

## ECO Fuel Catalyst Testing

### Baseline Data Pre-Installation

Date installed	Bus #	ECO SN	Installation Notes	Avg ECM Key Time between Re-Gen's	LTD Mileage @ Install	LTD Fuel Usage	LTD MPG
8/29/16	10101	0-8604	No Active Codes @ Install	8.33	346,450	66,852	5.18
8/29/16	10107	0-8730	No Active Codes @ Install	25.33	287,447	55,726	5.16
8/29/16	10105	0-8878	No Active Codes @ Install	16.89	350,539	67,683	5.18
8/29/16	10111	0-1474	No Active Codes @ Install	17.66	324,602	62,327	5.21
8/29/16	10112	0-9568	No Active Codes @ Install	17.00	313,750	65,133	4.82
8/29/16	10109	0-9572	No Active Codes @ Install	20.33	320,499	61,669	5.20
8/29/16	10102	0-9573	No Active Codes @ Install	21.77	357,915	81,374	4.40
8/29/16	10114	0-9580	No Active Codes @ Install	20.11	333,604	67,195	4.96
8/29/16	10106	0-9565	No Active Codes @ Install	13.63	286,340	60,933	4.70
8/10/16	10113	0-8564	New DPF & DOC (OEM) installed for testing.	13.30	316,805	63,889	4.96

### Post Installation Data Averages

Date installed	Bus #	ECO SN	Installation Notes	Avg ECM Key Time between Re-Gen's	Re-Gen% change	Miles Traveled Post Installation	Fuel Usage Post Installation	MPG Post Installation	MPG Difference	MPG % Change
8/29/16	10101	0-8604	ReGen 8/29/16 @ install	14.5	42.63%	4,926	892	5.52	0.34	6.13%
8/29/16	10107	0-8730	ReGen 8/29/16 @ install	25.1	-0.87%	1,779	427	4.16	-0.99	-23.90%
8/29/16	10105	0-8878	ReGen 8/29/16 @ install	18.2	12.19%	6,027	870	6.93	1.75	25.27%
8/29/16	10111	0-1474	NO ReGen or filter changes @ install	19.1	19.15%	6,240	1036	6.03	0.82	13.57%
8/29/16	10112	0-9568	NO ReGen or filter changes @ install	20.7	17.72%	6,527	1647	3.96	-0.85	-21.53%
8/29/16	10109	0-9572	ReGen 8/29/16 @ install	22.2	8.52%	4,717	823	5.73	0.54	9.33%
8/29/16	10102	0-9573	ReGen 8/29/16 @ install	24.9	12.53%	3,927	916	4.29	-0.11	-2.60%
8/29/16	10114	0-9580	ReGen 8/29/16 @ install	20.8	3.21%	5,606	1107	5.07	0.10	2.01%
8/29/16	10106	0-9565	NO ReGen or filter changes @ install	14.0	2.64%	4,959	854	5.81	1.11	19.10%
8/10/16	10113	0-8564	NEW DPF & DOC @ install	18.7	28.95%	11,832	1806	6.55	1.59	24.33%

Fleet Averages

19.82	14.67%	5654	1038	5.41	0.43	5.17%
AVG Time Between REGENS	REGEN Change	Miles Traveled Post Installation	Fuel Used Post Install	MPG Install	+MPG% Diff.	MPG% Change

**10 Cummins ISB (+/- 250 HP) 8.427% Reduction in Fuel Consumption**

## **PSTA ECO-4 Fuel System MPG Update August 29, 2016**

<b><u>Bus#</u></b>	<b><u>ECO#</u></b>	<b><u>MPG Before</u></b>	<b><u>MPG After</u></b>	<b><u>MPG % Difference</u></b>	<b><u>Miles on Bus</u></b>
10101	0-8604	5.18	5.52	+6.56%	346,450
10107	0-8730	5.16	4.16	-19.37%	287,447
10105	0-8878	5.18	6.93	+33.78%	350,539
10111	0-1474	5.21	6.02	+15.54%	324,602
10112	0-9568	4.82	3.96	-17.8%	313,750
10109	0-9572	5.20	5.73	+10.19%	320,499
10102	0-9573	4.40	4.29	-2.50%	357,915
10114	0-9580	4.96	5.07	+2.21%	333,604
10106	0-9565	4.70	5.81	+23.61%	286,340
10113	0-8564	4.96	6.55	<u>+32.05%</u>	316,805

**Average % of fuel saved on 10 Cummins ISB motors      +8.427%**

**Time between REGEN's increased average 14.6% with reduced severity.**

**No Forced REGEN Cycles required.**

Note: All installations were done on Cummins Diesel ISB (250 HP) motors with high mileage.

## ECO Fuel Catalyst Testing

### Notes, Comments & DTC Logged

Bus #	ECO SN	Details	# DTC
10101	0-8604	Installed ECO on 8/29/2016 - No active DTC.   9/13/16 Check engine light - regen & clear.	1
10107	0-8730	Installed ECO on 8/29/2016 - No active DTC. - Bus is OOS for a defective W/C ramp (will delay test).	
10105	0-8878	Installed ECO on 8/29/2016 - No active DTC.   9/18/2016 SCR Code - Regen.	1
10111	0-1474	Installed ECO on 8/29/2016 - No active DTC.   9/18/2016 SCR code - Regen.	1
10112	0-9568	Installed ECO on 8/29/2016 - No active DTC.   9/9/2016 Check Engine (1V57252) Regen.	1
10109	0-9572	Installed ECO on 8/29/2016 - No active DTC.   9/15/2016 Code 2518 cleared.	1

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10102	0-9573	Installed ECO on 8/29/2016 - No active DTC.	0
10114	0-9580	Installed ECO on 8/29/2016 - No active DTC.   9/9/2016 - Check Engine (code 3582-241) cleared.   9/15/2016 inactive SCR code cleared.	2
10106	0-9565	Installed ECO on 8/29/2016 - No active DTC.   9/10/2016 Check Engine (1V57297) Regen.   9/12/2016 Check engine SCR codes - cleaned Decomp Tube and clear code.   9/16/2016 Replaced Doser Valve.   9/19/2016 3582 SCR code - Regen.	4
10113	0-8564	8/22/2016 - Inactive water in fuel logged & cleared. No aftertreatment issues.   9/13/2016 check engine light for SCR code - regen & clear.   9/19/2016 3582 SCR code - Regen.	2
10103	N/A	(No ECO Test Catalyst) 8/24/2016   8/29/2016 OOS - Engine Failed   9/17/2016 SCR code - Regen.   9/18/2016 SCR code - Regen.	2
10104	N/A	(No ECO Test Catalyst)   8/27/16 SCR code present, regen & clear.   9/6/2016 SCR code, regen & check exhaust then clear code.	2
10108	N/A	(No ECO Test Catalyst)   8/29/2016 Check Engine high exhaust temp - could not duplicate complaint.	

### ECO Fuel Catalyst Testing

10110	NA	(No ECO Test Catalyst)   9/14/2016 check engine light & derate - clean decom tube regen & clear.   9/18/2016 SCR code - Regen	2
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## ECO Fuel Catalyst Testing

### ECM Key Time Between Re-Gen's

Bus #	ECO SN	Start	8/22/16	8/29/16	9/27/16								
10101	0-8604	8.33			14.52								
10107	0-8730	25.33			25.11								
10105	0-8878	16.89			18.22								
10111	0-1474	17.66			19.11								
10112	0-9568	17.00			20.66								
10109	0-9572	20.33			22.22								
10102	0-9573	21.77			24.89								
10114	0-9580	20.11			20.78								
10106	0-9565	13.63			14.00								
10113	0-8564	13.30	19.80	17.25	19.11								

10101		10107		10105		10111		10112		10109		10102	
Bus #	9/27/16	Bus #	9/27/16	Bus #	9/27/16	Bus #	9/27/16	Bus #	9/27/16	Bus #	9/27/16	Bus #	9/27/16
23204	8	20067	24	22790	25	21817	12	4400	25	24566	25	24591	25
23213	25	20091	25	22815	24	21829	25	4425	25	24591	25	24591	25
23238	13	20116	26	22839	25	21854	24	4450	25	24615	24	24615	24
23251	24	20142	29	22864	13	21878	7	4474	24	24640	25	24640	25
23275	13	20171	24	22877	26	21885	30	4499	25	24665	25	24665	25
23288	4	20195	25	22901	1	21889	25	4524	27	24689	24	24689	24
23292	5	20220	24	22927	1	21919	16	4546	26	24714	26	24714	26
23297	13	20244	25	22928	25	21944	29	4573	26	24738	24	24738	24
23310	25	20269	24	22929	25	21960	29	4574	26	24764	26	24764	26
23335	25	20293	24	22954	25	21989	29	4600	26	24790	26	24790	26

# ECO Fuel Catalyst Testing

## Weekly Mileage

Bus #	9/27/16	
10101	350,240	939
10107	289,226	1,244
10105	355,076	991
10111	329,292	1,380
10112	318,987	1,908
10109	324,274	416
10102	361,829	1,081
10114	338,073	1,515
10106	290,226	1,284
10113	324,114	1,029

## Weekly Fuel Usage

Bus #	9/27/16	
10101	67,744	234
10107	56,153	293
10105	68,553	208
10111	63,362	318
10112	66,354	451
10109	62,492	118
10102	82,290	266
10114	68,301	368
10106	61,787	259
10113	65,695	259



# ECO Fuel Catalyst Testing

## 10114

	9/27/16
22371	24
22395	14
22409	12
22421	27
22448	24
22472	25
22497	24
22521	22
22543	15
22558	

## 10106

	9/27/16
19282	14
19296	13
19309	13
19322	13
19335	13
19343	8
19356	13
19370	14
19395	25
19408	13

## 10113

	9/27/16

ECO Fuel Catalyst Testing

Baseline Data Pre-Installation

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10107	0-8730	No Active Codes @ Install	25.33	287,447	55,725.7	5.16
10105	0-8878	No Active Codes @ Install	16.89	350,539	67,683.3	5.18
10111	0-1474	No Active Codes @ Install	17.66	324,602	62,326.5	5.21
10112	0-9568	No Active Codes @ Install	17.00	313,750	65,133.2	4.82
10109	0-9572	No Active Codes @ Install	20.33	320,499	61,669.1	5.20
10102	0-9573	No Active Codes @ Install	21.77	357,915	81,374.0	4.40
10114	0-9580	No Active Codes @ Install	20.11	333,604	67,194.5	4.96
10106	0-9565	No Active Codes @ Install	13.63	286,340	60,933.3	4.70
10113	0-8564	New DPF & DOC (OEM) installed for tes	13.30	316,805	63,889.3	4.96

Post Installation Data Averages

Bus #	ECO SN	Installation Notes	Regen Interval	Miles Post Install	Fuel Post Install	MPG Post Installation
10101	0-8604	ReGen 8/29/16 @ install		2,886	389.5	7.41
10107	0-8730	ReGen 8/29/16 @ install		0	0.0	0.00
10105	0-8878	ReGen 8/29/16 @ install		3,735	415.1	9.00
10111	0-1474	NO ReGen or filter changes @ install		3,617	447.3	8.09
10112	0-9568	NO ReGen or filter changes @ install		3,329	358.5	9.29
10109	0-9572	ReGen 8/29/16 @ install		2,843	411.4	6.91
10102	0-9573	ReGen 8/29/16 @ install		1,149	260.4	4.41
10114	0-9580	ReGen 8/29/16 @ install		2,993	459.1	6.52
10106	0-9565	NO ReGen or filter changes @ install		2,773	406.2	6.83
10113	0-8564	NEW DPF & DOC @ install	18.53	9,718	1,285.4	7.56

Bus #	January-16	February-16	March-16	April-16
10101	2	1	6	2
10102	2	0	3	3
10103	3	6	2	1
10104	3	4	3	2
10105	2	0	0	1
10106	1	0	1	4
10107	1	0	1	2
10108	0	3	1	2
10109	2	2	5	3
10110	1	1	2	4
10111	1	1	0	0
10112	2	2	2	4
10113	2	0	2	3
10114	0	1	2	5
	22	21	30	36

May-16	June-16	July-16	August-16	September-16
3	2	5	5	
4	4	4	4	
1	2	13	5	
3	4	6	2	
1	5	3	3	
1	1	4	12	
0	0	1	1	
1	5	1	7	
2	3	3	4	
5	4	8	6	
1	4	3	4	
2	2	5	3	
5	7	12	9	
4	2	6	3	
33	45	74	68	0

October-16

November-16

December-16

0

0

0