California Fire Mechanics Association Newsletter

ISSUE:

MONTH: JULY
YEAR: 2022

In this Issue

LATEST NCFMA MEETING MINUTES:

The NCFMA meeting minutes are all attached inside this newsletter. The following Months are included:

Feb 2021 - April 2021 - June 2021 - August 2021 - October 2021 – December is below:

Date: December 16th 2021

Location: Cosumnes Fire Department

Officers Present: Rick N. Jack R. Mike G. Steve S. Fred Y.

Officers Absent: None

Officials Present: Tony B.

Vendors Present: California Fire Mechanics Academy: Scott C. Rob A. & Boyd Clegg (Training Instructor), O'Reilly auto parts: Aaron M., Power Products: Robert R.,Kussmaul Electronics: Ray P., Firetrucks Unlimited: Dallas P., Riverview International Trucks,LLC: Ernie P., Wattco: Vic G. Pam C., Lehr: Mike W., Bulygo & Associates: Tony B.

Meeting Minutes: of October 21st 2021 motioned Scott C. seconded Ed S. (accepted)

President: Moment of silence for Marty Schmeltz, Steve S. has retired (applause), please clearly print your information on the sign in sheet to help us update the email list, we are currently experiencing a great deal of undeliverable emails, 2022 will be a challenge with NFPA 1071 1901 new standards taking effect January 1st 2022, Boyd Clegg will be instructing NFPA 1071 training today, Smoke testing for outside agencies requires a Cdet# or the test is invalid.

1st. VP: Raffles today will be 50/50 and donated items, Braun Ambulance is supplying lunch with the Marriott brothers cooking.

2nd. VP: 2022 Training calendar will be available after January 1st 2022 on the website, we are looking for ideas of future swag you the members would like to see available for purchase.

Secretary: No report.

Treasurer: Current membership stands at: 163 regular members (of which 0 are new): 19 Vendors (of which 0 are new): 53 Lifetime/Comp/Political.

NCFMA MEETING MINUTES

Treasurer's report: motioned Ernie P. seconded Matt (accepted)

NFPA: No report.

Academy: Spring Academy will be March 21st - 25th in Rancho Cordova, the Marriott hotel is taking reservations, Fall 2021 Academy had 92 students and went very well.

Old Business: none.

New Business: Brian Marriott voted to lifetime membership, electrical apparatuses are now being sold by REV group, Pierce has 2 electric engine in service 1 in Madison WI. and 1 in the Portland Oregon area, the eclectic batteries are weighing almost 2 tons, Range Extender is a diesel engine powered generator, new oil filter wrench design displayed by Rob A. made by JM3 Rob is inviting JM3 to the manufactures showcase at the spring academy.

Good of the order: Thanks to all who donated to the go fund me account for Marty's family, a celebration of life is being considered after spring academy. The academy board is looking for new members. DEF headers are failing and parts can only be sourced thru the manufacture, throwing DEF quality codes.

Total number of attendees who signed in: 47

Next meeting location: TBA

Additional Meeting Minutes are in the back of the Newsletter

SCFMA MEETING MINUTES

LATEST SCFMA MEETING MINUTES:

Nothing to Report at this time

Look for new meeting and training information coming soon

Updates:

See the Minutes in the attachments later in this newsletter

SCFMA

Nothing to Report at this time

Look for new meeting and training information coming soon

Meeting Dates:

NCFMA

See next Page

Meeting Dates:

SCFMA

See next page

SHOP TALK

List of Articles and Information Attached with this Newsletter:

See attached Articles at end of the Newsletter

Please submit the info you find and want to share with the NCFMA and the SCFMA to: Tony@ncfma.org

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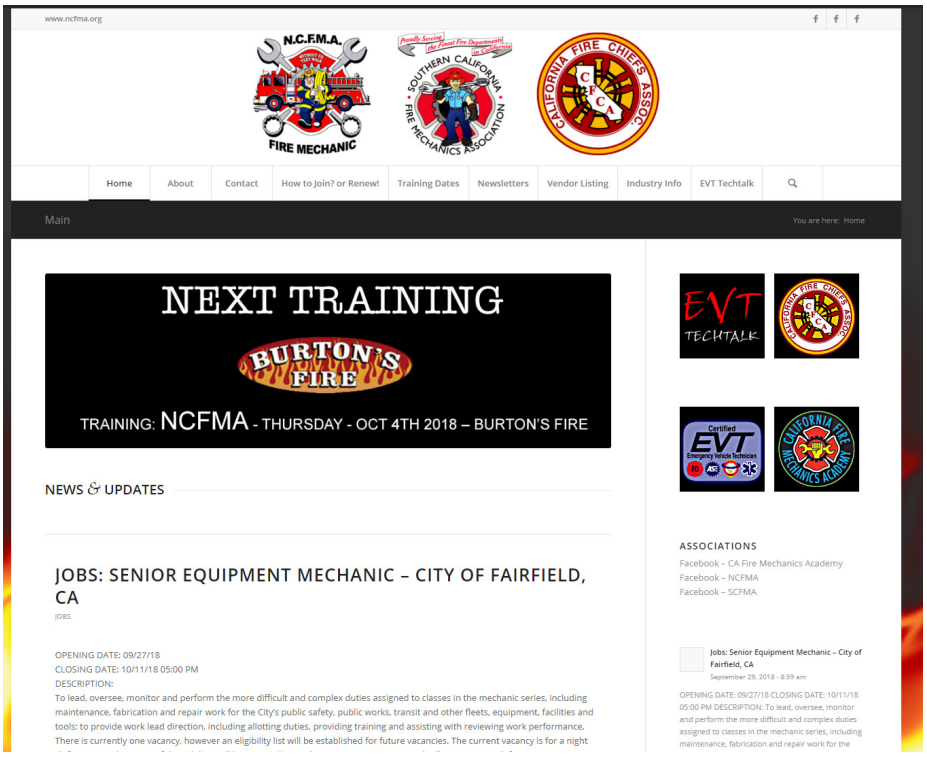


Please see our fully redesigned website now available at:

www.ncfma.org and www.californiafiremechanics.com

IS YOUR MEMBERSHIP UP TO DATE?

BULLETIN BOARD: http://www.evta.info/forums/

Upcoming Meetings

NCFMA NEXT TRAINING:

See our website for the latest Information

https://californiafiremechanics.org/trainings/

Next Training is August 18th at WATTCO

SCFMA NEXT TRAINING:

See our website for the latest Information

https://californiafiremechanics.org/trainings/

See the website for more information when available

CURRENT LIST OF SUPPORTERS FOR THE EVT TechTalk Bulletin Board:

www.evttechtalk.com

NCFMA - Washington Fire Mechanics – CFCA – SCFMA - OAEVT - Oklahoma Association of Emergency Vehicle Technicians Ohio Association of Emergency Vehicle Technicians (OAEVT) - EVTA of BC – Emergency Vehicle Technicians Association of British Columbia

Personal Supporters:

Steve Strom – Menlo Park Fire Department - Fred Rhodes – Rochester, MN Fire Department - John Weir – San Bernardino County Fire Department (CA) - Clyde Holland – Arizona - Bruce Marriott of Cosumnes CSD Fire Department
Brian Marriott of Cosumnes CSD Fire Department

To add your association or Group please see the forums

It is time to renew!

Please help by reviewing on-time to allow us to continue to provide you with updated information and services that your membership helps to pay for.

To Renew online see the bottom of this page.

It is time to renew your membership

Please help by reviewing on-time to allow us to continue to provide you with updated information and services that your membership helps to pay for.

To Renew online see the bottom of this page.

Time to Renew:

Please take a moment to renew now.

We have split California in half at approximately the Bakersfield line, if you are below Bakersfield, please download and join the Southern California Fire Mechanics Association. If you are above Bakersfield, please fill out and join the Northern California Fire Mechanics Association. If you have any questions please contact us and we can clear up any confusion.

See the website for the latest information:

https://californiafiremechanics.org/how-to-join/

After completing the form - please mail your application and payment to the address on the form.

Here is what you get for your low annual membership:

- Our Newsletter full of informative update info, TSB's, recalls and other information that directly affects your day to day work.
- Links and information on upcoming training classes
- Association meetings with free food!
- Access to the members area on this website
- Membership into one of the fastest growing Fire Mechanic Associations in the nation.
- The ability to ask technical questions to the association via our bulletin board or mailing list (Coming Soon!)
- And much more!

Please join today and tell your fellow mechanics - Our membership is bolstered by personal references from those in our service.

Fill out the form and send to the address on form.

Please download, fill out, and mail your application to the address on the form.

You can also pay online by clicking the links below:
When applying online - Please include all of your contact information with your payment

Click this link to Renew or Join Online:

https://californiafiremechanics.org/how-to-join/

About Our Organization

The Northern California Fire Mechanics' Association is a section of the California Fire Chiefs' Association. Our membership consists of government and private sector mechanics, who service and maintain fire service vehicles, emergency vehicles and equipment. Our goals are to inform the fire service mechanic, provide a forum for maintenance problems and solutions, and provide training.

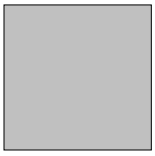
We hold bi-monthly training sessions in February, April, June, August, October and December. Through these trainings we provide updated information on current maintenance issues and the latest equipment available. It also is an opportunity for mechanics to share their problems and solutions to problems that they are experiencing.

Member Vendors are also present to assist and inform the members on the latest products and maintenance information.

Training classes are presented to update mechanics and help prepare for re-certification through Continuing Education (CE) credits when applicable.

We are proud of the accomplishments of our individual and vendor members and the contributions they make to the Northern California Fire Mechanics' Association.

NCMFA
5 Meadow Lane
Redwood City, CA 94063



We're on the Web!

See us at:
www.ncfma.org
www.californiafiremechanics.org

NCMFA
5 Meadow Lane
Redwood City, CA 94063

Phone
(661) 829-1448

Fax
(661) 829-1448

E-mail
newsletter@ncfma.org

MEETING MINUTES

NCFMA Minutes

Date: February 17th 2022

Location: AG Transmission

Officers Present: Rick N. Jack R. Steve S. Fred Y.

Officers Absent: Mike G.

Officials Present: Tony B.

Vendors Present: AG Transmission Frank B. and employees, Hi-Tech EVS Brian R. and employees, CFMA Scott C., Buiygo & Associates Tony B., Riverview International Trucks Ernie P., Wattco Vic G., Amsoil Kevin S., Lehr Mike W., Power Products Robert R..

Meeting Minutes: from Dec. 16th 2021 Motioned to accept Ed S. Seconded Scott C. Accepted

President: Attended Cal Chiefs Zoom meeting in January, trying to standardizeAmbulance guidelines and eliminate LIMSA, NFPA 1071lots of questions referred to Boyd C., All departments recommended to follow NFPA guidelines, Training to count toward Continued Education (CE Hours to be noted on certificates), Please write your email address legibly on the sign in sheet to receive current information and training blasts via email, Certificates turned in must have date and hours listed to count for CE Hours, Outside vendors must be certified for the repairs being performed.

1st. VP: No Report. There will be a 50-50 and Donated item raffles today.

2nd VP-Training: Given by Rick N. March Business Meeting to be during Spring Academy, June 16th @ Golden State Fire-shop safety and CPR, certification available, August 18th @ Wattco-Ray P. to cover Kussmaul Products, October 20th @ Burtons Fire training TBA, December 8th at Consumes Fire training TBA.

Treasurer: Current membership stands at: 56 regular members (of which 7 are new); 6 vendors (of which 1 is new); 52 lifetime/comp/political.
Motion to accept Treasurer's report by Joe B. Seconded by Scott C. Approved.

Secretary: No Report.

NFPA: Rick N. was asked to take Doug Links spot on the NFPA board to assist Shay P.

Liaison: Customer service email for ZF/ Wabco is wabconacustomercare@zf.com

Academy: Please sign up for Spring Academy, 165 currently signed up, hospitality night and soft 50th this year, Academy will be at Rancho Cordova Marriott - Sacramento Metro Shop and a couple other areas, Fall

Academy will be 1st. Week of November, October 30th. Thru November 4th. 2023 Spring Academy dates will be the week of March 20th.

Old Business: Smoke Testing must be done annually and if you smoke test for any outside agencies you must have a CDET number.

New Business: Electric Fire Engines they are coming, we will get instructors to train us in the future.

Good of the Order: Opacity testing WE ARE NOT EXEMPT, Brake Card required for all repairs, recap tires and tires in general are hard to get due to material shortages, Opacity testing needs CDET # for outside agency testing, Steve Strom voted to Lifetime Membership; Motioned by Fred Y. Seconded by Scott C. Approved.

Total number of attendees who signed in: 49

Next meeting: March during Academy.

NCFMA Minutes

Date: June 16th 2022

Location: Golden State Fire EVS

Officers Present: Rick N. Jack R. Mike G. Steve S. Fred Y.

Officers Absent: None.

Officials Present: None.

Officials Absent: Tony B.

Vendors Present: Golden State Fire EVS Ryan & Bill Wright & employees, Riverview International Trucks Ernie P., Wattco Vic G. & Tye W., Lehr Mike W., AG Transmission Don A.

Meeting Minutes: From February 17th 2022 Motioned by Bill W. Seconded by Ken Accepted

President: Per Joe Pastore, to be a Wildland Fire Mechanic you must have a Red Card, to get a red card you must apply on Cal Fire website and complete 2 classes 1 for Fire Safety & 1 for Communication, you will also need to submit a letter of approval to go from your Chief. NFPA 1071 booklet for reference is available online, fuel prices are rising, fight to keep fleet budgets, Cal Chiefs meeting attended via Zoom, AMR not able to fulfill contracts.

1st. VP: No Report.

2nd VP-Training: Swag for sale, trying to bring in AC training & Task Book training, August 18th at Wattco Fairfield training on Kussmaul, October at Burtons Fire, December 8th at Cosumnes Fire.

Treasurer: Current membership stands at : 67 Regular members (of which 9 are new); 7 Vendors (of which 1 are new); 53 Lifetime/Comp/Political.
Motion to accept Treasurer report motioned by Darin Seconded by Joe Accepted.

Secretary: No Report.

Liaison: No contact with SCFMA President, Tony B. has Covid, Many People have attempted to contact SCFMA President with no luck, we would like to coordinate SCFMA training with NCFMA training for Task Book sign off.
Smoke Testing must have CDET # for outside agency testing.

Academy: Spring Academy is October 24th thru 28th at The Ben Clark training center, flyers for fall academy go out June 24 2022.

Old Business: None

New Business: Rosenbauer's new Electric Fire Engine is in service in Los Angeles and has experienced a water tank rupture.

Good of the Order: Getting back to it after Covid.

Total number of attendees who signed in: 36

Next meeting: August 18th 2022 at Wattco Fairfield.

NCFMA Minutes

Date: No Meeting held in March or April.

Location:

Officers Present:

Officers Absent:

Officials Present:

Meeting Minutes:

President:

1st. VP:

2nd VP-Training:

Treasurer:

Secretary:

Liaison:

Good of the Order:

Next meeting:

Northern California Fire Mechanics Association

TRAINING BULLETIN

DATE: August 18, 2022

LOCATION: WATTCO

2230 Cordelia Rd.

Fairfield, CA 94534

707-435-9233

DESCRIPTION OF TRAINING: Kussmaul Training with Ray Paul

– Maximizing Web Page information

– On-Board battery charger selection

– Charger Troubleshooting / Maintenance

– Bar Graph Troubleshooting

– Idle Mitigation Systems

– Chief Charger Updates

SCHEDULE:

0900 - 0930 Meet and greet

0930- 1030 Association meeting

1030 - 1200 Kussmaul training

1200 - 1300 Lunch provided by WATTCO

1300 - 1500 Continue Kussmaul training

RSVP by August 12, 2022 to Brent@wattco.net or 707-435-9233

INDUSTRY INFORMATION

KEEP THESE 2022 CARB EMISSIONS REGULATIONS ON YOUR RADAR

The California Air Resources Board (CARB) Has Approved Two New Regulations:

The California Air Resources Board (CARB) has approved two regulations: the Advanced Clean Truck (ACT) rule and Omnibus Low NOx. While the regulations take effect in California first, many of the states that use CARB rules are expected to adopt the regulations.

ACT focuses on increasing electric vehicle sales by requiring truck manufacturers to sell a percent of their volume as electric vehicles starting in 2024. The goal is to gradually reduce the percentage of Internal Combustion Engine (ICE) trucks every year until they are officially banned in 2040.

The Omnibus Low NOx regulation kicks in much quicker, requiring .05 g/bhp-hr in 2024 and .02 g/bhp-hr in 2027 and new emission warranty requirements in January of 2022. Only CARB-Certified trucks will qualify for the CARB Clean Idle Certification sticker.

WARRANTY CHANGES

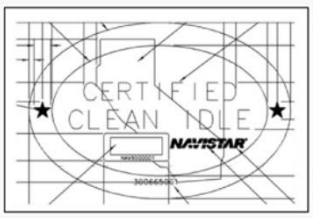
Starting in 2022, CARB and EPA will have different emissions warranty requirements. For the truck to be registered in the State of California, it must meet the following warranty requirements:

Emissions Warranty	2021	2022	2024	2027
CARB	60 mo./100K	60 mo./350K	60 mo./350K	60 mo./450K
EPA	60 mo./100K	60 mo./100K	60 mo./100K	TBD

-

CAN I GET CLEAN IDLE STICKER?

The Clean Idle Certification is required in many areas throughout the United States and Canada that restrict idling. The good news is that the International A26 is ALREADY 50-state compliant. Meaning that when you order a new truck, if you want that truck to qualify for the Clean Idle sticker, any A26-powered truck is ready to go (if the CARB-compliant base warranty is applied). If you order a truck with a Cummins engine and want the sticker, you must order the CARB-compliant version of that engine in addition to the CARB-compliant base warranty.



CARB Emission Warranty Compliant Engine	✓	✓
EPA 2021 Emission Compliant Engine	✓	✗

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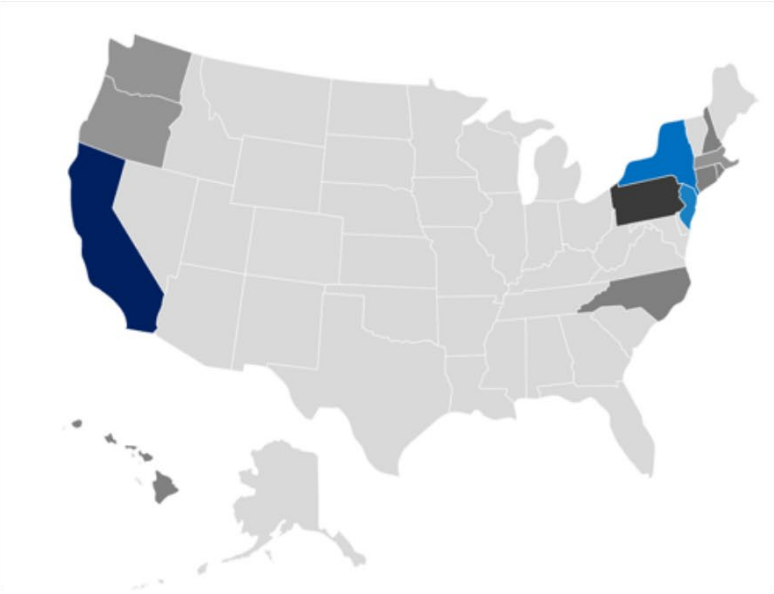
STATES THAT ARE LIKELY TO ADOPT THESE REGULATIONS

Many states are looking into adopting ACT and the Low NOx regulations or have signed the Memorandum Of Understanding (MOU). Under the MOU, state signatories will work together to accelerate the medium- and heavy-duty zero-emission vehicle market with input from communities, public health experts, organized labor, utilities, businesses, manufacturers, and environmental groups.



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HOP ON BOARD

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SIGN UP FOR OUR COMMUNICATIONS TODAY

REV Group® Announces Plans to Shift KME® Production to Other REV Fire Group Facilities

9.10.2021

MILWAUKEE, WI — September 10, 2021 — REV Group, Inc. (NYSE: REVG), parent company of leading designers and manufacturers of best-in-class specialty vehicle brands, announces the transition of KME Fire Apparatus production to other REV Fire Group facilities over the next year, which will allow improved lead times, quality, and delivery for KME customers.

KME has long-served municipal, state, and federal markets across the U.S. with its diverse range of custom apparatus including Aerial, Industrial, Pumper, Rescue, Tanker, and Wildland products. KME is renowned for its quality engineering, custom manufacturing, and dedication to deliver on customers' specific apparatus needs. From its Tractor-Drawn AerialCat™ with Steel-Safe™ technology to the new X-Series™ Custom Pumper, KME consistently innovates to provide custom configurations based on unique fire department requirements.

"The KME brand has a rich and enduring legacy. Our commitment with this transition is to preserve the legacy by continuing to deliver to our customers and dealer partners what they have come to expect from the KME brand through their many years of valued loyalty to KME," said Kent Tyler, president, REV Fire Group. "This shift in production locations enables us to better access our broad operational expertise and resources, provide custom engineering, enhance quality and improve delivery times by leveraging the advanced manufacturing capabilities that we have through the REV Fire Group network. New and current KME customers can be assured that our commitment to manufacturing excellence will continue to bring quality and value to KME fire apparatus."

Orders currently in progress will be manufactured at the KME facilities in Nesquehoning, PA and Roanoke, VA, with production expected to be completed by April 2022. Orders not yet in production and new incoming orders will be transferred to other REV Fire Group manufacturing facilities. Each order will be reviewed with the respective KME dealer and end-user customers immediately following today's announcement. In addition, KME is meeting with employees from the Nesquehoning and Roanoke facilities to discuss options and reassignments.

Will Air Brakes Fade Away?

October 4, 2021 • By Jack Roberts •

As autonomous technology and electric truck adoption advance, brakes need to change.

Photo: Plus

Autonomous vehicles and battery-electric trucks are no longer figments of engineers' imaginations. They are poised to reshape almost everything we know about building and operating heavy trucks — including traditional braking systems.

Truck air brake systems have evolved continually since the early years of the 20th century, when the Westinghouse Air Brake Company (later Wabco), introduced scaled-down versions of the braking systems first pioneered for trains in the 1800s. Performance has improved, and we've built in several layers of redundancy and added some electronic trickery in the form of antilock systems and stability control systems that can apply the brakes at specific wheel-ends.

“Since 2005, the industry has seen the addition of significant new features such as roll and yaw stability, an interface to ADAS [advanced driver assistance systems], and hill-start aid enhancements,” says Richard Beyer, vice president of technical sales and vehicle systems at Bendix Commercial Vehicle Systems.

The next decade will see more changes wrought on our not-so-humble braking systems than in the previous century. The systems must evolve to keep up with the twin mega-trends of automation and electrification.

“They are poised to put new demands on the air brake system as we know it, making it clear that an upgraded brake system is needed,” Beyer adds.

Obviously better integration with various electronic control systems is required, without necessarily adding layers of electronic control systems to air brakes to improve their performance. It’s probably better to start with a more or less clean sheet, Beyer says.

“In looking at the advanced technology coming at the industry now, it seems clear that current air brake systems will serve as the basic building block for new brake technology that is being developed,” says Beyer’s colleague at Bendix, Alex Augoustidis, who is product group director for the company’s electro-pneumatic brake systems division. “The dual-circuit air brake system will be the mainstay for future brake architecture into the future.”

Basic Brake Building Blocks

The industry knows and understands the current system. It’s robust and reliable, and the two-circuit design already offers the level of redundancy that safety advocates, regulators, and truck engineers are looking for. The system can tolerate a complete breakdown of one circuit while the other continues functioning, albeit in a slightly limited way. Among the questions engineers are grappling with is how to bring that level of reliability and redundancy to an electronically controlled system.

“That is a critical prerequisite for complex systems as will be needed to support the future vehicle combinations,” Beyer explains.

Part of the challenge lies in layering new technology on top of existing technology, before the existing technology can completely replace the legacy systems. Electronic controls

can replace much of the signal side of the brake system, but it will be some years before air reservoirs and pneumatic brake actuators are replaced by electromagnetic brake actuators.

Without going too deep into the weeds, in current brake systems, when the driver presses down on the foot valve, the valve sends air, a signal, to the relay valves located near the wheel-end-mounted brake actuators. Those valves are also plumbed to the air reservoirs. The signal from the foot valve opens the relay valve, allowing air to flow from the reservoirs through the ABS modulator to the actuators, causing the brakes to apply.

The time that elapses between the opening of the foot valve and the brakes applying is called brake lag. Certain design requirements demand the brakes apply within a certain amount of time, and those requirements are becoming more demanding. Electronic signals from the foot valve to the relay valves at the rear of the chassis would be instantaneous, virtually eliminating brake lag. Electronic brake controls also would eliminate some of the tubing and valving currently in use.

As trucks become more highly automated, they will require electronic brake controls.

“This approach differs from today’s brake control systems designed primarily for foot-pedal-based brake requests,” Augoustidis explains. “Second, electric vehicles will introduce the ability to simultaneously apply conventional friction braking and motor-based electric braking [also called regenerative braking].”

Disruptive but Complementary Technology

Electronically controlled braking systems (ECBS or EBC), sometimes called brake-by-wire, are already in service in some applications in Europe. In addition to simplifying the physical layout of the pneumatic side of the braking system and speeding up brake application timing, they enhance stability control functionality.

“ECBS is a proven technology. It outperforms pneumatic brake control systems,” says Wolfgang Hahn, ZF’s system innovation leader. “ECBS is expected to be one key enabler for [SAE Level 4 to Level 5] trucking automation because it brings all the brake management together under the stability control [system].”

According to Hahn, ECBS would offer multiple benefits for tractor-trailer units, because these systems could deliver better trailer stability, reduce brake lag at the trailer wheels with the help of electronic brake signals. And as we are already familiar with, in stability-control events, brake application pressures can be distributed to individual wheels more precisely than with current pneumatic valves and actuators.

In various test scenarios, Haldex reports EBS-equipped trucks have shortened stopping distances by as much as 25% compared to fully air-braked trucks. And that's just the beginning of the potential benefits electronic brakes could bring to Class 8 trucks, says Mark Gregory, chief application engineer at Haldex.

"Air brakes famously have a 10-millisecond lag between depressing the brake pedal and onset of brake force to the wheels," he says. "Obviously, electronic brake response will be instantaneous and vastly improved over current air systems."

Further improvements to application timing and application pressure precision are possible with electro-mechanical brake actuators. These devices would replace the pneumatic brake chambers now found at every wheel-end.

Fully electronic braking would allow precise control of application pressure and timing at individual wheels and would be fully integrated into what will evolve from the current antilock braking system (ABS) and electronic stability control (EBS) systems. For example, depending on the weight and load configuration of the truck, wheels on more heavily loaded axles may receive a higher brake torque request than the lighter axles to prevent lock-up on slippery roads.

The challenge facing developers at this point is the millions of legacy trailers that will be on the roads for decades to come. Tractors with full electric brake systems would likely not be immediately compatible with pneumatically braked trailers.

Looking further out, electrifying the brake system could allow the downsizing of the air compressor, if the need to supply brakes is eliminated, leaving just the suspension.

"Going to electronic brakes would deliver a major efficiency gain to the truck's air compressor," Gregory says. "That goes along with the opportunity to reduce weight and ease maintenance demands, since electronic brakes tend to have about half as many

parts as drum or disc air brake systems do. Although we still might need to retain onboard pneumatic systems for suspensions and other systems."

Regen or split-system braking

With electric vehicles, whether battery or fuel-cell powered, braking is a significant source of energy for replenishing batteries, and engineers will want to optimize vehicle deceleration events for maximum energy recovery. This will involve balancing the braking effort across the electric motor or motors and the foundation brakes at the wheels.

ECBS supports "split-system" braking, where the job of stopping the truck is shared between the foundation brakes and the regenerative braking system. The goal would be to optimize the charging opportunities for electric trucks by adjusting the level each braking system contributes to the stopping effort.

"We're seeing definite moves toward recovering brake energy on commercial vehicles," says John Bennett, chief technology officer of Meritor. "And I think what we're seeing is a move away from foundational brakes — which you obviously want to limit use of on an electric vehicle. The preference is to have the vehicle's kinetic energy captured and used or stored. So, in time, I think we'll see a sort of natural optimization of brake systems which largely mirror electric truck duty cycles."

For an intermediate step to full-blown electronic brakes, Bennett believes we may see some sort of electronically actuated pneumatic brake systems.

He also believes electronic control of vehicle deceleration will help lower maintenance costs for fleets. More regenerative braking means brake wear will be reduced. Less-frequent brake jobs mean labor and parts savings.

Moreover, he says, fully electronic brake systems will naturally complement any number of electronic sensors. That will not only give technicians more alerts when there is a problem with a brake system in the future, but also will precisely pinpoint the area and nature of the problem and allow technicians to get to work without much of the diagnostics and troubleshooting that takes place today.

EBS: The Ultimate Goal

As cutting-edge as all this may sound to North American ears, Beyer is quick to point out that EBS has been the standard brake spec in Europe for more than 20 years, making the technology a logical next step as the base system for North American commercial vehicle braking systems.

He says Bendix is currently working on electronic brake and steering integration systems that could be the answer to the redundancy riddle facing engineers.

For autonomous vehicles, he says, “these redundant braking and steering systems are needed to allow a vehicle to continue in case of single-system failures to the next depot, exit or rest area.”

In trucks with today’s Level 1 and Level 2 automated control systems, Augoustidis says, an electronically controlled braking system with a dual-circuit pneumatic system has enough redundancy for safety if the ECBS fails, because the driver is the backup.

“However, as Level 3 and higher automated driving systems evolve, there will be a need for new vehicle architectures on the control side for redundant power, plus the braking and steering systems,” he says.

And there’s more. “Lots of systems can start to come together electronically, even with ECBS,” ZF’s Hahn says. “Once you have electronic controls on the braking system, adding functionality to lift axles, tag axles and traction control systems becomes quite easy to do.”

For these reasons, Hahn says he believes electronic brakes will begin on tractors, and eventually extend back to the trailer. But he sees a few obstacles to this evolution.

“We will need to develop some sort of redundant air brake control line, as well as a redundant CAN brake control line. But once we solve those issues, we can introduce brake-blending between the tractor and trailer for coordinated, enhance stopping performance. And we’ll be able to transfer captured kinetic energy back and forth between tractors and trailers to extend range for electric trucks.”

The challenges to bringing electronic braking systems online in North America are daunting. However, there is no doubt that given current technology trends, it is a logical — and perhaps even critical — step for enhanced freight efficiency in the future.

Given the rapid development of both electric trucks and autonomous technologies, it seems that electronic brakes are not so much an “if” proposition for North America, but “when.”

Editor's note: As of Dec. 29, 2021, this article has been updated from the original October 2021 web version to clarify some technical aspects of brake operation. This corrected version also appeared in the December 2021 issue of HDT magazine.

From the HDT Archives (2018): The Foundational Future of Air Brakes

Electric Fire Apparatus Manufacturer articles to date: 9/7/2021, from their individual websites

Rosenbauer USA:

The RT (Revolutionary Technology) is based on a radical new design, making it unlike any other vehicle. It represents a milestone in firefighting technology. Equipped with state-of-the-art technology, the hybrid vehicle combines safety, ergonomics, functionality and digital operational support – with a strong focus on sustainability. Rescue workers, affected persons and local residents alike will appreciate this vehicle's revolutionary technology and battery powered drive, enabling emissions-free and virtually silent operations. So the RT is setting new visionary standards in climate protection, noise control and health protection.

Oshkosh/Pierce

Here are just some of the key characteristics of the Pierce Volterra pumper now in service in Madison.

- The vehicle is the first zero-emissions electric fire truck in service in North America.
- The vehicle is equipped with a 155 kW Battery pack to meet the City of Madison's daily duty cycle. The battery system allows for flexibility in sizing so Pierce can customize the solution to meet various department's needs.
- The operational range has been tailored to the City of Madison's needs and is designed for a minimum of a full-shift operation.
- The electric drive is extremely powerful and emission free.
- The electric fire truck also features significantly reduced noise emissions. This greatly reduces the noise level in the cab and on the ground, making it easier for the crew to communicate and benefiting nearby residents.
- The electric drive train only uses fuel when the electrical system is fully depleted. While in electric mode there is no diesel fuel consumed.
- Can be coupled to the internal combustion engine to provide continuous and uninterrupted power to the pumping system or drive system.

In partnership with the City of Madison Fire Department, Pierce is continuing the final development, evaluation, and on-highway certification process for their electric vehicle technology. Having this vehicle in service in the City of Madison's busiest fire station allows Pierce to closely monitor operator feedback and opportunities for further vehicle enhancements.

The push for green technology was fueled from within the organization as it began to focus on more environmental sustainability manufacturing and in reaction to global shifts in green-powered energy requirements.

With the introduction of the Pierce Volterra platform of electric vehicles, Pierce is proud to meet the needs of your fire department while providing advanced technology designed to support environmentally conscious initiatives.

REV Group

REV Fire Group, part of REV Group Inc., a leading manufacturer of specialty vehicles and related aftermarket parts and services, announces it will introduce the first fully electric North American-style fire apparatus.

Developed with technology partner Emergency One Group LTD - maker of the world's first EV fire truck – this new electric fire truck packs 316 kW of proven automotive-grade batteries to deliver the longest electric pumping duration in the industry. This enables departments to drive and pump on electric only.

"Our superior battery storage solution allows us to complete a fully electric NFPA pump test, while maintaining a safer, lower center of gravity," said Roger Lackore, Senior Director of Product Development, REV Fire Group Engineering. A range-extender diesel engine is used for backup when pumping beyond three to four hours on a hydrant or for extended operation in blackouts and natural disasters.

"Our new fully electric fire truck reflects our continued drive to innovate industry-leading fire apparatus built with strength and durability specifically for the fire service vocation," said Kent Tyler, President, REV Fire Group. "As we all focus on working and living in a more sustainable way, it will help fire departments throughout North America protect not only their citizens but the environment as well."

Available for delivery in 2022, this rig features a North American design and is completely customizable to every department's unique needs. It is built utilizing locally stocked components, making replacement parts readily available so customers can keep their equipment maintained and in top condition. This new product is available for preorders now through any E-ONE, KME, Ferrara or Spartan ER dealer sales representative.

To learn more, contact your authorized dealer today and schedule an exclusive virtual session with engineers from REV Fire.

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This is just the beginning of things to come as all manufacturers are in the R&D mode.
Embrace it, it's coming.

Five-Minute Investment to Increase Uptime

Allowing your engine to idle for five minutes after a run can significantly reduce the temperature in the turbocharger, which will greatly improve reliability. In custom fire apparatus installations, heat is trapped in the engine tunnel with very little airflow to reduce temperature. These extreme heat conditions can challenge the temperature capability limits of many engine components. Our testing has proven that a five-minute idle period prior to engine shutdown reduces critical component temperatures considerably in fire truck applications.

We know we can't change the design of a custom fire truck, so we've implemented a number of improvements since 2019 to increase turbo reliability in custom fire truck applications.

1. In 2019, we added additional coolant plumbing for the turbos that are most commonly used in fire apparatus. This reduces the temperature in the turbocharger and the variable geometry (VG) actuator.
2. To further alleviate heat concerns, we have implemented electronic components with higher temperature capability in the VG actuator that reduce the possibility of heat-related cracking failures.
3. A new turbo actuator calibration has been released to reduce cycling and further improve reliability.

Cummins is committed to continuing to develop engines with even greater reliability. Allowing your engine to idle for five minutes after a run can significantly improve the life of your turbocharger.

Toyota Warns (Again) About Electrifying All Autos

Is Anyone Listening?

BY BRYAN PRESTON

Depending on how and when you count, Japan's Toyota is the world's largest automaker. According to Wheels, Toyota and Volkswagen vie for the title of the world's largest, with each taking the crown from the other as the market moves. That's including Volkswagen's inherent advantage of sporting 12 brands versus Toyota's four. Audi, Lamborghini, Porsche, Bugatti, and Bentley are included in the Volkswagen brand family.

GM, America's largest automaker, is about half Toyota's size thanks to its 2009 bankruptcy and restructuring. Toyota is actually a major car manufacturer in the United States; in 2016 it made about 81% of the cars it sold in the U.S. right here in its nearly half a dozen American plants. If you're driving a Tundra, RAV4, Camry, or Corolla it was probably American-made in a red state. Toyota was among the first to introduce gas-electric hybrid cars into the market, with the Prius twenty years ago. It hasn't been afraid to change the car game.

All of this is to point out that Toyota understands both the car market and the infrastructure that supports it perhaps better than any other manufacturer on the planet. It hasn't grown its footprint through acquisitions, as Volkswagen has, and it hasn't undergone bankruptcy and bailout as GM has. Toyota has grown by building reliable cars for decades.

When Toyota offers an opinion on the car market, it's probably worth listening to. This week, Toyota reiterated an opinion it has offered before. That opinion is straightforward: The world is not yet ready to support a fully electric auto fleet.

Toyota's head of energy and environmental research Robert Wimmer testified before the Senate this week, and said: "If we are to make dramatic progress in electrification, it will require overcoming tremendous challenges, including refueling infrastructure, battery availability, consumer acceptance, and affordability."

Wimmer's remarks come on the heels of GM's announcement that it will phase out all gas internal combustion engines (ICE) by 2035. Other manufacturers, including Mini, have followed suit with similar announcements.

Tellingly, both Toyota and Honda have so far declined to make any such promises. Honda is the world's largest engine manufacturer when you take its boat, motorcycle, lawnmower, and other engines it makes outside the auto market into account. Honda competes in those markets with Briggs & Stratton and the increased electrification of lawnmowers, weed trimmers, and the like.

Wimmer noted that while manufactures have announced ambitious goals, just 2% of the world's cars are electric at this point. For price, range, infrastructure, affordability, and other reasons, buyers continue to choose ICE over electric, and that's even when electric engines are often subsidized with tax breaks to bring pricetags down.

The scale of the switch hasn't even been introduced into the conversation in any systematic way yet. According to FinancesOnline, there are 289.5 million cars just on U.S. roads as of 2021. About 98 percent of them are gas-powered. Toyota's RAV4 took the top spot for purchases in the U.S. market in 2019, with Honda's CR-V in second. GM's top seller, the Chevy Equinox, comes in at #4 behind the Nissan Rogue. This is in the U.S. market, mind. GM only has one entry in the top 15 in the U.S. Toyota and Honda dominate, with a handful each in the top 15.

Toyota warns that the grid and infrastructure simply aren't there to support the electrification of the private car fleet. A 2017 U.S. government study found that we would need about 8,500 strategically-placed charge stations to support a fleet of just 7 million electric cars. That's about six times the current number of electric cars but no one is talking about supporting just 7 million cars. We should be talking about powering about 300 million within the next 20 years, if all manufacturers follow GM and stop making ICE cars.

Simply put, we're gonna need a bigger energy boat to deal with connecting all those cars to the power grids. A LOT bigger.

But instead of building a bigger boat, we may be shrinking the boat we have now. The power outages in California and Texas — the largest U.S. states by population and by car ownership — exposed issues with powering needs even at current usage levels. Increasing usage of wind and solar, neither of which can be throttled to meet demand, and both of which prove unreliable in crisis, has driven some coal and natural gas generators offline. Wind simply runs counter to needs — it generates too much power when we tend not to need it, and generates too little when we need more. The storage capacity to account for this doesn't exist yet.

We will need much more generation capacity to power about 300 million cars if we're all going to be forced to drive electric cars. Whether we're charging them at home or charging them on the road, we will be charging them frequently. Every gas station you see on the roadside today will have to be wired to charge electric cars, and charge speeds will have to be greatly increased. Current technology enables charges in "as little as 30 minutes," according to Kelly Blue Book. That best-case-scenario fast charging cannot be done on home power. It uses direct current and specialized systems. Charging at home on alternating current can take a few hours to overnight to fill the battery, and will increase the home power bill. That power, like all electricity in the United States, comes from generators using natural gas, petroleum, coal, nuclear, wind, solar, or hydroelectric power according to the U.S. Energy Information Administration. I left out biomass because, despite Austin, Texas' experiment with purchasing a biomass plant to help power the city, biomass is proving to be irrelevant in the grand energy scheme thus far. Austin didn't even turn on its biomass plant during the recent freeze.

Half an hour is an unacceptably long time to spend at an electron pump. It's about 5 to 10 times longer than a current trip to the gas pump tends to take when pumps can push 4 to 5 gallons into your tank per minute. That's for consumer cars, not big rigs that have much larger tanks. Imagine the lines that would form at the pump, every day, all the time, if a single

charge time isn't reduced by 70 to 80 percent. We can expect improvements, but those won't come without cost. Nothing does. There is no free lunch. Electrifying the auto fleet will require a massive overhaul of the power grid and an enormous increase in power generation. Elon Musk recently said we might need double the amount of power we're currently generating if we go electric. He's not saying this from a position of opposing electric cars. His Tesla dominates that market and he presumably wants to sell even more of them.

Toyota has publicly warned about this twice, while its smaller rival GM is pushing to go electric. GM may be virtue signaling to win favor with those in power in California and Washington and in the media. Toyota's addressing reality and its record is evidence that it deserves to be heard.

Toyota isn't saying none of this can be done, by the way. It's just saying that so far, the conversation isn't anywhere near serious enough to get things done.

VENDOR SUPPORT

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Air Exchange Dick Bertani 800-300-2945 Website: www.airexchange.com		
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Burtons Fire 1301 Doker Dr. Modesto, CA 95351-1598 Phone: 209-544-3161 Fax: 209-544-1109 Website: www.burtonsfire.com		
Tim Smith Service Manager **BAUER SAN FRANCISCO** 267 E Airway Blvd Livermore, California 94551 Tel. 925-449-7210 Tel. 510-909-6033 (cell) Fax. 925-449-7201 tim.smith@bauersf.com www.bauersf.com		
Emergency Vehicle Equipment **Guy Reimche** Phone: 650-421-1020 Fax 650-726-9310 greimche@aol.com		Code 3 – PureForge Brakes – Go Rhino – *Drager Alcohol & drug testing equipment – B&B Enterprises Consoles Window Guards and Gun Racks*
Emergency Vehicle Outfitters Office 916-685-0800 Fax 916-685-0883 9255 Survey Road, Ste # 12 Elk Grove, CA 95624 www.emergencyvehicleoutfitters.net sales@emergencyvehicleoutfitters.net		
Ferrara Fire Apparatus Inc. Mike Doran 314 Littlefield Ave. South San Francisco, CA. 94080 650-615-9600 Office 225-567-7722Fax miked@ferrarafire.com		

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Golden State Fire Apparatus Inc. 7400 Reese Road Sacramento, CA 95828 916-330-1638 www.goldenstatefire.com daron@goldenstatefire.com	**SERVICE HOURS**: Monday thru Friday 7:00 AM to 4:00 PM, Closed Saturday and Sunday **SALES HOURS**: Monday thru Friday 8:00 AM to 4:00 PM, Closed Saturday and Sunday	
Valley Fire Sales & Service Marty Schmeltz 855 Stillwater Road West Sacramento, CA 95691 Website: www.valleypowersystems.com	24/7 Parts Service: (800) 350-5522 Main: (916) 372-5078 Fax: (916) 372-2721	
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Hi-Tech Emergency Vehicle Service & Crimson Fire Apparatus of Northern California 444 West Greger Street Oakdale, CA 95361 209.847.3042 (O) 209.847.2110 (F) Contact: Ben Ruthman benr@hitechevs.com Websites: www.hitechevs.com www.crimson-fire.com		

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West-Mark, Inc. Joshua Vincent West-Mark – Sales Toll Free:(800) 692-5844 Phone: (209) 537-4747 (ext. 3120) Direct: (209) 343-3120 Mobile: (209) 499-8700 Fax: (209) 537-1753 E-mail: jvincent@west-mark.com		
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Holt of California/CAT **Bob Wolfe** West Sacramento 916-373-4100 Stockton 209-466-6000 Los Banos 209-826-4919 bwolfe@holtca.com		
Fleet Repair Services **Douglas Wilson** jdwilson@sti.net 209-742-6028		

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Fire Research Corporation Craig Lecy Regional Sales Manager 18763 Peridont Street NW Anoka, MN 55303 763-567-8494 Cellular www.fireresearch.com clecy@fireresearch.com		

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Dartco Transmission Barry Jeshurin - 858-395-4468 3871 Beaver Street Irvine, CA 92614 562-328-3006 bjesh@att.net		
Emergency Vehicle Group 2883 E. Coronado Street Anaheim, CA 92806 714-238-0110 www.evginc.net		
Federal Signal Corporation Doug Schindler - 909-472-1300 800-264-3578 www.fedsig.com dschindler@federalsignal.com		

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Tomar Jason Shadle - 951-704-3586 jshadle@southwesttraffic.com		
Toxguard Fluid Technologies William Kughn - 714-357-4198 11942 Western Ave. Stanton, CA 90680 Fax: 714-698-3400 billkughn@aol.com	Toxguard is a specialty Antifreeze/Coolant company. We stock all types of heavy-duty coolants. Toxguard has technical service advisors on staff to answer your Antifreeze/Coolant questions. Toxguard is also one of the few vendor to provide a comprehensive heavy-duty coolant training class.	
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Whelen Engineering Inc. Mike Grenert - 714-980-0312 mgrenert@whelen.com www.whelen.com		
Young & Associates Charlotte Young - 626-914-5115 Fax: 626-914-5995 Cr.young2@verizon.net		