



Knuckle Buster



Newsletter of the Wisconsin Association of Emergency Vehicle Technicians

February 2011

2011 Spring Seminar Set

The 44th WAEVT Spring Seminar is set for Wednesday and Thursday, May 18-19 at the Fox Valley Fire Training Center in Neenah. Classes to be held are Hale Pumps, Interstate Advanced Electrical, and Cummins 2010 Emissions, sponsored by Spartan Chassis. Registration is required. The cost will remain the same as last year at \$100 prior to May 1st and \$120 after May 1st. Preregistration greatly assists us in planning for classroom and dinner space.

New Conference Hotel for May

We were approached by the Radisson Paper Valley hotel about having our annual Dinner Meeting and rooms at their facility. After the discussion at the Executive Board it was decided to move there for several reasons. We will be hosting our 45th Anniversary next year and are hoping to attract former Board members to attend and wanted a good location. There is also much to do with in walking distance of this hotel as it is located in downtown Appleton. We have a block of rooms under WAEVT. The cost for the rooms is \$70 single, \$80 double. For reservations call the hotel direct at 1-800-242-3499, between 8:00AM and 4:00PM, or call Radisson Central Reservations at 1-800-333-3333. Make sure to mention WAEVT to get the correct rate. We will be using this hotel next year and probably into the future.

Elections to Be Held at Annual Meeting

Elections will be held at the Annual Meeting May 18, 2011. Two positions are up for election this year. They are President, currently held by Jon Coutts, and Recording Secretary, currently held by John Roberts. If you are interested in being on the board of directors, or have ideas for us, please feel free to contact one of the board members.

IAFC Emergency Vehicle Management Section Steering Committee Meeting

This committee, which Jon Coutts represents the WAEVT on, has had two phone conferences over the last few months. I will bring you up to date on what has happened so far.

The name for the committee was formalized to be the Steering Committee of the IAFC Emergency Vehicle Maintenance Section.

The vision of the committee is: "*To be the national voice of the Emergency Vehicle Technician.*" There is representation on the committee from 9 state associations, and several states that do not have associations.

This group is seeking to develop a database of outlines and curriculums to be shared by all state associations and instructors to insure that training is similar across the country. They will also be based on the study materials necessary for EVT Certification and following NFPA Standards. They will also be developing a national instructor database to assist associations in finding qualified instructors to teach classes for them. Another area they will be working on is instructor development. As instructors retire, new instructors will be needed to replace them.

If you have any questions about this feel free to contact Jon Coutts.

Briggs and Stratton Develops Website to Assist EVT's

At our Fall Seminar, Don Koloski of Briggs and Stratton announced that emergency vehicle technicians will have online access to Briggs and Stratton Technical Service Bulletins, Parts Lookups, Repowering and other information. You will have to set up a user name and password and answer a few questions to register, but there is no cost. You will receive a confirmation e-mail after which time you will have access to The Power Portal website. To register go to www.thepowerportal.com/emergencyresponder.htm to register and get started using the resources they have made available to us.

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. 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.

Website News

We have a new website person that updated the website to a totally new look. If you haven't seen it yet, go to www.waevt.com and check it out. If you have questions or would like to have something posted contact Jon Coutts

E-Mail Addresses

Thank you to all of you that have provided 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. If you know the e-mail address of another member of the association, or someone who you think would be interested in receiving our information, please forward the address to Jon.

Association Anniversary

In 2012 the Wisconsin Association of Emergency Vehicle Technicians will celebrate its 45th anniversary. The Association was started in 1967 as the Wisconsin Fire Equipment Mechanics Association to provide training to the people in Wisconsin and surrounding states. We are looking for people to help with working on a celebration of this milestone. Please contact Jon Coutts if interested.

Training Opportunities

WAEVT Spring Seminar May 18-19, 2011 FVTC Fire Training Center Neenah, WI

Waterous Pump Schools <http://www.waterousco.com/training/mech.html>

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/>

Fox Valley Tech EVTCC Classes

<http://www.peopleware.net/index.cfm?siteID=365&eventDisp=EVTCC>

Fire Chief Magazine In Service Maintenance Section <http://firechief.com/inservice/shopcal>

EVT Bulletin Boards

EMERGENCY VEHICLE TECHNICIAN ASSOCIATION

www.evta.info/forums/

EMERGENCY VEHICLE LIGHTING AND WARNING SYSTEMS

www.emergencyvehicles.org

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Put the Brakes on

By Ralph Craven and Brian Brown

Your daily apparatus-inspection list, that is.

While many fire departments have programs in place that require daily apparatus inspections, many do not. In some departments, the daily inspection is primarily a tool inventory in addition to a fire pump and/or aerial operation check. But a thorough daily apparatus inspection program should be in place to ensure that the apparatus is response-ready and safe to drive.

Some states require that engineers/driver operators of fire apparatus have commercial-vehicle driver licenses and conduct pre-trip inspections. One item that is mandatory in such inspections is the brakes. Many fire departments do not take the time to insure that the engineers who operate the vehicles are properly trained to identify problems that are associated with the brakes on their vehicle.

The most-often-overlooked issue is referred to as slack-adjuster travel. All air-brake systems have several components that need to be inspected and tested, including valves, lines, tanks, air dryers, brake chambers and slack adjusters.

Brake chambers: All air-brake systems have brake chambers that are identified as Type 20 through Type 36. The number indicates the square inches of effective-air-pressure area that a brake chamber has. The most-common type of brake found on fire apparatus is the clamp-type S-cam brakes. The brake chamber is a diaphragm-type actuator that converts the energy of air pressure into mechanical force.

Slack adjusters: Slack-adjuster travel is the distance traveled by the push rod in the brake chamber to the slack adjuster in order to apply the brakes. For instance, the maximum travel for a Type-30 brake chamber is two inches, or a 90° angle or less while looking at the slack adjuster. The maximum travel for other brake chambers varies depending on the size.

All the driver needs to verify is the maximum travel of the slack adjuster when the brakes are applied. This can be done by chocking the vehicle, placing someone in the driver seat (do not start the vehicle), releasing the parking brake, applying air pressure by stepping on the brake pedal and holding it in place. Once all of this is carried out and it is safe, the engineer/driver operator can roll under the vehicle on a creeper and visually look at each slack adjuster at every wheel position. A tape measure also can be used to verify the slack-adjuster travel by the inches moved when the brakes are released. After the under-truck inspection is performed, if the slack adjuster exceeds the maximum travel allowed based on the manufacturer information (see table on page 93), then it needs to be adjusted.

NFPA 1911, 1071 and 1002 identify out-of-service criteria. Common items are missing linings, audible air leaks at chambers, too-thin linings and pads, loose air chambers, and loose or broken spider or camshaft brackets. Consult NFPA standards documents or contact the commercial division of your local state or law enforcement agency if you need more guidance.

OTHER CHECKLIST ITEMS

There are other items that need to be inspected when the shift starts. If yours is a volunteer department, you can check these items after you return and before the next call.

Parking-brake check (daily inspection): Refer to NFPA 1901 and 1911, as well as your most current IFSTA manual, and then locate a steep grade that will adequately test the parking brake. You may not be able to find a 20% grade in your area. The engineer/driver operator is seated in the vehicle and is applying the service brakes, apply the parking brake and set the wheel chocks an inch or two forward of the front or rear tires. Have the engineer/driver remove their foot from the brake pedal and check to see if the parking brake holds the truck on the grade.

The parking brake can also be tested by the engineer/driver operator alone. Place the unit on a flat surface. Be sure the brake should hold the vehicle by shifting into a lower gear and then gently press the throttle so that a pull is created against the parking brake.

Hydraulic-brake check (daily inspection): With the engine running, apply firm pressure to the service brakes with the brake pedal and hold for five seconds. The brake pedal should not move (depress) during the interval. If the vehicle is equipped with a hydraulic brake reserve (backup) system, leave the key off, depress the brake pedal and listen for the sound of the reserve system electric motor. Also, check that the warning buzzer and/or light are off. Check the service (foot) brake operation by moving the vehicle forward slowly (about 5 mph) and apply the brake firmly. Note any vehicle "pulling" to one side, unusual feel or delayed stopping action.

DOT air-brake check (daily inspection): Air-brake safety devices vary; however, this procedure is designed to ensure that any safety device operates correctly as air pressure drops from normal to a low-air condition. For safety purposes, in areas where an incline is present, you will need to use wheel chocks during the air-brake check. The proper procedures for inspecting the air-brake system are as follows:

- **Air-leakage rate (static check):** With a fully charged air system (typically 120 psi), turn off the engine, chock the wheels, release (push in) the parking brake button (all vehicles) and trailer air-supply button (for combination vehicles and tillers} and time the air-pressure drop. After the initial pressure drop, the loss rate should be no more than 2 psi in one minute for single vehicles and no more than 3 psi in one minute for combination vehicles.
- **Air-brake system leaks:** With parking brake (all vehicles) released (pushed in), apply firm pressure to the service brake pedal. Watch the air-supply gauge and listen for leaks. After the initial pressure drop, the loss rate for single vehicles should be no more than 3 psi in one minute and no more than 4 psi in one minute for combination vehicles and tillers. If the air-loss rate exceeds these figures, have the air system repaired before operating.
- **Low-pressure warning alarm and/or signal:** Turn the key to the "on" position. Rapidly apply and release the service brake pedal to reduce air-tank pressure. The low-air-pressure warning signal must come on before the pressure drops to less than 60 psi in the air tank. If the warning alarm/signal doesn't work, you could be losing air pressure without knowing it. This could cause the parking spring brakes to activate suddenly. Remember, if this should happen while driving the vehicle, only limited braking can be done before the parking spring brakes automatically come on.
- **Automatic spring brakes:** Continue to rapidly apply and release the service brake pedal to further reduce air-tank pressure. The trailer air-supply button (if it is a combination vehicle or tiller) and parking brake button should pop out when the air pressure falls to the manufacturer's specification, usually between 20 psi and 40 psi. This causes the parking spring brakes to come on.
- **Air-pressure buildup:** Based on current DOT standards, when the engine is operating at 1,200 rpm, the air pressure should return to 120 psi within 90 seconds in dual-air systems. If the vehicle has larger-than-minimum air tanks, the build up time can be longer and still be safe. Check the manufacturer's specifications. Most fire apparatus have rapid air-buildup tanks, so your build up time could be considerably less. Know your fire apparatus. If the air pressure does not build up fast enough, the apparatus air pressure may drop too low while driving, requiring an emergency stop.
- **Service brakes:** Wait for normal air pressure and then release the parking brake and trailer air-supply button for combination vehicles or tillers. Move the vehicle forward slowly at about 5 mph and apply the brakes firmly using the brake pedal. Note any vehicle "pulling" to one side, unusual feel or delayed stopping action. This test may show you problems that you otherwise would not know about until you needed use of the brakes on the road.
- **Air-brake adjustment:** Remember that if your brakes are marginally in adjustment when the brakes are cold, they will certainly be out of adjustment when the brake drums build heat. As the drums heat up, they expand and move away from the brake lining, causing the brake chamber pushrod and slack adjuster to travel even farther. Always have a certified EVT, ASE mechanic or Title 49 CFR 396.25 brake inspector do any adjustments or repairs to your vehicle.

Obviously, there are many ways to perform brake check inspections and it is critical to have a program in place. If you don't, your department is crossing a dangerous line concerning the lives of the firefighters and the citizens they are sworn to protect. A daily inspection of the brakes is a proactive approach to improve apparatus safety while significantly reducing the legal liability for any department. A well-oiled apparatus inspection-and-maintenance program is not just fleet maintenance, but also risk management.

Ralph Craven, Craven & Associates, was in the fire service for 23 years and actively involved in the maintenance of fire apparatus. In the eighties, Craven co-founded and was president of the National Association of Emergency Vehicle Technicians. He is an expert witness on aerials and fire apparatus and served as investigator with the National Highway Safety Transportation Association. Craven also teaches classes on fire apparatus and safety across the country.

Brian Brown is the fleet-services bureau chief for the South Metro Fire Rescue Authority in Centennial, Colo. He also is an award-winning emergency vehicle technician, Level I and II. Brown is an academy instructor for the Colorado Fire Mechanics Association and presented at the Fire Department Safety Officers Association's annual Apparatus Symposium.

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