



California Automotive Teachers

April, 2009

Spring Issue #34

CAT NEWS

www.calautoteachers.com

Newsletter Highlights

- CAT Website is being modernized!.
- Our president, Jim Custeau, writes his final letter to the membership.
- What's going on in Sacramento?
- Farewell from a Friend.
- Summer Training Opportunities.
- Variety of Advertisements!
- Newsletter has been expanded!

What's in this issue:

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“Website Changes, Help CAT go Green” by Tom Broxholm

I would like to take this opportunity to introduce myself. My name is Tom Broxholm and I teach automotive drivelines and an occasional computer class at Skyline College. I also have a computer business under the name of TGB Computing. My computer business takes care of computer hardware, software, and a few websites.

As of last November I have taken over as webmaster for the CAT website. Those of you who are used to contacting Clydie Rizzo, you now need to contact me at: tom@calautoteachers.com. If you lose my email address you can always contact me through the “Contact the webmaster” link that is found at the bottom of our homepage. Don't forget, our homepage is www.calautoteachers.com. In some ways the CAT website looks the same and in other ways you will find some subtle changes and some big changes. Converting the entire site from a site that was created in Front Page to a more dynamic site with the use of Dreamweaver has been challenging and time consuming. I still have a lot to do so please be patient with me.

Electronic registration is coming. This spring our CAT website sports the ability for all our conference vendors to register and pay electronically online. In addition to vendors, new members who wish to join CAT can now do so online and current members who wish to pay your annual dues can also do so electronically online. Because we realize that problems can occur when starting something new we have decided to beta test or allow a limited number of conference goers to register and pay for the spring conference electronically online through our website. If you would like to beta test our electronic registration and payment process I suggest you don't hesitate to register on our website.

Our goal is to find and fix issues or bugs so we can offer electronic conference registration to everyone next fall. From my perspective I would like to see 100% electronic conference registration from everyone in the future. Not only will this help us to go green, but it reduces a ton of man hours keeping track of who registered and who paid. CAT has opened a PayPal account. PayPal offers our CAT members two secured and safe methods for payment. You can use any major credit card or you can use a PayPal account. Rest assured, you do not have to have a PayPal account in order to pay CAT electronically.

(Continued on page 10)

CAT 2009 Spring CONFERENCE, April 24 & 25

Universal Technical Institute, 4100 Duckhorn Drive, Sacramento, CA 95834
Contact Jim Moore at 1-877-884-2254x16277, or techtraining@uti.edu for information.



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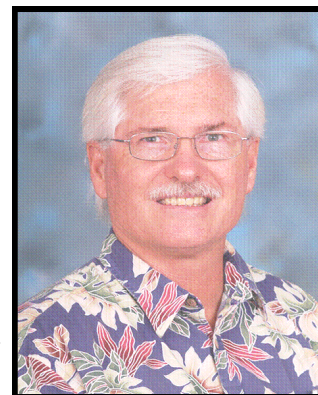


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President's Letter by Jim Custeau



It's hard to believe my two year term as President of CAT is coming to an end. It seems like only yesterday that then President, Drew Carlson handed the Presidency over to me. With the help of an awesome CAT Board, I believe the last two years has been productive for CAT. First, we were successful in getting NATEF to listen to some of your concerns, resulting in some subtle changes to the definition of tasks, which provides instructors more latitude in meeting the goals set forth by the NATEF standards. Secondly, our association is in good shape financially and we enjoy strong membership numbers. Additionally, our board and Executive Director, Bob Barkhouse, have worked tirelessly on your behalf to insure our members CTE interests are heard in Sacramento; and, we have had a good run of very successful conferences. Lastly, we have begun the job of converting our Membership and conference registration and payments to an on-line process – more on that later.

I want to thank you all for giving me the opportunity to serve as you President. I hope I have represented you well. I know our next President will do a great job as current Vice President, John Overton, Bret Harte High School, southeast of Sacramento will be taking over the duties of President on Saturday, April 25th at the Spring Conference. Speaking of the spring conference, it's going to be here very soon – April 24, 25 and will be hosted by Universal Technical Institute at their beautiful new campus just north of Sacramento. Jim Moore is the contact person and you can find conference materials, including the registration form on our CAT website

None of us could have predicted the financial melt-down that has occurred in the US and world economy. As I write this column, our Governor is preparing to sign an historic bill which will cover the projected \$42 billion dollar deficit our state faces over the next 18 months. Thanks partially to the efforts of faculty and faculty associations in K-14, our programs should emerge relatively unscathed. We must stay vigilant as there is still a better than even chance the economy will continue to get worse leading to the possibility of further cuts to education. Speaking of faculty associations, I would be remiss if I didn't remind you that CTA has again actively opposed CTE high school legislation, arguing that they can't support diverting funds to CTE programs. I'm sure Barkhouse will have something to say about this in his column.

We must work diligently to help get more new CTE faculty into the four year degree training pipeline, especially for our high school programs. Many of us will be retiring over the next 3-5 years and there aren't degreed teachers to replace us. This is particularly a problem in high schools which have resorted to hiring non-degreed teachers on rolling one year contracts at substandard wages with no chance for attaining tenure. Community colleges are more fortunate because most colleges can hire tenure track permanent teachers with an Associate Degree and six years of work experience.

During our winter CAT Board meeting we met with Dr. Don Austin from the school of Education at Fresno State who explained a unique program for CTE teachers in training to work on their BA in Industrial Technology and teaching credential at least partially on-line and possibly in partnership with a more local CSU campus in your area.

Thanks to our newly hired web master, Mr. Tom Broxholm, at Skyline College, we are in the early stages of converting to membership renewals and conference registration over the web – including the ability to pay your membership and conference fees on-line with PayPal or your credit card. One of the big benefits of this transition will be the ability for us to collect on-line membership and conference data electronically into our data base. Having just hosted the fall '08 CAT Conference, I can assure you that will help immensely with the mundane and time consuming clerical task of tracking who has registered and paid their dues, freeing the conference host to concentrate on the conference itself. We plan on continuing "snail mail" conference registration and membership renewal at least until we are sure our new process is working well. If you are adamant about continuing paper registration and sending in a check for your dues and conference registration, let us know! I just registered and paid for the spring conference on the web – it was painless and took less time than it would have taken me to address a letter and write a check, plus I already have a receipt to turn in for my reimbursement.

Again, I want to thank Rick Escalambre for taking on the job of putting together our twice yearly newsletter. He is doing a great job – make sure you thank him at the conference for a job well done.

While I'm thanking people, I want to offer a giant thank you to George Hritz, who will be leaving the CAT board after a doing a tremendous job for ten years. I told George recently that although he is leaving the board, I still have his cell, home and

(Continued on page 4)

work phone numbers and we won't hesitate to call on his wealth of CAT experience in the future. Finally, I want to wish my friend Wayne Brumett a happy and long retirement. Wayne has done a fine job in the Bureau of Automotive Repair (BAR) Training Unit. And although his relationship with us "smog instructors" didn't start out great, I've come to appreciate Wayne's conscientious efforts as he worked within a cumbersome and sometimes difficult bureaucratic environment. Please see Wayne's retirement letter to CAT Members elsewhere in this newsletter.

Well, I better get this article sent to Rick as he is chomping at the bit to get the newsletter out + I need to spend a little time with my wife, Brenda, tonight as I've been doing school stuff 24/7 and she deserves some of my time.



Farewell from a Friend of CAT

By Wayne Brumett

It's Barkhouse's Fault...

After 25 years of rewarding work, I am retiring from BAR. As I look back, some of my best memories have been linked with CAT conferences.

I first heard of CAT when I was in college in the late 70's in San Luis Obispo, studying to be an automotive instructor. One of my teachers, Lynn Mosher, asked me to read a book by Bob Barkhouse. The book was like no other I had ever read. The book even had racing stuff in it!

One day Lynn said, "I am going to the CAT conference. Do you want to go?" I thought to myself that this sounded like he wanted me to go to some hookers convention. I cautiously asked Lynn, "What is a 'CAT' conference?" He explained that it was a bunch of California automotive instructors that had formed a group to support and promote automotive education. He said if you go, you can meet Bob Barkhouse! In those days I imagined that all automotive textbook writers/publishers lived in New York high rises, so the idea of meeting this textbook writer excited me. Lynn told me that Bob lived in a place called "Yuba City". I thought to myself, Yuba City didn't sound like it was anywhere close to the Big Apple – reality was starting to set in. As it turned out, I didn't get to go to that CAT conference, but the idea of an association of automotive instructors seemed like a good idea, and it intrigued me.

When I became the first educational coordinator for BAR, I was invited to speak at a CAT conference in the early 90s. I was fresh from the BAR Enforcement Unit, and with my suit and tie, I proceeded to give my spiel on how the schools and instructors were not doing their job, and that they needed to shape up. Well ... what happened that night was real different from what I had planned. To my surprise, I received a barrage of criticism of how BAR was not doing its job! I thought to myself, "I am from BAR, no one questions 'BAR' but – again reality was starting to trickle in.

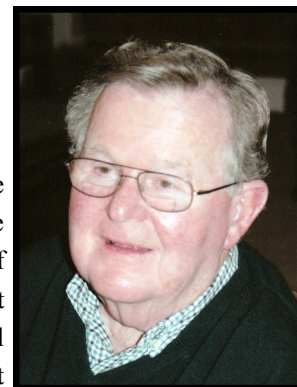
After many CAT conferences and speaking with hundreds of instructors over the years, I can say that you, the automotive instructors at CAT, are the best people I have ever known (you, too, Barkhouse!). As I leave, I would like to think I made some small contribution to the automotive educational field and that some students benefitted. Good-bye, my friends. I wish you all the best in your future endeavors. Perhaps you will see me at an upcoming CAT conference – this time I can do all the criticizing of BAR; now that would be a change! What a great ride it has been! Thank you.

To Wayne; Best Wishes from all your CAT friends, thanks for all the hard work and dedication!

Some of Wayne's Accomplishments:

- Wrote regulations for additional Smog Check school/station equipment (DSO, enhanced scan tool, etc.).
- Wrote regulations for inclusion of the Smog Check update course, ASE Alternative courses (A6, A8, L1), and separation of Basic and Advanced Smog Technician training.
- Introduced computerized web based: student course completion data entry, school and instructor renewals, instructor forum, and electronic course material downloads.
- Developed and administered the BAR instructor Train-the-Trainer course (not always a pleasant experience for the attendees!).
- Developed all the Smog Check technician update training courses.

Executive Director's Report by Bob Barkhouse



Man, are these challenging times for education or what???? It seems that everyone is caught in the middle. With loan agencies operating on greed, we all end up in financial chaos. Put that with our state politicians operating on strict political lines instead of trying to make decisions based on the real needs of the state, education and especially CTE finds itself right in the center of the money squeeze. The sad part of all this is, in four months this budget process has to start all over again. My hope is the voters will either move the responsible political rascals out or pass some ballot measures that will put a severe hurt on them if a budget is not passed on July 1, 2009.

This has put a severe bind on any political direction that CTE can take with bills this year. With that in mind, there are no CTE bills that we are watching this year. Just hang on if you can. Over my lifetime, in CTE there have been several periods of tight money. It seems that the money pendulum swings back and forth. We have just passed through several years of good times and now the pendulum is over to the bad times. I guess we should take a lesson from the lowly squirrel. In the good times (summer), he grabs all that he can and stores it for the bad times (winter). He always knows there will be another good time. He just has to wait. Our biggest problem is administration. CTE is expensive and they need money. This, coupled with the pressure of exit exams, no child left behind and everyone going to college consumes all the elective hours. No elective hours, no automotive students.

Things seem to be progressing on schedule for the upcoming spring conference at UTI in Sacramento. Drew Carlson is staying on top of all the issues that have to occur with putting on a conference. Drew is as good as they come and this will end up being another great conference. I know money is tight but as fast as technology changes we have to make time to keep up. Unfortunately, Automotive is not a stagnant curriculum such as Math, $2+2=4$ will never change. An Automotive teacher experiences more change in one year than a Math or English teacher has in a lifetime of teaching.

There was a fear that the BAR, due to tight money, was going to end its two Friday conference presentations at 10am and 7pm on Fridays. After some dialog with the BAR, they see the importance of a two way exposure between you, the BAR instructors, and the BAR. Obviously, most of you feel the same way since year after year each session has had about 50 to 75 in attendance. Where else are you to get the nuances of regulation and smog checks.

The Chancellor's Office has a VTEA State Advisory Board that is starting to make some real progress under its new leadership. Automotive is well represented at the table and their expectations are high. Our leader is Steve Tomory from Rio Hondo College. We do need your help in identifying as many automotive organizations as you can, giving the acronym and what it stands for, i.e. "CAT = California Automotive Teachers" and send your list by email to stomory@riohondo.edu or give it to Steve or myself at the Sacramento conference. Thanks in advance.

I hope all of you have had a chance to register on line by the time you read this message. Our webmaster, Tom Broxholm of Skyline College, has spent a lot of time revising our web page and shepherding us into website electronic registration and payment through PayPal. If you have any suggestions for improvement, contact Tom or a board member. It really is pretty simple and if I can do it, anyone can. For me, I am quite proud of my achievement after listening to Rick Escalambre tell others that "Barkhouse is so computer illiterate that he has trouble turning it on". One of these days, I will send him an email, won't he be surprised?!

How about the last two newsletters, what a great job. Rick Escalambre, again, has taken a new job (newsletter) and made us all proud. I think it was a great job and hope all of you feel the same. Newsletters are a thankless job and take a considerable amount of time. If you feel good about Rick's newsletter, let him know how much you appreciate his work.

I am still disappointed with the actions of your state organization - the CTA. They give lip service, publicly supporting CTE, but in the halls of Sacramento they are the reason for recent setbacks. The sad part is that you pay significant dues to an organization that is killing CTE. I also have a problem with an organization that contributes a gross amount of your dues to a ballot measure that has nothing to do with the classroom, while lower grade teachers are buying pencils and supplies out of their own pockets. There is something wrong with this scenario. They can talk a good cover-up but look behind the smokescreen to see reality.

Hope to see you at Sacramento UTI. Remember, "keep the shiny side up and the greasy side down". Bob

Summer Training Opportunities—Southern California

*****SOUTHERN CALIFORNIA*****

RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	6/22/09-6/24/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603				Materials Fee \$45		Times:	8:00 a.m. - 2:30 p.m.
Classes Offered:							
Alternative Energy Workshop: This course is designed for all instructors that would like to increase their knowledge of Alternative Energy Systems with an emphasis on Photovoltaic Systems. It is intended for people that want to learn basic information on the different types of alternative energy, rebate programs for alternative energy systems and electrical safety. Attendees of this workshop will learn about the impacts that our energy use has on the planet and ways to become energy independent.							
RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	7/13/09-7/14/09 8/3/09-8/4/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603				Material Fee \$30		Times:	8:00 a.m. - 2:30 p.m.
Classes Offered:							
BioDiesel SeminarThis course is intended for the individual who needs an introduction to one of the fastest growing, cleanest liquid alternative fuels – Biodiesel. This course will primarily cover an overview of this renewable energy source, including its background, history, future and present use as an alternative fuel. This course will also discuss in detail Biodiesel production and some of the operational and fuel quality issues.							
RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	7/15/09 & 8/5/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603				Material Fee \$15		Times:	8:00 a.m. - 2:30 p.m.
Classes Offered:							
ATech Electronics: This course is designed around the ATech S.E.T. Boards that provide hands-on technical training. This course will cover a general overview of the basics in vehicle electrical and electronic diagnosis, and discuss basic theory and wiring diagrams, diagnostic strategies, Ohm's Law, Kirchhoffs Theories, series/parallel/series-parallel circuits, volts/amps/resistance, and voltage drop testing.							
RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	7/16/09-7/17/09 8/6/09-8/7/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603						Times:	8am - 2:30 pm. Material Fee \$30
Classes Offered:							
Advanced ATech Electronics: This course is designed and uses the Atech 3600 series trainers utilizing computer assisted electronic testing boards. This course is intended for the individual who needs a detailed overview of vehicle electrical and electronics as it applies to Powertrain Management systems. This course will discuss semiconductor theory and application, computer-controlled inputs and outputs, wiring diagrams, diagnostic strategies, and use of DVOM, DSO.							
RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	8/10/09-8/11/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603				Mat. Fee \$30		Times:	8:00 a.m. - 2:30 p.m.
Classes Offered:							
Powertrain Management Electrical Repair: This course is intended for the individual who needs an overview of proper CAN wiring harness repair techniques on vehicles that use Allison Automatic Transmissions and Cummings Engine. This course will primarily cover an overview of the vehicle wiring harness between the Engine and Transmission ECU/PCM. This course will also discuss in detail system troubleshooting procedures, and advanced wiring repair procedures of the interface wiring harness.							
RIO HONDO COMMUNITY COLLEGE							
Location: 3600 Workman Mill Road, Whittier, CA						Dates:	8/12/09-8/13/09
Contact: Steve Tomory (562) 908-3433, FAX (562) 463-4603				Materials Fee \$30		Times:	8:00 a.m. - 2:30 p.m.
Classes Offered:							
Powertrain Management CNG Systems: This is an introductory course on alternative fuels as they pertain to use in modern School Bus/Medium/Heavy Duty vehicles. Various alternative fuels will be compared, such as Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG), etc. The theory of operations, system components, and safe handling of these fuels are included. The information is based on current John Deere HFNO 8.1 and Cummins L Plus, ISL-G fuel systems.							
To register for any of the Rio Hondo classes listed above, call 562 908-3433 All fees for above include materials, snacks and lunch							

Summer Training Opportunities—Northern California

*****NORTHERN CALIFORNIA*****							
AMERICAN HONDA							
Location: 123 Val Dervin Parkway, Stockton, CA 95206						Dates:	July 6 - 10 2009
Contact: Christine Vison (209) 983-4500 for enrollment procedure						Times:	8:30 a.m. - 4:30 p.m.
Classes Offered: * NEED TO FILL OUT HONDA ENROLLMENT FORM TO GAIN ACCESS TO CLASS *							
Honda's unique "Individualized Skills Training" approach allows students to concentrate their learning on subject areas of their choice. The focus is on acquiring hands-on skills that student-technicians will need to be successful in the dealership environment. Learners may choose subjects such as OBD-II, ABS, A/C, SRS, Multiplex, Electrical/Electronics, Fuel and Emissions, and others. It is suggested that you select an area of interest and complete all of the Self Study pre-work required to understand the theory behind the activities to be performed in the shop. Please contact the training center if you need access or have problems with your access to the Honda Interactive Network. Due to high demand for this course, it is important that you can commit to all five days when you enroll.							
TOYOTA MOTOR SALES, U.S.A. INC.							
Location: Regional Service Training Center, 2451 Bishop Drive, San Ramon, CA 94583						Dates:	July 13 -17 2009
Contact: Martin Ristad (925) 275-3336, FAX (925) 830-8368 email: martin_ristad@toyota.com						Times:	8:30 a.m. - 5:00 p.m.
Classes Offered: Enrollment by FAX or email							
2010 Prius New Model Training, Hybrid Diagnosis, Smart Key Operation & Diagnosis and Engine Control Diagnosis							
SKYLINE COLLEGE, AUTOMOTIVE TECHNOLOGY DEPARTMENT							
Location: 3300 College Drive, San Bruno, CA 94066						Dates:	June 22 - 26
Contact: Rick Escalambre FAX (925) 676-0890 email: escalambre@smccd.net for Reg form						Times:	M-Th 8-5, Fri 9-1
Classes Offered: Cost: \$43 CA resid.							
OBD II Diagnostics: Includes Drive Cycles and Monitors, Making Sense of MODE 6, Evaporative Emission Systems and Vehicle Networking systems. The week will include approximately sixteen hours of extensive hands-on assignments that include testing and diagnosing a variety of vehicles. Go to www.rlescalambre.com for a registration form.							
PERFECT SKY, INC. (JACK ROSEBRO)							
Location: 3300 College Drive, San Bruno, CA 94066						Dates:	June 15-18, 2009
Contact: Register with Kelly Karlstein (310) 801-7818 email: perfectskysupport@mac.com						Times:	3 days & 1 evening
Classes Offered: Hybrid/ElectricVehicle Workshop for Educators Cost: \$950							
Topics covered include: Permanent AC motor construction, AC and DC drive-by-wire motor operation, Switching modes of voltage-source inverters, Static and dynamic HV insulation testing, Speed and torque control loops for traction motors, DC brushed electric steering assist systems, Failure modes with and without DTCs.							

These classes provide an excellent opportunity to enhance your automotive teaching skills, network with your peers, and meet your annual NATEF training requirements. **Check the Website for additional workshops not listed!**

Other summer training opportunities not listed: NACAT 2009, see page 26.

This fall in Las Vegas is the CARS/NACE Conference November 5-7.

(<http://www.carsevent.com/cars09.html>)

Note: George Hritz and Drew Carlson did all that they could to line-up a variety of manufacturer sponsored workshops, but they did not receive many replies. So make sure to signup early and to attend the classes, so the existing manufacturers will continue to support future summer training workshops.



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With the right tools, you can do anything!



Four Refrigerants—Dealing With Global Warming

by Tom Birch

R-134a has been a good refrigerant since it replaced R-12 in the early 1990s. Engineers working with the advice of SAE and MACS have made A/C system improvements, and these have reduced vehicle and system emissions, reduced the size of A/C components, and have improved vehicle fuel economy. If we view the cradle-to-grave emissions (vehicle manufacture, normal operation, to recycling when the vehicle is done), vehicle costs and emissions, there is no better refrigerant. Also, R-134a works well with electric compressors in hybrid and electric vehicles. But, R-134a has a fairly high global warming potential, GWP, well above 150, and the European Union has set a GWP ceiling of 150. R-134a will be banned in Europe in 2011 in new-design vehicles and 2017 in all new vehicles.

This has created a problem for vehicle manufacturers that build vehicles for sale inside the European community and the rest of the world. A vehicle sold in Europe must have a low GWP refrigerant. This dilemma is expected to ripple through the World's vehicles in the near future. It looks like there are two contenders (R-744 and R-1234yf) and one possible choice (R-152a) to replace R-134a.

R-134a, CH₂FCF₃: A good, single-molecule refrigerant in use since early 1990s.

Ozone Depletion Potential (ODP): 0

Global Warming Potential (GWP): 1300

Very Slightly flammable

Toxicity, Acute toxicity exposure limit (ATEL): 50,000 ppm

Is a fairly efficient and mature (well developed) refrigerant and can probably be improved for more economical operation.

R-744, CO₂: A naturally occurring molecule; we breath in oxygen and exhale CO₂. But CO₂ requires A/C pressures that are 8 to 10 times R-134a. CO₂ operates at trans-critical pressures; it does not become a liquid in the high side heat exchanger so we can't call it a condenser. The high side heat exchanger is called gas cooler. Most systems use an additional heat exchanger between the suction line and the line leaving the gas cooler to liquefy the CO₂ for the expansion device.

R-744, CO₂:

ODP: 0, GWP: 1

Non flammable

ATEL: 40,000 ppm

R-744 requires all new A/C components that would add about \$300 to 450 to the price of the vehicle. The increased pressures will increase tailpipe emissions and reduce fuel mileage, especially in small vehicles, and there is questionable performance in hot climates. Components are not proven reliable at this time, and system service is estimated at 4-5 yrs. (10 yrs for R-134a systems). The level of CO₂ in the passenger compartment must be limited to protect the occupants; vehicle grade CO₂ will probably be odorized so a leak will be more noticeable. A leak detector will have to compare a possible leak to background, atmospheric levels. Recovery is not required, and we might not have an identifier. New service and leak detection equipment will be required.

(Continued on page 10)

(Continued on page 9—Birch)

R-1234yf, HFO-1234yf, $\text{CF}_3\text{CF}=\text{CH}_2$: (hydro-fluoro-olefin [HFO]) An azeotrope blend with a double carbon bond to become a single molecule. Jointly developed by DuPont and Honeywell. Operating characteristics are very similar to R-134a, a near drop-in.

R-1234yf, HFO-1234yf, $\text{CF}_3\text{CF}=\text{CH}_2$:

ODP: 0, GWP: 4

Slightly flammable, less than R-152a

ATEL: 101,000 ppm

A recent SAE International Cooperative Research Program (CRP) found that HFO1234yf “offers superior environmental performance” and have “been judged to have the lowest risk for use in MAC (mobile A/C) systems”. It also works well with hybrid and electric vehicle compressors. Because R-1234 (twelve-thirty-four) is hard to make, the cost might be \$40—60 per pound. Existing systems will be changed slightly to become optimized for R-1234yf; this will probably include a double-tube, integrated heat exchanger (IHX) for a double-loop system. New service and testing equipment (similar to existing) will be required. It might be possible to upgrade existing identifiers with a software and hose change. It will probably come to the USA by 2013 - 2015.

Because R-1234 is slightly flammable, retrofitting R-134a systems is not being considered. No one wants to be the person that has retrofitted the A/C system of a vehicle that had a serious fire.

R-152a, CH_3CHF_2 : A good, single-molecule refrigerant with limited use for some time. A near drop-in for R-134a systems.

R-152a, CH_3CHF_2 :

ODP: 0, GWP: 120

Slightly flammable

ATEL: 50,000 ppm

System must be designed to limit a maximum of 3.7% R-152a in the passenger compartment. New, currently available, service equipment will be required. It appears that no major manufacturer is considering R-152a at this time.

My crystal ball along with information from the MACS 2009 conference and a recent Web search (HFO-1234yf) says that the domestic and many of the foreign automakers are planning to adopt HFO-1234yf for our next mobile A/C system refrigerant. Please contact me at <http://tombirch.com> if you have any questions concerning automotive HVAC systems.

A special CAT “Thank you” to George Hritz who started on the board in 1994! WOW!

A special CAT “Thank you” to Clydie Rizzo who served as CAT’s first WEBMASTER!

(Continued from page 1— Website)

Job announcements you want posted on the CAT website must be sent to me. I prefer the majority of the information in a word document. If your school or company has additional job information online please provide me with the links. All job announcements will stay on our website for five months from the posting date. If you need your announcement to stay up longer contact me to request more time.

I hope everyone will visit our website and take advantage of the simplicity of online registration and payment for all of our future conferences. Not only will you help to save trees but you will reduce the work load on our volunteer CAT members.

I hope to see everyone at the spring conference being hosted by UTI, Sacramento.

FLUID SERVICES

(This article was provided by Johan Gallo of CalABC)

General Information and Purpose

The automotive repair industry has been faced with a myriad of opinions regarding the use of system flush equipment and flush chemicals. Whether you are talking about the engine crankcase, cooling system, fuel system or transmission, there is no lack of opinion on these subjects. In 2008, CalABC held several workshops to develop standards for these services. Once the workshops were complete, our next objective is to schedule a meeting with the Bureau of Automotive Repair staff and work with them to establish the guidelines to ensure compliance when recommending and performing these services. The group worked on Brake Fluid Testing & Flushes, Fuel System Services, Engine Oil and Transmission Services & Flushes. The group did not get to the Power steering Fluid Flushes and Differential Services but the same controversy exists with these services.

- We agreed that good workmanship, being truthful and honest with your customer is critical. One key is clear communication, which will avoid problems with your customers and consumer agencies. We discovered three standards exist.
- The Original Equipment Manufacturer – The manufacturer's specifications should be followed and the Owner's Manual is the default document for vehicle maintenance.
- Generally Accepted Trade Standards – These standards are based on a technician's skills, knowledge and ability and known history of various vehicle repairs. Recommendations for services are based on their experience.
- Informational Systems – Aftermarket Technical Service Bulletins, Mitchell Manuals and other independent research with supporting documents regarding services and repairs.

The critical component in each of these is the communication with the owner of the vehicle. Asking the consumer qualifying questions about the vehicle is critical. This includes the current problem, service and maintenance history, last time any of these services were performed. The service provider must verify what the Original Equipment Manufacturer' Scheduled Maintenance requires maintaining the system's integrity and the vehicle's warranty.

When it comes to fluid conditions, some examples of qualifying questions are:

- 1) How the vehicle is driven?
- 2) Has it overheated?

Do you tow with this vehicle?

The workshop objectives were to reach an agreement on the standards for recommending fluid services with the final goal of being synchronized with car dealers, manufacturers and regulators. According to the Bureau of Automotive Repair, the Original Equipment Manufacturer (OEM) is the one who sets the service standards. The service provider must default to the OEM specifications absent any other data to support a service. The aftermarket is conflicted with the OEM as some dealerships have their own recommendations for these services, which are contradictory to the OEM. While the Owner's Manual in many vehicles does not recommend services such as fuel cleaning, transmission power flushes and others, some dealerships recommend the same types of services in the same manner the aftermarket does.

Performing Fluid Service or Exchanges

This requires training the sales and service staff how to qualify the customer for the service and having the service staff perform it in compliance with the equipment and chemical manufacturer. The conflict that exists is with the Original Equipment Manufacturers as not all OEM's recommended these services. Again, many of the dealerships perform them just as the aftermarket does. Many are using the same or similar equipment and chemicals. Everyone relies on the research and scientific proof provided by the various companies for the basis of recommending these services to consumers. Everyone agrees that maintenance recommendations for these services should be based on the mileage, time of last service, fluid conditions and the manner in which the vehicle is driven from normal to severe usage.

A Source in Contrast – Published Industry References versus Agency Opinions and Beliefs

The following article is just about the need for brake fluid services however, it serves to point out that [*\(Continued on page 12\)*](#)

(Continued from page 11— Fluid Services)

service providers are basing the need for this service on research and scientific proof. Individuals that work in the agency that regulates these and other services has been quoted as saying “we do not believe in the science for how you are recommending this service.” They have not substantiated their reason for not supporting this and other services, but have stated that recommending these could constitute fraud.

Below excerpts from Articles in Brake & Front End Magazine By Larry Carley, 2001 & BABCOX Publications 2006

Brake Fluid is a hot topic because most people don't know why it should be changed. The average motorist who drives 10,000 to 15,000 miles a year uses his brakes about 75,000 times a year. Nearly half of all motorists in a recent Car Care Council survey said brake failure was their number one fear amongst driving emergencies. After three years of service, the average boiling point of the brake fluid has dropped to a potentially dangerous level because of moisture contamination and may not meet minimum federal requirements for brake fluid. Probably half of all cars and light trucks that are 10 or more years old in the U.S. have never had their brake fluid changed. Yet in many European countries, regular brake fluid checks are required, and half of all cars routinely fail such tests.

REPLACE BRAKE FLUID

Brake fluid is one of the most neglected fluids in vehicles today, yet is vitally important for safe driving. Consequently, professional technicians should be checking the fluid and recommending that the brake fluid be changed if it is contaminated. The issue is old brake fluid may not be safe if moisture contamination is above a certain level.

BRAKE FLUID PREVENTIVE MAINTENANCE

Many experts have long recommended changing the brake fluid every year or two for preventative maintenance. Their rationale is based on the fact that glycol-based brake fluid starts to absorb moisture from the moment it is put in the system. The fluid attracts moisture through microscopic pores in rubber hoses, past seals and exposure to the air. The problem is obviously worse in wet climates where humidity is high.

After only a year of service, the brake fluid in the average vehicle may contain as much as two percent water. After 18 months, the level of contamination can be as high as three percent. After several years of service, it is not unusual to find brake fluid that contains as much as seven to eight percent water.

An NHTSA survey found that the brake fluid in 20% of 1,720 vehicles sampled contained 5% or more water!

Excerpts from Articles in Brake & Front End Magazine By Larry Carley, c2001 & BABCOX Publications 2006

BRAKE FLUID PREVENTIVE MAINTENANCE -

As the concentration of moisture increases, it causes a sharp drop in the fluid's boiling temperature. Brand new DOT 3 brake fluid must have a dry (no moisture) boiling point of at least 401 degrees F, and a wet (moisture-saturated) boiling point of no less than 284 degrees. Most new DOT 3 fluids exceed these requirements and have a dry boiling point that ranges from 460 degrees up to over 500 degrees.

Only one percent water in the fluid can lower the boiling point of a typical DOT 3 fluid to 369 degrees. Two percent water can push the boiling point down to around 320 degrees, and three percent will take it all the way down to 293 degrees, which is getting dangerously close to the minimum DOT and OEM requirements.

DOT 4 fluid, which has a higher minimum boiling temperature requirement (446 degrees F dry and 311 degrees wet) soaks up moisture at a slower rate but suffers an even sharper drop in boiling temperature as moisture accumulates. Three percent water will lower the boiling point as much as 50%!

The fact is that today's front-wheel drive brake systems with semi-metallic linings run significantly hotter than rear-wheel drive vehicles. High brake temperatures require fluid that can take the heat. As stated earlier, the brake fluid in many of today's vehicles cannot because it is old and full of moisture.

In addition to the safety issue, water-laden brake fluid promotes corrosion and pitting in caliper pis-

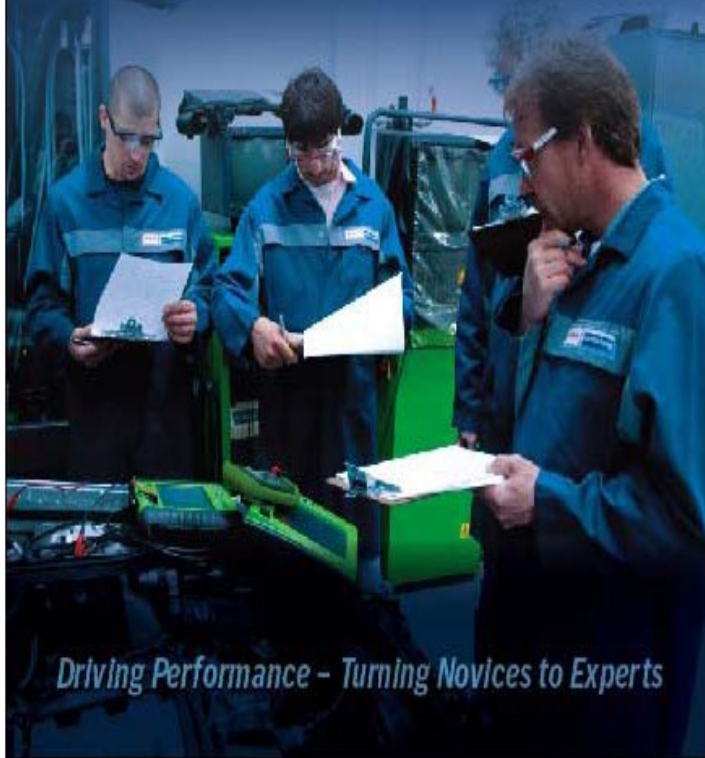
[\(Continued on page 20\)](#)

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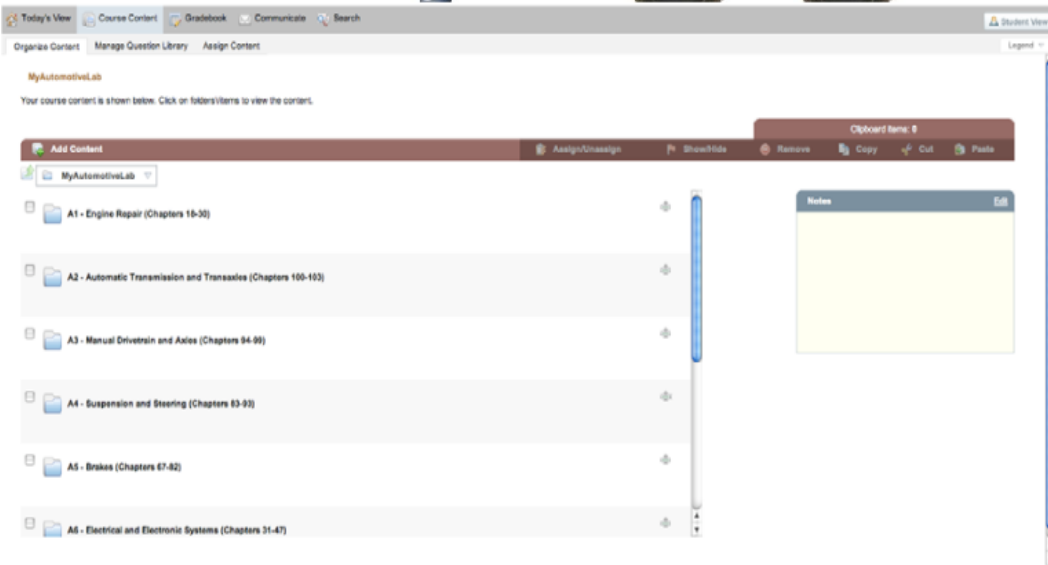
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Study Material

Show Recommended Study Material

Display Learning Objectives

Chapter 100 - Automatic Transmission/Transaxle Principles

Pass criteria: 100.00 % Your Score 33%

Name	Type	Score/Status	Options
 Chapter 100 E-book	Link	Not started	
 Chapter 100 PowerPoint	Link	Not started	
 Crossword Puzzle	Link	Not started	
 Chapter 100 Homework Questions	Homework	--	
 Torque Converter Exercise 1	Link	Not started	
 Torque Converter Exercise 2	Link	Not started	
 Planetary Gear Set Exercise	Link	Not started	
 Planetary Gear Set Animation	Link	Not started	

Chapter 101 - Hydraulic Components and Control Systems

Pass criteria: 100.00 % Your Score 0%

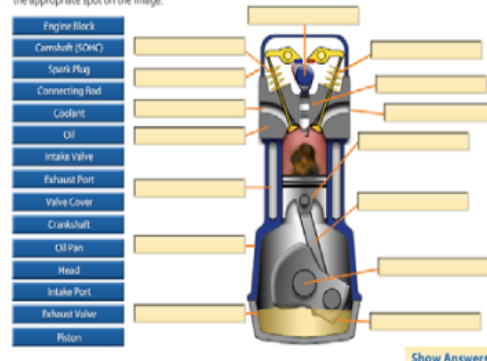
Name	Type	Score/Status	Options
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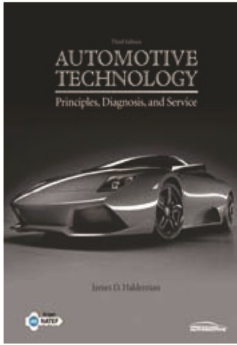
Identifying the parts of an internal combustion engine—just one of many fascinating media assets available in MyAutomotiveLab!

Internal Combustion Engine - Labeling Exercise

Use your mouse to drag each of the labels to the appropriate spot on the image.



Automotive Interactive: at a glance
These simulations pull automotive diagnosis and troubleshooting all together for students.

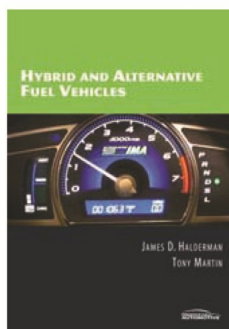
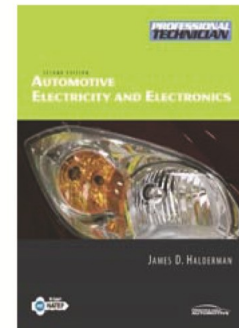
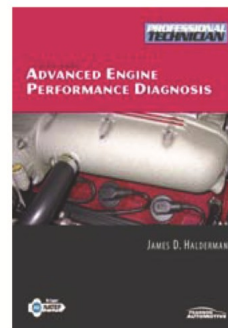
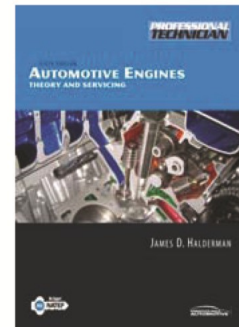
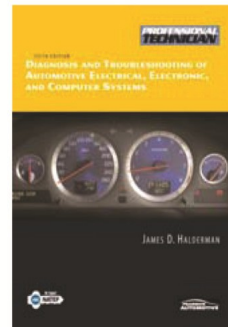


Automotive Technology: Principles, Diagnosis, and Service 3/e James D. Halderman

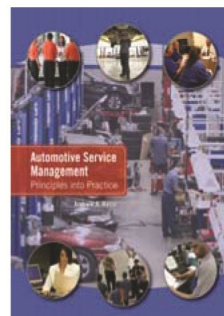
New To This Edition

- Careers in the Automotive Service area
- Additional chapter questions added to reinforce student understanding
- Content reformatted to allow instructors more flexibility in teaching content
- New chapter on basic math needed by service technicians
- 3 new chapters on Hybrid and Fuel cell vehicles and vehicle safety procedures

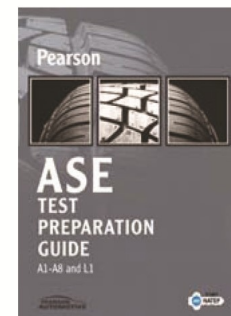
Pearson's Professional Technician Series offers comprehensive coverage of all aspects of engine repair. This series is written to correlate to the content needed for the ASE Technician Certification test and the NATEF task list, and provides a major emphasis on diagnosis and why operations are performed. Tech Tips and Real World Fixes provide real world applications. The volume includes a multimedia CD ROM with fully illustrated PowerPoint slides and a workbook with correlated activities.



Hybrid and Alternative
Fuel Vehicles
- Halderman



Automotive Service
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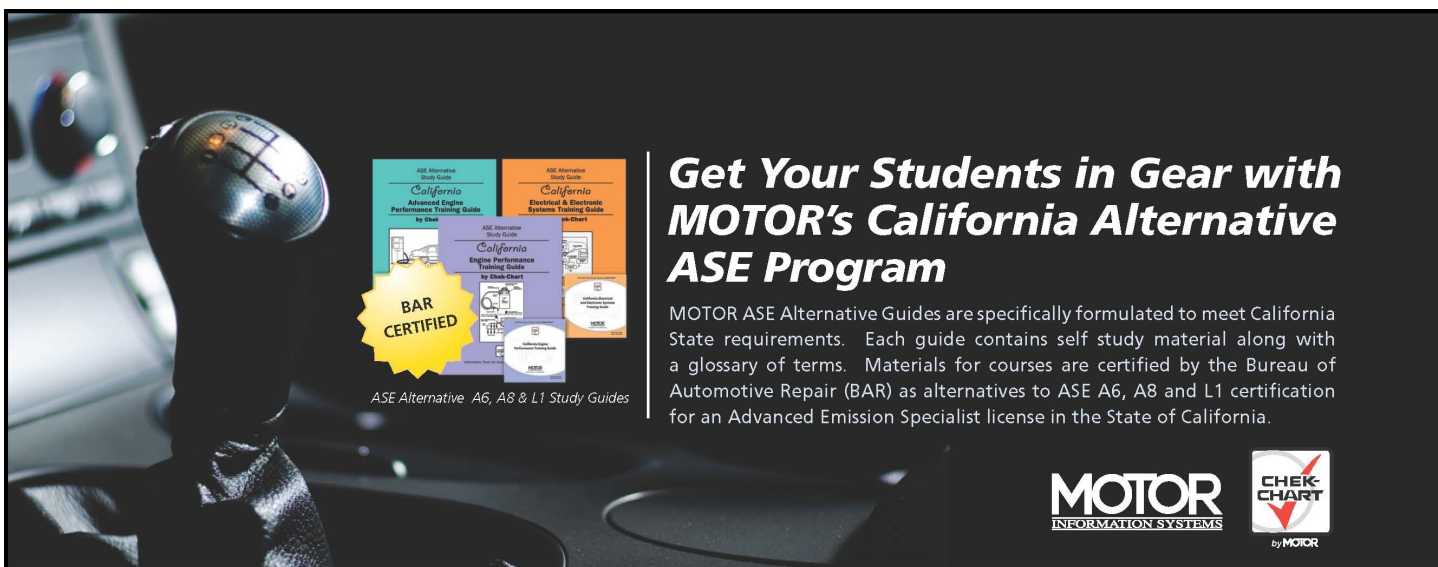
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"See you at the CAT Conference!"



Automotive Technician Training Standards – ATTS by George Hritz

WHAT IS ATTS?

ATTS was developed by industry and educators to evaluate automotive education programs. The process evaluates a program to minimum job entry skill levels developed by ATTS. Following an ATTS team evaluation of an automotive program, strengths and weaknesses are identified and a determination is made as to whether or not the automotive program meets industry training standards. If the program meets ATTS standards, it becomes ATTS Certified. The ATTS Program is owned and administered by the California Automotive Business Coalition (CalABC) Educational Foundation.

WHAT ARE THE BENEFITS OF ATTS CERTIFICATION?

- The automotive program will earn Industry validation in your region.
- The ATTS program provides clearly defined and measurable student learning outcomes for automotive program review and articulation between high schools and colleges.
- The automotive program will qualify for industry donations.
- Student graduates qualify as *entry level technicians* for the Automotive Service Industry.

WHICH "SKILL AREAS" CAN BE CERTIFIED?

An automotive training program can request inspection in Automotive Fundamentals and one or more of the following seven recognized automotive skill areas:

- Engine Repair
- Brakes
- Suspension
- Drive Train
- Heating and Air Conditioning
- Electrical/Engine Performance
- Emission Control

NOTE: *If an automotive program is currently certified by NATEF in any specialty area, this will satisfy ATTS equivalency.*

WHAT ARE THE THREE LEVELS OF ATTS COMPETENCY?

ATTS Certification provides three levels of competency. The three levels help standardize curricula statewide and provide an avenue for articulation between high schools and colleges. Each level recognizes limitations of the program related to space, finances, available teaching time, and individual instructor qualifications. A lower certification level builds a foundation for the next level. The ATTS Program is recognized training that meets California Department of Education State Standards.

Level I:

Level I is Automotive Technology Fundamentals, designed to standardize the first exposure to automotive education and prepare the student to enter Levels II and III. A student who completes this level will be able to identify basic automotive components, perform routine maintenance, and have an understanding of basic tools, materials and methods.

GRADUATES WILL REQUIRE CLOSE SUPERVISION AND GUIDANCE UPON EMPLOYMENT!

Level II:

Level II is only available in skill areas 1 through 7 and is a minimum vocational training program.

(Continued on page 18)

(Continued from page 17 - ATTS)

Graduates of a LEVEL II program have specialized in one or more skill areas and have sufficient knowledge to do basic service or repair, **as directed**, but will require overall supervision.

Level III:

Level III is only available in skill areas 1 through 7.

A graduate of this program will have completed comprehensive training in one or more skill areas and will require minimum supervision.

WHICH ATTS CERTIFICATION LEVEL IS RECOMMENDED?

Level I:

Level I is available to any school offering an "Automotive Technology Fundamentals" class.

Level II:

Level II is available only to high schools and regional occupational programs.

Level III:

Level III is available to any automotive training program that can meet the rigorous demands set forth in Level III. A program can certify in seven areas of specialization, or any one or more of the areas.

HOW LONG DOES CERTIFICATION LAST?

Program certification is for a five-year period. To recertify, the Program will undergo an abbreviated inspection called a "Compliance Check".

DURING AN ATTS CERTIFICATION VISIT, WHAT IS INSPECTED?

The Program will supply evidence of:

- Safety procedures and training
- A Mission Statement
- Course Outlines
- A Student progress system (Ed Code legal)
- A copy of the textbook for each specialty area
- Internet access location
- A copy of the syllabus for each area of inspection
- Lesson plans for each area of inspection
- Worksheets documenting skill competencies for each area of inspection
- Instructor's media storage location
- Articulation and/or work experience agreements
- Remedial support: what and where
- Advisory committee involvement/support
- Current year operating budget
- Parts purchasing and money handling procedures
- Repair Orders
- Facility and instructional equipment.

[\(Continued on page 19\)](#)

WHAT IF THE PROGRAM FAILS?

If the program (or a portion of it) fails, the program must correct enough of the deficiencies given in the "List of Corrections" to reach a passing score. ATTS will find a local repair business to “partner” with the program to assist the instructors in addressing the deficiencies. When the deficiencies have been corrected, the ATTS office in Sacramento will be notified with confirmation of the corrections. The ATTS office will make the decision for approval of certification.

WHAT FUNDING SOURCES ARE AVAILABLE TO PAY CERTIFICATION FEES?

- District Budget
- Perkins
- Club Funds
- Business sponsorship
- CalABC Educational Foundation will grant funding for any Level I or Level II certification.

WHAT WILL THE INSPECTION COST?

	LEVEL I	LEVEL II	LEVEL III	LEVEL III** 7 ATTS Areas with NATEF areas
Application and Scoring Process	\$100	\$100	\$100	\$100
Inspection Leader Travel Expenses	\$150	\$185	\$400	\$100
First Night Dinner Meeting			\$350	
Inspection Leader Honorarium	\$300	\$300*	\$550	\$200
Certificate and Plaque Process	\$75	\$75	\$125	\$125
Total Costs	\$625	\$660	\$1525	\$575

* For certifying two (2) areas. For additional areas, please add \$50 per area.

** Programs that currently have eight (8) areas certified by NATEF will in addition need to complete the ATTS Emissions area for full ATTS certification. Level I Fundamentals is optional when seeking Level III certification.

NOTE: Programs can earn Level II or Level III certification in one or more of the seven skill areas.

HOW CAN AUTOMOTIVE REPAIR BUSINESSES FIND QUALIFIED ENTRY LEVEL TECH’S?

Hire graduates from ATTS Certified Programs.

ATTS graduates will be able to present a “Skill Certificate” for each of their areas of competency.

Encourage your local high schools and colleges to apply for and earn ATTS Certification.

“Partner” with local schools to help them improve their programs

Provide **job shadowing**, **internships** and part-time employment for students attending automotive technician career training programs.

WHERE CAN I FIND MORE INFORMATION?

The California Automotive Teachers (CAT) website www.calautoteachers.com has all the information listed under “Program Certification”.

**Don’t miss out on this tremendous opportunity provided through
ATTS Certification to have your program earn Industry Validation.**

tons and bores, wheel cylinders, master cylinders, steel brake lines and ABS modulators.

FLUID RELATED BRAKE FAILURES

From time to time we hear about reports of "unexplained" brake failures that caused accidents. When the vehicle's brakes are inspected, no apparent mechanical fault can be found. The fluid level is normal, the linings are within specifications, the hydraulics appears to be working normally and the pedal feels firm. Yet the brakes failed. Something made the brakes hot, which in turn overheated the fluid causing it to boil. The underlying cause often turns out to be a dragging rear parking brake that does not release. The same kind of sudden brake failure due to fluid boil may occur in any driving situation that puts undue stress on the brakes: a sudden panic stop followed by another, mountain driving, towing a trailer, hard driving, etc.

OEM BRAKE FLUID RECOMMENDATIONS

General Motors and Chrysler do not mention brake fluid in their scheduled maintenance recommendations. A General Motors spokesperson said Delco Supreme 11 DOT 3 brake fluid contains additives than many other brake fluids do not, so it is essentially a lifetime fluid. Starting in 1993, GM began using a new type of rubber brake hose with an EPM lining and outer jacketing that reduces moisture penetration by 50%. Therefore, GM does not consider fluid contamination to be a significant problem.

- Ford, however, recently changed its position and now recommends fresh fluid every 36,000 miles or three years, and to replace the fluid each time the brake pads are changed.
- Several import vehicle manufacturers also recommend brake fluid changes for preventive maintenance. In Europe, brake fluid changes are often recommended. BMW says the fluid should be changed every two years.
- Honda recommends a flush & fill every 25,000 to 30,000 miles. Subaru also recommends a 30,000-mile brake fluid change. Volkswagen recommends changing the fluid every two years, and clearly states this in their owners' manuals.

Excerpts from Articles in Brake & Front End Magazine By Larry Carley, c2001 & BABCOX Publications 2006

OEM BRAKE FLUID RECOMMENDATIONS

If motorists would only follow this simple advice to change their brake fluid periodically, they could greatly reduce the risks associated with moisture-contaminated brake fluid. They could extend the life of their brake systems and likely save themselves a lot of money in the long run, especially if their vehicle is equipped with ABS (because ABS modulators are very expensive to replace!).

TESTING BRAKE FLUID

Since you can't tell how badly contaminated brake fluid is by its appearance alone (unless the fluid is full of rust or is muddy brown), the fluid should be tested unless you are changing it for preventive maintenance or as part of a brake job.

There are three ways to check the condition of the brake fluid:

1. An optical refractometer will clearly show the amount of moisture in the brake fluid. A small drop of fluid is placed in the tester, then the tester is held up to a light to read the amount of contamination. This tester is extremely accurate and shows both the percent of moisture and the fluid's boiling point. A source for this type of tool is [MISCO](#).
2. Chemical test strips. A chemical test strip made by Phoenix Systems (888-749-7977) www.stripdip.com called "Strip Dip" can reveal the condition of the corrosion inhibitors in the brake fluid. The FASCAR chemicals react to the presence of copper in the fluid. The test strip changes color to reveal the condition of the fluid. When copper levels reach 100, it indicates the corrosion inhibitors are nearing the end of their life. If the copper level is 200 or higher, the corrosion inhibitors are worn out and the fluid needs to be changed.
3. Electronic brake fluid testers actually measure the fluid's boiling point. The test takes only about a minute and is quite accurate. If the fluid's boiling temperature is getting dangerously low, replacement is recommended to minimize the risks of pedal fade caused by fluid boil. A source for electronic brake fluid testers is Alba Diagnostics at [Alba Diagnostics](#).

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California Automotive Teachers will meet at Universal Technical Institute for the spring 2009 Conference on April 24 & 25

Our spring conference is rapidly approaching and we hope you are making plans to attend.

If you are traveling by air the closest airport is Sacramento, which is 6.8 miles (10 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.

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.

Friday Activities

On Friday morning, there will be early bird registration for all members who have pre-registered. This means no waiting in registration lines Saturday morning. For early arrivals we have two possibly three tours. A free lunch will be available sponsored by Universal Technical Institute.

<u>Time</u>	<u>Activity</u>
7:30 – 12 noon	Exhibitors (Vendors) and registration
9:15 – 11:30 a.m.	Workshops
12 – 1:30 p.m.	Lunch/Business Meeting
1:30 – 2:00 p.m.	Exhibitors (Vendors)
2:15 – 4:30 p.m.	Workshops
4:30 – 5 p.m.	Closing Raffle/Door Prizes

<p>Four Points by Sheraton (.3 miles from campus) 4900 Duckhorn Dr. Sacramento, CA 95834</p> <p>UTI Rate \$119 – this rate is based on availability, don't wait to reserve. Call 916-263-9000 and mention UTI for the discount. Shuttle service from the airport (limited).</p>	<p>Hampton Inn and Suites (2.2 miles from campus) 3021 Advantage Way Sacramento, CA 95834</p> <p>UTI Rate \$109 Single, \$119 Double– this rate is based on availability, don't wait to reserve. Call 916-928-5700 and mention UTI for the discount.</p> <p>Room rate includes hot breakfast and 24 hour shuttle from the airport.</p>
<p>Holiday Inn Express (2.2 miles from campus) 2981 Advantage Way Sacramento, CA</p> <p>UTI Rate \$99 Single, \$109 Double– this rate is based on availability, don't wait to reserve. Call 916-928-9400 and mention UTI for the discount.</p> <p>Room rate includes hot breakfast and 24 hour shuttle from the airport.</p>	<p>Fairfield Inn and Suites (2.4 miles from the campus) 2730 El Centro Road Sacramento, CA 95833</p> <p>UTI Rate \$79 Single, \$89 Double– this rate is based on availability, don't wait to reserve, limited space available. Call 916-923-7472 and mention UTI for the discount. Shuttle service from the airport (limited).</p>

As of this time, detailed information on technical presentations is not yet finalized. We expect 3-4 manufacturers as well as some of our regular participants doing presentations. Please watch for details in coming weeks on the CAT website: **www.calautoteachers.com**

We are just a few minutes from the downtown Sacramento area which has a nice waterfront (Sacramento River) in Old Town Sacramento. The weather this time of year is typically in the upper 50's and into the 60's. We usually don't get much rain in the month of April but we have had a lot of rain lately so keep an eye on the weather report.

CHANGING BRAKE FLUID

When the fluid is changed, use the type of brake fluid (DOT 3 or 4) specified by the vehicle manufacturer. As any brake fluid supplier will tell you, brake fluid is NOT a generic product. Just because a fluid meets the minimum DOT 3 or DOT 4 specifications does not mean it can tolerate moisture or provide the same degree of corrosion protection as another brand of fluid.

Raybestos, for example, recently introduced a new "Super Stop Super High Performance" DOT 3 fluid with a dry boiling point of 550 degree F, which meets Ford's latest requirements.

So the next time you are inspecting or servicing the brakes, be sure to check the condition of the fluid as well as the level. If you add or change fluid, use type specified by the vehicle manufacturer (DOT 3 or 4) and uses the highest quality fluid you can get. Remember the benefits of changing the brake fluid for preventive maintenance.

The above excerpt was used to make a point regarding the need for brake fluid replacement. These publications listed three types of brake fluid tests and other systems for testing fluid exist including Fluid RX and their research with Noria Corporation, Herguth Laboratories and as well as the team from MAP/AMRA that worked on the Uniform Inspection Guidelines.

Time Standard for Service

The OEM has normal to severe service intervals; there are Industry Standards as well as the Motorist Assurance Uniform Inspection Guidelines for proper vehicle maintenance. The "Industry Standards" are under debate as they clearly conflict with OEM-Standards. According to a former Vice President of Operations for a national dealer group, the OEM's goal is to minimize their exposure and warranty cost on the vehicle until it's out of warranty. Dealerships are rated based their warranty claims and costs. Yet many dealerships are recommending these services for the same reason the aftermarket performs them.

Point of Sales Training

The service provider and advisor must qualify the customer's concerns and repair needs by assessing the vehicle's condition this would also include: Warranty Compliance, Service Indicators, Driving Conditions, Diagnosis (visual inspection), Service History and symptoms that would require additional repairs.

We must establish standard procedures that consistently qualify the need for the service and weigh the importance of the Original Equipment Manufacturer's Maintenance Schedule with the aftermarket information, research and scientific proof that qualify the need for the service. This includes the service provider's industry experience.

Future State

The future state would be that dealers and the aftermarket would agree with the standard procedures for recommending fluid services and have the information, research and scientific proof to support them. All service providers would have a standard to perform the service with a retest process to verify the fluid service was performed correctly. To build consumer confident the service provider can give the empty fluid bottles to the customer at the time of checkout and review the services performed.

While it remains to be seen whether the OEM's will ever agree with the aftermarket, the fact remains their own service providers perform services the OEM does not support.

Next Steps

Schedule a meeting with the Bureau of Automotive Repair staff to review our workshops and gain consensus on standards for performing these services. Communicate the on going progress and obstacles to members and interested parties to resolve the disparity that exists.

HYBRID AND ELECTRIC VEHICLE WORKSHOP FOR EDUCATORS

June 15 through 18, 2009

Three days and one evening of studying and working on the powertrains that will propel tomorrow's vehicles. Conducted at Skyline College, near San Francisco, by Perfect Sky, Inc.



Introducing a practical learning workshop for the professional automotive instructor

Developed by Jack Rosebro for Perfect Sky

Perfect Sky will present an intensive hands-on learning workshop for automotive instructors this summer, from June 15 through June 18, focusing on the challenges of teaching tomorrow's automotive technicians to diagnose and repair hybrid, plug-in hybrid, and electric vehicle powertrains. We will be referencing today's production hybrids and using Toyota's Generation II Prius for much of our study.

The workshop will provide instructors with an opportunity to immerse themselves in the theory behind the operation of xEVs (all vehicles which utilize electric drives) and then test their knowledge by working with actual vehicles and components. We will also be discussing the unique challenges of teaching students how to understand a powertrain for which they have no frame of reference.

Topics covered in classroom and lab include:

- ▶ *Permanent-magnet AC motor construction*
- ▶ *AC and DC drive-by-wire motor operation*
- ▶ *Switching modes of voltage-source inverters*
- ▶ *Static and dynamic HV insulation testing*
- ▶ *Speed and torque control loops for traction motors*
- ▶ *DC brushed electric steering assist systems*
- ▶ *Failure modes with and without DTCs*

The workshop structure will consist of about a dozen or more modules, each consisting of a classroom lecture, a lab, and a discussion. Each lecture will run about half an hour or so in length, followed by data collection, diagnosis, and discussion of the results. Please come to class ready to work in a shop environment.

Learn to teach yourself about hybrids and EVs

While battery electric vehicles differ from conventional hybrids, their core components (battery packs, inverters, AC motor-generators, and DC-DC converters) remain the same. Major automakers, including Ford, Nissan, Mitsubishi, and Subaru have signaled their intent to mass-produce electric vehicles for sale within the next three years. Many more vehicle manufacturers have already begun to develop plug-in hybrids, from passenger cars to medium- and heavy-duty commercial vehicles, for sale within the same time frame.

With those realities in mind, we have designed both classroom and lab content for this workshop to help automotive instructors develop skills and processes that will enable them to evaluate the technical aspects of future vehicles with electric drives, as well as the production hybrids that are on the road today.

Although some automotive technicians have yet to perform their first oil change on a hybrid, others have been diagnosing and repairing electric drives since the earliest examples of these vehicles arrived in the US and Canada almost a decade ago. We'll do our best to bring you examples of lessons learned by "early adopters": the shops that embraced electric drive technology early on. The Bay Area also hosts an enthusiastic plug-in hybrid conversion community, and we'll give you a quick glimpse into that world, as well.



Installing an inverter after bench testing

Workshop participants test theory with practical exercises that reinforce understanding, while sharpening diagnostic skills as well as familiarity with the latest test equipment and procedures



To help folks get started with their own teaching once they return home, we'll also supply each instructor with original photographs of hybrid vehicles and components, to use when building their own presentations. As the workshop is meant to be a catalyst for your own investigations into hybrid and electric vehicle technology, we'll also point you to plenty of resources that can help you extend your learning path.

Finally, we want you to enjoy yourself as well as the process of working with others during the workshop. Learning should be fun for you as well as for your students.

"We are going to have to apply some form of hybrid to about 80% of our fleet... the electrification of the automobile is inevitable"

- Bob Lutz, Vice Chairman of Global Development, General Motors

"Hybrids are a core technology for us"

- William Reinert, National Manager, of Advanced Technology, Toyota

Ford, GM, Mitsubishi, Nissan, Toyota, VW

- Automakers that have announced plans to produce plug-in hybrid or electric passenger vehicles for sale by 2012 or sooner

Details and more details: travel, lodging, and food

If you're coming in from out of town, don't hesitate to call on us if you need information about flights, hotels, places to eat, or local sights while you are in the Bay Area. There's a lot to see out here.

We'll have coffee, tea, and bagels ready for you every working morning. Lunch will be provided during our workshop sessions. Dinner is on your own, but we'll be happy to make local suggestions. Folks tend to continue classroom conversations well into dinnertime and beyond.

About our workshops, about Perfect Sky, Inc.

Perfect Sky delivers hands-on workshops and training seminars to automotive technicians, instructors, and engineers throughout North America, focusing on advanced automotive technologies. Our workshops are designed to enable our students to step out of the classroom and into practical field work.

Perfect Sky has the good fortune of being able to present our 2009 hybrid and electric vehicle educators' workshop at Skyline College, just a few miles from San Francisco as well as its airport.

Why Skyline? Because the wealth of hybrid vehicles and diagnostic equipment available at the facility are unparalleled. We think it's worth the trip, and our students come from all corners of North America to attend. Let us know what we can do to make your learning experience as productive and rewarding as possible.

Workshop cost per student: \$950

Registrations for all seminars and workshops are handled by Kelly Karlstein of Perfect Sky. Kelly can be reached at (310) 801-7818 from 9 AM to 4 PM PST, and by email at perfectskysupport@mac.com

NACAT09

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- A weeklong opportunity to exchange ideas and best practices with professional educators from all over North America. The camaraderie built with your new NACAT associates will last a lifetime.
- The golden opportunity to network with manufacturer representatives and other industry professionals.
- Tool suppliers, book authors and publishers, diagnostic equipment manufacturers, industry software developers, with systems and services relevant to the Transportation industry, exhibited in a trade show environment.
- Just enough social events to make you wish the conference lasted a couple more days.

**For more information on the NACAT09 conference,
and online conference registration, please visit www.cpcc.edu/nacat, or contact
Dave Seidel 704.330.4366 or Connie Volk 704.330.4154.**



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The CAT Newsletter is always looking for technical articles and advertisements! The deadline for submitting ads and articles is March 15th for the spring issue and September 15th for the fall issue. Articles should be submitted in Word. It is preferred that ads be submitted in JPEG or EPS formats, PDF will work but sometimes the text is distorted once it is placed into the newsletter. The cost and size for advertisements can be found on our Website.

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
Fall 2009
Cypress College
October 16 & 17

Conference Host Information

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