



Inspection Update

A Publication of the Massachusetts Enhanced Emissions & Safety Test Program

Volume 7, Issue 3, August 2006

Smooth Transition Expected on Oct. 1 When I&M Contract Extension Begins

Stations that opted for contractor-financed equipment when joining the enhanced I&M program seven years ago are approaching an important transition.

On October 1, they will begin paying a monthly maintenance fee of \$342, instead of a \$450 usage fee, because they will own their equipment outright on that date. They will also begin paying for some of the calibration gases they use.

These changes, and others, are linked to the recent two-year extension of the contract between the state and Applus+ Technologies, which administers the *Enhanced Emissions & Safety Test* program.

Originally scheduled to expire on September 30, 2006, the contract had a provision allowing the state to extend and modify it. Both parties came to an agreement on the extension this past May.

After October 1, Applus+ plans to deduct the new monthly maintenance fee from stations' accounts in the same way it has automatically collected the user fee.

There are 1,610 inspection stations in the Massachusetts I&M network. Applus+ arranged financing for the acquisition of test equipment at 1,200 of those stations in 1999, and charged stations monthly usage fees to recoup its costs. The remaining stations purchased equipment on their own, and therefore never paid usage fees.

The self-financed stations will experience no notable changes when the contract extension kicks in on October 1. Their monthly maintenance fee will stay at \$287.83 throughout the extension.

Under the original contract, the contractor-financed stations were entitled to four free gas bottles per year for calibrating

emissions testing equipment, while the self-financed stations had to pay for the first four bottles.

The Program Participation Agreement between Applus+ and the contractor-financed stations stipulates that free consumables will end on October 1, 2006. This stipulation applies to all consumables listed in the agreement, except calibration gases.

Contract Amendment 4, which was signed in 2004, changed the requirement for gas calibration frequency from once every 72 hours to once every 24 hours. Applus+ agreed at that time to provide all stations, free of charge, with the incremental gas necessary to perform these additional calibrations.

Under the contract extension, all stations will now pay for the first four gas bottles, and Applus+ has agreed to continue to supply all stations, at no cost, with the incremental amount of gas required to perform the increased frequency of calibration.

Jack Pierce, Massachusetts program manager for Applus+, noted that the cost to the stations of calibration gas bottles "has not increased a penny since the beginning of the program, and will not increase during the contract extension period."

Prices for gases and other consumables are listed under Section 12, Maintenance and Repair, in the Program Participation Agreement provided by Applus+ to every inspection station.

The transition from original contract to contract extension will have "little to no impact" on how stations operate, Pierce predicted.

"Their participation in the *Enhanced Emissions & Safety Test* program will not change," he said. "Their Program Participation Agreements with Applus+ allow

Stations Will See Some Changes:

- Contractor-financed stations will begin paying monthly maintenance fees, which will be lower than usage fees they've been paying.
- All inspection stations will pay for first four bottles of calibration gas per year.
- After four bottles have been expended, Applus+ will pay for incremental amounts of gas needed to perform required calibrations.
- Except for incremental gas, there will be no free consumables.

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Do you have questions on the contract extension?
Call the Station Support Hotline, 877-297-5552

Beware of Great Deals on the Internet for After-Market Converters

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predictable results: failing grades on the *Enhanced Emissions & Safety Test* and subsequent repairs involving new converters.

Shops are turning to online sources more than ever to obtain parts, increasing the chances that the wrong catalytic converter will be selected during an emissions repair.

"A shop can save a lot of money today buying parts on the Internet," Jannoni said. "They do that by cutting out the middleman. Customers like it because the shops pass on part of the savings to them."

Massachusetts has adopted the strict vehicle pollution control standards of California, which include the requirement that after-

Every time you're in the market for an after-market cat, you have to ask the supplier if the part has the EPA label, and if it comes with the EPA-required warranty...

— Paul Jannoni

market cats be EPA-certified. However, non-certified cats are legal in many other states.

No matter how or where an after-market cat is obtained, the Massachusetts repair facility or dealership is responsible for making sure the part is EPA-certified. Certified after-market cats have labels with a series of distinctive letters and numbers on them.

New certified after-market cats also carry warranties guaranteeing that they'll meet federal durability and performance standards. These warranties state, for example, that vehicles will meet EPA emissions standards for 25,000 miles when properly operated and maintained.

"This is simple, straightforward stuff," Jannoni said. "Every time you're in the market for an aftermarket cat, you have to ask the supplier if the part has the EPA label, and if it comes with the EPA-required warranty. If the answer to either question is no, don't buy it, no matter how good the deal is."

It's also important to purchase an after-market cat that matches both the manufacturer and EPA specifications for the make and model in question.

"The after-market cat can be a good product and it might even be EPA-certified, but if it isn't compatible with the OBD (onboard diagnostic) system on the vehicle, it will never enable the vehicle to pass the emissions test," Jannoni said. ■

Saturday Service Requirement Emphasized

In granting a two-year contract extension to Applus+ Technologies, the state agencies that oversee the *Enhanced Emissions & Safety Test* program put a priority on Saturday service for inspection stations.

"While the contract always provided for Saturday service, we felt the need to clarify and emphasize that fact in the extension document, as well as in our comments to Applus+ at the time the extension was finalized," said Paul Davis, I&M program manager for the Massachusetts Department of Environmental (MassDEP).

To qualify for Saturday service, a station must be open for inspections a minimum of four hours on that day and have its hours posted on the VID (Vehicle Information Database).

Stations may seek technical support or equipment repair assistance on a Saturday by calling the program's toll-free Station Support Hotline at 877-297-5552.

"All stations were asked about Saturday hours, and if they were open, their hours were posted on the VID," explained Jack Pierce, Massachusetts program manager for Applus+. "We also ask new stations when they join the network if they plan to open on Saturday, and post their hours accordingly."

All normal support and assistance provided to program participants by Applus+ during the week is also available on Saturdays, according to Pierce.

"Service tickets are opened on a Saturday as they are during the week, and addressed as promptly as possible in the order in which they are opened," he said. ■

Contract Extension

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them to continue automatically as inspection stations during the entire extension period. They do not have to sign new contracts."

Likewise, stations will continue to obtain Inspection Authorizations through their workstations, and the price of authorizations will stay the same. Applus+ will continue to debit stations' accounts for authorizations. ■

If you have questions on the contract extension or want more information, call the toll-free Station Support Hotline at 877-297-5552.

CORRECTION

In the last edition of *Inspection Update* (June 2006), there was an error in the listing for the Website of the *Enhanced Emissions & Safety Test* program in an article on page 7 on the new Station Locator feature. The correct Web address is: <http://www.mass.gov/vehicletest/>. ■

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, observa-

tions 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.



AAA Endorsement a Big Plus on Cape Cod

About 10 years ago, Rick Smithson decided it would be good for his auto service and repair business on Cape Cod if it were designated an “AAA Approved Auto Care” garage.

“I figured this would send a signal to people visiting the Cape that we were a dependable and reputable business,” said Smithson, who has owned and operated Route 134 Auto Care in Dennis for 20 years. “Someone in AAA who’s down here on vacation and has car trouble would be more likely to use us, I thought, if we’re an AAA-approved garage.”

To earn that designation, Smithson had to open his files to an AAA review team. “They came in one day and removed at random about 200 service and repair records,” he explained. “Then they sent detailed questionnaires to those customers.



Summer is the busiest time of year at Route 134 Auto Care in Dennis, and the workforce is more than up to the challenge. From left, are: Rick Smithson, owner; Pat Willet, Simon Wright and Damon Tellegen.

“As I recall, the guidelines were that 80 percent of the customers who received questionnaires had to respond, and that 95 percent of those responding had to be satisfied with the work we’d done.”

Route 134 Auto Care met those requirements, became an “AAA Approved Auto Care” garage, and has held onto that designation through several periodic AAA re-evaluations. Only three other shops on Cape Cod currently enjoy that status, according to Smithson. “It’s hard to get and it’s hard to keep it,” he said.

So popular has Route 134 Auto Care become with AAA members that the organization named it the “Top Shop” in Southeastern New England for May 2006. That honor was based on the results of recent AAA customer satisfaction surveys.

Customers rate Route 134 Auto Care highly, Smithson asserted, because “we do good work and charge fair prices,” and “we act like professionals and communicate well.” Also important, Smithson said, is the “warmth and respect” that he and his employees try to show every customer.

“This community is fantastic, a great place to do business. I’ve made so many friends here,” he said. “I’m fortunate to have long-term relationships with many, many customers. In fact, I’m starting to see the grandchildren of some of my original customers. When I start seeing the great-grandchildren, I’ll know it’s time for me to retire.”

Smithson, 55, began working at a gas station and repair shop on the site of Route 134 Auto Care in the mid-1970s after moving to the Cape from his hometown, Delta, Pennsylvania.

In 1986, he acquired the business, which consisted of a Shell station that sold fuel around the clock and did routine maintenance and repairs. Four years later, he demolished the gas station, built a new one, and added a spacious facility dedicated to inspections, service and repairs on an adjoining lot.

With business booming at Route 134 Auto Care, Smithson sold the gas station in the mid-1990s. “Gas was 10 percent of my business and auto care was 90 percent,” he said. “It only made sense to concentrate my efforts there.”

Between 300 and 400 vehicles are inspected monthly at Route 134 Auto Care.

A great believer in the power of technology to manage and market the company, Smithson uses software that allows him to generate a continuous stream of mail to customers. When you’re due for a lube and oil change, for example, you get a postcard

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Mobile Inspector on a Roll, Thanks to

David Flynn had a business plan, a lot of confidence, and a willingness to invest a big chunk of his savings when he started a mobile inspection service for heavy-duty diesel vehicles, Commonwealth Mobile Inspections, in mid-2001.

But he didn't have any customers, or even any prospective customers.

"So I started knocking on doors," said Flynn, who learned how to handle every kind of vehicle, from the smallest to the largest, during the years he worked at his father's business, the former Flynn's Towing Service in Randolph.

One of the first doors he knocked on was at the department of public works yard in the town of Pembroke, where he resides. As it happened, the public works director had several heavy-duty diesel vehicles that were almost due for their first emissions tests under the state's *Enhanced Emissions & Safety Test* program. He decided to give Commonwealth Mobile Inspections a try.

Five years later, Flynn is still inspecting Pembroke's heavy-duty diesels, as well as the vehicles owned and operated by several other municipalities and by scores of private companies: trash trucks, snow plows, school buses, fire engines, dump trucks and more. Flynn can drive and inspect them all.

Business is so good today that Flynn, 40, is seriously thinking about abandoning his solo-practitioner/home-based business model,

hiring a full-time employee to help him, and setting up shop in rented space somewhere on the South Shore.

"There's a lot of work out there," Flynn said. "Businesses, not to mention cities and towns, like the convenience of having a vehicle inspector come to them."

Flynn attributes the success of Commonwealth Mobile Inspections to "good communication, good service and good pricing." Rather than an hourly rate, he charges a flat per-vehicle fee, which includes the \$29 price of the *Enhanced Emissions & Safety Test*. There is an additional charge if Flynn also performs a federal Department of Transportation (DOT) inspection, which he is qualified to do.

By authorizing mobile inspections, the state helped to foster Flynn's business and others like it. *See accompanying list of mobile services.* As Flynn sees it, mobile services have also been a boon to their customers because the customers save "a lot of time and money" by not having to bring vehicles to inspection stations.

"The Registry of Motor Vehicles and the Department of Environmental Protection deserve a lot of credit for encouraging this approach," he said. "It's a system that works well for everyone involved."

When Flynn gets new customers, he always sends them a list of all the items he'll be checking during inspections. "This helps them to prepare for the inspections," he said, "and, in many cases, to fix something that otherwise would have caused a failure."

David Flynn of Pembroke started his mobile inspection service in 2001 and operates the business as a solo practitioner.



Heavy-Duty Wheels

Flynn tests heavy-duties, vehicles that weigh from 10,001 to more than 70,000 pounds, by appointment only.

Most of his customers have five to ten vehicles needing inspections; some of them have fleets of 200 to 250 trucks, which he inspects in groups of 10 to 20 over the course of the year.

A low percentage of vehicles tested by Commonwealth Mobile Inspections end up failing, for either safety or emissions, but when there is a safety failure, the owner will usually have someone on hand to fix it immediately.

"Nine times out of ten, I'm in someone's garage, and they'll have a mechanic there with the right tools and parts to do the job," Flynn said.

The safety failures he encounters most often are caused by bad tires, broken springs and defective tie rods. "But at one time or another, I've found every kind of safety problem," he said.

Flynn has witnessed a small annual decrease in the number of heavy-duty diesels failing the emissions test. "The engines on the newer vehicles are definitely better -- and cleaner," he explained. "Also, most of the diesel fuel used today burns cleaner because it has a lower sulfur content. And owners are doing better maintenance because there is an emissions test."

Diesel emissions are tested using a smoke opacity meter: the darker the smoke, the higher the opacity reading, and the greater the pollution.

The *Enhanced Emissions & Safety Test* for gasoline-powered vehicles debuted on October 1, 1999. Testing of heavy-duty diesels began 16 months later, on February 1, 2001.

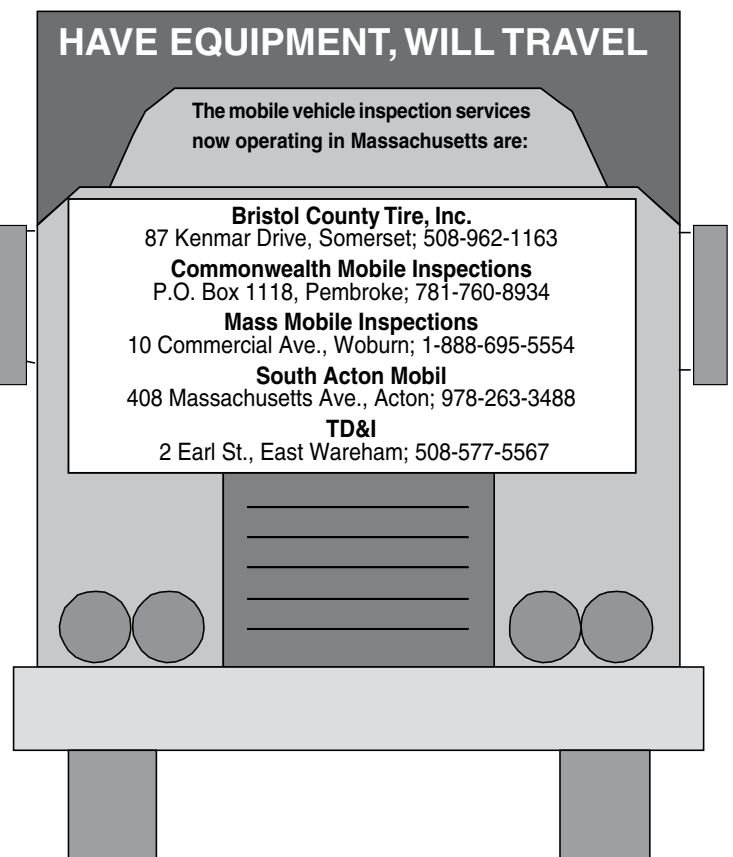
Like gas vehicles, heavy-duty diesels need to undergo state safety inspections every year and emissions tests every other year. (Some heavy-duty diesels, such as farm equipment, backhoes and road graders, are exempt from emissions testing.)

Diesel cars and light-duty diesel trucks (10,000 pounds or less) are subject only to annual safety inspections.

All of the equipment Flynn needs for an inspection is contained in a 6-by-12-foot trailer. Pulling it with an oversized pick-up truck, Flynn has become a familiar, and welcome, sight at businesses and in communities throughout eastern Massachusetts.

"You wouldn't believe how many of my customers have thanked me for discovering a problem that their repair shop or in-house technician missed just a week or two before," said Flynn. "Most people I deal with truly support the program. They don't want a safety failure to cause an accident. They don't want to be tying up traffic for hours with a breakdown." ■

Commonwealth Mobile Inspections
Post Office Box 1118
Pembroke, MA 02359
781-760-8934
Inspections by Appointment Only



PROFILE: Dennis

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to remind you. And whenever you spend \$75 or more on your car there, you receive a postcard within days, thanking you for your business.

The company database contains the names, addresses and contact information of roughly 10,000 customers residing on the Cape and beyond. Smithson and his employees are always putting new-customer information into the database, while the names of customers who haven't been there for 18 months are automatically deleted.

His regular customers tend to be scrupulous on matters of maintenance, Smithson reported. "Most people living on the Cape take care of their cars," he said, "and when the 'check engine' light comes on, they come in and say they want it repaired regardless of whether the car's due for inspection or not. Maybe that's why we see so few emissions failures."

Route 134 Auto Care has three full-time employees and one part-time employee. In July and August, when volume jumps by at least 15 percent, Smithson hires a second part-time employee. ■

Route 134 Auto Care
3 Market Place
South Dennis, MA 02638
1-800-778-8885
Monday-Friday, 8 a.m.-5 p.m.; Saturday, 8 a.m.-1 p.m.

'Great Appreciation' Expressed for I



Judy Dupille

Judy Dupille has held management positions in Massachusetts state government for 22 years. Currently, she heads the Registry of Motor Vehicles (RMV) department that oversees the Enhanced Emissions & Safety Test program for the agency: Vehicle Safety and Compliance Services. Dupille is an expert on inspection and maintenance (I&M) programs, having served as both assistant director and director of the RMV department that preceded Vehicle Safety and Compliance Services. Her professional experience also includes a long stint as assistant director of the Department of Public Utilities, now the Department of Telecommunications and Energy, where she was in charge of all rail and bus inspections. Dupille's views on the state of I&M merit close attention on many counts, not least because she was a leading member of the RMV-Department of Environmental Protection team that designed the current program and will likely design the next.

How would you describe your role in the Enhanced Emissions & Safety Test program?

To ensure that we have the best vehicle inspection program in the country.

Do you feel that Massachusetts has succeeded in building and running a successful I&M program?

Yes, we have, in collaboration with a good network of inspection and repair facilities.

As Director of Vehicle Safety and Compliance Services, what do you expect of the people who work for you?

I try to ensure that our field investigators treat station owners and employees with respect and understanding. I want our investigators, as they're entering a station, to be asking themselves, "How would I want to be approached and treated at a time like this?"

Would you say that the RMV relates well to those in the I&M network?

We do. I think that, for the most part, we have credibility with the stations. Even though we regulate the stations, we think of them as customers of the Commonwealth of Massachusetts, all 1,610 of them.

Everyone's happy?

Of course not. Sometimes we deal with complaints that are very difficult to resolve for one reason or another. But we keep our cool. We persist. Until we figure out what the complainant needs and deserves, we stay with it.

What's the most challenging part of your job?

Probably getting the contractor to keep in mind that the inspection stations are our customers, and that they always have to treat the station personnel that way.

What is the typical interaction between an RMV field investigator and the staff of an inspection station?

Our investigators have to cover specific territories, and they have general schedules to follow. Every inspection station has to be

inspected by an investigator at least four times a year. The typical interaction is the quarterly visit.

Do they make appointments for quarterly inspections?

No, these are unannounced. Sometimes they arrive in the middle of a vehicle test; they watch the inspection, and they wait until it is over to begin their investigation. Sometimes they'll park across the street for a while and just observe what's going on before entering the premises.

Do they always interview the station owner or manager during a quarterly inspection?

No. The inspection can consist simply of an investigator observing a vehicle test in progress, and making sure the station has all the required equipment on hand.

"Most people in the network are legitimately trying to do a good job and are succeeding at doing a good job."

Anything else an investigator always does?

Yes. On entering the premises, they'll look for a vehicle that has just been inspected. If they find one, they'll give it the once-over to make sure it meets all visible safety requirements. They'll be thinking, "Should this car have passed the inspection?"

Is it unusual for them to find a vehicle that passed but shouldn't have?

No, but it doesn't happen every day. I've had investigators walk onto a lot and see a bright, new sticker next to a big crack in the windshield. What they usually find is the car belongs to a friend or relative of the inspector, and that person has told the inspector he's "going to have the windshield fixed the next day, so don't worry about it." Of course, that's not acceptable.

Inspectors on the 'Front Lines' of I&M

You folks have to lower the boom sometimes, but it's obvious you don't regard yourselves as adversaries of the people in the network.

Absolutely correct. As I said before, we try to treat the stations as we would want to be treated if we were doing inspections for a living. An inspection station is a place of business that functions in a competitive marketplace. It's how an owner feeds his family. We're going to get paid at the end of the week no matter what. But the station owner might not meet payroll if he isn't able to do his job because we've interrupted him or have been careless with his time.

How would you categorize the level of compliance with program regulations?

There's a very high level of compliance. Most people in the network are legitimately trying to do a good job and are succeeding at doing a good job.

Do the inspection stations often call for your assistance?

When the program began, we thought we'd be supporting the stations until they got up and running, and were comfortable with the new testing procedures. But we're still supporting them on a daily basis.

What do you mean?

Unexpected things come up every day on the front lines of the *Enhanced Emissions & Safety Test*. Stations will call us sometimes when they're stumped, and we can't turn a deaf ear.

For example?

A motorist might have a problem because they don't even know their registration has been suspended or has expired. The motorist shows up for an inspection, but the VID (vehicle information database) won't allow the test to proceed. The inspector may call us at that point, ask us what's going on, and ask us what he should say to the customer.

You won't find these calls in your job description, will you?

(Laughs.) No. But we have to understand how the inspector on the other end of the

"...the new contract will reflect technology improvements that will make the emissions test easier to administer."

line feels. He's trying to do a job and we have to support him.

So you have an all-calls-must-be-answered policy?

When our phones aren't being answered, I want to know why – and I'm a pretty easy person to work for. One thing I can't take is ignoring a customer who needs answers.

Is there a particular reason you've made accessibility a priority?

When you've been around as long as I have, you remember when people in state government were not as accessible to the people they regulate as they are now. We've improved; I want to keep it that way.

What's the most common violation of the program?

Probably failure to perform a required emissions test. Sometimes stations don't do the test at all. Maybe the vehicle needs a dyne

test and they don't want to spend the time it takes to put it on the dynamometer and strap it down. Sometimes they'll try to do an offline emissions test.

What's the next most common violation?

Probably failure to jack up the vehicle and do a thorough check of the front end.

If you had all the vehicle inspectors in a big room, what would you say to them?

I'd thank them for the good job they've done. I'd thank them for the good job that I'm confident they're going to continue to do. I have a great deal of appreciation for what the people on the front lines of this program do every day, and I would encourage them to keep up the good work.

If I'm an inspector thinking of the future, should I be encouraged?

Looking further down the line, inspectors should like the next contract because we're still committed to the original program goals, including making it fit with the industry. Also, the new contract will reflect technology improvements that will make the emissions test easier to administer. For instance, we're thinking about using only OBD for emissions testing. ■

ENFORCEMENT ACTIONS

April 1 - June 30, 2006

Violations Issued to Inspectors : 143

Violations Issued to Stations: 142

Inspector Privileges Revoked: 5

Inspectors Required to Retrain: 15

Inspectors Suspended: 55

Stations Suspended: 68



Before Working on a Hybrid,



Craig Van Batenburg is an ASE-certified L-1 Master Technician, a certified Master Hybrid Technician and the owner of the Automotive Career Development Center (ACDC) in Worcester, www.auto-careers.org. For years he operated his own repair facility, Van Batenburg's Garage, Inc., but now devotes himself to teaching, speaking and running seminars on a host of managerial and technical topics. He also contributes articles regularly to "Motor Age," "Auto, Inc." and "Action" magazines. Van Batenburg may be reached at craig@auto-careers.org.

By Craig Van Batenburg

What do you need to get into hybrid vehicle repair?

The same things you always need when confronted with new technology: education, a new level of safety precautions, new equipment, and some good old trial-and-error.

Hybrid repair poses some big but not insurmountable obstacles.

The high voltage (HV) in hybrids is a serious consideration in terms of personal safety, but it has been blown out of proportion, in my opinion. I say that because it is still gas tank removal and gas tank repair that pose the biggest threat to our personal safety.

If manufacturers had taken half as many precautions in the service procedures and redundant features of the gasoline storage system as they have in the high voltage storage systems of hybrids, many of the fires, injuries and deaths we have seen with gas tanks might have been avoided.

So what do you need to know before working on a hybrid?

Well, you have to know how to shut down the hybrid system for simple service. And you have to know how to "de-power" the high-voltage (HV) system for service and repairs.

You should also have in your possession a CAT III-certified digital volt ohm meter (DVOM) and a pair of 1,000-volt rubber protective gloves rated Class O.

Scan tools are another consideration. Currently, a factory scan tool is needed in many hybrid service cases. However, EASE and OTC have recently added hybrid capability to their scan tools, as have others.

I strongly urge all shops to obtain as much up-to-date information on hybrids as possible, and to send their technicians to school for hybrid training.

Talk to your staff and see who wants to be the hybrid expert. Pick someone who is knowledgeable in electrical systems, loves to learn, and sees a good future in this industry. Then set that person loose to learn as much about hybrid systems as possible. It will pay off in the future, as hybrids are not going away.

Since safety is such a big concern in dealing with hybrids, I think it would be helpful if I related how I once salvaged some valuable parts from a hybrid that had been in a bad accident:

In 2005, I heard from one of my students about a salvage and recycling yard that had a 2004 Toyota Prius. After sustaining extensive front-end damage in a collision, the Prius had been totaled.

The salvage yard owner was literally afraid to touch it. He had heard too many stories about electrocutions, fires and explosions. This hybrid was his first one; I don't blame him for being afraid.

I proposed a deal: I would train two of the yard owner's employees on hybrid safety for free and he would give me some of the parts from the wrecked vehicle. Deal made, I drove over with my son Mike and we went out to the car.

It was in a puddle and couldn't easily be moved. Rule Number One: Don't work on hybrids in puddles.

The car was dragged a few feet to safer ground. I had my 1,000-volt rubber gloves and a DVOM ready. With tools and my digital camera in hand, we set out to render it safe to work on, which meant, in this case, removing the HV NiMH battery.

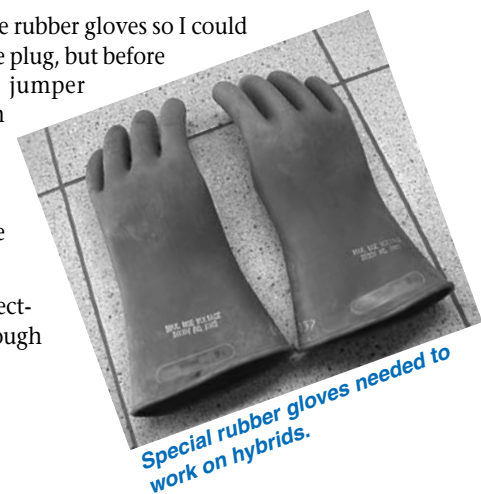
After looking at the front-end damage, it was clear why this Prius was done.

Then I noticed that the inverter had been ripped out, apparently by an unsuspecting tow truck driver, and placed in the back seat.

Now, once an orange wire on a hybrid has been dislodged, a series of events takes place in milliseconds. A set of contactors -- think of these as relays that must work every time--go to their normally open positions, and three large and dangerous capacitors discharge. It takes a minute or more for the capacitors to lose their stored energy. This keeps the high voltage contained within the HV battery pack, similar to the way that race car fuel tanks use sponge-like devices to keep the fuel within the tank.

Taking no chances, I put on the rubber gloves so I could remove the large orange service plug, but before I could do that, I needed a jumper pack, as this car had no hatch key, only a transmitter and the 12-volt battery, which was dead. After the hatch was opened, we had access to the HV battery.

To be extra careful, we disconnect- ed the 12-volt battery, even though



Here's What You Need to Know



Parts were salvaged carefully from this wrecked Prius.

it was dead. And we took other precautions, such as getting out the DVOM every time we had to disconnect an orange cable.

Once we had disconnected the HV cables, we were ready to remove the battery itself. The removal was successful: No sparks!

After that, we made a last go-round with electrical tape to isolate and tape up any dangling orange wire leads. Two of us then carried the HV battery pack to the storage room where it would sit until it was sold.

There's a couple of things you should know about the storage of hybrid main battery packs:

One, if these NiMH batteries sit for too long, they will discharge, and, after a period of months, may not be saleable due to degraded cells. At ACDC, we're working on the development of a charger to address this problem.

Two, NiMH batteries need a lot of cooling to survive. If a customer of yours has a hybrid in need of body work, make sure the body shop doesn't "roast" these batteries in its paint oven. Insist that the hybrid be the last paint job of the day, so it can dry overnight. ■

Routine Service on Car Suddenly Became Exciting

Even routine maintenance on a hybrid has to be approached carefully, as the following story related by Craig Van Batenburg illustrates:

"A shop owner in the Midwest was asked by a regular customer who had just bought a 2002 Prius if the shop could do an oil change.

"The owner opened the hood, made sure the filter was in stock, (it is a standard Toyota filter used on other models), and said yes. A young technician with no prior knowledge of hybrids drove the warmed up gas-electric vehicle into his bay. As the car was in electric mode at that point, the internal combustion engine did not start.

"Not hearing the engine running, the tech went right to work, hoisting the car into the air, swinging the oil drain bucket under the oil pan, removing the drain bolt and reaching for the oil filter. Strong of hand, he easily removed the filter.

"Immediately, oil started flying around the shop!

"The engine had been in standby mode during the first part of the oil change. But, in just minutes, the voltage level dropped and the onboard computer started the engine in order to recharge the high-voltage battery.

"If the tech had only removed the key after bringing the hybrid into the bay, this wouldn't have happened. Luckily, a quick-thinking tech in the next bay got the situation under control before any damage occurred.

"You really have to know what you are doing before you change the oil -- or do anything else -- on a hybrid."





Paul Davis

Program Manager's Priorities: Timely Service, Helping Repair Techs Maximize Their Skills

Twenty years of working for the San Diego Air Pollution Control District gave Paul Davis a heightened awareness of how difficult it is for small business owners to make a go of it.

That awareness, in turn, has influenced the way he performs his current duties as program manager of the *Enhanced Emissions & Safety Test* for the Massachusetts Department of Environmental Protection (MassDEP).

"It is a policy of the program that inspection stations receive timely service when their equipment breaks down or isn't working right," said Davis. "But I don't push service because it's a policy, I push it because of how it affects the business: the longer a station waits for service, the more it impacts their bottom line, and the more it impacts their ability to meet their customers' needs."

In California, Davis worked on regulating stationary sources of pollution, such as power plants, vehicle fueling stations, auto body shops and dry cleaners. At one point, he was the San Diego Air Pollution Control District's ombudsman to small businesses, an experience he describes as "invaluable."

Said Davis: "There's nothing quite like standing in front of an audience of a thousand small business people, introducing new air quality regulations that are going to cost them money, and persuading them of the importance of doing so."

A graduate of Dartmouth College and the son of teachers, Davis relished the challenge of distilling complex subjects into persuasive presentations. But he enjoyed even more the opportunity to be the voice of small business owners within the San Diego Air Pollution Control District.

"I had to explain to my colleagues how the implementation of a regulation would affect the business owner day to day, and what its practical impact would be on a particular enterprise," said Davis. "I saw my advocacy as helping businesses adapt to necessary changes without suffering unnecessary trouble or expense."

Davis and his family moved east in 1999 and he began working for MassDEP just as the *Enhanced Emissions & Safety Test* program was getting under way. "Some people thought we were crazy to be leaving the perfect southern California climate," he said, "but

my roots are in New England, and my wife and I wanted our son, who was then nearing school age, to be educated in a good system in Massachusetts."

The Davis lineage goes back to the small farming towns in the Lake Champlain Valley of Vermont, where self-reliance, thrift and tenacity were prized. Both his paternal grandfather and father worked a farm in Jericho, Vermont. Davis was born nearby in the state's largest city, Burlington.

His father sold the farm when Davis was a young boy, after which both his parents held a succession of teaching jobs in Vermont and upstate New York. Davis graduated from Franklin Academy in Malone, New York, and attended Dartmouth for a year.

While he enjoyed college, Davis was restless and inquisitive. He yearned to see other parts of the country. Leaving school, he traveled down the East Coast, working as a manual laborer along the way, and eventually found his way to California.

Three years later, he decided it was time to hit the books again. He enrolled for a year at the University of Vermont and then returned to Dartmouth for his junior and senior years. Davis earned a degree in geography from the Ivy League school in 1977.

"In those days, they didn't offer environmental studies majors, or I would have chosen one," he explained. "Geography, coupled with environmental studies courses, was the closest I could come."

Not long after graduation, the West Coast reasserted its claim on Davis's heart. He returned to California, found employment in San Diego, got married and settled down.

Davis has always had an aptitude for the sciences – he loved physics and chemistry in high school – and that ability is evident when he presides at the quarterly meetings of the I&M Advisory Committee at MassDEP headquarters in Boston.

An audience member who interrupts a discussion on the future of tailpipe testing with a specific question on gas calibrations finds, for example, that Davis not only knows the parts of the gas bench by heart but also that he can easily tick off the technical reasons why frequent calibrations are an absolute necessity.

DON'T FORGET!

Give a Vehicle Emissions Repair Packet to every motorist whose vehicle fails the Enhanced Emissions & Safety Test

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– PAUL DAVIS

The same holds true for his knowledge of a host of other technical topics, from the evolution of onboard diagnostics (OBD) to the continuous refinement of the test software, from the various engine problems that cause emissions failures to the audit procedures that uncover program fraud electronically, etc., Davis has the science of I&M down cold.

It was not science, however, that formed his environmental sensibility. It was nature. The town where Davis lived the longest as a boy was Peru, New York, on the northern edge of the Adirondack Park.

"I grew up in a near wilderness, one of the most beautiful places on earth," he said. "That's where my love of nature comes from. I was always hiking, biking, swimming, canoeing and kayaking. With a childhood like that, I don't know how you could be anything but an environmentalist."

As an Environmental Analyst, his first job at MassDEP, Davis was deeply involved in the implementation of the enhanced program. "That was all-hands-on-deck time (late-summer and early-fall of 1999)," he recalled. "Everybody was doing whatever had to be done to get as many stations as possible testing vehicles as quickly as possible."

Davis was also charged with conducting an early evaluation of the program and helping to establish the first equipment audit procedures. "The overall thrust at that time," he said, "was what did we have to do, quality assurance-wise, to meet EPA (the U.S. Environmental Protection Agency) requirements, and how could we demonstrate that we were complying?"

In the fall of 2003, Davis was promoted to MassDEP program manager of the *Enhanced Emissions & Safety Test*. Along with his counterpart at the Registry of Motor Vehicles, Mark C. LaFrance, and others, Davis helped steer the program through a difficult period when all of the emissions testing equipment used by stations had to be upgraded or replaced.

With equipment reliability and test accuracy improving, and with program contractor Applus+ Technologies now holding a contract extension through September 30, 2008, what does Davis see as current program priorities?

"Number one," he said, "we have to ensure that stations receive timely service when the (testing) machines break down, particularly for stations that are open on Saturdays, when many motorists are seeking inspections. *See related article on page 2.*

"Number two, we have to continue to work harmoniously and effectively with the RMV to make sure the public receives fair and honest inspections.

"And, number three, we have to do everything we can to help the state's automotive techs help their customers by completely fixing vehicles -- on the first attempt -- that have failed the emissions test."

To facilitate effective repairs, Davis pointed out that Applus+ has assigned an L 1 technician full-time to the task of assisting technicians with "problem vehicles and problem failures -- vehicles that are difficult to diagnose and difficult to repair."

The new position was created under the terms of the contract extension recently granted to Applus+. ■

Some Web Sites Offering Helpful Info to Repairers

www.iatn.net

www.indentifix.com

www.lindertech.com

www.motorage.com

www.howstuffworks.com

www.hi-tektraining.com

www.asashop.org

www.autoinc.org

www.motor.com

www.nastf.org

Helpful Web Sites on Drive Cycles

Web sites to visit when needing information on readiness for OBD II testing and on drive cycles that re-set monitors:

<http://www.mitchell1.com>

<http://www.alldata.com/techtips>

<http://www.obdii.com>

Only EPA-Certified Converters May Be Used in Massachusetts

Massachusetts repair technicians who use the wrong replacement catalytic converters in attempting to fix emission failures are shortchanging their customers and risking big fines to boot.

To avoid these woes, repairers should use only replacement, or aftermarket, converters certified by the U.S. Environmental Protection Agency (EPA).

If it comes to light that a non-EPA-certified converter was installed, the shop where the work was done can be fined up to \$2,500 per repair. Dealerships making the same mistake can be fined as much as \$25,000.

Complaints on non-certified cats are directed to federal authorities.

"We see it fairly often," said Paul Jannoni, an L-1 tech employed by Applus+ Technologies, the contractor for the *Enhanced Emissions & Safety Test* program. "Someone replaces the cat; the motorist pays a big bill, takes the car back for a re-test, and fails again. The motorist gets angry and calls the state to complain. We look into it and find there's a new, non-certified cat in the vehicle."

In those situations, Applus+ always furnishes the motorist with the form needed to file a formal complaint with the EPA. The agency investigates and levies fines where appropriate. EPA may even turn a case over to prosecutors if there is evidence that deceptive and/or fraudulent practices were used against a customer

"If you put the wrong cat in a car, you're the one responsible for paying the fine, period," Jannoni emphasized.

On a properly tuned and well-maintained vehicle, the catalytic converter will usually last as long as the vehicle. Many motorists, however, do not take good care of their cars, with

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Where to Turn When You Have a Question

Station Hotline

877-297-5552

For workstation and other equipment problems

Motorist Hotline

877-387-8234

For consumer issues

Department of Environmental Protection

617-292-5745

For emissions issues

Registry of Motor Vehicles

617-351-9333

For various Registry issues

Web Site

www.mass.gov/vehicletest

General program information

printed on recycled paper

Tips for Working Safely on High-Voltage Hybrids
See article by master technician on pages 8-9

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