SPECIAL DIESEL ISSUE

Inspection Update

A Publication of the Massachusetts Enhanced Emissions and Safety Test Program

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New Diesel Technology, Fuel on Horizon

To make our air cleaner and healthier, the federal government is driving a revolution in diesel engine technology and fuel.

Change is coming in the form of new standards for diesel engine emissions of oxides of nitrogen (NOx) and particulate matter (PM) by the U.S. Environmental Protection Agency, and in a federally mandated switch to ultra-low-sulfur diesel fuel.

Working on a parallel track to government, manufacturers are re-engineering diesels to reduce emissions in a major way without sacrificing engine performance or fuel economy.

"This is similar to what happened in the 1970s when automobiles were redesigned to run on unleaded gasoline with emissions control devices," explained Julie Ross, a regional planner with the Massachusetts Department of Environmental Protection and one of the agency's leading experts on diesels. "The next generation of diesel engines will run on ultra-low sulfur fuel so that their emissions controls will function without being poisoned by the sulfur."

Tighter federal standards on diesel fuel and engines are coming in three steps: lower NOx emissions in 2004; the sale only of ultra-low-sulfur fuel in 2006; and lower PM emissions in 2007.

On account of all these changes, the overall level of pollution from the next generation of diesel engines could be as much as 95 lower than it is today, Ms. Ross said.

Diesel manufacturers have been designing engines to run cleaner for well over a decade, and have made the combustion process, in the words of Ms. Ross, "about as efficient as it can get." During this long, painstaking process, engineers discovered a distinct trade-off between PM and NOx reductions: If a proposed engine design reduced NOx significantly, it also increased PM. The converse was also true: When PM was reduced, NOx increased.

Ultimately, it was determined that a switch to ultra-low-sulfur diesel fuel, combined with new engine technologies, is the most feasible and reliable way to cut PM *and* NOx emissions.

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Positive Impact on Air Quality Seen in Diesel Emissions Test

Massachusetts began requiring heavy-duty diesel-powered vehicles to undergo biennial emissions testing, in conjunction with its *Enhanced Emissions & Safety Test* program, on Feb. 1, 2001.

With the completion of the first two-year heavy-duty diesel emissions testing cycle, state environmental officials say the test has been successful in persuading owners of many "gross polluting" vehicles either to repair them or take them off the road.

"We realized from the get-go that the smoke opacity test for diesels is not perfect or comprehensive, but that it could be effective in identifying the gross polluters of the diesel world," said Julie Ross, regional planner for the Massachusetts Department of Environmental Protection. "Most observers would agree that the test has, indeed, been helpful in identifying and cleaning up many of the gross polluters — not all, but many."

Among those in the diesel maintenance and repair sector who agree with Ms. Ross is Brian LaVigueur of Boston Fuel Injection, a busy, full-service diesel shop with four locations in three New England states.

"The diesel emissions test has had a definite positive impact on air quality," Mr. LaVigueur asserted. "It's impossible to measure the precise impact, but we've seen a major improvement in terms of lower emissions from heavy-duty diesels registered in Massachusetts." *A profile of Boston Fuel Injection appears on Page 3 of this edition of Inspection Update.*

Since the advent of the emissions test for heavy-duty diesels, fleet managers in Massachusetts have adapted quickly and well to the necessity of "maintenance for emissions control," according to Ms. Ross.

"For the most part, fleets have done a good job preparing their vehicles for the annual

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Software Tweaked To Make Stickers Easier to Read

In April, software enhancements were installed on all SPX workstations. And, in June, all ESP machines were scheduled to receive software updates as well. The changes are accomplishing two goals:

One, enhancing the printing of numbers on inspection stickers. Print heads will strike twice on the inspection sticker, rather than once, substantially increasing the amount of ink on each sticker.

Two, enabling Registry of Motor Vehicle field staff to sign onto workstations and conduct a test print of a sticker to ensure that the station has replaced ribbons as required.

Should you have questions about workstation software updates, please contact the Station Hotline: 877-297-5552 ■

Diesel Technology Turning Green

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Only through the use of ultra-low-sulfur diesel fuel will it be possible for the government to adopt the new sulfur content fuel standard of 15 parts per million. Comparing that to today's standard – 500 parts per million – is like comparing a Dachshund to a Clydesdale.

And only through the use of ultra-low-sulfur fuel will it be possible to protect the newly mandated diesel engine emissions control devices from sulfur poisoning, assuring that these devices function effectively over the long haul.

Interestingly, manufacturers have taken different approaches to reducing emissions of NOx, a main chemical ingredient of smog, which is produced under intense heat within the internal combustion engine.

Companies such as Cummins, Detroit Diesel and Mack produced and tested engines cooled by exhaust gas recirculation (EGR) technology before introducing them, successfully, in the 2002 model year.

Caterpillar, by contrast, is banking on ACERT, Advanced Combustion Emissions Reduction Technology. ACERT integrates four engine systems (fuel systems, air systems, electronics and after-treatment) in a new way to cut NOx and PM.

Caterpillar plans to incorporate ACERT into a number of its products over the next several years, including on-road, off-road and stationary engines.

International is going with a "Green Diesel Technology" that makes constant adjustments to the combustion process and uses a catalyzed diesel particulate filter in combination with ultra-low-sulfur fuel. "Green Diesel Technology" already meets the 2007 PM emissions standards and is becoming a popular choice for companies and school districts acquiring new school buses.

In view of the increasing sophistication of diesel emissions control technology, Julie Ross predicts that states will, sooner or later, adopt diesel emissions testing procedures more sophisticated than today's widely used smoke opacity test for heavy-duty vehicles.

Further, Ms. Ross noted, "diesel technicians will continue to need advanced training to repair these sophisticated modern engines." To meet this anticipated need, Thompson Learning/Delmar is already working with ASPIRE to develop a diesel emissions repair curriculum. Mass. Bay Community College intends to adopt that curriculum when it becomes available. ■

Fleets Adapt Well to New System

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safety inspection, which has been in place for years in Massachusetts," said Ms. Ross. "Now, we're seeing them take the same approach to every-other-year emissions tests for heavy-duty diesels."

The diesel emissions test in Massachusetts, often referred to as the smoke opacity test, measures the blackness of a vehicle's exhaust during an in-use snap acceleration. The thicker and blacker the exhaust, the higher the opacity reading will be, and the more likely the vehicle is to fail the test.

All heavy-duty diesel vehicles manufactured after 1983 must undergo an emissions test every two years. New heavy-duty diesels are exempted from emissions testing during the first two years they're on the road, just as new automobiles are exempted, under the rules of the *Enhanced Emissions & Safety Test* program.

It is generally acknowledged that: (a) the smoke opacity test has inherent limitations because it only looks at smoke; (b) diesel engine technology is advancing all the time, becoming more sophisticated and complex in the process; (c) emissions testing is bound to be improved just as diesel engines themselves have been improved; and (d) the smoke opacity test will inevitably be replaced at some point.

Some manufacturers of vehicle testing equipment have already developed laboratory-grade equipment that can measure emissions of oxides of nitrogen (NOx) and particulate matter (PM), which has long been the hope of advocates for the environment and public health. Research and development efforts are now aimed at producing field-grade, affordable diesel emissions testing equipment with exactly these capabilities. ■

EPA Diesel Website:
www.epa.gov/otaq/retrofit

Boston Schools Retrofitting Buses

Because a diesel-powered vehicle was not made "clean" in the factory does not mean it is fated to produce pollutants at levels common during the previous century.

Many kinds of "old" diesels can be transformed into "green" diesels by retrofitting with the latest in emissions control technology, such as catalytic converters, exhaust gas recirculation devices, and particulate matter traps.

Retrofitting was just the ticket, for example, on the "Big Dig," where much of the excavating equipment was equipped with special catalytic converters to protect people in nearby Boston neighborhoods and businesses from diesel fumes. *The December 2002 edition of Inspection Update carried a front-page article on "Big Dig" retrofits.*

Under a different, ongoing project, the Boston Public School system is working with the New England office of the federal Environmental Protection Agency to retrofit approximately 100 buses used to transport students to and from school. ■

Inspection Update is published quarterly and distributed to the automotive service and repair industry in Massachusetts by the Department of Environmental Protection and the Registry of Motor Vehicles, in association with Agbar Technologies, Inc.

Our mission is to help foster the success of the enhanced vehicle inspection and maintenance program by providing news and useful information to vehicle inspectors and repair technicians in a timely fashion.

We also want to facilitate the sharing of helpful information among people within the industry. Toward that end, we encourage our readers to contact us with their suggestions, observations and constructive criticism. Ideas that would benefit the industry as a whole will be presented in subsequent editions of *Inspection Update,* as space allows.

To register your comments, please e-mail or phone:
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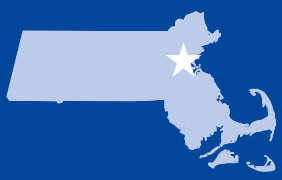
The Vehicle Maintenance Initiative Committee (VMI), composed entirely of volunteers from the repair industry, serves as *Inspection Update's* editorial advisory board. William Cahill, of B.C. Auto Repair, Randolph, is chair of the VMI Committee.



PROFILE

Chelsea

Boston Fuel Injection Focuses on Everything Diesel

Boston Fuel Injection's Chelsea facility

Boston Fuel Injection was the first business specializing in diesel engine maintenance and repair to qualify as a registered diesel emissions repairer in Massachusetts.

"Early on, we saw the importance of supporting the *Enhanced Emissions & Safety Test* program, so as soon as diesel testing began (February, 2001), we were ready to inform the DEP (Department of Environmental Protection) that we wanted to be a certified and registered emissions repairer," said Brian LaVigueur, Boston Fuel Injection's sales manager.

(The DEP and the contractor for the enhanced program, Agbar Technologies, are finalizing the necessary arrangements to include diesel emissions repairers on the Commonwealth's list of registered repair facilities. As soon as the arrangements are complete, Agbar will contact all diesel inspection stations and every diesel shop that has expressed interest in becoming a registered repair shop.)

"We're a full-service diesel fuel shop," Mr. LaVigueur said. "Besides performing all normal maintenance and repairs on diesel engines, we specialize in fuel injection pumps, fuel injectors and turbo chargers for the trucking, marine, manufacturing and heavy-equipment sectors of our economy.

"All our diesel technicians are certified, and they have at their disposal the most sophisticated, up-to-date equipment for the analysis and repair of diesels. Our guys can handle the new electronic diesel engines as skillfully as the old-style 'mechanical' diesels."

Brian LaVigueur working in the shop at Boston Fuel Injection

Boston Fuel Injection's main location is on Beacham Street, Chelsea, next door to the Dennis K. Burke Truck Stop and around the corner from the sprawling New England Produce Market, where the incoming and outgoing movement of huge tractor trailer trucks never stops. Other Boston Fuel Injection facilities are in Worcester, Smithfield, Rhode Island, and Bow, New Hampshire. The company has been family-owned since its founding 50 years ago; Sal Salvato of Peabody is the current owner/president.

Flexibility and mobility have been a key to the firm's success. As a service to its regular customers, for example, the company conducts mobile emissions tests for truck owners and fleet managers who want to know how their vehicles will fare on the state-required test. It uses a Bosch RT100A smoke meter when performing emissions tests.

For almost half the year, Boston Fuel Injection assigns two technicians full time to work on diesel-powered commercial fishing boats. "They're out there (on the water) every day during the good weather," said Mr. LaVigueur.

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"We're *not* part of the diesel inspection station network," Mr. LaVigueur pointed out, "because we weren't interested in doing safety inspections and safety-related repairs. Also, we wanted to continue focusing on engine repairs, including emissions-related repairs."

Boston Fuel Injection services and repairs all makes and models of diesel vehicles, including Mack, Peterbuilt, Kenworth, Isuzu and Navistar. In addition, it is an authorized service and parts dealer for Caterpillar, Cummins, Stanadyne, Northern Lights, Perkins, Bosch, Denso and Zexel.

Mr. LaVigueur says he strongly supports the *Enhanced Emissions & Safety Test* program for reasons of public health, business efficiency and productivity, and fuel economy. "First of all, I believe the program overall has had a very positive impact on air quality," he said. "Secondly, I see a definite connection between cleaner air and good diesel engine performance. If your diesel is not performing at its peak, emissions are going to be higher than they have to be, and miles per gallon will be less than optimal."

On average, Boston Fuel Injection makes five diesel emissions repairs per month. In about 75 percent of those repairs, company technicians trace the problem to one or more of the components of the fuel injection system, such as the injectors themselves, the injection pump or the filters.

Boston Fuel Injection's land-based business is divided equally between fleets and independently owned and operated diesel trucks. The company has about 30 full- and part-time employees.

Boston Fuel Injection, 410 Beacham St., Chelsea, MA 02150, 617-884-5151, Monday through Friday, 8 a.m. – 5 p.m. ■

Which Diagnostic Approach Is Best?

How to Test Your Air Pump of an

By Brian Manley

Perhaps it's just the way my brain is built, but I never liked the following math statement: "To every rule there is an exception." And then there's one the writers know: "I before E except after C..." Good thing I'm not a writer.

Just give me a basic engine: a block and a crank and some pistons and rings. No exceptions to the rules when performing basic engine tests, right? Well, sort of.

Brian Manley

An engine can have high cranking compression readings and still have an engine mechanical issue that will require parts replacement. So what is the first, the best, the most accurate test for analyzing an engine's mechanical integrity? To answer those questions, let's use as an example a vehicle owned by one of my recent customers...

This 1985 Honda Accord with 215,000 miles rolled into my bay running very rough and spewing some grey smoke from the tailpipe. As the mileage indicated, this Accord's engine may have been breathing its final breaths, so I set out to find the root cause(s).

My first plan of attack was to gather as much information as quickly as possible, so I grabbed my vacuum gauge. Hooked to a manifold vacuum source, the gauge jumped erratically from 12 inches to 16 inches.

An engine is just an air pump. This means that the amount of power that can be obtained from a given displacement engine is determined by the amount of air it is able to breathe in a certain period of time. Any flaw in the engine's ability to breathe, such as a worn camshaft lobe, will reduce the ability of that cylinder to contribute to the overall performance of the engine.

Based on the above vacuum readings, I determined that one cylinder of my "air pump" wasn't creating much, if any, negative pressure. So I moved onto the test that would help me isolate the weak cylinder, the relative compression test, for which I used my Fluke 98 Series II Scopemeter.

This relative compression test calculates the relative compression of the cylinders by measuring the voltage drop or current increase created from each cylinder during cranking. The larger the voltage drop or current increase, the more compression a cylinder has.

I was performing the synchronized (SYNC) relative compression test, so I clamped a trigger pick-up around the Number 1 sparkplug wire to identify which cylinder would appear first on my screen.

Are you ready for your first exception to the rule?

This test won't work on distributorless ignition systems (DIS) or coil on plug (COP) ignition systems. Also, this test works best for engines with six cylinders or fewer because interpretation becomes increasingly more difficult as the number of cylinders increases due to more compression overlap and less difference in current draw of the starter motor.

To prepare for this test, I pinched the fuel line to the carburetor and ran the engine until it died, then blocked the throttle open for even airflow. So, with all of the preparation involved, why didn't I just screw a compression tester into my four cylinders and take readings?

Speed is often the reason, although either test may have required the same amount of time. But isn't it nice to be able to show your customer a nice, clean scope readout? Also, access is a big issue when choosing this test over the manual method. Can you think of any engines that have difficult sparkplug access? No, I can't either.

Figure 1 shows the results of my first test. Since the firing order is 1-3-4-2, cylinder 4 is currently working only 60 percent as hard as cylinder 1. And cylinders 2 and 3 are also a little lazy. I repeated this twice with the same result. What conclusions can we draw? Cylinder 4 is not breathing or sealing as well as it should.

It was time to pull the plugs, and perform the leak-down test.

Figure 2 shows the valve cover off the engine and the leak-down adapter going in cylinder 4.

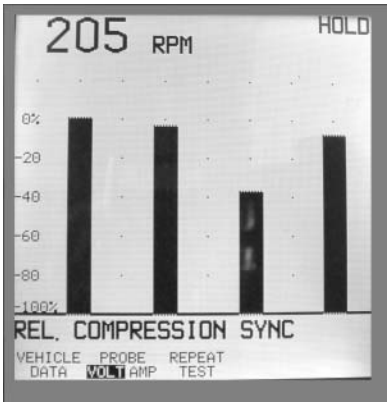

Figure 1

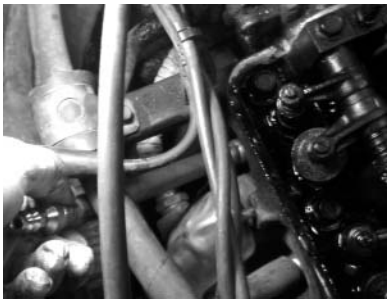
Figure 2

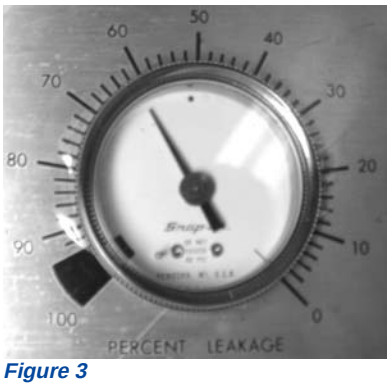

Figure 3

Figure 4

Engine for Mechanical Integrity

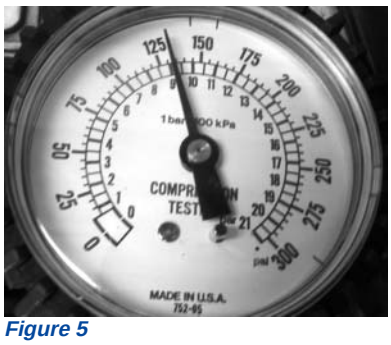

Figure 5

I pull the cover on these Hondas so I can accurately locate "top dead center" (TDC) of cylinders by watching the camshaft and timing marks.

Figure 3 shows the reading on the tester, which held steady at 60 percent. The coolant was so furiously bubbling in the overflow that it pushed it out onto the floor.

OK, so we've confirmed a blown head gasket or, worse, a cracked head or block. But are we finished with our diagnosis? No. The leak-down reading in Figure **4** (0 percent) is what I expect to see in a "good" cylinder — and that's what I saw in cylinder 1. But when I let the air fill cylinder 2, I got a reading of 65 percent, with a corresponding hiss of air from the tailpipe – a burned exhaust valve!

That left just cylinder 3, and, when filled with air, it created a 30 percent leak and a rush into the crankcase – worn rings! This engine had it all: worn rings, a burned valve, and a blown head gasket.

Figure 6

I didn't stop with the leak-down test in cylinder 4 because of the miles on the engine. The blown head gasket would have explained the gray smoke from the tailpipe, but I always try to cover my posterior when possible! It was time for cranking and running compression testing. Did we need to perform more tests on our high-mileage Honda? No, but before it went off to Honda Heaven, it would breathe a few more times for us.

Figures 5 through **8** show the cranking compression in cylinders 1 through 4 in order: 130 pounds per square inch (psi), 110 psi, 115 psi and 50 psi. These readings mirrored the synchronized relative compression test we did. A squirt of oil into cylinder 4 was in order.

Figure 7

Wet vs. Dry Compression Testing

A retest showed no increase in compression, which illustrated another exception to the rule when compression testing: If a wet compression test isn't higher than a dry test, the valves are probably the culprit. That doesn't hold water any better than the fourth cylinder of our Honda does, but remember, our Honda was an exception to the rule.

At this point, our Honda was so full of coolant it wouldn't run right…So we'll continue our discussion using another test subject, a car seen recently at Linder Technical Services, (an automotive technician support facility).

Michele "The Sleuth" Winn, a diagnostic technician at Linder Technical Services, worked on a 1999 Mercury Cougar with a 2.5 liter V-6 engine and 54,000 miles. The customer complained of a slight misfire at idle that seemed to go away with an increase in rpm. There was also a P0304 code (cylinder 4 misfire) and a check engine light that was "on." OBD II is so helpful; it had already identified the problem cylinder for Michele!

Figure 8

After ruling out ignition, fuel, vacuum leaks or an EGR issue, Michele decided to perform cranking and running compression tests. Here are the results:

CYLINDER NUMBER	1	2	3	4	5	6
Cranking Test:						
First Puff	125	130	125	65	130	125
Final Reading	180	180	180	90	190	185
Running Compression Test:	145	145	150	120	150	145

Michele said that, even without knowing the compression specifications for this engine, it was easy to tell there was a problem with cylinder 4, and, just like doing a quick check with an ignition scope, you are looking for one or two cylinders that stand out as being different from the others. After the engine was torn down, a defective piston was found.

But why did Michele perform a running compression test? Didn't the cranking test show her a low cylinder? Read on…

Engine volumetric efficiency refers to how much of a cylinder's volume is filled during different running conditions. Flow of air is related to the opening it must flow through, so for a fixed pressure, the flow through a fixed opening is time-related. If pressure is increased, flow will also increase, but only until the area of the hole stops the increase in flow. If an engine

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has a worn intake camshaft lobe, it will have low compression on that cylinder because the volume will be decreased due to the shorter time the valve is open.

During cranking, the cylinder fills completely with air because the valves are open for a long period of time, which allows the pistons to pull in a full load of air. This will result in a cranking pressure of around 150 psi, or less, if you live in Denver.

When an engine is running, the throttle is closed, the valves are open a shorter period of time, and the pistons are moving four times faster than cranking speed, which reduces the total volume of air being pulled into the cylinder. The piston is simply moving faster than the air can move.

That's why Michele performed both tests. She knows cranking compression will test for cylinder seal leaks, but running compression will test for volumetric efficiency, or "breathing" problems.

Idling compression pressure is usually 50 to 70 percent of cranking compression, but when you "snap" open the throttle, the pressure should rise to at least 80 percent of the cranking value. This is because we briefly increase air volume while maintaining the same basic idle speed. If one or more cylinders are higher than the rest, then there could be an exhaust restriction or an exhaust valve lift issue. If the number is lower, then there could be an intake restriction or valve issue.

Trouble "Pumping Up"

Problem cylinders may have trouble pumping up and may increase by only 10 psi per stroke. You may be able to crank these cylinders enough times to come close to the other cylinder's total psi, and this is one reason to limit the number of compression strokes. Poor rings usually cause this condition.

Be aware that a cylinder suffering from excessive oiling, even from bad rings, can yield high compression test results because the excess oil in the cylinder seals the rings. Other symptoms may give you a clue to the problem (a smoking engine).

There are some variables that affect the readings obtained from compression testing. They are cranking speed, altitude, temperature, worn camshaft lobes and high-performance/long-duration profile camshafts. The cranking speed needs to be maintained the same for each cylinder. This may mean jumping your battery to maintain the speed.

There are factors to compensate for the different altitudes and the corresponding temperature differences. These are as follows: 1,000 feet = .9711; 2,000 feet = .9428; 3,000 feet = .9151; 4,000 feet = .8881; 5,000 feet = .8617; 6,000 feet = .8359; 7,000 feet = .8106; 8,000 feet = .7860.

The equivalent compression reading for a cylinder that should be 135 psi by the data at 5,000 feet would be 135 x .8617 = 116.33. ■

Brian Manley is a vocational automotive instructor for the Cherry Creek school district in Aurora, Colorado. He is an ASE triple master certified technician and a member of the National Automotive Technicians Education Foundation (NATEF) board of trustees. "Inspection Update" thanks Mr. Manley for his generosity in allowing us to reprint this article, which first appeared in AutoInc. magazine, a publication of the Automotive Service Association.

Here's a Step-by-Step Diesel Emissions Repair

Since the advent of heavy-duty diesel emissions testing in Massachusetts on Feb. 1, 2001, emissions-related repairs have become a small but steady part of the business at Boston Fuel Injection, a diesel engine specialist with four locations in New England.

Asked to describe a typical emissions repair by Boston Fuel Injection, the company's sales manager, Brian LaVigueur, gave this account of a 1989 Mack Midliner that had failed the heavy-duty emissions test. Before being repaired, the vehicle had a smoke opacity rating of 58%; after repairs, that rating dropped dramatically.

The truck had failed the diesel emissions test by three points, as heavy-duty diesels manufactured between 1984 and 1990 are allowed an opacity rating no higher than 55%, under the *Enhanced Emissions & Safety Test* program.

Besides the heavy black smoke produced by the truck, the owner was aware of a fuel leak, which he suspected was somewhere in the fuel injection system.

Vanduir DaSilva, a certified L-2 diesel technician, quickly traced the emissions problem to the fuel injection pump and the fuel injectors. Checking the engine filters and engine timing, DaSilva found that the fuel injectors were leaking fuel and the fuel pump was out of time by three degrees. He removed the pump and the injectors (both manufactured by Bosch) for service in the large shop adjoining the truck bays at Boston Fuel Injection's Chelsea facility.

Related Article, Page 3

Leo LaVallee, a company fuel technician specially trained and authorized to work on Bosch parts, performed a complete teardown of the mechanical governor assembly. This consisted of a thorough inspection, the rebuilding of the governor assembly, and the recalibration of the governor assembly to factory specifications. But in the process, LaVallee discovered an additional problem: an oil leak at the throttle link on the fuel pump. This was repaired.

Next, service manager Erik Salvato "pop tested" the injectors and discovered that the number one injector was leaking fuel at the nozzle tip. The injector was repaired and calibrated to factory specifications. (A Bosch injector must have an equal spray pattern and "fire off" at a force of 3,200 pounds per square.)

Vanduir re-installed the fuel pump and injectors, and, to complete the work, re-timed the fuel injection pump. The truck was ready for an opacity re-test, which Brian LaVigueur performed.

Success! The 14-year-old Mack Midliner now had an opacity rating of 21%, which meant the repairs had cut the particulate smoke coming from the vehicle by more than half. ■

A Good Story Just Beginning to Be Told:

'How *Much* Cleaner the Diesel Is Becoming'

with Julie Ross

Inspection Update: Your title at the Mass. Department of Environmental Protection is regional planner. What does that position entail?

Julie Ross: The obvious answer is "planning." That means using a set of skills to address an issue or problem and to implement steps that resolve a problem or improve a situation. Typically, a planner uses goals, objectives and input from various stakeholder groups to guide her research and her evaluation of various ways of addressing an issue or resolving a problem.

IU: What has been the focus of your planning activities for the agency?

JR: Program planning, as in the *Enhanced Emissions & Safety Test* program. This differs from what most planners do, which is land use planning — zoning, commercial and residential development, etc.

IU: Is your work over when implementation of a plan begins?

JR: Oh no. Once a plan has been in place for a while, we evaluate its effectiveness, and, if necessary, make recommendations for adjustments and changes.

IU: How would you complete the sentence: "If I hadn't become a regional planner for the DEP, I'd now be…"?

JR: Driving tour buses and giving tours in New England.

IU: You work now part-time as a bus driver. Does driving a big tour bus take a lot out of you?

JR: No. I love to drive and the buses are one outlet for that energy. I'm curious about most everything, so I'm always reading and looking up stuff, and using that information on the tours. I recently began my twenty-fifth consecutive season as a tour guide in Massachusetts.

IU: Has driving a tour bus helped you be a better regional planner?

JR: It has really helped me develop skills I use every day at the DEP: research, public speaking, effective communication, and keeping a sense of humor when events don't go the way you want or expect. Sometimes when I'm frustrated by something at work, I remind myself that I once spent three hours and twenty minutes in a tour bus trying to get through a traffic light in Dewey Square (South Station, Boston). And that was long before the Big Dig!

IU: Haven't you had experience in ozone forecasting?

JR: DEP provides air quality forecasts during the ozone season (May 1-September 30). We have a meteorologist on staff who makes air quality predictions, but when he's on vacation, or taking a day off, I serve as the back-up ozone forecaster.

IU: Are you enthused about the pending switch to ultra-low-sulfur diesel (ULSD) fuel? (The federal government is mandating that, by 2006, only ULSD may be sold at the pump.)

JR: You bet. It's not generally understood how much cleaner the diesel engine is becoming as a result of technological advances and emissions control devices. These devices work effectively only if the engine is running on ultra-low-sulfur diesel. There'll be fewer ozone alerts in the future, I hope, because of these changes.

IU: Tell us about your background.

JR: I started driving coaches back in the '70s because the money was pretty good and I liked being outside all day. Driving coaches brought me to the tour buses, and the tours gave me an appreciation of redevelopment projects, architecture, history, geography, climate, etc. After many years of describing projects done by others, I started thinking, "I could do that." So I took a chance and went back to college. Half of the things I've done were because it never occurred to me that I shouldn't.

IU: You've been involved with the *Enhanced Emissions & Safety Test* program since it was in the planning stages. Looking back, what do you think was the single best decision made relative to the design of the program?

JR: To build relationships with our stakeholder groups, including environmental and health advocates, the inspection stations, the automotive technicians in the repair industry, commercial fleet managers and all. We tried very hard to establish relationships with all the groups affected by the emissions test. Their feedback on the pros and cons of proposed ideas has been extremely valuable.

IU: What advice would you give to another state where officials might be considering a decentralized vehicle inspection and emissions testing program similar to the one in Massachusetts?

JR: Limiting my comments to heavy-duty diesel testing, I'd advise my peers in other states to make sure that their new policies or regs are not at odds with other regulations governing commercial drivers and commercial equipment. A regulation that can be simply applied to a light-duty passenger vehicle can become troublesome in the heavy-duty arena.

IU: Give us an example.

JR: Checking the information on a car engine label can be pretty simple. You open the hood; the labels are usually right in front of you; they're easily read. But if you required that same procedure in a cab-over tractor, on something ten or fifteen years old, it might take twenty minutes to roll the cab up, and, if the engine has been replaced, you might not find, after all that, the information you're looking for. ■

As a result of the state's fiscal crisis, Julie Ross's position was among those recently eliminated at the DEP. Julie was an important and valued member of the I&M team, and her services, not to mention her superlative personality, will be missed.

Program Delivering Anti-Idling Message to Diesel Drivers

Why keep that bus running when you don't have to, especially if you can help the environment just by turning the ignition key off?

That's a question that officials from several governmental agencies, including the Massachusetts Department of Environmental Protection (DEP), want school bus drivers to ask themselves every time they park their vehicles.

Simple "anti-idling" measures, as officials term them, can go a long way toward improving air quality wherever diesel-powered vehicles go — not to mention protecting the health of school children and anyone else who walks the sidewalks of our cities and towns.

Aided by the DEP, a number of Massachusetts communities are developing anti-idling programs. Some of these programs are focusing on modifying the common practice of drivers leaving buses idling outside schools while waiting for students to be dismissed. Others are looking at not only school buses but also other vehicles that idle in areas where children congregate.

The DEP recently produced a five-minute training video, "School Bus Anti-Idling Guidelines," for use in the mandatory eight-hour annual training session for all Massachusetts school bus drivers. "School Bus Anti-Idling Guidelines" is part of a free packet to be offered to the trainers who conduct the annual sessions.

Additionally, the DEP recently completed work on a 30-second video public service announcement (PSA) designed to bring the anti-idling message to school bus drivers and the general public. While the PSA incorporates bits of the five-minute training video, its message is broader than the video in that it appeals to all drivers who ever have to park in a school zone. The DEP will soon be offering the PSA to major television stations and community cable providers. ■

Be the First on Your Block To Get the Anti-Idling Packet

If you're involved in your community, or if you're active in the parent-teacher organization at your child's school, you could be in a position to help the Department of Environmental Protection get the anti-idling message out.

Upon request, the agency will provide anti-idling training materials for school bus drivers and an anti-idling video public service announcement to local school districts, school boards, PTOs and other organizations with direct involvement in schools.

"While some of this information pertains specifically to the operation of a heavy-duty diesel, the materials are still very useful to schools that want to reduce student exposure to vehicle exhaust," said Julie Ross, a DEP regional planner who helped develop the materials.

If interested in promoting this message in your community, contact Lee Andrews, Department of Environmental Protection, 617-292-5647.

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Testing for 'Integrity,' Pages 4-6

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