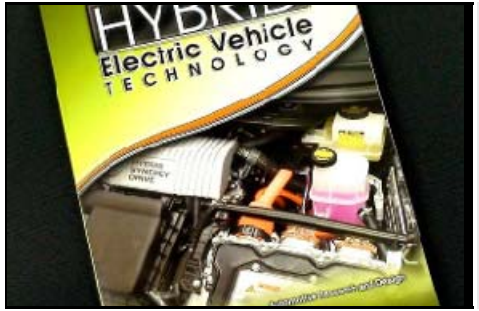


AR&D

Automotive Research and Design

Technology and Training Since 1987

HEV Tip of the Month

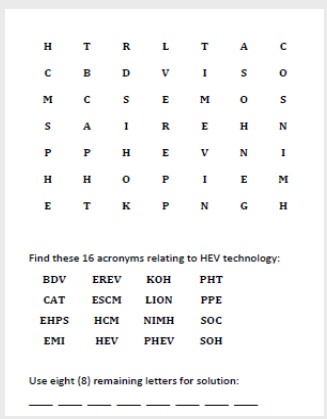
When performing voltage measurements on a high voltage system with an oscilloscope a differential scope probe must be used and rated at a higher voltage than the circuit you are measuring. The differential probe can be:

- **Internal to the oscilloscope (check your scope specs)**
- **Connected externally (as a separate tool)**

Fuel Update

The average price of unleaded fuel is $3.94 per gallon in the United States.

Visit Gas Buddy to find the lowest gas prices in your area!



Word Seek!

Correctly identify the HEV Technology acronyms in this word seek. The remaining letters spell the answer. The first five emails with the correct answer will receive a tool pen! (Click on the thumbnail for larger image; Please include a valid USPS

Five (5) Basic Things That Your Customer Needs to Know About Hybrid Vehicles

A customer informs you they will be purchasing a hybrid electric vehicle (HEV), either new or used, and are asking you for the things that they need to know prior to making the purchase. Although there is a litany of technical topics that you could cover with the customer, you have decided to narrow the discussion to a broader list to ensure that they understand the range of hybrid ownership considerations.

Insurance costs – could be higher cost due to new technology.

Insurance costs for an HEV can be higher than that of a traditional vehicle. This can be due to placement of expensive high voltage components in the probable crash zones of the vehicle. Even if the components are not placed in highly probable crash zones, the cost of electric propulsion components can be very high and the insurance companies may react accordingly with the insurance premiums.

Vehicle Residual Value – may not be known until after a vehicle has been released into field for many months or years.

This can be determined by how the manufacturer treats service parts, component reliability (high infant mortality through mid-life and low reliability), and adjustments to provide a “special policy” to parts or systems. Vehicle campaigns (i.e., recalls) due to safety, quality, etc. can significantly affect the residual value. Manufacturers can opt to extend Warranty coverage for components or systems but, it is not a requirement. Your customer should know that higher cost of ownership accompanies any new (major) technology advancements which will have minimal longitudinal field data to normalize the ownership cost.

Out of Warranty Component Replacement Cost – The cost of HEV high voltage components can very expensive (e.g., $800.00 – $8,000.00) depending on the component.

The typical Warranty for hybrid powertrain and energy storage systems (i.e., battery packs) is 8 years/100,000 miles. As of 2012 some manufacturers will be enhancing the Warranty to 10 years/150,000 miles. So, if your customer is contemplating

We have seats available in two of the remaining HEV TTT courses for year 2011.

Click here for registration info

FEATURED CLASS
5-Day Train The Trainer
at
Peninsula College in Port Angeles, WA
July 5-15, 2011
Click here for registration information

To view the complete 2011 and 2012 training schedules, click here.

AR&D has two satellite schools we schedule HEV TTT courses to support summer availability.

Madison Area Technical College

Click here for more information

address in your submission.)

HEV News

Hybrid/Electric Car Sales Up 37%

GM Says Electric Car Goes 1,000 Between Fill-ups

Plugging to the U.S. Dept. of Energy's Clean Cities Program (Workshop)

Events

AR&D attended the California Automotive Teachers Conference on April 30th, 2011!

Bill Steen of Training for Tomorrow's Technology presented the Hybrid and Electric Vehicle Technology for Technical Education seminar on behalf of AR&D. We would like to thank everyone who attended the seminar and visited our exhibitor display.

AR&D will be attending the California Automotive Teachers Conference at Rio Hondo College on October 21st & 22nd, and the ATRA Powertrain Expo at the Las Vegas Hilton on October 27-31.

Bookmark us!

www.autoresearchanddesign.com
Updates and new information on this technology is added to our

purchasing a used HEV (that is out-of-warranty or very close to it), they should be aware of component part replacement cost and the associated diagnostic/repair labor costs.

Expectations of What a Hybrid Is and Isn't – Traditional HEVs are designed to provide highly efficient operation at low to mid-range.

However, at highway speeds electric traction has minimal propulsion input. Therefore, if the commute of your customer is predominantly city or suburban driving then, a hybrid would provide a very efficient and fuel saving option. However, if the commute is predominantly high speed highway driving then, a hybrid will not provide enough of a fuel economy differentiator to warrant the vehicle cost.

Cost of diagnostics will likely cost more if problems occur – This is primarily due to the two propulsion systems on vehicle.

An HEV contains the traditional internal combustion engine (ICE), fuel, ignition systems, etc. It also contains a complete electric propulsion system that can operate in tandem or separately from the ICE. Therefore, the cost of diagnosing propulsion related problems can be extensive due to the time investment to analyze both propulsion systems. Although vehicle on-board diagnostics can assist with analyzing each system, the data may only lead to more questions and not answers because of the systems complexities.

Although there are many, many more items that we could have included in this article focused on a customer's ownership experience with HEVs , we felt that topics such as these, which are not typically broached with customers, would be beneficial to include and discuss. Future newsletters will be much more technical in nature as a rule of thumb. However, it all starts and ends with the customer.....and that's where the genesis of this newsletter began, with the customer.

Next Month - *Predictive Maintenance: How the Aftermarket Can Capitalize on Servicing Hybrid Vehicles.*

To view previous newsletters, access our newsletter

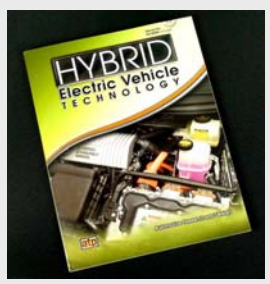
Portland Community College

Click here for more information

We provide you with equipment specifically designed to analyze and diagnose Hybrid and Electric Vehicle Systems.

Click here for more information.

The All Test Pro® 33EV is the most powerful tool to analyze and diagnose any 3-phase motor-generator on an a hybrid or electric vehicle. Click on the photo above to learn about its functions and how to use them.



Are you looking to implement HEV curriculum into your class offerings?

Click here to complete the online request form with our publisher to receive a **complimentary** instructor review copy of our Hybrid Electric Vehicle Technology Student Textbook.

site regularly.

- If you found this newsletter helpful.. Please forward it to colleagues so they may receive its value as well.
- As a recipient of a forwarded email, please sign up to receive future editions by clicking here to register.

archive

Until next time remember - knowledge is ***POWER***

AR&D Tech Team

WEBINARS

To support increased demand in the educational & aftermarket industries, we will be adding webinars to our training products (September 2011), providing you the opportunity to interact with the instructor. For a listing of webinar topics and descriptions click here.

Currently, we provide e-Learning training modules through our partner NAPA. For more information click here

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