

# **Winnebago County Highway Department**

## **SMART Emissions Reducer Trial Program Report**



**November 8, 2012**

*Prepared by:*



150 Main Street, Ogdensburg, NJ 07439

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Website: [www.extremeenergysolutions.net](http://www.extremeenergysolutions.net)

## Report and Results

### Introduction:

Extreme Energy Solutions Inc., SMART Air Fuel Saver LLC (Extreme/SMART), working in partnership with local SMART Emissions Reducer Product Representative Larry Robertson, had offered the County of Winnebago a free trial program that would assist in the validation of the SMART Emissions Reducer installed in their vehicle fleet. The purpose of the program would demonstrate to officials of Winnebago County Highway Department that the SMART Emissions Reducer would reduce harmful vehicle emissions while providing a return on investment by reducing fuel consumption.

Winnebago County agreed to the trial program proposed by Extreme/SMART, at no upfront cost. If the SMART Emissions Reducer did not prove its worthiness, then the equipment would be removed from the vehicles, and returned to Extreme/SMART, at the cost of both companies, and would restore the vehicles to the previous state before the modifications took place. In the event the County found the devices to have value, and perform as represented, then the County would have the option to purchase the equipment, pay for labor services, and continue a rolling production of installs of the device, provided by Extreme. This trial program would last a period of 90 days.

On April 9, 2012, Extreme Energy Solutions Inc. began to install devices on vehicle authorized to be retrofitted for the trial program (see **Appendix item A**). This authorization and program was supervised by Dan Davis, Winnebago County Highway Department Operations Manager.

### Action Plan:

On Tuesday, April 9, 2012, Extreme/SMART Technicians reported to the Winnebago County Operations Compound, where Highway Department, located at 424 N. Springfield Ave, Rockford, IL 61101-5097, to begin installing the SMART Emissions Reducer on selected vehicles. All installs were then concluded by Friday, April 13, 2012.

Prior to the SMART device installation, a series of vehicle verifications, to qualify the vehicle free from any mechanical issues that would effect the results of the overall outcome of the testing, would be performed. Each vehicle would undergo an emissions test, using a calibrated five gas analyzer and provide a copy of the results on site. At the conclusion of the 90 day period, each vehicle would again be tested for emissions readings. This would demonstrate the emissions increase or decrease at that time. Diesel vehicles would undergo an opacity test to check emissions levels before the device was installed and after the vehicles had operated 90 days with the SMART device.

A total of eight vehicles were originally selected to be offered as candidates. And additional vehicle was added later during the program.

Winnebago County would track its fuel mileage results throughout the 90 day trial period, and Extreme/SMART would monitor the emissions results before and after the 90 day trial program, then compile all results in a report, and share them with the County for review. The County would regularly share fuel consumption data with Extreme/SMART Representatives, so Extreme/SMART Representatives could examine the trend of the program, and make a determination whether SMART devices would have to be serviced.

In addition, Extreme Energy Solutions Inc./SMART Air Fuel Saver LLC would share emissions results with third party BKW Transformations Group Inc., from Piscataway, NJ, in performing a Carbon Footprint analysis at the end of the trial, with no extra cost to Winnebago County.

During the 90 day trial program, Extreme/SMART Technicians and Representatives, would be responsible for troubleshooting any and all issues with the device, perform periodic emissions testing of vehicles retrofitted with the SMART device, and assist in servicing the SMART Emissions Reducer, as required by the manufacturer (SMART Air Fuel Saver LLC). Extreme/SMART Technicians would share how to maintain the unit with Winnebago County Highway Department Fleet Mechanics, so County Mechanics can take on the responsibilities of maintaining the SMART units. In Addition, Extreme/SMART Technicians would bring to the attention of County Mechanics, any potential vehicle faults that Extreme/SMART Technicians would find during their monitoring of the vehicles, for priority to be repaired. This would allow for vehicles with faults not to run out the clock of the 90 day trial program without being repaired, and those faults effecting the vehicle's test results.

Since opacity testing was not originally performed on vehicle #129, 234, and 240, once an opacity tester (for testing diesel emissions) was made available, Extreme/SMART Technicians has gone back to the Winnebago County Highway Department Compound, and tested vehicles of the identical vehicle specifications, including but not limited to: vehicle manufacturer, engine make/model, vehicle usage, GVW, fuel type, and within in the same comparable vehicle age and mileage use of vehicle, so that Extreme/SMART Technicians could properly compare the heavy duty diesel vehicles retrofitted with the SMART device versus vehicles without the SMART device. Winnebago County Highway Department service vehicles #250 and #231 were selected as the control test vehicles, not retrofitted with SMART device.

Officially, the 90 day trial program calendar had concluded on July 9, 2012, however the trial program was monitored and facilitated until Friday, October 26, 2012, when Extreme/SMART Technicians and representatives had the opportunity to collect any and all final emissions data, and meet with Operations Manager, Dan Davis, to review the data, and report generated by his department concerning the fuel economy results collected by the county. Extreme/SMART was asked to compile all data, reports, and proposals for review, including an invoice submitted for all SMART devices and labor services provided to date.

## Vehicle Inventory:

Winnebago County Vehicles retrofitted with the SMART Emissions Reducer for trial program include the following:

- 1. Winnebago County Sheriff's Department, Patrol Vehicle #93.** 2009 Ford Crown Victoria, VIN #2FAHP71V29X145742. Retrofitted with R200 SMART device for gasoline engines.
- 2. Winnebago County Highway Department, Service Vehicle #10.** 2005 Ford F250 Pick-up Truck, VIN #1FT5W20P75EC36994. Retrofitted with P300 SMART device for light diesel powered engines.
- 3. Winnebago County Highway Department, Service Vehicle #94.** 2004 Chevrolet Silverado 1500 Pick-up Truck. VIN #1GCEK19V74Z285740. Retrofitted with R200 SMART device for gasoline engines.
- 4. Winnebago County Highway Department, Service Vehicle #100.** 2008 Ford Explorer, VIN #1FMEU73E384A88715. Retrofitted with R200 SMART device for gasoline engines.
- 5. Winnebago County Highway Department, Service Vehicle #102.** 2000 Dodge Durango, VIN #1B4MS28N4YF233698. Retrofitted with R200 SMART device for gasoline engines.
- 6. Winnebago County Highway Department, Service Vehicle #129.** 2005 International/Navistar 7400 Dump Truck, VIN #IHTWDAAN95JI65838. Retrofitted with B500 SMART device for heavy duty diesel powered engines.
- 7. Winnebago County Highway Department, Service Vehicle #234.** 2004 International/Navistar 7400 Dump Truck, VIN#IHTWHADT94J026998. Retrofitted with B500 SMART device for heavy duty diesel powered engines.
- 8. Winnebago County Highway Department, Service Vehicle #240.** 2003 International/Navistar 7400 Dump Truck, VIN #IHTWHADT83J074989. Retrofitted with B500 SMART device for heavy duty diesel powered engines.
- 9. Winnebago County Highway Department, Service Vehicle #130.** 1985 International Service Rack Body Vehicle. *\*Note: This vehicle was added later, and no official trial document was submitted to include this vehicle. Vehicle retrofitted at the request of Dan Davis, Operations Manager for Winnebago County Highway Department.* Retrofitted with B500 SMART device for heavy duty diesel powered engines.

Vehicles tested, without SMART device are vehicles #250 and #231. Original vehicles retrofitted as a part of the trial are noted in trial documents (**see Appendix item A**).

**3. Winnebago County Highway Department Service Vehicle #94.** 2004 Chevrolet Silverado 1500 Pick-up Truck, 5.3 Liter V8 gasoline engine.

Type of Emissions Being Tested	Prior to Install of SMART Devices	At Conclusion of Trial Program	Trend Decrease or Increase Emissions
<b>O2%</b>	.83	.63	-
<b>CO2%</b>	14.80	10	-
<b>HC PPM</b>	106	10	-
<b>CO%</b>	.39	.01	-
<b>COK%</b>	.33	.01	-
<b>AFR</b>	14.09	19.50	Not Applicable
<b>NOX PPM</b>	14	25	+
		<b>Overall Trend</b>	<b>Decrease in Emissions</b>

This vehicle has followed the normal trends in decrease in emissions as most GM vehicles from factory with the 5.3 liter gasoline engine, equipped with SMART device. Within increases in emissions numbers, effecting variables on this vehicle would be excessive idling, which is normal for the usage of this particular fleet vehicle usage. Other factors in increased emissions would be the continuance of carbon build up in the engine, cycling out the engine as a result of the SMART device form and functionality.

**4. Winnebago County Highway Department Service Vehicle #100.** 2008 Ford Explorer SUV, V6 gasoline engine

Type of Emissions Being Tested	Prior to Install of SMART Devices	At Conclusion of Trial Program	Trend Decrease or Increase Emissions
<b>O2%</b>	.57	.58	-
<b>CO2%</b>	15	15	No Change
<b>HC PPM</b>	-.01	.04	+
<b>CO%</b>	.04	.05	+
<b>COK%</b>	.03	.04	+
<b>AFR</b>	15.12	15.06	Not Applicable
<b>NOX PPM</b>	00	02	+
		<b>Overall Trend</b>	<b>Increase in Emissions</b>

This vehicle has *not* followed the normal trends in decrease in emissions as most Ford vehicles, gasoline engine, equipped with SMART device. With in increases in emissions numbers, effecting variables on this vehicle would be excessive idling, which is normal for the usage of this particular fleet vehicle usage. Other factors in increased emissions would be the continuance of carbon build up in the engine, cycling out the engine as a result of the SMART device form and functionality. It would be suggested that further monitoring and servicing of this vehicle be continued, watching for emissions, reduction

trends to begin to decrease, comparable with like make and models.

**5. Winnebago County Highway Department, Service Vehicle #102.** 2000 Dodge Durango

Type of Emissions Being Tested	Prior to Install of SMART Devices	At Conclusion of Trial Program	Trend Decrease or Increase Emissions
O2%	.77	.67	-
CO2%	14.9	15	+
HC PPM	-.01	.02	+
CO%	.05	.03	-
COK%	.03	.02	-
AFR	15.24	15.18	Not Applicable
NOX PPM	04	10	+
		<b>Overall Trend</b>	<b>Not enough data to determine trend</b>

This vehicle has *not* followed the normal trends in decrease in emissions as most Dodge vehicles, gasoline engine, equipped with SMART device. Within increases in emissions numbers, effecting variables on this vehicle would be excessive idling, which is normal for the usage of this particular fleet vehicle usage. Other factors in increased emissions would be the continuance of carbon build up in the engine, cycling out the engine as a result of the SMART device form and functionality. It would be suggested that further monitoring and servicing of this vehicle be continued, watching for emissions reduction trends to begin to decrease, comparable with like make and models.

**6. Winnebago County Highway Department Service Vehicle #129.** 2005 International/Navistar 7400 Dump Truck, DT 466 diesel powered engine.

Type of Emissions Test: Overall Opacity	Control Vehicle #231 (Without SMART Device Installed)	Test Subject with SMART Emissions Device Installed, At Conclusion of Trial Program
Percentage of Opacity %	6.43	1.87
Trend Decrease or Increase Emissions	<b>Overall Trend</b>	<b>Decrease in Emissions</b>

This vehicle has followed the normal trends in decrease in emissions as most International/Navistar vehicles equipped with SMART device.

**7. Winnebago County Highway Department Service Vehicle #234.** 2004 International/Navistar 7400 Dump Truck, DT 466 diesel powered engine.

Type of Emissions Test: Overall Opacity	Control Vehicle #231 (Without SMART Device Installed)	Test Subject with SMART Emissions Device Installed, At Conclusion of Trial Program
Percentage of Opacity %	6.43	4.32
Trend Decrease or Increase Emissions	<b>Overall Trend</b>	<i>Decrease in Emissions</i>

This vehicle has followed the normal trends in decrease in emissions as most International/Navistar vehicles equipped with SMART device.

**8. Winnebago County Highway Department Service Vehicle #240. 2003**  
International/Navistar 7400 Dump Truck, DT 466 diesel powered engine.

Type of Emissions Test: Overall Opacity	Control Vehicle #231 (Without SMART Device Installed)	Test Subject with SMART Emissions Device Installed, At Conclusion of Trial Program
Percentage of Opacity %	6.43	2.88
Trend Decrease or Increase Emissions	<b>Overall Trend</b>	<i>Decrease in Emissions</i>

This vehicle has followed the normal trends in decrease in emissions as most International/Navistar vehicles equipped with SMART device.

**9. Winnebago County Highway Department Service Vehicle #130. 1985 International**  
Service Rack Body Vehicle. *\*Note: This vehicle was added later, and no official trial document was submitted to include this vehicle. \*\*Engine was repowered in 2006, with rebuild.*

Type of Emissions Test: Overall Opacity	Control Vehicle #250 (Without SMART Device Installed)	Test Subject with SMART Emissions Device Installed, At Conclusion of Trial Program
Percentage of Opacity %	18.1	15.9
Trend Decrease or Increase Emissions	<b>Overall Trend</b>	<i>Decrease in Emissions</i>

This vehicle has followed the normal trends in decrease in emissions as most International/Navistar vehicles equipped with SMART device. This vehicle has minimal operational time/miles in this trial since this vehicle was added to the list much later in the trial program. It would be suggested that further monitoring and servicing of this vehicle be continued, watching for emissions reduction trends to begin to decrease, comparable with like make and models.

***Control Vehicles used in the test:***

**10. Winnebago County Highway Department Service Vehicle #231.** 2004 Navistar/International 7400, Dump Truck, DT 466 diesel powered engine.

**11. Winnebago County Highway Department Service Vehicle #250.** 1995 White GMC Tandem Axle Dump Truck, with L10 Cummins diesel powered engine

For reference of the control vehicle's emissions test data, refer to Appendix (**see Appendix item D**) Carbon footprint analysis will be supplied in a separate report, prepared and supplied by BKW Transformations Group Inc.

**Summary:**

Overall emissions reductions were achieved on the majority of the vehicles in the 90 day SMART Emissions Reducer product trial program. Winnebago County expressed fuel economy gains (reduction in fuel consumption) via their report.

Please reference "Carbon Footprint Analysis", by BKW Transformations Group Inc., for third party environmental impact review.

Report prepared by:

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CEO/President, Extreme Energy Solutions Inc.  
Vice President, SMART Air Fuel Saver LLC.

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Ogdensburg, NJ 07439  
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SMART Air Fuel Saver LLC  
PO Box 392  
Ogdensburg, NJ 07439  
Website: [www.smartafs.com](http://www.smartafs.com)



## **Appendix**

### **Appendix A:**

Copy of original 90 day SMART device trial program documents, signed by Dan Davis, Operations Manager, Winnebago County Highway Department.

### **Appendix B:**

SMART Air Fuel Saver Emissions Control Device Beta-Test Report; Evaluation by Winnebago County Highway Department Officials

### **Appendix C:**

Emissions Testing for vehicles retrofitted with SMART Emissions Reducer

### **Appendix D:**

Emissions testing for control vehicles not retrofitted with SMART device.

**Appendix A:**

Copy of original 90 day SMART device trial program documents, signed by Dan Davis,  
Operations Manager, Winnebago County Highway Department.



## SMART Air Fuel Saver LLC

141 East Central Street, Suite #300, Winter Haven, FL 33880

www.smartafs.com

Company, Municipality, or Entity Name: Wauchusa County Highway Department  
90 DAY TRIAL PROGRAM (SMART Emissions Reducer)

SMART Air Fuel Saver LLC. (SMART AFS), is offering a risk free 90 day trial period for evaluations of the SMART Emissions Reducer product(s). SMART AFS., will work with the above listed entity to install, test and evaluate the appropriate SMART device for the vehicle or vehicles listed on page 2 (please fill out additional pages for additional vehicle intake).

The company or entity intending to utilize this evaluation procedure shall provide to SMART AFS., all the vehicles information requested and have the equipment in satisfactory running condition ready to deliver to SMART AFS., or its affiliate representative, upon notification of availability of installation/test dates. *(It is suggested that you consult with SMART AFS. to determine which vehicle best represents the average vehicle in your fleet for evaluation purposes.)* Prior to installation (unless otherwise specified in writing) the company evaluating the device shall also provide a signed copy of the trial agreement, work order for the SMART device(s), separate work order to be delivered upon determination of properly sized SMART device(s), and work order of the installation costs including any necessary hoses, fittings, or other parts necessary to complete the installation.

The evaluating company shall provide baseline data of vehicles or equipment fuel consumption prior to device installation. Supplied data should be accurate, current and verifiable. The most recent state federal or local emissions testing results (if required) should be made available to SMART AFS. If no emissions baseline is available, SMART AFS, will arrange to test using a 5 gas analyzer and or 6 gas analyzer. Test will be applied prior to installation and then after installation, allowing for a reasonable operation time to elapse.

The company testing the device and SMART AFS shall closely monitor vehicle performance for the next 90 day period. Recommended inspection intervals are as follows 30<sup>th</sup> days after install, at 60<sup>th</sup> day, then on the 90<sup>th</sup> day.

After the 90 day period, the vehicle shall be made available to SMART AFS., for inspection and retested with the 5 gas and or 6 gas analyzer and or other emissions testing procedures as may be deemed reasonable or necessary by SMART AFS. SMART AFS, will supply third party testing for heavy diesel vehicles using a state licensed inspector.

If the follow up inspection and evaluations shows a positive result for emissions reductions and an increase in fuel economy your company/municipality/entity agrees to enter into negotiations for the purchase & installation of the device on the remainder of your fleet or other vehicles you wish to have modified. If the device does not show any significant reduction in toxic emissions it is designed to reduce and/or there is no increase in fuel economy, SMART AFS. will remove the device at no cost to your entity, and provide a full refund on the product.

Company Winneshaw County Sheriff's Department

Address: Public Safety Bldg  
420 W. State St  
Rockford IL 61101

Contact: KURT DITZLER Job title: \_\_\_\_\_

Phone: 1-815-319-6312 Fax: \_\_\_\_\_

Other: \_\_\_\_\_ Email: \_\_\_\_\_

Additional Contact Information:

\_\_\_\_\_  
\_\_\_\_\_

VEHICLE INFORMATION FOR 60 DAY TRIAL

# 93

Year 2009 Make Ford Model CROWN VIC

Vin # 2FA1H1P71V29X145742

Engine Manufacturer: Ford

PCV Line Inside diameter: \_\_\_\_\_

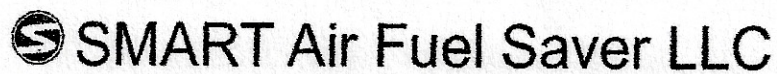
Odometer Reading: \_\_\_\_\_ Date: \_\_\_\_\_

Vehicle Use: POLICE CAR Average Miles per day driven: \_\_\_\_\_

Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winneshaw County Sheriff's Department

Company Winnebago County Highway Department

Address: 414 N. Springfield Ave  
Rockford, IL 61101-5097

Contact: Dan Davis Job title: Operations Manager

Phone: 815 319 4000 Fax: 815 319 4001

Other: \_\_\_\_\_ Email: ddavis@wincoil.us

Additional Contact Information:

Rick Rundblade, Maintenance Foreman  
rrundblade@wincoil.us

VEHICLE INFORMATION FOR 60 DAY TRIAL

#10

Year 2005 Make Ford Model F250

Vin # 1FT5W20P75FC36994

Engine Manufacturer: Ford 2.3

PCV Line Inside diameter: 1/4"

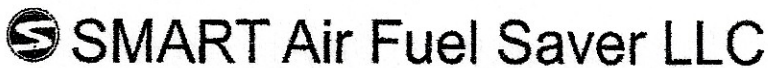
Odometer Reading: 85146 Date: 4/3/08

Vehicle Use: Road Repair use Average Miles per day driven: \_\_\_\_\_

Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle #10

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2012  
Print Name: Danby H. Davis Title: Operations Manager

Approval for trial program SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4/10/2012  
Print Name: Samuel Burton Title: V/P

Tentative Start Date of Test: 4/10/12 End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY, AT ITS DISCRETION CHOOSE TO INITIATE PURCHASE OF THE SMART EMISSIONS REDUCER PRIOR TO FULL COMPLETION OF THE TRIAL PROGRAM.
- 3) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY ELECT TO ACCEPT THE SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS THE ACCEPTABLE STANDARD.

Company Winnebago County Highway Department

Address: 424 N. Springfield Ave  
Rockford IL 61101-5097

Contact: Don Davis Job title: Operations Manager

Phone: 815 319 4000 Fax: 815 319 4001

Other: \_\_\_\_\_ Email: ddavis@wincoil.us

Additional Contact Information:

Rick Rundblade, Maintenance Foreman  
rrundblade@wincoil.us

VEHICLE INFORMATION FOR 60 DAY TRIAL

# 74

Year 2004 Make CHEV Model SILVERADO 1500

Vin # 1GCEK19V74Z285740

Engine Manufacturer: GM 350

PCV Line Inside diameter: UNK

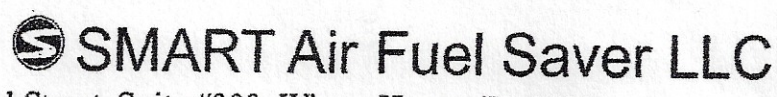
Odometer Reading: 83272 Date: \_\_\_\_\_

Vehicle Use: Engineering Average Miles per day driven: \_\_\_\_\_

Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle #94

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2012  
Print Name: Danny H Davis Title: Operations Manager

Approval for trial program- SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4/10/12  
Print Name: Samuel Bailey Title: VIP

Tentative Start Date of Test: 4/10/12 End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) The company or municipality or entity named in this document MAY, AT ITS DISCRETION choose to INITIATE purchase of the SMART EMISSIONS REDUCER PRIOR TO full completion of the TRIAL PROGRAM.
- 3) The company or municipality or entity named in this document may elect to accept the SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS the ACCEPTABLE STANDARD.



Company Winnebago County Highway Department  
Address: 424 N. Springfield Ave,  
Rockford IL 61107-5094

Contact: Dan Davis or Rick Rundblade Job title: Operative Manager/Maintenance Foreman  
Phone: (815) 319-4000 Fax: (815) 319-4001  
Other: \_\_\_\_\_ Email: ddavis@wincoil.us or rundblade@wincoil.us

Additional Contact Information:

VEHICLE INFORMATION FOR 60 DAY TRIAL

#100

Year 2008 Make Ford Model EXPLORER  
Vin # 1FMF473E384A88715  
Engine Manufacturer: Ford  
PCV Line Inside diameter: UNK  
Odometer Reading: 32,473 Date: 4/4/2012

Vehicle Use: general transportation Average Miles per day driven: \_\_\_\_\_  
Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle #100

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2010  
Print Name: Danny H. Davis Title: Operations Manager

Approval for trial program - SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4-10-2012  
Print Name: Samuel Borkum Title: Vice President

Tentative Start Date of Test: April 10, 2012 End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY, AT ITS DISCRETION CHOOSE TO INITIATE PURCHASE OF THE SMART EMISSIONS REDUCER PRIOR TO FULL COMPLETION OF THE TRIAL PROGRAM.
- 3) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY ELECT TO ACCEPT THE SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS THE ACCEPTABLE STANDARD.

Company Winnebago County Highway Department  
Address: 424 N. Springfield Ave.  
Rockford, IL 61101-5097

Contact: Don Davis Job title: Operations Manager  
Phone: 815 319 4000 Fax: 815 319 4001  
Other: \_\_\_\_\_ Email: ddavis@wincoil.us

Additional Contact Information:  
Rick Rundblade, Maintenance Foreman  
rrundblade@wincoil.us

VEHICLE INFORMATION FOR 60 DAY TRIAL

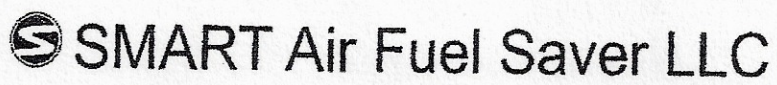
102

Year 2000 Make DODGE Model DURANGO  
Vin # 1B4HS28NYF233698  
Engine Manufacturer: Dodge  
PCV Line Inside diameter: UNK  
Odometer Reading: 155663 Date: 4/3/2012

Vehicle Use: manager vehicle Average Miles per day driven: \_\_\_\_\_  
Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? UA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle # 102

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2012  
Print Name: Denny A. Davis Title: Operations Manager

Approval for trial program- SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4-10-2012  
Print Name: Samuel Burton Title: VICE President

Tentative Start Date of Test: \_\_\_\_\_ End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY, AT ITS DISCRETION CHOOSE TO INITIATE PURCHASE OF THE SMART EMISSIONS REDUCER PRIOR TO FULL COMPLETION OF THE TRIAL PROGRAM.
- 3) THE COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT MAY ELECT TO ACCEPT THE SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS THE ACCEPTABLE STANDARD.

Company Winnebago County Highway Department  
Address: 424 N. Springfield Ave  
Rockford IL 61101-5097  
Contact: Den Davis Job title: Operations Manager  
Phone: 815 319 4000 Fax: 815 319 4001  
Other: \_\_\_\_\_ Email: ddavis@wincoil.us

Additional Contact Information:  
Rick Rundblake, Maintenance Foreman  
rrundblake@wincoil.us

VEHICLE INFORMATION FOR 60 DAY TRIAL

#129  
Year 2005 Make NAVISTAR Model 7400  
Vin # 1HTWDAAW95J165838  
Engine Manufacturer: INTERNATIONAL DT466  
PCV Line Inside diameter: 1.27926 UNK  
Odometer Reading: 138,926 Date: 4/3/2012

Vehicle Use: Rental work Dump Truck Average Miles per day driven: \_\_\_\_\_  
Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle B129

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2012  
Print Name: Denny H. Davis Title: Operations Manager

Approval for trial program- SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4/10/12  
Print Name: Samuel Burton Title: V/P

Tentative Start Date of Test: \_\_\_\_\_ End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) The company or municipality or entity named in this document may, at its discretion choose to initiate purchase of the SMART EMISSIONS REDUCER PRIOR TO FULL COMPLETION OF THE TRIAL PROGRAM.
- 3) The company or municipality or entity named in this document may elect to accept the SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS THE ACCEPTABLE STANDARD.

Company Winnebago County Highway Department  
Address: 424 N. Springfield Ave  
Rockford, IL 61101-5097

Contact: Dan Davis or Rick Rundblade Job title: Operations Manager / Maintenance Foreman  
Phone: 815-319-4000 Fax: 815-319-4001  
Other: \_\_\_\_\_ Email: ddavis@wincoil.us or rundblade@wincoil.us

Additional Contact Information:  
\_\_\_\_\_  
\_\_\_\_\_

VEHICLE INFORMATION FOR 60 DAY TRIAL

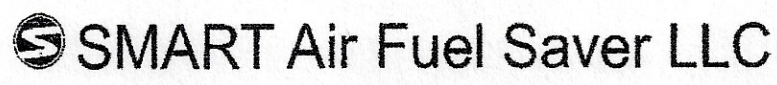
# 234

Year 2004 Make NAVISTAR Model 7900  
Vin # 1HTWHADT94J026998  
Engine Manufacturer: INTERNATIONAL DT 466  
PCV Line Inside diameter: NA  
Odometer Reading: 133 339 Date: 4/3/2012

Vehicle Use: DUMP TRUCK Average Miles per day driven: \_\_\_\_\_  
Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:  
\_\_\_\_\_  
\_\_\_\_\_



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winnebago County Highway Department

Vehicle # 234

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/4/2012  
Print Name: Danny H. Davis Title: Operative Manager

Approval for trial program- SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4/10/12  
Print Name: Samuel Burhan Title: VP

Tentative Start Date of Test: \_\_\_\_\_ End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

- 1) SMART AFS agrees to include a CARBON FOOTPRINT ANALYSIS AT END OF TRIAL, AT NO COST TO COMPANY OR MUNICIPALITY OR ENTITY NAMED IN THIS DOCUMENT.
- 2) The company or municipality or entity named in this document MAY, AT ITS DISCRETION choose to initiate purchase of the SMART EMISSIONS REDUCER PRIOR TO full completion of the TRIAL PROGRAM. Page 3 of 3
- 3) The company or municipality or entity named in this document may elect to accept the SMART AIR FUEL SAVER 5-GAS ANALYZER RESULTS AS the ACCEPTABLE STANDARD.



Company Winneshaw County Highway Department  
Address: 424 N. Springfield Ave.  
Rockford, IL 61101-5097

Contact: Dan Davis or Rick Rundblade Job title: Operations Manager/Maintenance & Foreman  
Phone: 815 319 4000 Fax: 815 319 4001  
Other: \_\_\_\_\_ Email: ddavis@wincoil.us or rundblade@wincoil.us

Additional Contact Information:

VEHICLE INFORMATION FOR 60 DAY TRIAL

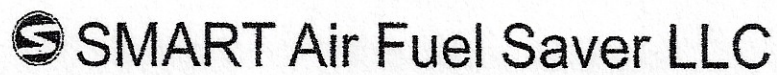
#240

Year 2003 Make NAVI STAR Model 7400  
Vin # 1HTWMAJT83J074989  
Engine Manufacturer: INTERNATIONAL DT 466  
PCV Line Inside diameter: UNK  
Odometer Reading: 190082 Date: 4/3/04

Vehicle Use: DUMP TRUCK Average Miles per day driven: \_\_\_\_\_  
Fuel Use: (co.stated) \_\_\_\_\_ MPG: \_\_\_\_\_

Any known vehicle issues? NA

Other special Terms & conditions of Trial:



141 East Central Street, Suite #300, Winter Haven, FL 33880 [www.smartafs.com](http://www.smartafs.com)

Company, Municipality, or Entity: Winneshaw County Highway Department

Vehicle # 240

I am authorized by the above stated company to enter into this agreement and do hereby accept and agree to the terms set forth in the above paragraphs.

I have been informed and understand that this device is primarily marketed as an emission control and that in the past previous users have experienced an increase in fuel economy. Test results have and will vary from vehicle with many conditions and variables affecting an individual vehicle's performances. SMART Air Fuel Saver LLC., does not warrant or make any claims to any specific amount of fuel economy increase by using the SMART device. Proper maintenance (required) of unit after trial is the responsibility of the user.

This testing is voluntary and mutually agreeable to all parties. The company in trial testing understands how the mechanical failure or issues for the duration of the trial period.

After trial period, if company determines usefulness of product and continues to use device, manufacturers' limited 3 year warranty shall apply.

Signature: [Signature] Date: 4/11/2012  
Print Name: Danny H. Davis Title: Operations Manager

Approval for trial program- SMART Air Fuel Saver LLC Assigned Representative

Signature: [Signature] Date: 4/10/12  
Print Name: Samuel Barber Title: VP

Tentative Start Date of Test: \_\_\_\_\_ End Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Notes:

1) SMART AFS agrees to include a Carbon Footprint Analysis at end of trial, at no cost to company or municipality or entity named in this document.

2) The company or municipality or entity named in this document may, at its discretion choose to initiate purchase of the SMART Emissions Reducer prior to full completion of the trial program.

3) The company or municipality or entity named in this document may elect to accept the SMART Air Fuel Saver 5-gas analyzer results as the acceptable standard.

**Appendix B:**

SMART Air Fuel Saver Emissions Control Device Beta-Test Report; Evaluation by  
Winnebago County Highway Department Officials.

# COUNTY OF WINNEBAGO

## HIGHWAY DEPARTMENT

424 North Springfield Avenue

Joseph A. Vanderwerff, Sr., P.E.

Telephone (815) 319-4000

Rockford, IL 61101-5097

County Engineer

Fax (815) 319-4001

### **Subject: Smart Air Fuel Saver Emissions Control Device Beta-Test**

We were afforded the opportunity to perform a beta-test of the emissions control device offered by Smart Fuel Saver. The primary purpose of the emissions device is to assist vehicle owners in meeting emission compliance standards set forth in federal and state regulations. Use of the emissions device has produced a secondary benefit of improved engine performance, particularly in fuel efficiency. Initial test results from other agencies and companies have shown improved emissions and fuel efficiency ranging from 1% to as much as 10%.

Our beta-test was scheduled for a 90 day period. We included four diesel and four gas powered vehicles. The diesel vehicles included one commercial and three construction type vehicles (dump trucks). The regular gas powered vehicles were all general utility/passenger type vehicles. The objective of our beta-test was focused more on the secondary benefit of improved fuel efficiency.

A baseline MPG (miles per gallon) average was determined for each vehicle. We performed our first review of data at 45 days into the test period and then a close-out comparison at 90 days.

The mid-term beta-test evaluation revealed anomalies we had not anticipated. These were:

1. Idling time
2. Outside refueling
3. Failing to separate refueling amounts – vehicle versus reserve service tank
4. The practice of 'pumping off' or siphoning

The anomaly of idling time primarily pertained to the heavy commercial trucks (dump trucks) and the Sheriff's Department's vehicle. The hours of operation for each vehicle should have been included as recorded data for each vehicle. Unfortunately, not all vehicles have an hour meter nor does the refuel station require the input of hours.

The second anomaly was associated with the ability to track off site refueling. This only applied to the

Sheriff's Department vehicle and to one Highway Department vehicle. The main issue for this anomaly is that the mileage is not recorded when refueling at an outside source.

The third anomaly is accounting for the reserve refueling tanks when filling up. The current procedure does not require the operator to separate the refueling of the vehicle from the filling of the reserve tank. Similarly, the fuel dispensed from the reserve tank is not accounted for by vehicle number. This made it impossible to determine the secondary benefit of fuel efficiency in this particular vehicle under these circumstances.

The last anomaly is the practice of "pumping off" fuel or siphoning from a dump truck to refuel field equipment. This skewed the miles per gallon ratio.

We were able to identify three vehicles in which there were no anomalies or if there were, the impact was not significant. Two of the vehicles are gas powered and one is diesel. The gas powered vehicles showed a fuel efficiency improvement of 8.9-10.3%. The diesel truck showed an improvement of 29%.

Using this information and the current prices for the respective fuels (regular unleaded @ \$3.44 and diesel @ \$3.50) and the approximate cost of installation for a volume purchase of the emissions device (\$521.00 per utility/passenger vehicle and \$1,299 per commercial truck), the payback for the installation on a regular unleaded gas vehicle would be approximately 1,515 gallons. This means a medium use regular gas vehicle could reach payback within two to three years.\*

If the diesel improvement holds true, the payback would be achieved at the 3,429 gallons of diesel use point which equates to two years or less based upon current fuel usage.

We were not able to collect complete data on the Sheriff's Department vehicle, but if it is a medium to high use car, the payback would potentially be within one year.

**\*NOTE: After reaching the payback point, the respective agency would see a proportionate amount in savings per vehicle per year based upon reduced fuel usage. A medium use utility vehicle (V-8 pick-up truck) which averages 10,000 to 12,000 miles per year and has a 12-15 MPG rating with a 10% increase in fuel efficiency could see a savings of approximately \$208.46 to \$312.69 per year. Another means of measuring the monetary savings is that a 10% overall improvement in fuel efficiency would equate to a cost savings of 10% per gallon based upon the current fuel price. Using the County's current fuel prices as cited, the unleaded savings would equate to \$0.344 per gallon of regular unleaded and \$0.35 per gallon of diesel fuel.**

#### Recommendation:

The first option is more conservative and would involve equipping 25% of the County's fleet with the device. The County would then continue with a validating data collection study for 90 days. After collection of the follow-up data, if the values hold true, implement an installation program for the remaining vehicles in the fleet.

The second option is more aggressive and is to implement a programmed installation of the emissions device on the County's vehicle fleet over a one year period. This could then be used to collect more data to validate the beta-test results and to compensate for the anomalies encountered in the beta-test.

Appendix C:

Emissions Testing for vehicles retrofitted with SMART Emissions Reducer.

**Vehicle #93 (Before)**

*Crown Vic*

SNAP ON

DATE 04-12-12  
TIME 01:16:24

FUEL GASOLINE

O2 %	1.21
CO2 %	14.6
HC ppm	12
CO %	0.10
COK %	0.10
AFR	15.50
NOX ppm	01

**Vehicle #93 (After)**

SNAP ON

DATE 10-26-12  
TIME 14:30:18

FUEL GASOLINE

O2 %	0.75
CO2 %	14.5
HC ppm	0.09
CO %	0.08
COK %	0.08
AFR	15.10
NOX ppm	01

**Vehicle #94 (Before)**

*04 SilverADO*

SNAP ON

DATE 04-12-12  
TIME 06:55:18

FUEL GASOLINE

O2 %	0.83
CO2 %	14.8
HC ppm	106
CO %	0.39
COK %	0.38
AFR	15.09
NOX ppm	14

**Vehicle # 94 (After)**

SNAP ON

DATE 10-25-12  
TIME 11:23:48

FUEL GASOLINE

O2 %	4.63
CO2 %	18.0
HC ppm	04
CO %	0.01
COK %	0.01
AFR	19.50
NOX ppm	25

**Vehicle #100 (Before)**

*08 Explorer*

SNAP ON

DATE 04-11-12  
TIME 01:31:18

FUEL	GASOLINE
O2 %	0.57
CO2 %	15.0
HC PPM	0.01
CO %	0.04
COX %	0.03
AFR	15.12
NOX ppm	00

**Vehicle #100 (After)**

SNAP ON

*100*

DATE 10-26-12  
TIME 15:01:10

FUEL	GASOLINE
O2 %	0.58
CO2 %	15.0
HC PPM	0.02
CO %	0.05
COX %	0.04
AFR	15.06
NOX ppm	02

**Vehicle #102 (Before)**

*00 DURANGO D*

SNAP ON

DATE 04-11-12  
TIME 01:20:43

FUEL	GASOLINE
O2 %	0.77
CO2 %	14.9
HC PPM	0.05
CO %	0.03
COX %	0.03
AFR	15.24
NOX ppm	04

**Vehicle # 102 (After)**

*#102*

SNAP ON

DATE 10-25-12  
TIME 11:11:17

FUEL	GASOLINE
O2 %	0.67
CO2 %	15.0
HC PPM	02
CO %	0.03
COX %	0.02
AFR	15.18
NOX ppm	16



**Vehicle #129 (After)**

**Vehicle #234 (After)**

SAE J1667 OPACITY TEST REPORT

SAE J1667 OPACITY TEST REPORT

EXTREME ENERGY SOL  
150 MAIN ST  
973 209 3450  
DOUG SHULL

EXTREME ENERGY SOL  
150 MAIN ST  
973 209 3450  
DOUG SHULL

Test Date: 10-25-12 Test Time: 11:50:59

Test Date: 10-25-12 Test Time: 16:30:49

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12013717 Model: Smoke Check 1667  
Software Version: 3.71NNJR

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12013717 Model: Smoke Check 1667  
Software Version: 3.71NNJR

Test Type: SNAP TEST  
Tested by: DOUG SHULL  
Veh. ID: 129  
Year and Make: 04 INTERNATIONAL  
Vehicle Mileage: 128887  
Year of Engine: 2004  
Engine Mfg: INTERNATIONAL  
Stack Dia: 4 in.

Test Type: SNAP TEST  
Tested by: DOUG SHULL  
Veh. ID: 234  
Year and Make: 04 INTERNATIONAL  
Vehicle Mileage: 139396  
Year of Engine: 2004  
Engine Mfg: INTERNATIONAL  
Stack Dia: 5 in.

Ambient Temp: 71.8 F  
Baro. Press: 29.53 inHg  
Rel. Humidity: 71 %

Ambient Temp: 70.2 F  
Baro. Press: 29.52 inHg  
Rel. Humidity: 60.7 %

Visual Inspection.....OK

Visual Inspection.....OK

Preliminary Cleanout Snaps

Test #	Peak %
1	3.22
2	1.88
3	1.87

Preliminary Cleanout Snaps

Test #	Peak %
1	3.42
2	3.62
3	4

.....OFFICIAL OPACITY TESTS.....

.....OFFICIAL OPACITY TESTS.....

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	Peak %
1	1.55
2	2.51
3	1.57

Test #	Peak %
1	4.29
2	4.24
3	4.45

Peak Opacity Difference: 0.959  
Difference within spec  
Test is VALID

Peak Opacity Difference: 0.214  
Difference within spec  
Test is VALID

3 TEST AVERAGE OPACITY:.....1.87 %

3 TEST AVERAGE OPACITY:.....4.32 %

Max Limit - Engines 1997 and Newer: 20 %  
Zero-Drift Check.....PASS

Max Limit - Engines 1997 and Newer: 20 %  
Zero-Drift Check.....PASS

\*\*\*\*\*  
TEST RESULTS: \*\*\*\* PASS \*\*\*\*  
\*\*\*\*\*

\*\*\*\*\*  
TEST RESULTS: \*\*\*\* PASS \*\*\*\*  
\*\*\*\*\*

Last Calibrated On: 00-30-12 12:22:33  
Calibration Filter: 48.5

Last Calibrated On: 00-30-12 12:22:33  
Calibration Filter: 48.5

Vehicle #240 (After)

Vehicle #130 (After)

SAE J1667 OPACITY TEST REPORT

EXTREME ENERGY SOL  
150 MAIN ST  
973 289 3458  
DOUG SHULL

Test Date: 10-25-12 Test Time: 16:49:11

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12813717 Model: Smoke Check 1667  
Software Version: 3.71NNJR

Test Type: SNAP TEST  
Tested by: DOUG SHULL  
Veh. ID: 240  
Year and Make: 03 INTERNATIONAL  
Vehicle Mileage: 136128  
Year of Engine: 2003  
Engine Mfg: INTERNATIONAL  
Stack Dia: 5 in.

Ambient Temp: 68 F  
Baro. Press: 29.53 inHg  
Rel. Humidity: 62.7 %

Visual Inspection: OK

Preliminary Cleanout Snaps

Test #	Peak %
1	2.28
2	3.33
3	2.88

OFFICIAL OPACITY TESTS

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	Peak %
1	2.78
2	2.77
3	3.09

Peak Opacity Difference: 0.324  
Difference within spec  
Test is VALID

3 TEST AVERAGE OPACITY: 2.88 %

Max Limit - Engines 1997 and Older: 20 %  
Zero-Drift Check: PASS

TEST RESULTS: \*\*\* PASS \*\*\*

Last Calibrated On: 08-30-12 12:22:33  
Calibration Filter: 48.5

SAE J1667 OPACITY TEST REPORT

EXTREME ENERGY SOL  
150 MAIN ST  
973 289 3458  
DOUG SHULL

Test Date: 10-26-12 Test Time: 14:38:42

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12813717 Model: Smoke Check 1667  
Software Version: 3.71NNJR

Test Type: SNAP TEST  
Tested by: DOUG SHULL  
Veh. ID: 130  
Year and Make: 85 INTERNATIONAL  
Vehicle Mileage: 23981  
Year of Engine: 1965  
Engine Mfg: INTERNATIONAL  
Stack Dia: 4 in.

Ambient Temp: 63.4 F  
Baro. Press: 30.13 inHg  
Rel. Humidity: 23.7 %

Visual Inspection: OK

Preliminary Cleanout Snaps

Test #	Peak %
1	31.4
2	15.7
3	14.8

OFFICIAL OPACITY TESTS

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	Peak %
1	14
2	14.6
3	19

Peak Opacity Difference: 4.95  
Difference within spec  
Test is VALID

3 TEST AVERAGE OPACITY: 15.9 %

Max Limit - Engines 1990 and Older: 40 %  
Zero-Drift Check: PASS

TEST RESULTS: \*\*\* PASS \*\*\*

Last Calibrated On: 08-30-12 12:22:33  
Calibration Filter: 48.5

Appendix D:

Emissions testing for control vehicles not retrofitted with SMART device.

**Vehicle #231**

S/E J1667 OPACITY TEST REPORT

EXTREME ENERGY SOL  
150 MAIN ST  
973 289 3450  
DOUG SHALL

Test Date: 10-26-12 Test Time: 15:10:28

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12813717 Model: Smoke Check 1667  
Software Version: 3.71NMJR

Test Type: SNRP TEST  
Tested by: DOUG SHALL  
Veh. ID: 231  
Year and Make: 04 INTERNATIONAL  
Vehicle Mileage: 96583  
Year of Engine: 2004  
Engine Mfg: INTERNATIONAL  
Stack Dia: 5 in.

Ambient Temp: 62.8 F  
Baro. Press: 30.13 inHg  
Rel. Humidity: 23.9 %

Visual Inspection.....OK

Preliminary Cleanout Snaps

Test #	Peak %
1	5.28
2	4.64
3	6.11

.....OFFICIAL OPACITY TESTS.....

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	Peak %
1	5.65
2	6.61
3	7.02

Peak Opacity Difference: 1.38  
Difference within spec  
Test is VALID

3 TEST AVERAGE OPACITY:.....6.43 %

Max Limit - Engines 1997 and Newer: 20 %  
Zero-Drift Check.....PASS

\*\*\*\*\*  
TEST RESULTS: \*\*\*\* PASS \*\*\*\*  
\*\*\*\*\*

Last Calibrated On: 08-30-12 12:22:33  
Calibration Filter: 48.5

**Vehicle #250**

S/E J1667 OPACITY TEST REPORT

EXTREME ENERGY SOL  
150 MAIN ST  
973 289 3450  
DOUG SHALL

Test Date: 08-30-12 Test Time: 15:15:11

Meter Mfg: Red Mountain Engineering, Inc.  
S/N: 12813717 Model: Smoke Check 1667  
Software Version: 3.71NMJR

Test Type: SNRP TEST  
Tested by: DOUG SHALL  
Veh. ID: 250  
Year and Make: 994 GASK  
Vehicle Mileage: 126997  
Year of Engine: 1994  
Engine Mfg: CUMMINS  
Stack Dia: 4 in.

Ambient Temp: 93.9 F  
Baro. Press: 29.79 inHg  
Rel. Humidity: 38.6 %

Visual Inspection.....OK

.....OFFICIAL OPACITY TESTS.....

Test #	IDLE RPM	MAX RPM	RISETIME
1	0	0	0 sec
2	0	0	0 sec
3	0	0	0 sec

Test #	Peak %
1	25.8
2	14.9
3	13.4

Peak Opacity Difference: 12.4  
Difference exceeds 5%  
Test is INVALID

3 TEST AVERAGE OPACITY:.....18.1 %

Max Limit - Engines 1991-1996: 30 %  
Zero-Drift Check.....PASS

\*\*\*\*\*  
TEST RESULTS: \*\*\*\* FAIL \*\*\*\*  
\*\*\*\*\*

Last Calibrated On: 08-30-12 12:22:33  
Calibration Filter: 48.5