Knuckle Buster

Newsletter of the Wisconsin Association of Emergency Vehicle Technicians
www.waevt.com

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Great Turnout for Fall Seminar

Our 2013 Fall Seminar was held September 19th at the FVTC Fire Training Center. We had two Wisconsin State Patrol (WSP) Commercial Vehicle Inspectors provide a presentation on Commercial Vehicles, Daily Inspections, Annual Inspections and what they look for at roadside inspections. We also had Duo Safety provide a demonstration and instruction on Ground Ladder Testing. This will allow departments to complete annual ground ladder testing in house.

Questions for Wisconsin State Patrol

At our class in September, there were many questions asked of the WSP. While they were able to answer some questions, some needed more research. If you have any questions that you did not get answered, or have arisen since the class, forward them to Jon Coutts at jdcoutts@sbcglobal.net. He will forward them to the WSP for answers. We are anticipating having them return in September to provide the answers to these questions and provide more information on the Commercial Vehicle regulations in Wisconsin.

2014 Spring Seminar

The 2014 Spring Seminar will be held May 14-15, 2014 at the Fox Valley Fire Training Center in Neenah, WI. The classes will be Cummins Engines, NFPA 1911 inspections, and Leece-Neville starting/charging systems and alternators.

Elections at Spring Seminar

We will be holding elections for three Board positions at the 2014 Spring Seminar. The positions are Vice President, currently held by Mike Meyer; Executive Secretary, currently held by Mark Evel; and Treasurer, currently held by Dave Kamps. Mark and Dave are no longer actively involved in apparatus maintenance and will not be running for reelection. Please consider joining the board to maintain the educational opportunities provided by the organizations. Contact Jon Coutts or one of the other board members for more information.

Congratulations to Master Technicians

Several members recently received Master Technician Certification form the EVTCC.

Randy Klaybor – Milwaukee Area Technical College – Master Fire Apparatus Technician

Pat Stevens – City of Racine Fire Department – Master ARFF Technician

Congratulations to both of them on this achievement. For more information EVT Certification, got to www.evtcc.org. We offer onsite testing at both our Spring and Fall Seminars.

WAEVT Members on EVTCC Validation Committees

Several WAET members serve on Validation Committees for EVT Certification tests. They meet once a year validate and update the test questions. Members serving on these committees are: Mike Meyer, Randy Klaybor and Kevin Roberts. Thank you for assisting with this program.

EVTA Bulletin Board

Do you have a problem that is causing you trouble and can't figure out? Go to the EVTA Forums and become a member of the site. There is no charge and there are technicians and factory personnel from around the country asking and answering questions on all topics. There are several WAEVT members on the board as well. If you haven't visited the website, it is a very valuable source of information and sharing. You do need to register to post to the site, but there is no cost. Visit the site at www.evta.info/forums.

E-Mail Addresses

Thank you to all those that provided your e-mail addresses. We would like to utilize e-mail for sending information and newsletters to help keep costs down. If you receive the newsletter by US Mail and have an e-mail address please send it to Jon Coutts at jdcoutts@sbcglobal.net.

How to tilt test a fire apparatus

*Jul. 30, 2013***A.K. Rosenhan** **(**Originally in Fire Chief InService July 31,2013. Reused with permission)

Over a 10-year period statistics gathered showed some 20-35% of firefighter deaths were because of vehicle accidents, many of them rollovers. A review of such rollover incidents indicated there were several causes, including driver error, road conditions, and high vertical centers of gravity. Several automotive industry standards, such as SAE J2180 and various NHTSA relate to vertical center of gravity values, but there was no specific fire apparatus industry standard. Something had to be done to reduce the toll of rollover incidents.

After considerable discussion, research, and conversations the NFPA 1901 Committee recommended an addition to the standard that would provide for three methods of addressing the problem of rollover. Each of the three solutions has pros and cons, but provides flexibility for small to large manufacturers, using custom or commercial chassis, to meet the standard.

The specific section of the 1901(2009 edition) standard which relates to the problem of rollover is 4.13 Vehicle Stability.

Section 4.13.1.1 of NFPA 1901 provides that:

1. An electronic stability control (ESC) be provided.
2. The apparatus shall remain stable to 26.5 degrees in both directions when tested on a tilt table in accordance with SAE J2180 A Tilt Table Procedure for Measuring the Static Rollover Threshold for Heavy Trucks,

3. The calculated or measured vertical center of gravity (vcg) is no higher than 80% of the rear axle track. All tests to be conducted with the apparatus loaded to its operational weight, i.e., water, equipment, manpower, etc. In addition the longitudinal and traverse cg values must be within criteria.

While there were three methods listed to meet the NFPA 1901 requirement, each had its advantages and disadvantages:

- Calculation method, in which the center of gravity of each part or assembly of a vehicle is entered into a spreadsheet and ultimately produce the longitudinal, lateral, and vertical centers of gravity is a cumbersome and sometime inaccurate measure.
- Electronic stability control (ESC) is an expensive solution (although prices are coming down) and is a maintenance problem for some. And some drivers simply do not want the computer to take away their ability to control brake and throttle operations.
- Tilting to the vehicle to a specific angle. After much discussion, the consensus of the committee was that a lateral acceleration of 0.5g was the danger value for a tipping point. Keeping in mind the normal drag factor (coefficient of friction) between a roadway and tires is 0.7 and that a 0.5g lateral acceleration will make a driver rather nervous.

Such a lateral acceleration may be produced by simply driving the vehicle in a circle of specified radius at a specified speed (aradial = v^2/r). Obviously, such is pretty hard on tires and chassis. Plus, if a vehicle fails the test, it really fails. Simply tilting the vehicle to a particular angle accomplishes the same thing, but without any danger of damage.

The angle for fire apparatus was determined to be 26.5° (the arctangent of 0.5) with off-road and crash-rescue vehicles being tilted to 30° (the equivalent of a 0.58g lateral acceleration). Obviously, a restraint system is employed to keep a vehicle from completely turning over if it cannot pass the appropriate test.

Tilt-table alternative

Seeing the wisdom of using the tilt table alternative, which relies on Mother Nature's physics, Ferrara Fire Apparatus, a fire apparatus manufacturer in Holden, Louisiana, elected to build a large tilt table. This table is a 10- x 50-foot platform, capable of tilting vehicles up to 150,000 pounds to close to 40°. There are wheel scales at the end of the platform which provide for the automatic evaluation of lateral and longitudinal cg values.

In addition to their own products, the tilt table is used by other manufacturers. Recently BrandFX Body Company of Fort Worth, Texas, used the facility to test their latest designs.

All passed the NFPA test with flying colors, and one design was tilted to the upper limit of the table — some 39.2° — without tipping. All this with a full tank of water and all equipment, with ballast simulating the weight and location of crew members.

While tilt testing won't eliminate fire apparatus rollovers, it does prove the design and performance abilities of the vehicles tested. The singular constant in all operations is gravity. Tests that do not rely on anything other than gravity are quite constant.

Getting equipment and personnel to and from the scene of an emergency is important. Tilt-table testing is helping to ensure the safe operation of emergency vehicles.

A.K. Rosenhan, PE, CEng is the fire services coordinator for Oktibbeha County, Miss., and does consulting work for fire apparatus and equipment manufacturers.

Training Opportunities

WAEVT Spring Seminar May 14-15, 2014 FVTC Fire Training Center, Neenah, WI

Hale Pump Schools http://www.haleproducts.com/Main/Content,30,10.aspx

Pierce Factory Training http://www.piercemfg.com/company/training.cfm

EVT Certification Commission http://www.evtcc.org/

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