	N/A
SITE	18
REMARKS	Ecologic

REAL TIME INERTIA	6000 lbs
SIM ERROR	0.00 %
MANUAL LOAD	OFF
ANALOG LOAD	OFF
ROADLOAD FORCE	0 lbs
COMMAND FORCE	0 lbs

Esc Exit F1 Run F2 Config F7 Align F8 Speed F9 Hold F10 Set/Alt ALT-R Review

Ecologic Engine Testing Laboratories
1370 S. Acacia Ave. Fullerton California

TEST NUMBER	V5023779	DATE	02-11-2015	RANGE	AUTO
VEHICLE REF	SAVICORP TOYOTA	VEH. TYPE	PC	FUEL TYPE	INDOLENE
V.I.N.	JTEDS43A682067687	TIRE PSI	30	DENSITY	16.33
ENGINE FAM.	8TYXT03.5BEM	ENGINEER	D.OGDEN	SPECIF. CO2	13.4
EVAP FAMILY	8TYXR0165P22	OPER/DRVR	A.HERRERA	Gr.C/gal.	2425
MAKE	TOYOTA	TEST TYPE	NEDC .NED	FUEL Fract.	.8649
MODEL	HIGHLANDER	SHIFT FILE	AUTO .N_D	SP. GRAVITY	.741
YEAR	2008	INERTIA	6000	N.H.V.	18482
TANK CAP		FORCE A	20.14	WT FACTOR	1
ODOMETER	103063.2	FORCE B	-0.0273	WT FACTOR	1
TRANS.	AUTO	FORCE C	0.02969	WT FACTOR	0
REMARKS	BASELINE				
REMARKS	TEST #1				
REMARKS					
START TIME	08:19:11	END TIME	08:38:52	FINAL ODO.	103070.1

#	EVENT	MILES	Km	TIME	TIME trace	HOLD	TIME trace	ERROR	GrCtrl	
1	CRANK	0.000	0.000	1.1	0.0 for	0.0	0.0 for	0.0	787	
2	PHASE 1	2.464	3.961	780.0	0.0 for	0.0	0.0 for	0.0	787	
3	BAGS	0.000	0.000	0.1	0.0 for	0.0	0.0 for	0.0	787	
4	PHASE 2	4.343	6.980	399.9	0.0 for	0.0	0.0 for	0.0	1831	
5	BAGS	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	515	
6	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
7	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
8	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
9	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
10	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
11	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
12	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1	
13	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0	
14	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0	
15	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0	
TEST COMPLETED		1180.1	SECONDS DVT=	0.0	A=	0.0214	B=	0.9992	HP@50=	0.0

PHASE 1	THC	CO	NOx	CO2	NMHC	Tdry=	73.7	Tdp =	-1.5
SAMPLE	13.8	51.7	1.2	0.784	47.7	BARO =	30.00	SEC =	781.2
AMBIENT	3.7	1.2	0.0	0.045	47.5	NoxKf=	0.804	VOLc=	4128.6
GRAMS	0.696	6.884	0.216	1587.64	.499	M.P.G.	13.67	DF =	16.950
GMS/MI	0.282	2.794	0.088	644.34	.202	MPGnhv	13.68	MI =	2.464
G/Mwgt	0.102	1.011	0.032	233.24	.073	R-H =	19.00	KM =	3.960

PHASE 2	THC	CO	NOx	CO2	NMHC	Tdry=	76.2	Tdp =	-2.2
SAMPLE	4.7	47.0	1.6	1.510	.6	BARO =	30.00	SEC =	399.9
AMBIENT	3.5	1.1	0.0	0.042	.6	NoxKf=	0.801	VOLc=	2087.8
GRAMS	0.054	3.168	0.145	1594.29	.052	M.P.G.	24.12	DF =	8.844
GMS/MI	0.013	0.729	0.033	367.09	.011	MPGnhv	24.10	MI =	4.343
G/Mwgt	0.006	0.365	0.017	183.55	.005	R-H =	16.60	KM =	6.981

WEIGHTED	THC	CO	NOx	CO2	FUEL ECONOMY			
GRAMS/MI	0.110	1.477	0.053	467.45	M.P.G.	18.89	NHVmpg	18.889
GRAMS/KM	0.069	0.919	0.033	290.83	L/100k	12.45	NHVkpl	8.031

MAXIMUM CFV RATIO= 0.000 RATIO LIMIT = 0.837

Ecologic Engine Testing Laboratories
1370 S. Acacia Ave. Fullerton California

TEST NUMBER	V5023817	DATE	03-23-2015	RANGE	AUTO
VEHICLE REF	SAVICORP TOYOTA	VEH. TYPE	PC	FUEL TYPE	INDOLENE
V.I.N.	JTEDS43A682067687	TIRE PSI	30	DENSITY	16.33
ENGINE FAM.	8TYXT03.5BEM	ENGINEER	D.OGDEN	SPECIF. CO2	13.4
EVAP FAMILY	8TYXR0165P22	OPER/DRVR	A.HERRERA	Gr.C/gal.	2425
MAKE	TOYOTA	TEST TYPE	NEDC	FUEL Fract.	.8649
MODEL	HIGHLANDER	SHIFT FILE	AUTO	SP. GRAVITY	.741
YEAR	2008	INERTIA	6000	N.H.V.	18482
TANK CAP		FORCE A	20.14	WT FACTOR	1
ODOMETER	103594	FORCE B	-0.0273	WT FACTOR	1
TRANS.	AUTO	FORCE C	0.02969	WT FACTOR	0
REMARKS	BASELINE				
REMARKS	TEST #1				
REMARKS					
START TIME	08:00:54	END TIME	08:20:35	FINAL ODO.	103600.8

#	EVENT	MILES	Km	TIME	TIME trace	HOLD	TIME trace	ERROR	GrCtrl
1	CRANK	0.000	0.000	1.1	0.0 for	0.0	0.0 for	0.0	787
2	PHASE 1	2.465	3.961	780.0	0.0 for	0.0	0.0 for	0.0	787
3	BAGS	0.000	0.000	0.1	0.0 for	0.0	0.0 for	0.0	787
4	PHASE 2	4.352	6.996	399.9	0.0 for	0.0	0.0 for	0.0	1831
5	BAGS	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	515
6	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
7	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
8	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
9	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
10	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
11	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
12	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
13	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
14	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
15	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0

TEST COMPLETED 1180.1 SECONDS DVT= 1.3 A= 0.0069 B= 1.0014 HP@50= 0.0

PHASE 1	THC	CO	NOx	CO2	NMHC	Tdry=	72.5	Tdp =	11.8
SAMPLE	16.3	39.7	1.6	0.755	3.2	BARO =	30.10	SEC =	781.2
AMBIENT	3.4	1.7	0.0	0.044	2.2	NoxKf=	0.934	VOLc=	4225.8
GRAMS	0.904	5.308	0.342	1563.33	.825	M.P.G.	13.91	DF =	17.618
GMS/MI	0.367	2.153	0.139	634.21	.335	MPGnhv	13.92	MI =	2.465
G/Mwgt	0.133	0.779	0.050	229.31	.121	R-H =	50.80	KM =	3.962
PHASE 2	THC	CO	NOx	CO2	NMHC	Tdry=	76.1	Tdp =	11.9
SAMPLE	4.7	5.4	0.1	1.442	2.5	BARO =	30.10	SEC =	399.9
AMBIENT	4.0	2.5	0.0	0.045	3.0	NoxKf=	0.935	VOLc=	2135.4
GRAMS	0.039	0.223	0.011	1552.13	.039	M.P.G.	24.90	DF =	9.286
GMS/MI	0.009	0.051	0.002	356.65	.009	MPGnhv	24.88	MI =	4.352
G/Mwgt	0.005	0.026	0.001	178.32	.004	R-H =	45.30	KM =	6.995

WEIGHTED	THC	CO	NOx	CO2	NMHC	FUEL ECONOMY	
GRAMS/MI	0.138	0.811	0.052	457.01	.126	M.P.G.	19.36
GRAMS/KM	0.086	0.505	0.032	284.34	.078	L/100k	12.15
						NHVmpg	19.363
						NHVkpl	8.233

MAXIMUM CFV RATIO= 0.000 RATIO LIMIT = 0.837

Ecologic Engine Testing Laboratories
1370 S. Acacia Ave. Fullerton California

TEST NUMBER	V5023821	DATE	03-24-2015	RANGE	AUTO
VEHICLE REF	SAVICORP TOYOTA	VEH. TYPE	PC	FUEL TYPE	INDOLENE
V.I.N.	JTEDS43A682067687	TIRE PSI	30	DENSITY	16.33
ENGINE FAM.	8TYXT03.5BEM	ENGINEER	D.OGDEN	SPECIF. CO2	13.4
EVAP FAMILY	8TYXR0165P22	OPER/DRVR	A.HERRERA	Gr.C/gal.	2425
MAKE	TOYOTA	TEST TYPE	NEDC .NED	FUEL Fract.	.8649
MODEL	HIGHLANDER	SHIFT FILE	AUTO .N_D	SP. GRAVITY	.741
YEAR	2008	INERTIA	6000	N.H.V.	18482
TANK CAP		FORCE A	20.14	WT FACTOR	1
ODOMETER	103913	FORCE B	-0.0273	WT FACTOR	1
TRANS.	AUTO	FORCE C	0.02969	WT FACTOR	0
REMARKS	DEVICE #30 TEST 2				
REMARKS					
REMARKS					
START TIME	09:03:40	END TIME	09:23:20	FINAL ODO.	103919.8

#	EVENT	MILES	Km	TIME	TIME trace	HOLD	TIME trace	ERROR	GrCtrl
1	CRANK	0.000	0.000	0.1	0.0 for	0.0	0.0 for	0.0	787
2	PHASE 1	2.456	3.948	780.0	0.0 for	0.0	0.0 for	0.0	787
3	BAGS	0.000	0.000	0.1	0.0 for	0.0	0.0 for	0.0	787
4	PHASE 2	4.349	6.990	399.9	0.0 for	0.0	0.0 for	0.0	1831
5	BAGS	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	515
6	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
7	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
8	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
9	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
10	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
11	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
12	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
13	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
14	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
15	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0

TEST COMPLETED 1180.1 SECONDS DVT= 1.1 A=-0.0278 B= 1.0012 HP@50= 0.0

PHASE 1	THC	CO	NOx	CO2	NMHC	Tdry=	76.0	Tdp =	10.6
SAMPLE	3.8	4.5	0.1	0.648	2.5	BARO =	30.00	SEC =	780.2
AMBIENT	3.5	2.7	0.0	0.046	2.5	NoxKf=	0.916	VOLc=	4197.3
GRAMS	0.032	0.267	0.021	1314.98	.030	M.P.G.	16.58	DF =	20.653
GMS/MI	0.013	0.109	0.008	535.42	.012	MPGnhv	16.57	MI =	2.456
G/Mwgt	0.005	0.039	0.003	193.24	.004	R-H =	41.70	KM =	3.948
PHASE 2	THC	CO	NOx	CO2	NMHC	Tdry=	77.1	Tdp =	11.1
SAMPLE	3.3	5.5	0.2	1.396	1.7	BARO =	30.00	SEC =	399.9
AMBIENT	3.1	2.9	0.0	0.043	2.2	NoxKf=	0.923	VOLc=	2129.5
GRAMS	0.018	0.204	0.021	1498.86	.018	M.P.G.	25.77	DF =	9.593
GMS/MI	0.004	0.047	0.005	344.64	.004	MPGnhv	25.74	MI =	4.349
G/Mwgt	0.002	0.023	0.002	172.32	.002	R-H =	41.60	KM =	6.990

 WEIGHTED THC CO NOx CO2 NMHC FUEL ECONOMY
 GRAMS/MI 0.007 0.069 0.006 413.50 .007 M.P.G. 21.48 NHVmpg 21.455
 GRAMS/KM 0.005 0.043 0.004 257.26 .004 L/100k 10.95 NHVkp1 9.122

MAXIMUM CFV RATIO= 0.000 RATIO LIMIT = 0.837

Ecologic Engine Testing Laboratories
1370 S. Acacia Ave. Fullerton California

TEST NUMBER	V5023820	DATE	03-24-2015	RANGE	AUTO
VEHICLE REF	SAVICORP TOYOTA	VEH. TYPE	PC	FUEL TYPE	INDOLENE
V.I.N.	JTEDS43A682067687	TIRE PSI	30	DENSITY	16.33
ENGINE FAM.	8TYXT03.5BEM	ENGINEER	D.OGDEN	SPECIF. CO2	13.4
EVAP FAMILY	8TYXR0165P22	OPER/DRVR	A.HERRERA	Gr.C/gal.	2425
MAKE	TOYOTA	TEST TYPE	NEDC	FUEL Fract.	.8649
MODEL	HIGHLANDER	SHIFT FILE	AUTO	SP. GRAVITY	.741
YEAR	2008	INERTIA	6000	N.H.V.	18482
TANK CAP		FORCE A	20.14	WT FACTOR	1
ODOMETER	103906	FORCE B	-0.0273	WT FACTOR	1
TRANS.	AUTO	FORCE C	0.02969	WT FACTOR	0
REMARKS	DEVICE #30				
REMARKS	TEST 1				
REMARKS					
START TIME	08:32:46	END TIME	08:52:27	FINAL ODO.	103912.8

#	EVENT	MILES	Km	TIME	TIME trace	HOLD	TIME trace	ERROR	GrCtrl
1	CRANK	0.000	0.000	1.2	0.0 for	0.0	0.0 for	0.0	787
2	PHASE 1	2.455	3.947	780.0	0.0 for	0.0	0.0 for	0.0	787
3	BAGS	0.000	0.000	0.1	0.0 for	0.0	0.0 for	0.0	787
4	PHASE 2	4.364	7.015	399.9	0.0 for	0.0	0.0 for	0.0	1831
5	BAGS	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	515
6	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
7	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
8	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
9	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
10	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
11	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
12	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	1
13	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
14	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0
15	END	0.000	0.000	0.0	0.0 for	0.0	0.0 for	0.0	0

TEST COMPLETED 1180.1 SECONDS DVT= 0.4 A=-0.1067 B= 1.0072 HP@50= 0.0

PHASE 1	THC	CO	NOx	CO2	NMHC	Tdry=	74.0	Tdp =	9.7
SAMPLE	3.7	6.8	0.1	0.672	2.0	BARO. =	30.00	SEC =	781.3
AMBIENT	3.1	2.3	0.0	0.047	2.0	NoxKf=	0.903	VOLc=	4208.9
GRAMS	0.052	0.640	0.021	1369.10	.038	M.P.G.	15.91	DF =	19.909
GMS/MI	0.021	0.261	0.008	557.68	.015	MPGnhv	15.90	MI =	2.455
G/Mwgt	0.008	0.094	0.003	200.77	.005	R-H =	42.00	KM =	3.946

PHASE 2	THC	CO	NOx	CO2	NMHC	Tdry=	74.9	Tdp =	9.9
SAMPLE	3.6	6.1	0.2	1.471	2.2	BARO. =	30.00	SEC =	399.9
AMBIENT	3.3	3.3	0.1	0.049	2.5	NoxKf=	0.906	VOLc=	2132.1
GRAMS	0.023	0.222	0.012	1577.96	.023	M.P.G.	24.56	DF =	9.103
GMS/MI	0.005	0.051	0.003	361.59	.005	MPGnhv	24.54	MI =	4.364
G/Mwgt	0.003	0.025	0.001	180.79	.002	R-H =	41.30	KM =	7.014

WEIGHTED	THC	CO	NOx	CO2	NMHC	FUEL ECONOMY			
GRAMS/MI	0.011	0.127	0.005	432.18	.008	M.P.G.	20.54	NHVmpg	20.523
GRAMS/KM	0.007	0.079	0.003	268.89	.005	L/100k	11.45	NHVkpl	8.726

MAXIMUM CFV RATIO= 0.000 RATIO LIMIT = 0.837