



California Automotive Teachers

October, 2008

Fall Issue

CAT NEWS

www.calautoteachers.com

“Nobody Said It Would Be Easy” by Bill Haas from ASA

Special points of interest:

- **Nobody Said It Would Be Easy.**
- **Our president, Jim Custeau, writes a letter to the membership.**
- **Barkhouse barks about what's going on in Sacramento.**
- **Hybrid Grant and Essential Safety Procedures.**
- **Instructor Training Opportunities.**

For many automotive instructors teaching was not their first career choice and most often it is simply an extension of a previous career. Many in the profession of teaching automotive technology today were mechanics/technicians previously, not an easy job either. Don't get me wrong, mechanics/technicians do not make the transition to teaching because it is easy. More than likely, making the change had more to do with the physical demands of the job. It is just downright hard on the body, knees, lower back, elbows, wrists, neck, etc. So, it makes perfect sense for that veteran mechanic/technician to move to the classroom as the physical demands are less.

No doubt spending time in the service bay is great preparation for an auto shop instructor. Students benefit from the sharing of knowledge and the real-world experience of having “been there, done that.” It is easy to find the similarities between the two careers. Understanding system operation and performing diagnostics requires patience, also necessary in a classroom or lab of inquisitive learners. Every mechanic/technician experiences that incredible sense of accomplishment after solving a difficult problem or returning a vehicle to perform as it was designed. That is really why we do it, not for the money or the prestige (there is not enough of either). Well, I found teaching to offer the same gratification; yes, I spent time in education after my career as a mechanic and before coming to the association. The reward of seeing some bright mind grasp the concepts presented and then actually go to the lab and perform the tasks was just as rewarding. The other parallel I can make between the two careers is the constant quest for information and continuous improvement. Staying current with the discipline of teaching is no different than the mechanic/technician staying abreast of new vehicle technology. These two careers require that you subscribe to be a lifelong learner.

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CAT 2008 FALL CONFERENCE, October 17 & 18

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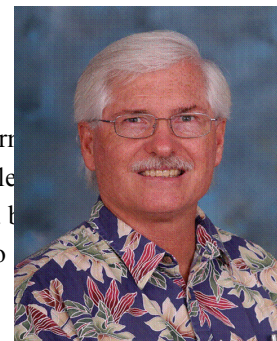


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President's Letter by Jim Custeau



As I sit down to write this article for the CAT Newsletter, the Governor has finally signed the California delay. Congress is working feverishly on a national financial system bailout and record numbers of people. These are tough times – I find the students at my college stressed financially, trying to purchase overpriced books to class. But looking on the bright side, I still have a great job, my students still have a class to come too, and we are going to need talented technicians to repair them.

Which leads me to the next point – when I last spoke to you at the CAT Conference at Skyline College, I told you the details of the NATEF 2008 Standards Workshop, which I attended as your representative. The most significant change, thanks to Darrell Parks' (long time NATEF Consultant) inspiration, was a change in the definition of a task. This definition came under attack by some workshop members in a series of emails during the first weeks after the January workshop ended (see my letter in the spring 2008 CAT Newsletter). I put in my "two cents worth" and spoke with Bill Kersten, NATEF President about CAT's interests and he said the final word about whether the new task definition would be written into the standards would be up to the NATEF Board, which was meeting in July to finalize the 2008 NATEF Automobile Standards.

I am happy to report that a few weeks ago when I received my 2008 ETL Handbook, Bill Kersten made a point of including in his cover letter the new definition of a task, which is as follows:

TASK: A psychomotor or cognitive entry-level learning activity consisting of one or more measureable steps accomplished through an instructor presentation, demonstration, visualization or a student application.

This definition clearly addresses the concerns the CAT Board spelled out in its December 2007 "White Paper" (see the entire text of that paper in the Spring 2008 CAT Newsletter). We see this very significant change in NATEF Standards as a step to make NATEF Certification more reasonable and manageable for programs throughout the United States.

CAT is not done with its work in the NATEF arena. Our next big push is to lobby for separate standards for Secondary and Post Secondary Programs. I believe NATEF has interest in this effort and I believe there is tremendous support from a broad segment of education and industry to make this happen. Just like the task definition change, this change will not occur over night. The 2008 Standards will be in place until 2011, which will give us time to sit down and develop a reasonable differentiation between Secondary and Post Secondary standards. Let the CAT Board know your thoughts on this change by emailing me at: jim.custeau@gcccd.edu

If you attended the spring Conference at Skyline College, I'm sure you were as impressed as I was with the organization and overall quality of the conference. Again, I want to thank Rick Escalambre and his team for an awesome job. The conference moves to southern California and my school, Cuyamaca College near San Diego, October 17 and 18. Look elsewhere in this Newsletter for updated conference information or check on the CAT website <http://www.calautoteachers.com> My staff has been hard at work organizing tours, (Crower Cams, Bilstein Shocks and Fortin Racing Transmissions), setting up the trade show and organizing the technical presentations.

If you are interested in being on the CAT Board let a board member know in the next few months (all board members contact information is available on our website) so you can be included in the Board discussion as we develop the list of VP nominees. It is a significant commitment to serve on the Board because once you are voted in as Vice President - you will cycle through additional two year positions as President, 1st Past President, 2nd Past President and 3rd Past President. That's right – it's a TEN YEAR Commitment. John Overton, Bret Harte High School, will take over as the CAT President when my term expires at the spring conference in 2009. That conference will be held at UTI in Sacramento. Before I finish talking about our conferences, we are still looking for a school to host the southern California conference for fall 2009.

(Continued on page 4)

I invite you to attend our next CAT Board meeting at 7:00 pm at Cuyamaca College on October 17th. This is your association and we always welcome your suggestions on how we can improve.

Before I go I want to thank Sid Burks for his contributions as editor of our Newsletter the past couple of years. Sid recently was selected as a Dean at his college and no longer has the time to do our Newsletter. Rick Escalambre has agreed to be our new Newsletter Editor – thanks Rick for taking over this important CAT role.

Lastly, thanks to Clydie Rizzo, who tirelessly works to keep your CAT website current and Bob Barkhouse, our Executive Director who is constantly vigilant insuring that our interests are heard in Sacramento.

I hope to see you at my college for the fall 2008 CAT Conference on October 17 and 18.

Executive Director's Report by Bob Barkhouse



I wrote in the last newsletter that the Skyline College CAT conference last spring would be outstanding if you will have to agree (if you went). There was something for everyone, lots of seminars and trade show vendors. Sometimes, it takes a lot of work and staff commitment to host a CAT conference and Skyline did not let us down.

Jim Custeau and the Cuyamaca College staff have been very busy over the last 6 to 9 months getting ready for our fall conference on October 17th and 18th. Things look really good at this point. Like all of you, Cuyamaca Automotive has really had a plate full in addition to the conference. In addition to all the fires in that area, they have been going through a NATEF recertification along with budget uncertainty. I know it will be worth your time and effort to attend CAT's fall conference.

I have always had the opinion that the more the CAT name can be spread, the better that different associations will understand and appreciate the role that you are playing in the economy and mobility of California. You never know where contacts will lead to. In that light, I have been attending the Governors Advocate's Advisory Board for Small Business in California in your behalf and that of CalABC. My message always stresses the importance of CTE to the workforce in California. One thing about keeping the fleet moving is that it can not be outsourced and you are an essential part of the whole picture. About 3 months ago a Transportation Committee was formed to draft a white paper on the State needs in transportation. This white paper was to go on to the governor to inform him of the status and needs of commercial and private transportation. At first it was only dealing with CalTrans and the Ports of Long Beach and LA. Through a lot of CAT pressure, the report ended up dealing with all forms of private and commercial vehicles and the importance of keeping them running. It now includes CTE and small businesses as major components. Again, CAT and CalABC just being there, may eventually lead to a position of mutual benefit to the State, CAT and the vehicle repair industry.

Due to the State budget situation, and other factors which I will discuss in a minute, the two CTE bills that we were pushing this year have been vetoed. This means that we will have to regroup and try again. The defeat that we experienced this year was really disheartening in light of the positive attitude of the Legislature and the Governor leading up to the 08 legislative session. The reason for the bills going down, can be laid directly on CTA. It is appalling to me that CTA, your own professional representation that you pay substantial annual dues to, took it upon themselves to take a position of support for academic and to oppose CTE bills. They are very powerful in the Capital and with the governor as it relates to opposition or support at election time. CTA opposition to CTE bills in the Legislature and with the Governor was felt by this pressure. If you pay dues, why haven't they supported you? It is time for you to demand answers from your local chapter and make it resonate up the chain of command until those at the top realize that there has to be equality among the segments of education. You are just as important to the educational process as the academic teachers. I would venture to say that collectively, the CTE teachers in CTA are a significant portion of the money that they are using to put you and your profession down. Another food for thought - why is it that all areas of education (including P.E.) are a part of

(Continued on page 5)

the High School graduation requirement except CTE? Are you second class citizens? It is time for all of you to rise-up and make your cause known to those at the top of the CTA decision process.

There were a couple of bills signed by the Governor that you may be able to use. This will take a little thinking outside of the box but could be the salvation for your high school auto program. The Governor signed Senate Bill 658 which reallocated \$90 million from a previous pot of money to the Charter School Facility Grant Program. A second bill, Senate Bill 2033, which lowered the interest rate for lease payments on approved charter school facility projects. If you are down to a half time program, why not combine your program with a charter program. The regulations for charter students/programs are different and depending on the County School Superintendent you may be able to swing a deal. Worth a try!!!! I guess it is time to climb down off my soap box and move on to other items.

Recently, CalABC has held several very important meetings of franchisers, small independent shop owners, chemical and testing manufacturers, associations and state agencies. The meetings dealt with; when is the appropriate time to exchange fluids (flushes?) such as; transmissions, power steering, brakes, coolant, etc. If there eventually is a consensus, I will get the info to you.

Recently, we lost several key people that have performed CAT duties. They have become Deans and can no longer perform their CAT jobs. At this point, it looks like CAT has everything covered. A huge thanks has to go out to Sid Burks. Sid was our newsletter editor and recently became a Dean. Sid took what was a great newsletter to another height. The format and color was great. Thanks Sid, we all wish you huge success in your new Dean job. We hope to see you at future conferences, you are always welcome.

Remember, keep the shiny side up and the greasy side down.

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This article and the permission to reprint it was provided by MOTOR'S National Accounts Service Manager, Holly Wright.

The potential for hearing loss in your shop is very real and not something to be ignored. Sam Bell shares his personal experiences, and offers some good advice on this important topic.

Contributing Writer Sam Bell recently asked if he could use this space to share important information about the potential for hearing loss in the shop environment. His report, which follows, provides "sound" advice to anyone who's exposed to high levels of noise in the workplace.

My wife got tired of repeating herself, and began to worry that maybe—just maybe—I wasn't merely ignoring her. So it was that one day earlier this year I found myself at the audiologist's office for a hearing test. According to the audiologist, a very large percentage of working automotive service technicians suffer significant hearing loss. In her experience, most are directly traceable to the use of air tools, especially impact guns and air hammers.

John Tanis, a BMW specialist from Rocky River, OH, suffers from a profound hearing loss. Like my audiologist, he hastens to point out that hearing loss is cumulative.

Hearing loss can be temporary or permanent. Temporary loss often results from exposure to relatively brief, but extremely intense, sounds. Permanent loss is more likely to be the result of prolonged exposure to painful noise levels. If you *don't* find the sound of unmuffled air tools painful, you may already be experiencing some degree of hearing loss.

There is good news on the prevention front, however. Most hearing loss is readily preventable. If you've ever seen the flight deck crew of an aircraft carrier, or the ground crew at an airport, you already know that the most effective form of hearing protection is wearing those "mouse ears." They're far more effective over the long haul than other in-the-ear devices, such as earplugs. Even so, regular use of "hearing bands" or earplugs is far better than no protection at all. Indeed, Tanis recommends the hearing bands because "they're cheap and easy. You just keep them with you around your neck all the time."

Recent advances in pneumatic tool design also offer considerable reason to cheer. The newest generation of impact guns develops substantially more torque while emitting much less noise. In fact, some manufacturers have encountered resistance to the new guns because technicians have equated their quiet manners with a lack of power. Tanis's other advice to his fellow technicians is "Get rid of your loud tools." On some of the newer impact guns, the exhaust is routed away from the user, so they're much quieter. You'd be surprised at the "silent" power.

One of MOTOR's Top 20 Tools award winners for 2006 was something called the Exhausted Air Recycling System (E.A.R.S.). In addition to claimed compressor energy savings of up to 30%, the system also significantly reduces air tool noise, in some cases to less than 10% of its original level. There's good news to report as well concerning the treatment of hearing loss. Newer hearing aids are smaller, lighter and more efficient than older designs, and sport much greater battery life. The newer ones also work better with telephones. Of course, this good news carries a steep price tag. A pair of good, midlevel digital hearing aids like the ones Tanis uses will set you back about \$4000; high-end devices may cost another 50% or more, another good reason to protect your hearing now.

Unfortunately, there's a built-in obstacle that even the most sophisticated devices cannot overcome. Waiting before addressing the problem allows the brain to commandeer unused neural pathways and put them to other uses. But with appropriate rehabilitation and therapy, you can often regain lost hearing abilities. The key is to seek professional help as soon as the problem is identified.

I was lucky. I've been wearing my very stylish mouse ears diligently for many years now, and it has paid off. Testing showed that while my right ear has experienced a slight diminution of hearing in the higher frequencies, my overall hearing remains well within normal limits. In fact, my left ear sports better-than-normal hearing. So now my wife sits on my left side, and I can hear her just fine.

Granted – Experience A Vision Into The Future by Mike Morse, Yuba College

A little over a year ago, I had a vision to introduce students and the community to hybrid/alternative fuel vehicles. I explored this vision with the Chancellor's Office and the Administration at Yuba College. Through the course of these discussions, ultimately, we came up with a proposal to obtain grant funding to advance the automotive department into the hybrid/alternative fuel arena. The end goal was to be able to offer advanced training and yet, at the same time, look at emerging technology connected with hybrid vehicles. Initially, it appeared to be risky considering all the hype about the electric vehicles 7-8 years ago. After working with several community groups to pursue the opportunities offered by electric vehicles, we experienced the rise and fall of electric vehicle technology which left us holding expensive equipment. Consequently, I was initially a little apprehensive diving into the hybrid vehicle market not exactly knowing what the future would hold in regards to these vehicles. But, as they say, "he who risks nothing, has nothing."

In collaboration with the Chancellor's Office and Shasta College, the Yuba College Automotive Department was able to participate in two different grants which allowed us to purchase two new hybrid vehicles, a Nissan ALTIMA and a Toyota PRIUS, as well as an E-85 Flex Fuel GMC pickup. This has essentially thrust us into a emerging technology. In light of the high cost of fuel and balancing fuel costs with environmental concerns, technicians and numerous groups within the local community have responded with great interest to alternative fuels and to vehicles that can get over 40 mpg. The public, as well as our college community, has appeared to embrace the technology as something that definitely aligns itself with sustainability and "green" technology. This has certainly raised the eyebrows of our community leaders.

In my 26 years teaching, I've never experienced automotive technology changing as rapidly as it is currently changing. It is exciting and it has been quite a ride to experience the excitement that the students have as well as the interest of the community in their exposure to the latest technology. The timing of these activities has fit in well with current news events on changes within the transportation industry and, as a result, the public is definitely embracing the hybrid/alternative fuel vehicles.

Since actively getting involved with this technology, I have been able to connect with a variety of community groups as well as companies that are exploring the future of "green technology." I am currently working on a national event entitled "Odyssey" which is allowing Yuba College to host and showcase technology which is environmentally clean and safe, as well as allowing us to promote the hybrid and alternative fuel vehicles. It is refreshing to be able to work with people who are excited and supportive of the current technology.

When I display the vehicles, I have found that the majority of the people would like to have a ride and experience the "new" transportation. This past summer the Yuba College Dean of Career Technical Education, Dr. Ed Davis, Instructor Bill Steen, and I had an opportunity go to Asheville, North Carolina to a week long conference with the National Alternative Fuel Training Consortium. We were able to participate in this conference which promotes understanding as to where the U.S. is going with the new technology surrounding hybrids and alternative fuels. Out of this conference, we were not only able to become a member of the group, but also a Northern California regional training center for the NAFTC. It has been a promising alliance, as in the near future, it will enable us to offer first-responder training, to host electric/hybrid vehicles and alternative energy vehicles, as well as to offer courses on the cutting edge of today's advanced automotive technology. The plunge into Hybrid/Alternative Fuel Vehicles has helped bring about new exposure to the Yuba College Automotive Program on a national, state and local level. These alliances have provided a refreshing experience as we develop closer connections with multiple industries.

I especially would like to thank all those at Yuba College and from within the community who have worked together to bring this about. The Yuba College Administration, the Yuba College Advisory Committee, and the Instructional Staff have all pulled together to bring this vision into a reality.

(Continued from page 1 -Haas)

This November during the Congress of Automotive Repair and Service (CARS), a special “train the trainer” session will be held on Saturday at the Mandalay Bay Convention Center in Las Vegas. This session will be presented by Jeff Curtis and Dan Beeson, of Bellingham Technical College in Bellingham, Wash. Dan and Jeff practice and promote active, lifelong learning in their lives and the lives of their students. They will share their experiences (success and failures) with active learning. Jeff and Dan will offer guidance on developing and maintaining effective teaching techniques and promise you will leave the session with strategies and ideas to engage students and promote learning your students will appreciate. This is not your typical 300-PowerPoint-slide-show and lecture. Additional information and registration is available at www.CARSevent.com. I encourage you to plan to attend this valuable seminar and I hope to see you there.

Bill Haas
Vice President of Education and Training
Automotive Service Association

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Essential Hybrid Safety Procedures by Jack Rosebro of Perfect Sky

Reprinted from GEARS Magazine, ATRA

An instructor wrote me the other day; he'd just attended an expensive seminar on hybrid vehicle technology. The class was offered by a national parts organization that had licensed hybrid training materials from a knowledgeable author with a good reputation.

Deviating from the curriculum, the instructor explained that a technician must wear rubber insulating gloves and a face shield when using a scan tool on a hybrid, because, "high voltage might come through the scan tool and kill you." My friend reported that the techs who'd paid for this so-called knowledge — knowing no better — "were eating it up."

More than eight years after North America saw its first hybrid (the 2000 Honda Insight in late 1999) technicians still have a lot of nonsense about these vehicles, even though accurate information is readily available. In addition, some of the explanations are inconsistent or thorough in their explanations of safety procedures for working with hybrids. Let's take a look at some of the more common misconceptions.

The hybrid vehicle doesn't create more risk in the service bay; it simply presents a *different* kind of risk. If proper training, including safety training, is available, the most important thing you can do is keep up with the changes that affect these systems.

Hybrids are already making significant changes to your world: particularly the transmission repair industry. In most of today's hybrids, the electric motors are located in the transaxle or transmission assembly; in others, the electric motor is positioned next to a conventional transaxle. We can't avoid working on or around these assemblies in the future.

More change is on its way. General Motors plans to announce a new hybrid every three months for the next three years, and Toyota is scheduled to announce its first plug-in hybrid next year. In the face of such a rapid change, you can't depend on training alone to stay on top of your game. You must become a proactive learner.

Working around high voltage isn't new: The electric utility industry has been dealing with circuit voltages as high as 500,000 volts for decades. Sensible standards and practices for daily work with high voltage were in place long before the first hybrid hit the showroom floor.

In this article, we'll concentrate on safety procedures. But remember: always review the latest OEM service information before servicing, diagnosing or repairing hybrids.

Where's the Danger?

For our purposes, we'll define *high voltage* as anything over 60 volts. Hybrid vehicles include a high-voltage (HV) electric drive in their powertrains. HV electric drive components have their own dedicated ground circuit, and *aren't* grounded to chassis. The vehicle's 12-volt bus still uses a chassis ground, just like a conventional vehicle.

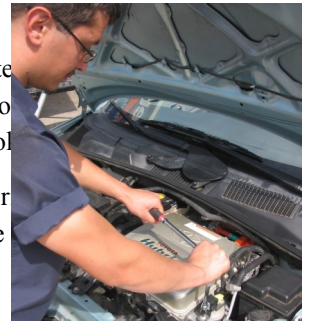
Hybrids incorporate high-voltage leak detection circuits that will set a DTC and, when appropriate, shut the vehicle down if any part of its high-voltage circuits short to the chassis.

The vehicle's OBD-II diagnostic link connector (DLC) *isn't* a high-voltage circuit, so using a scan tool on a hybrid won't put you at risk of electrocution.

An electric drive consists of these high-voltage components:

- A battery pack or other energy storage system, to power the vehicle's traction motor(s).
- A controller, usually referred to as an inverter assembly, which converts the battery pack's direct current to AC, to operate the electric motors.
- One or more high-voltage AC electric motors, which may include motors to drive accessories such as air conditioning.
- A DC-DC converter, which steps the high voltage down to power the vehicle's 12-volt bus.
- Orange HV cables to connect the battery, inverter, motor or motors, and DC-DC converter.

(Continued on page 14)



When and How to Disable the System

Normal service and maintenance procedures don't require you to disable HV circuits. Of course, you still have to turn the vehicle off before working on it.

Some hybrids also have electrohydraulic brake circuits that must be disabled before servicing the brake system. This is necessary on any vehicle with an electrohydraulic brake system, and isn't related to HV circuits. In other words, normal precautions remain in place, and common sense is still necessary.

Normally you should disable the HV system when performing any work on or around HV components. Every production hybrid has a device that lets you interrupt the HV circuit, to reduce the possibility of electrical injury. While the specific procedures differ from vehicle to vehicle, generally you disable the HV system like this:

- Verify that the vehicle has been turned OFF.
- Put on a pair of rubber insulating gloves.
- Remove the service plug or turn the switch off to open the circuit.

The service plug or switch is wired in series with the vehicle's battery pack; removing the plug or turning the switch off:

1. Opens the vehicle's HV circuit, and...
2. Electrically separates the battery pack into two smaller, less-dangerous assemblies.

WARNING: Even separated, the pack segments are always live and remain a danger!

Once the HV circuit has been disabled, high-voltage capacitors in the inverter assembly automatically begin to discharge. OEM directions normally tell you to wait until the capacitors discharge fully before working on the HV circuits. This usually takes five to ten minutes, but always check the latest OEM service information for the correct procedure and time interval.

When Should You Take a High-Voltage Measurement?

Strictly speaking, you'll rarely have to measure a live HV circuit directly. But if you need to work on or near HV components, you'll need to check the circuit after disabling or discharging it, to make sure there's no voltage present before performing any work.

This is the most common type of HV measurement you'll have to make. Always assume voltage is present until you've confirmed otherwise. And always remember that a hybrid vehicle's battery pack remains charged even when the vehicle is off.

Using the Correct Meters and Leads

Some automakers specify a minimum meter rating in their service information; others don't. If the necessary electrical measurement equipment are already in place. Meters and leads are rated as either CAT (category) for a particular voltage level, with higher numbers indicating the ability to withstand larger transient voltages. The ratings are set by Underwriters Laboratories (UL) and the International Electrotechnical Commission (IEC).



From the tips of the probes to the meter itself, every part of your multimeter must be rated for the voltage of the system you're measuring. Hybrid battery packs currently range from 144V to 384V. In some cases, some hybrid motors and inverters may develop as much as 650 volts.

A rating of 1000V CAT III/600V CAT IV is generally sufficient for today's hybrid and electric vehicles. The meter will have this rating stamped on the face of the meter; approved leads will have the rating molded into the insulation. The meter's internal fuse is specifically designed to protect you as well as the meter. Never substitute a lower-rated meter.



Care and Use of Insulating Gloves

Automakers typically recommend rubber insulating gloves when working on HV circuits. But OEM guidelines on the care, test and use of insulating gloves vary widely. Some manufacturers advocate a “puff” test: blowing into the glove to inflate it and check it for leaks. *We know of no glove manufacturer or safety-and-standards organization that recognizes this test.*

Although professional inflators are available, the most common approved field test is to trap air in the glove itself, then roll the cuff tightly to inflate the working area of the glove. This test is approved by the US Occupational Safety and Health Administration (OSHA) and ASTM International, an organization that creates material testing standards.

The field test begins with a through visual inspection of all glove surfaces for imperfections or damage, followed by a *roll* test (manual inflation) of both gloves to check for punctures. When properly performed, the roll test will trap air in the glove, enabling you to hear or feel leaks.

Always test your insulating gloves before *and* after each use. By doing this, you’ll discover glove problems before they occur, and will have more time to replace damaged gloves.

Field Testing Rubber Insulating Gloves

1. Visually inspect both insulating gloves, inside and out, for any flaws or damage (**Figure #1**).
2. Using both hands, hold the insulating glove by the edge of its cuff and let it hang naturally glove (**Figure #2**).
3. Pull the cuff tight to trap as much air in the glove as possible.
4. Keeping the cuff sealed, lay the glove on a clean, dry, horizontal surface with the fingers pointed away
5. Roll the cuff toward the fingers to inflate the glove as much as possible, without allowing any air to leave.

Note: You can’t damage a glove in good condition by doing this.

6. Listen for air leaks and watch the glove for any signs of deflation. If the glove deflates, make sure air isn’t leaking from a loosely-rolled glove cuff.
7. Put the inflated part of the glove (fingers and palm) close to your face to feel for any silent leaks.
8. Repeat the test sequence for the other glove.

If you’re having trouble performing the roll test:

- You may not be trapping enough air in the glove before rolling it up, or...
- You may be rolling the glove cuff too loosely, allowing trapped air to escape.

Not all OEMs recommend using leather overprotectors, which are special gloves that fit over the rubber insulating gloves to protect them against cuts and abrasions. However, virtually all rubber insulating glove manufacturers recommend leather overprotectors unless the job requires a level of dexterity you can’t reach with the overprotectors on.

When will you need to wear rubber insulating gloves?

- While disabling a hybrid vehicle's high-voltage circuit.
- While testing a high-voltage circuit to confirm it’s de-energized.
- While working on or around a hybrid battery pack that has HV terminals exposed.



Figure #1



Figure #2



Figure #3

Finally, OSHA regulations specify that rubber insulating gloves issued by the employer must be tested or replaced every six months after they've entered service. If the gloves aren't being used yet, the first test or replacement can occur as long as twelve months after the gloves were purchased. Glove manufacturers can provide a list of approved testing facilities.

The Last Word

Common sense is your most valuable tool when working on hybrid vehicles. With proper training, you can learn how to service, diagnose, and repair these vehicles safely. More information on safety procedures is available from manufacturers of personal protective equipment such as rubber insulating gloves, from manufacturers of quality electrical meters and leads, from the publishers of accepted safety standards and procedures, and from the vehicle manufacturers.

By developing a solid understanding and use of sensible safety practices, you can learn to work safely and efficiently on hybrid vehicles, and can build a foundation that will serve you well as the hybrid becomes an increasingly common sight in your service bay.

Resources for this article included:

- www.aeswave.com: Retailer of rubber insulating gloves, CAT III/CAT IV meters and leads, and multimeters.
- www.whsalisbury.com: Manufacturer of rubber insulating gloves.
- www.support.fluke.com/find-sales/download/asset/1263690_6116_eng_h_w.pdf: Fluke Instruments article on multimeter safety ratings system.

New and Improved Fuel Economy Estimates

More Accurate Estimates

The U.S. Environmental Protection Agency has revised the way it determines city and highway fuel economy estimates for vehicles. Starting with 2008 models, the new estimates more accurately reflect realistic driving conditions and include considerations for things such as cold-weather operation, higher driving speeds, air conditioning usage, and faster acceleration.

Facts You Should Know

- The new city and highway estimates for 2008 models will likely be lower than those for models from previous years. The new estimates, however, do not mean cars are less fuel efficient. The new tests just reflect more realistic driving conditions.
- EPA continues to perform testing under strictly controlled laboratory conditions to ensure each model is tested in exactly the same way.
- Standardized testing allows consumers to compare the fuel economy of one model to another with confidence.
- Even though the new testing methods provide more realistic estimates, drivers' actual mileage will still vary according to factors such as road conditions, how and where they drive, vehicle condition and maintenance, fuel variations, vehicle variations, and engine break-in.
- Individual fuel costs will differ depending on annual miles driven, driving behaviors, and fluctuations in fuel prices.
- For more information on EPA's new fuel economy label or how to achieve the best fuel mileage for any vehicle, visit www.fueleconomy.gov.

New and Improved Fuel Economy Label

More accurate and informative annual fuel cost estimates

More accurate city and highway test results

Sliding scale compares a particular vehicle's fuel economy to others in its class

EPA Fuel Economy Estimates

These estimates reflect new EPA methods beginning with 2008 models.

CITY MPG

18

Expected range for most drivers
15 to 21 MPG

Estimated Annual Fuel Cost

\$2,039

based on 15,000 miles at \$2.80 per gallon

HIGHWAY MPG

25

Expected range for most drivers
21 to 29 MPG

Combined Fuel Economy

This Vehicle **21**

10 31
All SUVs

Your actual mileage will vary depending on how you drive and maintain your vehicle.

See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov

Web link added for more information

NACAT News

A short announcement that NACAT memberships run from September 1 – August 31 and if you are a member you may be due to renew. Members can check their renewal status by logging in to the www.nacat.com site.

The Mobile Air Conditioning Society (MACS) Worldwide is again providing scholarships for NACAT and CAT automotive teachers to attend their conference in February in Dallas. The scholarship includes registration fees for the technical training sessions, social functions and trade show but does not include any travel expenses. Information and an application are available on www.nacat.com. CAT members can use the NACAT registration form. Last year there were more scholarships than applicants so anyone interested should apply. MACS is again providing complementary meeting resources for the NACAT Officers and Board meeting during their conference.

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July 19-24, 2009

Newsletter Editor's Disclaimer

This issue of the CAT News includes two "Instructor Training Opportunity" advertisements. They are not meant to show any favoritism towards any individual or organization. It is our goal in the future to provide one full page of Instructor Training Opportunities. The training can be online, classroom, conference related, or workshop seminars. If you know of any opportunities please forward them to rescalambr@aol.com for inclusion in the future newsletter.

California Automotive Teachers will meet at Cuyamaca College for the Fall 2008 Conference on October 17 & 18

Our fall conference is rapidly approaching and we hope you are making plans to attend. If you are traveling by air the closest airport is San Diego, which is 18.6 miles (26 minutes) away. If you plan to bring a RV and park overnight on campus it must be self contained since there are no electrical hookups or lavatories provided. A list of hotels is attached to this letter.

Activities on Friday include BAR meetings in the morning and evening. A free lunch is included and tours will visit Crower Cams and Equipment, Fortin Racing, and Bilstein Shocks. The CAT Board meeting will be Friday evening.

On Saturday, we are planning a variety of technical seminars to help you sharpen your skills. Vendors will be out in full force to show you the latest in books, training materials, and equipment. Door prizes will be given away at the end of the workshop on Saturday. We will finish by 5:00 PM., so try to arrange your travel plans so you can stay to the end.

Since we are 15 minutes from the world famous San Diego Zoo and 25 minutes from Sea World and Beaches, we are hoping that you will bring the entire family and enjoy the whole weekend. The weather should be comfortable in the 70's or 80's. It could be hotter if we have a "Santa Ana" – upwards of 100 – so keep an eye on the weather report. Generally, it is 10 degrees warmer at our college than it is in downtown San Diego or at the beach.

GOOGLE: La Mesa and El Cajon – or go to your favorite on line booking source such as Expedia, Travelocity or Orbitz. Remember – the earlier you book the better rates you are likely to get. I recommend the Sycuan Resort if you want a rural country club setting (note the special rate is first come first serve and may not last based on occupancy). The Holiday Inn and Holiday Inn Express are nice suburban hotels. The Hilton and Marriott are typical big city.

Contact Jim Custeau at 619-660-4334, or jim.custeau@gcccd.net for information.

California Automotive Teachers met at Skyline for the Spring 2008 Conference

The spring California Automotive Teachers (CAT) Conference was held at Skyline. One hundred and fifty members attended the conference. On Friday, Dave Amlin, Wayne Brumett, and Marty Gunn from BAR Standards and Training conducted workshops designed to update certified clean air car course instructors regarding the latest changes to the smog check program. They also discussed tentative plans for the 2009 Smog Check Update course that will rollout this fall. Approximately ninety instructors attended the two workshops. The Skyline Auto Tech Club hosted a barbeque lunch and then members went on tours to Roy Brizio's Hot Rod Shop and The Military Vehicle Technology Foundation. Jack Rosebro from Perfect Sky hosted an afternoon Toyota PRUIS workshop for thirty-five instructors. Tom Broxholm from Skyline College hosted a Friday evening hands-on POWERPOINT workshop for thirty instructors. CAT Members and their families had time to socialize while they enjoyed Mexican food. Saturday included a variety of workshops spread out over five hours. Twenty-eight exhibitors were in attendance to display their latest tools, materials, software, and equipment. One hundred and eighty people attended the luncheon/business meeting.

Jack Rosebro's Friday afternoon Hybrid class



BAR Meeting conducted by Wayne Brumett,

Phil Fournier in action on Saturday teaching a



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For additional information about the California Automotive Teachers organization,
future conferences, job announcements and much more:

visit our WEBSITE at

www.calautoteachers.com

CAT Conference
Spring 2009
Universal Technical Institute
April 25 & 26

Conference Host Information

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