

Inspection Update

A Publication of the Massachusetts Enhanced Emissions & Safety Test Program

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OBD Emissions Testing Trends: Repair Techs Hold the Keys to Fewer Failures

After more than a year of pass/fail on-board diagnostic (OBD) emissions testing in Massachusetts, two trends are emerging: Too many motorists are bringing their model year 1996 and newer vehicles in to be inspected even when their “check engine” lights are telling them they will fail, or bringing them back after repairs before they are “ready” to be tested.

Between July 2004 and March 2005, slightly more than 1 million cars, light trucks and SUVs (73 percent of all vehicles tested during that period) received OBD emissions tests in Massachusetts, and 8.8 percent of those vehicles failed on the first try. In nearly two-thirds of those vehicles, the “check engine” light was on when they arrived for inspection. For OBD testing.

“If repairers get in the habit of alerting customers to the significance of the ‘check engine’ light, everyone will be happier, vehicles with emissions problems will get fixed sooner, and air quality will improve,” said Paul Davis, *Enhanced Emissions & Safety Test* program manager for the Department of Environmental Protection (DEP). “Fewer motorists will get stuck making multiple trips to inspection stations or paying huge repair bills after ignoring small problems that get worse.”

Davis explained that when a customer brings a vehicle in for preventive maintenance or repairs with the “check engine” light turned on, it’s a sure sign that the vehicle has emissions-related problems. By running the appropriate diagnostics, a knowledgeable repair tech can

usually pinpoint what’s wrong and fix the vehicle so it will pass its next inspection.

But once repairs have been made, the vehicle still needs to be put through its prescribed drive cycle so it can complete its self-checks and be “ready” for OBD emissions testing. Otherwise, the vehicle will fail its initial inspection or be turned away from its re-test.

Helping customers successfully return their vehicles to “ready” status not only spares them from the frustration of having to make repeated trips to inspection stations, but also reduces the likelihood that they will come back to complain about the quality of repair work done on their vehicles.

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Positive Start for Online Inspector Recertification

Vehicle inspector recertification testing moved smoothly onto the internet in May and is continuing daily without a hitch, according to I&M program contractor Applus+ Technologies. An average of five inspectors per day are now taking the free, 50-question test online – and most are passing.

“The implementation of online recertification was seamless, and it hasn’t hit a snag yet that I’m aware of,” said Jon Hess, QA/QC Services Manager for Applus+ Technologies.

Periodic recertification is a requirement for an inspector to keep his/her license to perform the *Enhanced Emissions & Safety Test*. To be recertified, an in-

spector must score at least 76 on the test.

The only way now for an inspector to be recertified is by taking the online test.

Inspectors have handled not only the process of online recertification well, but also the test material itself. A very high percentage of inspectors are getting passing marks, or better, on their first attempt.

Of the 148 inspectors who took the online test during the first month and a half it was offered, 92 passed it with a mark of 90 or above. While 17 inspectors failed the test on the first try during

that period, all but two of them passed when they took it a second time.

Inspectors are given three opportunities to pass the test within a 45-day period. An inspector who fails the test three times in succession must take the initial inspector training course again at a cost of \$150, and then retake the recertification test.

The Registry of Motor Vehicles drives the entire process by sending letters weekly to inspectors due for recertification. The letters direct inspectors to the recertification web site, www.massrecert.com, tell them how to log in, encourage them to read the in-

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Q&A with Applus+ Audit Leaders

Heading Off Problems Is What It's All About

Since July 1, 2004, Applus+ Technologies, the contractor for the Enhanced Emissions & Safety Test program, has been performing quarterly compliance and equipment reliability audits of every inspection station in the program operating with a gas bench. With seven auditors doing an average of four to five audits per day, there is an Applus+ auditor active in virtually every part of the state every work day. For an inside look at how that auditing has progressed and what it has accomplished, Inspection Update interviewed Jon Hess, QA/QC Services Manager for Applus+, and his colleague, Equipment Auditing Supervisor Don Costa.

What are your thoughts in general about the compliance and equipment reliability audits?

Hess: I'm pleased by how effective the audits have been. And I'm especially pleased by how well the stations have taken to the audits.

Costa: At the beginning, I was concerned about how the stations would accept all this auditing. But those concerns weren't justified. The stations for the most part have been extremely cooperative.

Why have the stations embraced more frequent audits?

Costa: The auditors, the station operators and the station personnel have been able to establish relationships based on trust. The stations know now that we're there not just to audit but also to see where we can help them on equipment maintenance. Good maintenance translates into less downtime.

Hess: And less downtime translates into more revenue.

Costa: The work of the auditors has also increased the pride that station personnel take in maintaining their equipment. Auditors sincerely want to help the stations and vice-versa.

Hess: There's no doubt about it: the strong relationships built around auditing have strengthened the inspection program.

What about the impact of quarterly auditing on equipment performance?

Hess: Because of the way auditors frequently identify equipment problems before there are breakdowns, there's been a marked decrease in breakdowns and in requests for service.

Costa: Across the board, we've seen a great reduction in equipment failures. The quarterly audits results show that, and so, too, do the covert audits and the DEP audits.

Hess: I have a graph that shows the combined gas bench and VMAS failure rate is now below three percent.

With the failure rate dropping like that, are you as aggressive in correcting gas bench and VMAS failures today as you were when the audits began?

Costa: Absolutely. If the auditor can't correct the problem on the spot, a service ticket is opened immediately.

Hess: We give the information right away to SPX, and SPX has been very good about responding to stations needing repair services.

Costa: Our objective is to head off problems with the equipment before there is a failure or breakdown. That's how we've made the emissions test more reliable and more accurate. But when there is a failure, we jump on it regardless of whether it is detected during an audit or is called in by the station.

Hess: The auditing relies on simply comparing readings taken at the analyzer to the cutpoints. If the reading is over the cutpoint, a service call is made and the numbers are communicated to SPX service personnel for diagnostic aid.

You both cite the good relationships between the Applus+ auditors and the stations. What about your relationships with SPX?

Hess: There's good communication between Applus+ and the SPX engineering department and SPX field service repre-

sentatives. We work closely with SPX to monitor trends in equipment performance, and to identify and correct deficiencies in the service infrastructure. SPX is always eager to accept insights from our auditors that will help them repair equipment and keep it running well.

Costa: SPX is very responsive to our information and to the needs of the stations. They take repairs seriously.

Not long ago, all of the emissions testing equipment used in the Enhanced Emissions & Safety Test was either upgraded or replaced. Is that upgraded and new equipment living up to expectations?

Hess: The equipment has remained highly reliable. It continues to perform well.

Costa: The equipment had a positive impact on (test) reliability early on and continues to do so.

Is there anything stations can do to make the audits easier on themselves and the auditors?

Costa: They should be conscientious about maintaining equipment according to basic standards. They should be sure to do the recommended daily maintenance at the same time they're performing the gas calibrations. For example, every daily bench calibration should be accompanied by a cleaning of the cabinet air filter. *See Recommended Daily Maintenance page 4.*

Hess: I would urge the stations to get our auditors into the building as quickly as possible. The faster they get in, the faster they get out.



Don Costa, Audit Supervisor



Jon Hess QA / QC Services Manager

What kind of services?

Costa: We now do some of the maintenance that SPX formerly had to do in response to a station-initiated service call, such as changing the zero air generator catalyst and NOx scrubbers. The auditors are also now delivering calibration gases as part of every audit.

Hess: Every time an auditor goes to a station, he's delivering a set of calibration gases -- one high, one low. We want every station to have a calibration gases "cushion."

Costa: We don't want anyone ever to hesitate to do a calibration, and we don't want anyone to use expired gas bottles.

Have you kept all of the data you've developed through auditing?

Hess: Yes. Everything.

So you can look at the record and see what's happened at each of 1,500-plus inspection stations since you began auditing?

Hess: It's relatively easy to look at the entire equipment reliability and performance record of every station, and also to see program-wide trends and problems. We have a lot of data points and we do a great deal of trend analysis. We not only retain this data, we use it to improve the program.

Costa: It's important for the stations to know we don't just put this information on the shelf. We use it to help them keep the test equipment operating in top form.

Anything else you'd like to say about auditing?

Hess: We couldn't be happier with the performance of our auditors. They deserve a lot of credit for their consistently high level of performance and for the volume of work they perform. Also, they function well as a team.

Costa: The auditors help the stations, but they also help one another. Any problems they come across, any errors they make, they put it on the table for everyone to see, so that everyone can improve together. See list of Applus+ auditors. ■

Costa: That's probably our main drawback: the large number of stations that are reluctant to let the auditors in as soon as they arrive. We've gotten a lot quicker. We can get the job done and quickly move on to the next audit. We also avoid going to a station for an audit on the last day or the first day of the month.

Hess: There's a tendency to think it would be better if the auditor came back in two hours. But that's seldom the case. You're better off getting it done right away, even if there is a line of cars waiting to be inspected.

How much faster is an audit today than it was a year ago?

Hess: We've cut the time to do an audit by, on average, 30 to 40 minutes. It typically takes us less than 45 minutes to do a complete audit now.

How was that accomplished?

Hess: Number one, the auditors have become extremely proficient at performing their various tasks. Two, we've made many upgrades to the auditing software, and these have speeded up the process considerably. Three, we've improved the way the (audit) trucks are outfitted, which has made the auditors more efficient...To help put this into perspective, I'd like a station operator, when he sees one of our audit trucks arriving, to think this is not going to take any longer than a transient test on a rear wheel drive vehicle. That's all we're talking about now: 45 minutes or less for one of these audits.

Costa: At the same time, we've added services to the audit to help the stations.



ENHANCED EMISSIONS & SAFETY TEST

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 Applus+ Technologies.

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, chairs of the VMI Committee.

Applus+ Auditors

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Emphasis Now on Kreftsmanship at West Springfield DTC

One of the busiest Diagnostic and Training Centers (DTCs) operated by Applus+ Technologies is under new leadership.

Ben Kreft was recently promoted to supervisor of the West Springfield DTC, succeeding Mike Zabik, who left to run his own business. For the previous year, Kreft had served as a computer specialist responsible for helping inspection facilities solve workstation-related problems.

While relatively new to Applus+, Kreft's been around the *Enhanced Emissions & Safety Test* program almost since its inception: he worked for five years as a service tech for ESP Corp., one of the program's original two suppliers of emissions testing equipment. His terri-



Ben Kreft,
DTC Supervisor

tory for ESP was mainly central Massachusetts, but he also serviced inspection stations in many communities south of Boston.

"We're very happy that Ben has stepped up to a larger role," said Jack Pierce, Massachusetts program manager for Applus+. "Our center in West Springfield is an important one with lots of activity, and Ben was more than ready for the challenge."

A U.S. Marine Corps veteran who has served for years as a military reservist, Kreft is due to retire from the reserves this summer. He credits his military training with propelling his career in private industry.

"Serving in the Marine Corps gives you the organizational skills, discipline and focus that

are essential in this (automotive) field and so many others," he said. While in the Marines, he became proficient in aircraft radio electronics, and was responsible for in-flight repairs to sophisticated communication systems. He also worked on component-level electronic troubleshooting.

Kreft is a graduate of Bay Path Regional Vocational Technical High School in Charlton, where he concentrated on automotive electrical, mechanical and powertrain systems, structural assembly of vehicles, collision repair, and vehicle safety. A resident of Southbridge, his hobbies include restoring vintage cars.

The West Springfield DTC, located at 33 L Street, is one of five contractor-operated facilities in Massachusetts. The others are in Bridgewater, Dedham, Shrewsbury and Woburn. ■

OBD Emissions Testing, continued from page 1

"Repair technicians should make a point of learning the readiness routines for the makes and models they work on most frequently so they can send their customers off to inspection stations with vehicles that are ready to be tested," Davis said. "Techs also need to be able to effectively communicate about readiness-related issues, particularly since this is the first OBD failure/repair cycle for most motorists."

OBD emissions test readiness is covered by inspector and repairer courses offered at the state's automotive training institutes, and there is a wealth of information about vehicle drive cycles available from manufacturer manuals and subscription-based online services like All-Data, Mitchell-on-Demand, and Motor. ■

OF COURSE, YOU SCAN!!

Reminder: Inspectors are required to use workstation scanners with the Enhanced Emissions & Safety Test wherever possible; inspector license numbers, VINs, sticker numbers, etc.

Scanning saves time and ensures accuracy.

Call the Station Support Line at 877.297.5552, if your scanner is not working right.

Recommended Daily Maintenance

Vehicle inspectors should perform the following user maintenance tasks every day at the same time they calibrate test gases:

- Inspect sample probe tips and replace faulty ones.
- Check sample probe and hoses. *Altering sample hoses is prohibited. Also, the sample hose connection, auxiliary hose assembly, and the probe to inspect dual exhaust vehicles must be available and in good working order at all times.*
- Inspect, clean and replace dirty sample system and cabinet filters.
- Inspect and replace faulty VMAS hoses.
- Check printer ribbon and replace if worn or faded. *Printer ribbon should be replaced after 600 stickers have been printed. A new ribbon is provided with every shipment of stickers, the standard delivery packet.*
- Check VIR toner cartridge and replace if necessary. *If VIR printing becomes dark or streaky, printer drum may have to be replaced. Call the Station Support Hotline (877-297-5552) for all printer repairs.*
- Inspect calibration gas bottles. *New bottle values must be scanned into the workstation software immediately. Inspectors should verify bottle values with every calibration. If bottle values do not match stored values in the analyzer software, inspectors should scan correct values into the workstation software.*

Extreme Altered Vehicles = Safety Failure

When it comes to major alterations of a car or truck, beauty is in the eye of the beholder, but acceptability is defined in the laws and regulations of the Commonwealth of Massachusetts. The Registry of Motor Vehicles (RMV) has precise rules, for example, governing how high above or close to the ground a vehicle's body or chassis may be.

"Vehicles raised too high can end up with a dangerously high center of gravity, increasing the chances of a rollover accident," said Judy Dupille, the RMV's Director of Vehicle Safety and Compliance. "On the other hand, a vehicle whose chassis has been lowered too much may not be able to clear the pavement in many normal driving situations, which makes for not only poor ride quality but also for erratic braking and steering when approaching bumps or ruts in the road."

Inspectors have an obligation to protect motorists from the effects of their "wildest impulses" to alter the heights of vehicles, Dupille believes, and they should fulfill that responsibility "every time an altered-height vehicle comes in for an inspection."

"We have nothing per se against a motorist customizing a vehicle, or adapting it to reflect more of his or her individual preferences and tastes," she added, "but we draw the line at alterations that create a potentially unsafe condition."

RMV regulations define a vehicle's original manufacturer's height as the highest distance from a level surface, "inclusive of the largest tires and highest suspension available as standard or optional equipment."

Those regulations dictate that the "highest distance" be measured from the level surface on which the vehicle rests to one of three points: (1) the lowest edge of the centerline of the operator's door; (2) the lowest point where the operator's door would meet the body on vehicles without doors; or (3) the lowest point on the floor panel directly below the operator's position on vehicle's designed without doors.

Regulations on altered height vehicles apply to vehicles weighing 10,000 pounds or less, and they differ depending on whether a vehicle is two-wheel or four-wheel drive.

For two-wheel drives, the regulation is simple and brief: the chassis, or body, cannot be raised or lowered more than two inches beyond original manufacturer's height.

For four-wheel drives, the chassis *can* be raised or lowered more than two inches beyond original manufacturer's height, but the height change is limited by a formula that produces different results for different kinds of vehicles.

The height change limitation formula requires an inspector to multiply the wheelbase by the wheel track, and divide the product by a safety factor of 2,200. *See accompanying definitions.* Here's an example:

For an SUV with a 92-inch wheelbase and a 58-inch wheel track, the inspector would multiply 92 by 58, producing a figure of 5,336. The inspector would then divide 5,336 by 2,200 for a product of 2.425. To determine the maximum allowable change in vehicle

height, the inspector would then round 2.425 to the nearest whole number, 2.

Thus, a strict application of the regulation would require the inspector to fail the SUV for safety if its chassis had been raised or lowered more than two inches beyond original manufacturer's height. **However, the RMV regulations state that, "due to slight variations in production tolerances," violations must be in excess of one inch.**

In practical terms, then, the chassis of this vehicle would have to be more than three inches higher or lower than original manufacturer's height to fail for safety.

By allowing the extra inch, the RMV "avoids a degree of strictness that is not really necessary while at the same time protecting the safety of the occupants of the altered-height vehicle and the motoring public," said Dupille.

In doubtful cases, or in any case where the original manufacturer's specified height is not known or is unavailable, or where a vehicle is assembled with a homemade chassis or body, the RMV is empowered to determine the allowable maximum height and to issue or deny a permit for the operation of the vehicle.

The altered-height vehicle regulations contain more details, provisions and conditions than can be covered in this limited space. Therefore, inspectors should refer to the regulations themselves, which are reprinted in the appendices to the "Training for Inspectors" manual for the *Enhanced Emissions & Safety Test* program. ■

See related item on page 7

Altered Heights Defined

Wheelbase: The shortest distance between the center of the front and rear axle.

Wheel Track: The shortest distance between the centers of the tire treads on the same axle. On vehicles having different axle lengths, the measurement shall be made on the longest axle.

Note: *The wheel track may be increased by the use of spacers and rims for a maximum total increase of four inches beyond the original manufacturer's specification. The use of spacers to increase wheel track is prohibited. Fractions shall be excluded in all measurements and final calculations.*

November 1 Deadline for Training

Repair technicians who have not yet taken advanced OBD II training will have many opportunities to do so before it becomes a requirement for all registered repairers on November 1, 2005.

The course will be offered at six locations, starting in September, under the sponsorship and direction of Massachusetts Bay Community College (MBCC) and the contractor for the *Enhanced Emissions & Safety Test* program, Applus+ Technologies.

In addition, Applus+ and the Massachusetts Department of Environmental Protection are working with Craig Van Batenburg, owner-operator of the Automotive Career Development Center (ACDC) in Worcester, to offer a round of courses in late-September and October. *See accompanying notice on the ACDC-sponsored courses.*

The MBCC-sponsored courses will consist of 16 hours of classroom instruction over four nights at each of the six locations, plus a four-hour, hands-on session one Saturday morning at the MBCC Technology Center in Ashland. **The hands-on session will be offered only at Ashland.**

Including the cost of a manual and other course materials, the course fee is \$411.50. But many students will pay significantly less because the state is offering a \$112.50 per-student subsidy -- first-come, first served -- to encourage as many repairers as possible to be trained in advanced on-board diagnostic and repair techniques. Thus, for a student who receives one of the subsidies, the total cost will be \$299.

To enroll in one of the courses listed below, visit the MBCC web site, www.massbaytraining.org. Registration forms may also be filled out and faxed to the college. To request a form, call Chuck Pearson, 781-239-3048.



Dennis Collari, Collari Automotive, Kingston



l to r—Dick Sullivan, Sully Auto and Chuck Pearson of Mass Bay Community College



l to r—Bruce Reynolds, Longhorn Service, Lawrence; David Adario, Dave Adario Service, Melrose; John Larson, Larson Service Peabody; Karl Schneider, instructor



l to r—guest instructor Mike Kotarba, Classic Chevrolet, Amherst; Rick O'Neil, Jim's Service, Dracut; Dick Sullivan, Sully's Auto, Westford; Robert Finos, Bow St. Auto, Everett; Tom Dennett, Regan Service, Newton

Training Locations and Dates

The MBCC-sponsored courses will be offered at the following sites, dates and times:

Ashland

MassBay Technology Center
250 Eliot Street
Oct. 3, 5, 11 & 13, 6:00-10:00 p.m.
Hands-On, Oct. 15, 8:00 a.m.-12 Noon

Bourne

Upper Cape Cod Regional
Technical High School
220 Sandwich Road
Oct. 24 & 26, Nov. 1 & 3, 6:00-10:00 p.m.
Hands-On, (Ashland), Nov. 5, 8:00 a.m.-12 Noon

Bridgewater

Bridgewater Diagnostic & Training Center
30 Bedford Park
Oct. 17, 19, 25 & 27, 6:00-10:00 p.m.
Hands-On, (Ashland), Oct. 29, 8:00 a.m.-12 Noon

Shrewsbury

Shrewsbury Diagnostic & Training Center
175 Memorial Drive
Sept. 19, 21, 27 & 29, 6:00-10:00 p.m.
Hands-On, (Ashland), Oct. 1, 8:00 a.m.-12 Noon

West Springfield

West Springfield Diagnostic & Training Center
33 L Street
Sept. 21, 22, 26 & 28, 6:00-10:00 p.m.
Hands-On, (Ashland), Oct. 1, 8:00 a.m.-12 Noon

Woburn

Woburn Diagnostic & Training Center
10-V Gill Street
Oct. 3, 5, 11 & 13, 6:00-10:00 p.m.
Hands-On, (Ashland), Oct. 15, 8:00 a.m.-12 Noon

roduction page for instructions on taking the test, and lay out the options for completing it.

An inspector, for example, does not have to finish the test in one sitting; he can do it in as many sessions as he'd like over the allowed 45 days. He can also review and change his previous answers at any time before submitting the completed test.

Every weekday morning, a staff person at Applus+ Technologies reviews the tests taken the previous day, and enters the scores into an inspector licensing database. For inspectors with passing grades, records are changed to reflect the newly-earned recertification, which is good for two years.

One of the best features of the online test, said Hess, is the link to an online version of the inspector recertification training manual. There is one question per page on the test, and from each page, an inspector can click onto the pertinent section of the manual and review all the information needed to come up with the right answer.

"This is like an old-fashioned open-book examination, only better," Hess said, "because you don't have to go flipping through the 'book.' The online test gives you a quick, direct route to the information you need to form an answer to a specific question."

The links to the manual were included both to help inspectors prepare for the test at their convenience, and to aid them as they are actually taking it. Before they're ready to take the test, inspectors are free to log on at any time to review questions and to study corresponding material in the manual. Even after taking and passing the test, an inspector can visit the site as many times as he'd like to refresh his knowledge.

"The recertification test aside, it's a great repository of information on the *Enhanced Emissions & Safety Test*," Hess said. "Let's say, for example, that an inspector has a car in the bay with dark-tinted windows and he forgets what the vehicle-specific window tinting exclusions are. He can go to this web site (www.massrecert.com), refer to the section of the manual addressing window tints, and quickly get the answer."

If an inspector due for recertification does not have access to the internet, he can order a printed manual and schedule a test at one of the five Diagnostic and Training Centers operated by Applus+ Technologies around the state. This can be done by calling the Station Support Hotline at 877-297-5552.

Another option for inspectors, Hess pointed out, is to use the internet access provided free at virtually every public library in the state. ■

Altered State

Here are the general requirements concerning alterations to vehicles:

- Any alterations or modifications to the original braking, steering and suspension systems that impair the ability of the driver to operate the vehicle safely are prohibited.
- All replacement parts and equipment must be able to perform the functions for which they are intended; further, they shall be equal or greater in strength and durability than the original parts or equipment they are replacing.
- No vehicle shall be altered or modified in any way that may cause the body or chassis to come into contact with the roadway.
- Alterations that may cause the fuel tank to be exposed to damage during a collision are prohibited.
- Alterations that may cause the tires to come into contact with the body, chassis or steering components under normal driving conditions are prohibited.
- The horizontal plane, front to rear, of an altered-height vehicle shall not differ more than two inches.
- The wheel track may be increased by the use of tires and rims for a maximum total increase of four inches beyond the original manufacturer's specification. The use of spacers to increase wheel track is prohibited. (Fractions shall be excluded in all measurements and final calculations.)



See related article page 5

ACDC COURSE

Information on advanced OBD II programs to be offered this fall at Craig Van Batenburg's Automotive Career Development Center (ACDC) in Worcester is now available online. Course schedules and registration information are posted on the ACDC web site, <http://www.auto-careers.org>, and on the web site for the *Enhanced Emissions & Safety Test*, <http://www.mass.gov/vehicletest>.



Three Generations at Ed's Service Produce Five-Star Results

At an age by which most men have retired, Edward J. Arsenault, Sr. has an undiminished appetite for work.

"I love to work," said the 70-year-old Arsenault, who founded Ed's Service 35 years ago along with his wife, Georgia. "When I'm washing dishes, I love washing dishes."

The first Ed's Service was a Sunoco gas station and repair shop in Middleton. In 1983, the Arsenaults moved the business to the center of Peabody, where it continued to sell gas under a lease with Sunoco. The third and current version of Ed's Service opened in 1997 in a former machine shop on Oak Street in Peabody.

"When we started the business, my wife asked me, 'How long do you think it will take before we know if it's a success?' and I answered, 'Five years,'" Arsenault recollected. "Well, we were all in the new shop (on Oak Street) one night painting the walls, and my wife called out from one end of the building where she was working to me at the other end, 'Has it been five years yet?' I laughed so hard I almost fell over."

Arsenault added: "My wife is a gem. Without her and the kids, this business wouldn't be here." The "kids" would be sons Edward J. Arsenault, Jr., 45; Michael Arsenault, 43; and grandson Heath Liford, 23, all of whom work full-time at Ed's Service. Another son, George, also worked in the business before his untimely death four years ago.

"George was one of the youngest people ever to earn ASE certification as a master automotive technician, which he did when he was 18," Arsenault noted.

The men at Ed's Service are all licensed vehicle inspectors and ASE-

certified master automotive technicians. In addition, Ed Jr. is a certified L-1 technician.

Ed's Service is no longer in the gasoline retailing business, but it is a busy inspection station and a highly effective repair shop. It performs an average of five emissions repairs per month and has always had a five-star rating on the report card for the *Enhanced Emissions & Safety Test* program, the ERSR (Emissions Repair Success Rating).

"We're a registered repair shop and our name comes up on the Vehicle Inspection Report when a motorist in this area fails the emissions test," Arsenault said. "We get new business all the time because of that."

New business and old make for a heavy workload at Ed's Service: There are more than 2,000 names in the company's active client database. "Our customers usually stick with us for the long haul," Arsenault said.

"No one likes to spend money on maintenance and repairs, but we provide honest service at a fair price, and most of our customers seem to realize that. Many of our customers become our friends."

Since the I&M program moved to full pass/fail OBD II emissions testing, Arsenault said the team at Ed's Service has seen its communication skills often challenged by the issue of test readiness and drive cycles.

"Overall, OBD II has been very good," he said. "But we've had difficulty getting through to some customers about putting their cars through the precise drive cycle before bringing it back for the re-test. Even though we give a copy of the recommended drive cycle to every motorist in that situation, some people either don't understand it or don't take it seriously.

We're always patient. We hang in with the customer until the problem has been resolved."

Arsenault sees Ed's Service remaining a viable small business indefinitely because his sons and grandson are committed to developing new skills and knowledge through ongoing training, and to acquiring the best available diagnostic equipment.

Thinking of the future, he's most encouraged, however, by the spirit of self-sacrifice that he observes daily on the shop floor. "I know the boys will stay close," Arsenault said. "Everyone here bends over backwards to help the other person. We all do what's needed to get the job done, no questions asked. No one keeps score."

If fate continues to smile upon them, Ed and Georgia Arsenault will be helping to keep that sense of oneness glowing for years to come. "Why would we retire?" Ed Sr. said. "This is what we love to do." ■

Ed's Service, Inc.

23 Oak Street
Peabody, MA
978-531-9875

Hours of operation: M—F 7 a.m.—5 p.m.



The workforce at Ed's Service is a family in every sense of the word. From left, are: Edward J. Arsenault, Jr., Edward J. Arsenault, Sr., Georgia Arsenault, Heath Liford and Michael Arsenault.

Used Vehicles: Ready or Not for OBD Emissions Testing?

Auto dealerships commonly operate vehicle inspection facilities for the convenience of their customers. For dealerships and their inspectors, the Department of Environmental Protection recently prepared the following recommendations for ensuring used vehicle readiness for the OBD II emissions test.

Are the used vehicles on your lot “ready” for OBD II emissions testing?

In June 2004, Massachusetts started using an on-board diagnostics (OBD II) test to determine whether emissions control systems in model year 1996 and newer vehicles are operating properly. A used vehicle’s “readiness” for the new computerized test can affect the outcome of the state inspection it is required to undergo within a week of being registered.

A vehicle’s OBD II computer monitors engine, transmission, fuel system, and emissions control performance. Up to eleven “readiness monitors” or software routines continuously or periodically check these major systems and components under specific operating conditions. If enough monitors have not completed their checks by the time an inspection station connects to a vehicle’s OBD II system for an emissions test, the vehicle is “not ready” and will not pass its inspection. Certain common repairs or maintenance procedures can temporarily interrupt power from a vehicle’s battery to its OBD II computer, leaving monitors “not ready” for an emissions test because the power loss has cleared all diagnostic results from the computer’s memory. After power is restored, the computer needs to monitor various driving conditions long enough to run the required number of checks again, determine whether emissions-related systems or components are performing correctly, and store this information to be “ready” for the *Enhanced Emissions & Safety Test*.

Until the computer is “ready” for OBD II emissions testing, the vehicle will fail its initial inspection or be turned away from a re-test. There may in fact

be nothing wrong with the vehicle; the computer simply needs to complete its checks. One week of combined highway and city driving is normally enough to reset the system and provide an accurate reading of vehicle performance.

If a model year 1996 through 2000 vehicle is being tested, it can pass its state inspection with as many as two OBD II monitors “not ready.” If the vehicle is model year 2001 or newer, no more than one monitor may be “not ready” for it to pass. All vehicles that fail their initial tests due to catalytic converter efficiency problems (trouble codes PO420, PO422 or PO432) need to complete their checks and show catalyst monitors as “ready” before they can undergo re-tests.

Typical reasons for a vehicle being “not ready” for an emissions test include the battery being disconnected recently, the computer not completing its checks, or a repair technician not accessing the right data from the on-board computer. Being aware of the major contributors to readiness problems can go a long way toward helping you and your customers avoid them.

- **Maintain power to the OBD II computer.** Changing a battery may be necessary for any number of reasons – from refurbishing a used vehicle to restarting a car that has been sitting unattended for a long time – but interrupting power to the vehicle’s computer will automatically reset all OBD II monitors to “not ready.” To avoid this problem, you can maintain power to the computer with a lantern battery and alligator clips running to the terminals. Never try to reset a dashboard “check engine” light by disconnecting the battery for a while. Although this turns off the light, it also erases diagnostic information such as trouble codes and “freeze frames” of operating conditions at the time those codes were recorded. This leaves the vehicle “not ready” for a state emissions test.
- **Be sure that system checks are completed.** When an OBD II computer cannot run its monitors, it is

generally for one of two reasons: either the vehicle has not been driven in a way that resets the system, or a problem with the vehicle is preventing its monitors from running. If you think a vehicle needs additional driving before it will be “ready” for an emissions test, you can help your customer immensely by explaining the driving sequence (“drive cycle”) that will activate all monitors in the vehicle. This information is available from several sources, which are discussed below. Less frequently, a problem such as an antilock braking system (ABS) fault or broken vehicle speed or fuel level sensor prevents the OBD II computer from completing its checks. In this case, no amount of driving will run the monitors. Whatever is preventing the monitors from running must be identified and corrected so the vehicle can complete its checks and be “ready” for an emissions test.

- **Look at the right data.** Although OBD II computers in model year 1996 and newer vehicles generate two streams of data, the *Enhanced Emissions & Safety Test* looks at only one of them: the SAE (or “generic”) data stream, which is dedicated to emissions. If you look only at the other (or “manufacturer”) data stream, you will not be able to confirm that a vehicle is “ready” for emissions testing and is not storing generic emissions-related trouble codes, even though there is some overlap between the two data streams. You should make sure the scan tool you are using is able to access both (some cannot). If you don’t observe any anomalies in the manufacturer data stream, check the generic side to confirm that there is nothing wrong with the vehicle and it is “ready” for testing.

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How a Repairer Comes Through in the Clutch When the Transmission Is Slip, Slipping Away

It may or may not be a trend, but some Massachusetts repair shops and auto dealerships report seeing more vehicles lately that display trouble codes for torque converter clutch (TCC) problems in their transmissions.

The situation prompted General Motors recently to issue a technical service bulletin advising technicians to take an essentially conservative approach to transmission repairs in GM vehicles.

If excessive slip speed is noted and the condition cannot be corrected by using diagnostic trouble code P0741, worn seals from slippage of the drive sprocket is probably the cause, according to the GM bulletin. In that case, repair the transaxle, the bulletin recommended, but do *not* replace the complete transaxle assembly. A copy of the GM technical service bulletin is posted on the *Enhanced Emissions & Safety Test* web site, www.mass.gov/vehicletest. Go to Inspector & Repair Industry Info, click on OBD Test Starts, and scroll to “How Can I Learn More about OBD.”

The condition may be apparent to the motorist, who complains that the transmission is laboring too hard during acceleration (“chuggling”) or is slipping. The inspection station may also detect it during an OBD II emissions test. For GM vehicles, and especially for Cadillacs and Oldsmobiles, the repair of the transaxle is the *likely* fix if the technician observes excessive slip in the TCC.

In vehicles where the TCC has been slipping for a long time, or where the slippage is pronounced, the engine often runs hot, producing excessive NOx. The problem thus can trigger an emissions failure on the *Enhanced Emissions & Safety Test*.

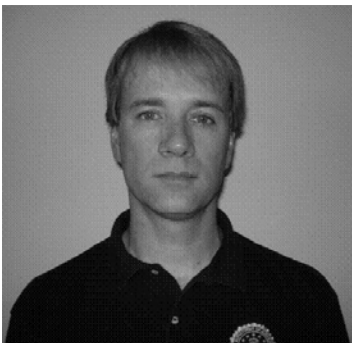
The torque converter is a hydraulic coupling that converts, or multiplies, the power in the transmission in order to move the vehicle from a stop when the driver steps on the gas. The TCC is the mechanical coupling inside the torque converter, similar to the clutch disc in a standard shift vehicle. When operating properly, the TCC smoothly reduces engine RPM as the vehicle reaches higher speeds.

The TCC performs three important functions:

1. Reducing heat. (A large amount of heat is generated by the torque converter as a vehicle accelerates from a stop. When the TCC is applied, the hydraulic torque multiplication is eliminated, dramatically reducing the heat. Getting rid of that excess heat is essential for the engine to function properly and the vehicle to meet emissions control standards.)
2. Lowering engine RPM, while maintaining vehicle speed, to achieve greater fuel economy.
3. Lowering RPM to control emissions.

An expert in the diagnosis and repair of transmission problems, Christopher Prescott, believes that the typical, mainstream, auto service and repair shop should not attempt to fix disabled or malfunctioning transmissions, no matter how “obvious” the cause seems to be, “unless they have someone on staff with a lot of concentrated transmission training and experience in cars and trucks, both old and new.”

Prescott’s viewpoint is influenced no doubt by the fact that he’s the lead transmission technician at a high-volume, transmission-only repair facility in Worcester, Acme Transmission. But his words deserve to be considered when one reflects on the inherent complexity and high cost of such repairs.



Chris Prescott, Acme Transmission, Worcester, Massachusetts

“For the same reason we don’t diagnose emissions problems at Acme Transmission, the typical emissions repair shop should not diagnose and fix transmission problems,” he said. “Too many specialized tools, and too much specialized ability, are required in both cases. The worst thing any of us in this industry can do is take on a repair we’re not qualified for, give the customer a big bill, and then have to explain a week later why the old problem is still there, or why there’s new problem.”

In many cases, Prescott has found that TCC slip can be corrected simply by replacing a worn-out valve body, which he describes as the “main hydraulic controls for the transmission.”

The valve body, he explained, “receives electrical signals from the computer, transmitted through the solenoids in the transmission, to convert the signals to hydraulic valve movements that make the torque converter apply and make it release.” As they constantly oscillate, these valves create wear and tear inside the bores that contain them, “and eventually they just wear to the point where the oil blows by the valve, the valve doesn’t function like it’s supposed to, and the torque converter clutch starts slipping,” Prescott said.

When the slippage first occurs, the vehicle’s computer system may or may not activate a trouble code or turn on the “check engine” light, but over time both will almost always occur. The computer system’s invariable response to the slippage, according to Prescott, is to elevate the line pressure in the transmission.

“The PCM (powertrain control module) knows it’s slipping and it thinks, ‘All right, let’s give it more pressure and clamp the clutch down tighter,’ ” said Prescott. “Unfortunately, the byproduct of elevated line pressure in the transmission is overly firm shifting from gear to gear. The customer will usually tell you something like, ‘This morning, it shifted fine, but after I drove it awhile, it was bang, bang, bang whenever I accelerated.’ Here’s what’s usually happening: the torque

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converter clutch slippage only occurs after the transmission warms up, which can take up to half an hour depending on the vehicle and *Continued from previous page*

the weather; then the PCM ratchets up the line pressure, which creates even more heat.”

If the problem is diagnosed in its early stages, replacing the valve body will usually be sufficient in most vehicles, Prescott said. But if the TCC has been slipping for a long time, and if the slippage has produced prolonged excessive temperatures in the transmission, the lining of the TCC and/or the internal seals in the torque converter will have been damaged or destroyed, he explained, meaning the torque converter itself will have to be replaced, and the valve body will have to be repaired or replaced.

In some instances where the TCC is slipping badly and the vehicle has a lot of miles on it, a major transmission service would be necessary because the transmission and the torque converter share the same fluid, Prescott added. ■

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In most cases, sufficient driving time is all that is needed to reset all monitors and ensure that a vehicle is “ready” for an OBD II emissions test. Just how much driving time is enough depends on the vehicle’s manufacturer and designated drive cycles. For some vehicles, 20 minutes behind the wheel will do the trick. For others, driving sequences need to be precise and drivers unaware of the requirements for their vehicles might need to go through several tanks of fuel before the system will reset.

You can obtain drive cycle information from the manufacturer or from a commercial database product such as All-Data, Mitchell, or Motor. Also be sure to check for recalls and technical service bulletins, since the vehicle may require a calibration update that will improve its computer system’s ability to perform self-checks. ■



Transmission Trouble Shooting

Q: *A vehicle failed its OBD emissions test due to a trouble code related to its transmission (P0741 and P1860 are most common). What types of vehicles have been seeing these problems?*

Three quarters of the transmission-related OBD trouble codes recorded at inspection stations across the state have been found with Cadillacs and Oldsmobiles. For both makes, model year 1996-99 vehicles seem to return these trouble codes most frequently.

Q: *How does a faulty transmission affect a vehicle’s emissions?*

A: When a vehicle has one or more faulty transmission components, it operates less efficiently, and can produce up to 20 percent more smog-causing nitrogen oxide (NOx) emissions than it would normally. Fixing the problem will reduce air pollution, and help a vehicle pass its biennial emissions inspection.

Q: *Does this problem affect a vehicle’s operation?*

A: Even if a vehicle seems to be running and handling normally, transmission problems identified by these trouble codes mean that a vehicle is operating less efficiently than it should be. Getting the problem fixed will improve a vehicle’s performance on the road.

Q: *Does a transmission-related OBD trouble code mean that a vehicle needs a new transmission?*

A: Not necessarily. The problem may lie with a component or part of the transmission that can be repaired or replaced. For example, a vehicle may have a faulty torque converter clutch, transmission solenoid, or on-board transmission system computer. If a vehicle’s transmission seemed to function normally on the road before an OBD emissions test identified a transmission-related trouble code, there is a good chance that replacing the faulty component will solve the problem at a lower cost than replacing the entire transmission.

Correction

In the last edition of *Inspection Update*, there was an error in the listing of the Web site used by Massachusetts Bay Community College to enroll students in automotive technology programs. The correct site is: www.massbaytraining.org. *Inspection Update* apologizes for any difficulties this error may have caused.

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