



# INSPECTION UPDATE

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Spring 2013

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**Inspection Update is a publication produced by Massachusetts Vehicle Check; a joint program of the Massachusetts Department of Environmental Protection (MassDEP), the Registry of Motor Vehicles (RMV) and Parsons Environment and Infrastructure Group, Inc.**

## Introduction to Emissions Test Results Lookup

There is a useful new feature on the Massachusetts Vehicle Check Program, Emissions Test Results Lookup, which is available at [http://www.massvehiclecheck.state.ma.us/motorist\\_emission\\_test\\_results.html](http://www.massvehiclecheck.state.ma.us/motorist_emission_test_results.html).

The Emission Test Results Lookup can be helpful to motorists in several ways. First, motorists can use its drop-down menus to compare their cars' emissions performance with other vehicles on the road. Second, it lets drivers compare their cars' diagnostic trouble codes (DTC) with those of other vehicles. Finally, it allows potential used car buyers to research whether the vehicles they are considering have any common on-board diagnostics (OBD) test failures.

The user-friendly lookup retrieves Massachusetts Vehicle Check data from the start of the program on October 1, 2008. Data is currently available for 1996 through 2007 model years. Data for OBD test counts and DTC counts is updated every 10 minutes. Data for OBD readiness monitor "not ready" rates is updated nightly.

Using the Vehicle Lookup tab, after the motorist selects a model of vehicle, the website displays:

- The number of initial OBD tests performed on the model of vehicle selected
- The overall OBD test failure rate
- The OBD diagnostic link connector (DLC) failure rate
- The OBD communication failure rate
- The OBD Malfunction-Indicator-Lamp (MIL)-on failure rate
- The OBD monitor "not ready" rate for each readiness monitor

Using the DTC Category tab, after the motorist has selected a DTC Category, he or she will be prompted to choose a specific DTC. The website will then display the following:

- The top 25 kinds of vehicles with that DTC
- The respective initial OBD failure rate with that DTC

After the motorist's chosen report appears on the screen, he/she may click the underlined data to see more specific information. The website provides motorists with annotated examples of each report to help them understand the data presented.

**Motorists can use the Emissions Test Results Lookup drop-down menus to research common vehicle OBD test failures and DTCs.**



## Motorist Assistance Center Repair Technician's Corner



2000 Infiniti I30. Source: Edmunds.com.

A 2000 Infiniti I30 was initially presented for inspection on March 5, 2012. The vehicle failed with the Malfunction Indicator Lamp (MIL) commanded on and a stored P0430 DTC (Bank 2 Catalyst Efficiency Below Threshold). The inspection test history over the next several months is displayed below.

2000 model year vehicle can have no more than two OBD monitors “not ready” to enable the vehicle’s re-inspection to proceed. In addition, if a vehicle fails the OBD test for a catalyst efficiency code, then the catalyst monitor must be “ready” when the vehicle is presented for its reinspection. After the third unsuccessful attempt to re-inspect with insufficient monitors “ready,” the vehicle was referred to a Motorist Assistance Center (MAC). Once a vehicle has received a MAC Referral inspection result, it cannot finish the inspection process until the owner contacts the nearest MAC.

The motorist contacted the motorist hotline which resulted in the scheduling of an appointment for the vehicle at the closest MAC. The MAC’s goal is to assist the motorist or

repair facility to identify the next logical step(s) to allow the vehicle to complete the inspection process.

In this vehicle’s case, the same two incomplete monitors (catalyst and oxygen sensor) were “not ready” on May 9 and December 15 retests. The motorist had been to a few repair shops between those two retests and was repeatedly told to drive the vehicle because “there was nothing else that could be done.”

The MAC connected an OBDII generic scan tool to the Infiniti and reviewed the data for any possible conditions that may be preventing the catalyst monitor from completing. Below is a screenshot of the generic data taken with a fully warm engine, at idle. Do you see any obvious problems in the O2 sensor values (located in the blue box below)?



Looking at scan tool oxygen sensor values (in the blue box) doesn't always reveal what needs to be repaired.

*(Continued on page 3)*

### Supported Non-Continuous Monitors

Inspection Date	Inspection Sequence	Catalyst	Evap	O2 Sensor	O2 Sensor Heater	EGR	Inspection Result
3/5/2012	Initial Test	Not Ready	Ready	Not Ready	Ready	Ready	Fail with DTC
5/4/2012	Retest 1	Not Ready	Ready	Ready	Ready	Ready	Turnaway
5/7/2012	Retest 2	Not Ready	Ready	Ready	Ready	Ready	Turnaway
5/9/2012	Retest 3	Not Ready	Ready	Not Ready	Ready	Ready	Turnaway
12/15/2012	Retest 4	Not Ready	Ready	Not Ready	Ready	Ready	MAC Referral

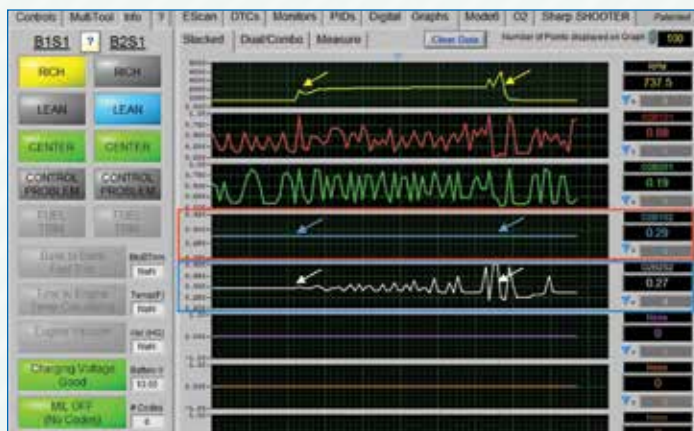
## Repair Technician's Corner

(Continued from page 2)

Nothing obvious stuck out to the MAC, either. When faced with this type of failure, common monitor-blocking items to look for should include: engine temperature (value too low), fuel trims approaching their limits, a throttle position (TP) reading that doesn't appear correct, or pending DTCs. Basically, repair technicians need to look for any issues with the enabling criteria that must be met in order to allow the "not ready" monitors to run.

So, at first look, there appears to be nothing obviously wrong with the vehicle. But what if you were to perform a dynamic test and graph the data? An engine speed (RPM) snap or wide open throttle (WOT) test is a quick test that you can use in your bay to see if you have a dead or slow/lazy O2 sensor. O2 sensors must have the ability to detect a rich mixture (exceeding 800 mV), as well as lean mixture (less than 200 mV). If an O2 sensor is incapable of reaching these thresholds, then it is incapable of performing its job and should be replaced. Another diagnostic option would be to add propane into the engine intake to richen up the mixture, and alternately create a large vacuum leak and see if the O2 sensors respond accordingly.

The MAC performed an RPM snap test on the Infiniti and looked at the following graph. Now do you see any problems with the O2 sensors?



Graphing rear oxygen sensor values during an RPM snap test (in the red and blue boxes) reveals what needs to be repaired.

Something is plainly wrong with the signals from both rear O2 sensors. If you look at the times on the graph where the RPM values were increased (indicated by arrows), you

can also see that the rear O2 sensor signals have very little activity, even while snapping the throttle. The bank one rear sensor (O2B1S2) signal is stuck at a fixed value of 0.29 Volts or 290 milliVolts (mV). The bank two rear O2 sensor (O2B2S2) signal doesn't look much better, alternating between 200 and 400 mV.

This graph revealed the most likely reason that the Infiniti was experiencing the readiness monitor issue, which would have been very difficult to diagnose without graphing the data. In other words, graphing O2 sensor data provided better illustration of what was going on with the vehicle rather than looking at scan tool values changing in a scan tool data stream.

The MAC advised the motorist that his vehicle had a potential problem with its rear oxygen sensors that could prevent the monitors from running and to visit a Registered Emissions Repair Shop for diagnosis and repair with this new information. As a result, both rear O2 sensors were replaced, the motorist drove the vehicle themselves to get the vehicle ready, and the vehicle passed the inspection as seen below.

It is interesting to note that on January 5, the catalyst monitor was ready before the O2 sensor monitor. It may seem weird, but it is not uncommon. Also of interest is that the O2 sensor monitor was ready on May 4 and May 7 inspection attempts but the catalyst monitor was not.

The motorist could not remember, but the MIL may have come on again for the catalyst efficiency code after being cleared with no repairs performed. The rear O2 sensors may have been just starting to fail and were able to pass the O2 sensor monitor before May 7, but the ECM would not run the catalyst monitor, or the MIL came back on and was turned off again. By May 9, the sensors had degraded to a point where the O2 sensor and catalyst monitors would not run at all.

All of the MACs have observed motorists or repair technicians clearing an undiagnosed DTC in hopes the code does not return. However, this attempt always proves futile, as the DTC inevitably returns. In other words, clearing the DTC only extends the repair process, frustrating everyone involved.

(Continued on page 7)

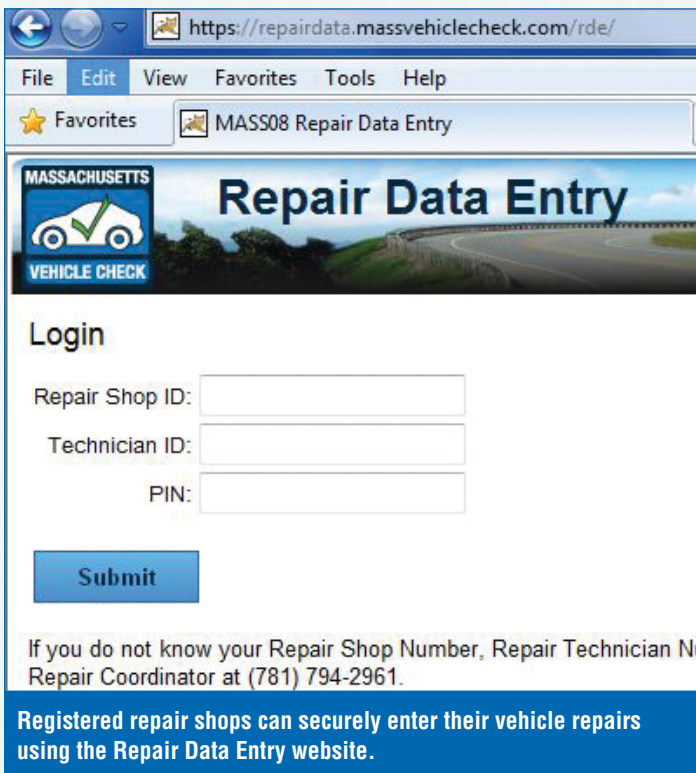
Inspection Date	Inspection Sequence	Catalyst	Evap	O2 Sensor	O2 Sensor Heater	EGR	Inspection Result
1/5/2013	Retest 5	Ready	Ready	Not Ready	Ready	Ready	Pass

## Registered Repair Technician Updates

### ► Repair Data Entry Reminders

In January, the Massachusetts Vehicle Check Program began collecting vehicle emissions repair information with the introduction of a Repair Data Entry application on the program's website. Registered emissions repair shops can securely enter vehicle repair data so that the program can assign each shop an Emissions Repair Success Rating (ERSR). Once the program has collected six months worth of repair data, ERSRs will be generated on a quarterly basis.

The repair data entry website link is: [http://www.massvehiclecheck.state.ma.us/inspection\\_repair\\_data\\_entry.php](http://www.massvehiclecheck.state.ma.us/inspection_repair_data_entry.php). From this page, you can print and fill out a blank Repair Data Entry form for each vehicle repair. When you are ready to enter vehicle repairs, visit this page and click the link that opens the Repair Data Entry application, or visit the following page directly: <https://repairdata.massvehiclecheck.com/rde/>.



The screenshot shows a web browser window with the address bar displaying <https://repairdata.massvehiclecheck.com/rde/>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. A Favorites bar shows 'MASS08 Repair Data Entry'. The page header features the Massachusetts Vehicle Check logo and the title 'Repair Data Entry'. Below the header is a 'Login' section with three input fields: 'Repair Shop ID:', 'Technician ID:', and 'PIN:'. A blue 'Submit' button is positioned below the fields. At the bottom of the page, there is a blue banner with white text that reads: 'Registered repair shops can securely enter their vehicle repairs using the Repair Data Entry website.'

Registered repair shops are responsible for entering data for every month by the tenth day of the following month. Each vehicle repair entered will count toward the total number of repairs in each six-month reporting period. If the entered vehicle repair is associated with a passing re-inspection, the repair will be counted as a Retest Pass. If the vehicle repair entered is associated with a failing reinspection, or if the repaired vehicle is turned away for unset readiness monitors, the repair will be considered a Retest Fail.

Vehicles that received waivers or hardship extensions will not be counted. Also, if a vehicle happens to have its retest aborted before receiving a pass, fail or turnaway result, the aborted retest is ignored.

Registered repair shops will receive an ERSR based on the ratio of Retest Passes to Total Repairs. These ratios will then be converted to an ERSR score, which is based on a five-star rating system. Shops with the best repair success information will have five stars.

### ► Spring 2013 Ongoing Training Courses

All current Registered Emissions Repair Technicians are required to attend one four-hour ongoing training module by March of each year in order to keep their Massachusetts Vehicle Check Program registrations current.

The first opportunity for Registered Techs to complete this annual requirement will be at the Spring 2013 ongoing training seminar.

Parsons is offering this seminar from 6:00 PM to 10:00 PM at the following Motorist Assistance Centers: Medford (June 10), Pocasset (June 11), Shrewsbury (June 12), and West Springfield (June 13).

The spring seminar will focus on Evaporative Control System Diagnostic Trouble Codes (DTCs). Since the Massachusetts Vehicle Check Program began, more than 165,000 vehicles have failed the on-board diagnostics (OBD) test with at least one evaporative system DTC. The training will concentrate on effective diagnostics and repair of vehicles that have failed their emissions tests due to evaporative system DTC problems.

The cost of the seminar is \$150, and payment may be made by either check or credit card. The application for this course is available at [http://www.massvehiclecheck.state.ma.us/inspection\\_ongoing.html](http://www.massvehiclecheck.state.ma.us/inspection_ongoing.html). If you need help registering or have questions about this course, please call our Registered Repair Coordinator at (781) 794-2961. Space is limited to 35 per class, so it is important to sign up as quickly as possible.

### ► Fall 2012 Registered Repair Technician Ongoing Training Recap

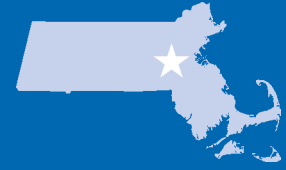
In November, the Massachusetts Vehicle Check program offered a Registered Repair Technician ongoing training module titled "Exhaust Gas Recirculation (EGR) Diagnostic Trouble Codes (DTCs)."

Instructor "G" Truglia taught 34 repair technicians at four Motorist Assistance Centers about effective diagnostics and repairs on vehicles that have failed their emission inspections because of EGR DTC problems.

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## Inspection Update Profile

Murphy's Automotive, Framingham MA



From left to right, the Murphy's Automotive team members include: Joseph Murphy, Sr., Owner; Raymond Silva, Technician; Edward Stanton, Technician; Joseph Murphy, Jr., Technician; Wayne MacKeil, Technician; and Doug Boulter, Technician

**Q: What services does Murphy's Automotive offer?**

A: Murphy's Automotive provides complete automobile and light truck repairs and maintenance. Our undercar services include brakes, exhaust, steering, suspension, and wheel alignment. Most days we diagnose and repair vehicles that have the "check engine" light on. We also perform heating, ventilation, and air conditioning (HVAC) repairs.

**Q: How many owners does your business have? What are the roles and responsibilities of each?**

A: I am the shop owner. My job is to oversee the day-to-day operations of the business, which include service writing, distribution of technician jobs, preparing and selling estimates, and supporting the technicians as needed.

**Q: How many employees do you have?**

A: Murphy's Automotive has eight employees. Six of our eight employees have been with the company for over 10 years. Our National Institute for Automotive Service Excellence (ASE) L-1 Master Technician, Wayne MacKeil, will have worked with us for 30 years this October.

**Q: How did you get your start in the automotive industry?**

A: My father Jerry founded Murphy's Automotive in 1964. We started as a gasoline service station. I started pumping gas as a young teenager, and over time I moved from the pumps to the service bays. Eventually we bought new property and retired from the gasoline business, shifting our attention to servicing automobiles.

**Q: Have you attended any of the Massachusetts Vehicle Check Program ongoing training seminars? How else do you keep up with changes in vehicle technology and emerging technologies in the Industry?**

A: We have attended all required and available classes at the Shrewsbury Motorist Assistance Center (MAC). This includes Inspector, Commercial Inspector, and Registered Repair Technician Classes. Having been in the business over the years, we have attended many different training classes and are currently planning to attend courses that are offered by Bosch.

**Q: Are you a Registered Repair Technician? How has being a Registered Repair Technician (RRT) helped your business?**

A: Yes, I am a Registered Repair Technician, and our shop has had RRTs on staff since we started in the automotive service business. Having our business listed on the Vehicle Inspection Reports of vehicles that have an emission test failure has brought in new customers. Working with Eric Johansen at the Framingham MAC, we have been able to help motorists with more challenging emission repair problems that other repair shops haven't been able to solve.

**Q: What are some of your most challenging vehicle repairs?**

A: Automotive service today is more challenging due to new technologies, which often require more research time. In today's economy, some of the most common challenges we see are vehicles that need more work than our customers can afford. Much of our time is spent trying to prioritize repairs, because in some cases the total repair cost as determined by our diagnosis of the problem exceeds the value of the vehicle.

**Q: What should motorists begin to do to ready their vehicles for spring?**

A: No matter what season it is, motorists should make sure that all of their vehicles' recommended services have been performed, paying especially close attention to the condition of the tires and wipers. If motorists don't have a clear view out of their windshields or their vehicles have insufficient tire tread to maintain proper contact with the road, they are putting themselves and others in danger.

**Q: How do you advertise your business?**

A: We advertise the shop through our website (<http://www.murphysautomotivema.com>) as well as the Yellow Pages. We also advertise through many youth and local activities that we support. Most new customers come to us after they receive a referral from an existing customer.

**Q: What is your business motto?**

A: At Murphy's Automotive, we are committed to the safety and reliability of your vehicle.

## Inspection Procedure Reminders

### ► Massachusetts Vehicles Transporting Nine to 15 Passengers Originating or Traveling Out-of-State Need Commercial Safety Inspections

The Federal Motor Carrier Safety Administration (FMCSA) requires that vehicles designed to transport nine or more passengers (including the driver) for direct compensation (“for hire”) that are also participating in interstate commerce are required to undergo an annual FMCSA Periodic Inspection, commonly referred to as the annual DOT inspection.

The FMCSA has determined that ground transportation providers, servicing facilities such as airports and ship terminals, with passengers originating or traveling out-of-state are participating in a “furtherance of interstate commerce.” Therefore, these vehicles must undergo an annual DOT inspection.

Because the Massachusetts Commercial Vehicle Inspection (CVI) has been accepted as equivalent to the FMCSA Periodic Inspection, vehicles that undergo the CVI meet this federal inspection requirement.



**Nine-to-15 passenger vans transporting passengers from airports or seaports for direct compensation need a CVI. Source: NHTSA website.**

Massachusetts Commercial Inspection Stations are reminded to ask the drivers of nine-to-15 passenger vehicles (including the driver) about intended vehicle use. If a vehicle is used to transport passengers for direct compensation to and from facilities such as airports or seaports, with passengers originating or traveling out-of-state, inspectors should recommend that the vehicle undergo a CVI to meet the federal requirement.

The Registry of Motor Vehicles reminds inspectors that they can change the safety inspection type from non-commercial to commercial on the bottom of the second page of the vehicle input screen of the workstation. However, inspectors must have the proper station and inspector licensing credentials to perform a CVI.

### ► Studded Tire Reminder

Studded tires are permitted on vehicles in Massachusetts, but only from November 1 through April 30. Vehicles equipped with studded snow tires that are inspected between May 1 and October 31 should be rejected.



**Source: Nokian Tyres website.**

### ► Workstation Reminder

The workstation, monitor, and printer should be properly shut down nightly. This procedure helps to increase the reliability of the components, minimizes workstation downtime, and can reduce your station’s electricity costs.

## Website Updates

In February, the Massachusetts Department of Transportation Registry of Motor Vehicles (RMV) Division launched a redesign of its website at a new address, <http://www.massrmv.com/>.

Also in February, the Massachusetts Vehicle Check Program added two new pages to its website. The first new page, [http://www.massvehiclecheck.state.ma.us/motorist\\_top\\_ten\\_questions.html](http://www.massvehiclecheck.state.ma.us/motorist_top_ten_questions.html), lists the answers to the Top Ten Motorist Hotline Questions, such as “What are the safety inspection requirements for vehicles?” The second new page, [http://www.massvehiclecheck.state.ma.us/motorist\\_rmv\\_questions.html](http://www.massvehiclecheck.state.ma.us/motorist_rmv_questions.html), provides the answers to common RMV Questions, such as “How do I get Replacement Plates?”



**In March, Massachusetts Vehicle Check introduced a new webpage that lists the answer to the most common hotline questions.**

## Repair Technician's Corner

(Continued from page 3)

The scenario with the vehicle above is not uncommon; we tend to think that the computer is smarter than it really is. A MIL is not always going to turn on when the vehicle has a problem, such as a slow rear O2 sensor. Repair technicians must be able to look at the data stream and pick out any anomalies that may be present. Remember to routinely plug a scan tool into a known-good vehicle so that you will be familiar with a good sensor values, as this will help you identify anomalies more easily.

One last thing to remember when using any scan tool is that quite often the tool may not update the displayed data fast enough to see or display everything that occurred. This is a function of the speed of the software in the vehicle and the scan tool. For instance, it is quite common to be watching the throttle position PID on your scan tool and not see it update even though the vehicle's throttle was given a quick WOT.

If you suspect that the data update is too slow, it is best to actually test the suspected sensor with a lab scope or graphing multimeter. Another way to make your data update (refresh rate) faster is to select a smaller number of data parameters (PIDs) from the available list. This will greatly speed up the refresh rate of the data on your tool. In this case, the MAC selected only five data PIDs for display in the graph.

## Registered Repair Technician Updates

(Continued from page 4)

### ► Prospective Registered Emissions Repair Technicians

If you would like to become a Registered Repair Technician, please visit [http://www.massvehiclecheck.state.ma.us/inspection\\_repair\\_tech.html](http://www.massvehiclecheck.state.ma.us/inspection_repair_tech.html) and review the application and training requirements.

The next OBD Diagnosis and Repair Training Class will be offered April 8-11, 2013 at the Shrewsbury MAC. Application forms can be downloaded from the program website at this address: [http://www.massvehiclecheck.state.ma.us/inspection\\_forms.html](http://www.massvehiclecheck.state.ma.us/inspection_forms.html). If fewer than six repair technicians enroll by the week before a class begins, Parsons may cancel the class.

### Spring 2013 OBD Diagnosis and Repair Training Schedule

#### Shrewsbury MAC (Day Class)

Monday and Tuesday, April 8-9 – 8:00 AM to 5:00 PM  
Classroom/Hands-On Training

Wednesday, April 10 – 8:00 AM to 12:00 PM  
Classroom/Hands-On Training

Thursday, April 11 – 8:00 AM to 5:00 PM Hands  
On Training/Exam

Please contact our Registered Repair Coordinator at (781) 794-2961 if you have any questions about the OBD Diagnosis and Repair Training Course.

### ► Answers to Your MassDEP Compliance Questions

It can be a challenge to keep up with all the requirements that apply to your motor vehicle inspection and/or repair business: What do I need to know about generating, accumulating and labeling hazardous waste and waste oil? Is the floor drain in my inspection or repair bay legal? How often do I need to inspect the underground storage tanks and Stage II Vapor Recovery System?

Find answers to these and other questions about environmental rules and best practices at MassDEP's Motor Vehicle Fueling, Service & Repair web page: <http://www.mass.gov/dep/recycle/hazardous/vehicles.htm>



Motor vehicle fueling, service and repair businesses can find the answers to environmental compliance questions on this MassDEP webpage.

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**Inspection Update  
Massachusetts Vehicle Check Program**

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**MA Vehicle Check Program Website Update and Inspection Procedure Reminders Inside!**

**Massachusetts Vehicle Check Program At A Glance**

Program at a Glance			Enforcement Statistics	
	Count	Failure Rate		Count
Non-Commercial Safety Inspections	1,007,736	5.0%	Violations Issued to Inspectors	98
Commercial Safety Inspections	35,793	5.2%	Violations Issued to Stations	112
7D Safety Inspections	5,515	2.0%	Inspector Privileges Revoked	1
OBD Emissions Inspections	827,534	6.3%	Inspector Required to Retrain	6
Opacity Emissions Inspections	21,055	1.7%	Inspectors Suspended	10
Emissions Waivers Issued	1		Stations Suspended	16
Repair Hardship Extensions Issued	20		Penalties Assessed	\$44,000
Hotline and Training Statistics			Licensed Stations	
	Count			Count
Motorist Calls Received	3,000		Class A Stations	1,211
Inspection Station Calls Received	7,390		Class B Stations	185
Initial Non-Comm. Inspectors Trained	329		Class C Stations	29
Initial Commercial Inspectors Trained	61		Class D Stations	305
Initial 7D Inspectors Trained	2		Class E Stations	9
Initial Motorcycle Inspectors Trained	6		Reg. Emissions Repair Shops	195

*For period 10/01/2012 to 12/31/2012*



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