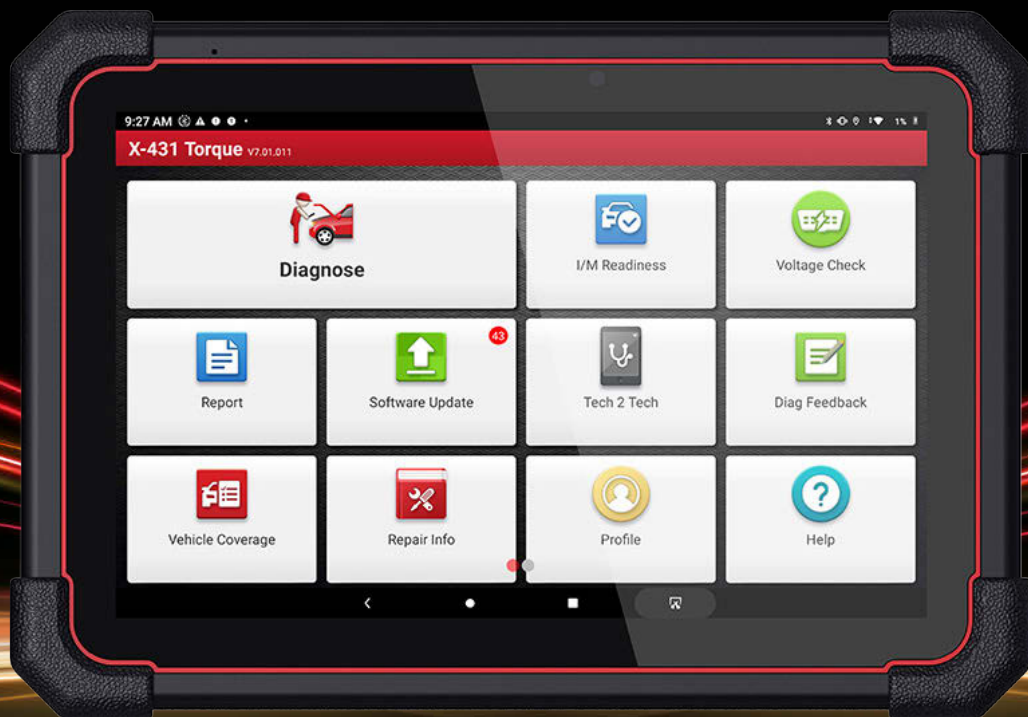


PTEN

PROFESSIONAL TOOL & EQUIPMENT NEWS

\$15.00 - March 2023
Volume 34, Number 2

ENDEAVOR
BUSINESS MEDIA



X-431 TORQUE 5

ADVANCED INTELLIGENT
FULL-SYSTEM VEHICLE DIAGNOSTICS
BY LAUNCH TECH

TOOL BRIEFING
A/C SERVICE TOOLS
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DIAGNOSTIC TECH
A LOOK AT TESLA
SERVICE & REPAIR
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DETAILS ON THE COVER PRODUCTS
AND OTHER NEW TOOLS **PAGE 8**

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▲ Ideal for diesel
repair shops



▲ Detects intermittent
electrical faults



▲ Ergonomic
acetate tri-lobular
handles

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CORDLESS PRODUCTIVITY COUNTLESS POSSIBILITIES

INTRODUCING THE ALL NEW G5351 IQV® 20V Cordless 4.5/5.0" Angle Grinder & Cut-Off Tool. Bring the power of pneumatic with the mobility of a cordless tool.

- **Industrial Design:** Includes Side Handle with Left or Right Attachment Points and Tool-Free Accessory Changes and Guard Adjustment
- **Power & Performance:** Delivering 1.0hp output with up to 8,000 rpm and compatible with all Ingersoll Rand IQV® 20V batteries
- **Versatility:** Ergonomic Handle with Comfortable Overmolded Grip and Spindle-Lock (5/8"-11 Arbor) with Quick-Release Button

Break free from the cord with the **G5351 IQV® 20V Cordless 4.5/5.0" Angle Grinder & Cut-Off Tool** that brings the power of pneumatic with the mobility of a cordless tool. Slim and well-balanced, the **G5351** allows access to tight spaces and weighs 30% less than its leading competitor. Tool features an extended paddle switch and unique inline battery design that eliminates interference from the forearm during use. The **G5351** couples a high-performance brushless motor with advanced features like anti-kickback and e-brake for safe, reliable performance.



BUY TODAY

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X-431 Torque 5 by Launch Tech

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VIDEO



PTEN Tool Review: John Baumgardt from Baumgardt's Auto Repair reviews the GEARWRENCH Bolt Biter Screw Extractor Set which is designed to grip stripped, frozen, and damaged screws.

VehicleServicePros.com/21290707

TECHNICIAN PROFILE



Brandon Laguire may have met his career goal, but he doesn't plan on slowing down – he wants to continue expanding his knowledge and keep improving. It's no wonder this young technician made it into the top ten candidates for the second annual *PTEN* and *Motor Age* Best Young Tech Award.

VehicleServicePros.com/21294224

CASE STUDY



A customer brought in their 2009 Ford F-250 saying the battery goes dead overnight. Although when tested, the battery and charging system checked out good.

VehicleServicePros.com/21293636

PODCAST PLAYLIST



Looking for something to do as you impatiently wait for spring and avoid the winter chill? Check out this month's podcast playlist for industry updates on tackling ASE tests, what it's like for a woman in this industry, advice for new shop owners, and more.

VehicleServicePros.com/21294349

SHOP OPERATIONS



Inflation, the pandemic, and supply chain disruptions have been making it more expensive for small shops to conduct business. You may be hesitant to raise prices for fear of alienating customers, but here are 12 tips for raising prices without losing customers.

VehicleServicePros.com/21291942

FEATURED PRODUCTS



Milwaukee Tool

80-pc Shockwave Impact Duty Driver Bit Set

VehicleServicePros.com/21295694



Matco Tools

3" Reversing Flex Head Pneumatic Cut Off Tool - Blue

VehicleServicePros.com/21294985



Fluoramics

Compu-Lube

VehicleServicePros.com/21292835



Oil-Dri

5-Gallon Bucket Oil Spill Kit

VehicleServicePros.com/21295734



Attitude of gratitude

Do you need an attitude adjustment?

By **Brendan Baker**, Editor
BBaker@EndeavorB2B.com

Sometimes you just need a reset like the ECU or the module you are working on when everything starts to go haywire. What you need is an attitude reset. It's all about perspective and mindset.

My grandfather, who was a tire salesman in Chicago in the first part of his life, always told me not to say, "I hate this..." but instead say, "I dislike this or that's not my favorite." Using strong words with negative connotations gets embedded in our brains and multiplies like a virus.

Working toward gratitude in our daily lives will bring much more happiness and inner peace. But it's not easy to remember to stay positive. Growing up in an automotive-oriented family, I learned I had mechanical ability early on. I also discovered that working on cars could be the most frustrating thing in the world if you have a bad attitude.

While I found cursing helped me vent my frustration, it never fixed a single vehicle, as far as I know. The underlying frustration was still there. Maybe I didn't have the right tool for the job (which was often the case). Or I didn't have the knowledge I needed to follow the correct procedures. I'm more of take it apart and figure out how to put it back together after kind of guy.



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I'm trying to make the point that everyday life and working on cars (or with shops that work on cars) can be frustrating. You can get caught up in the little irritating things like bad customers and vehicles that are a complete disaster, but you still have to work through it to the end. However, you can get your inner peace back in check with an attitude reset.

Heather Faulkner, a clinical programs supervisor at Diversus Health, suggests that to develop this "attitude of gratitude," you should begin by doing the following:

1. Ask yourself, what are you grateful for?
2. Write down three things that you are grateful for each morning.
3. Tell someone three things that happened which made you grateful.
4. Start a gratitude journal.
5. Give yourself credit for the big and small wins.
6. Acknowledge other people and thank

7. Meditate on gratitude.
8. Surround yourself with people who share a mindset of gratitude.
9. Give thanks for what you have and where you are in your life right now.
10. Commit to practicing gratitude.

Working on cars and trucks, and sometimes motorcycles for a living (or assisting those who do), can be a challenge if I'm being polite. The reality is that it is often tricky, with days filled with never-ending problems and issues to solve. By practicing gratitude daily, you will be rewarded by one of the most influential people in your life – you.

Give it a try. 

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FEATURED NEW PRODUCTS



IDEAL FOR DIESEL REPAIR SHOPS

The **ProMAXX Tool DEF Doser Decomposition Reactor Repair ProKit** allows diesel technicians to quickly complete an on-the-truck repair on Cummins ISX, ISB, ISC, ISL, Navistar N9, N10, N13, and PACCAR MX-11/M-13 engines. The kit's ProPlate fits over the dosing valve mounting plate, correctly aligning to its bolt holes. The included machine-shop-grade drill bit and tap tooling removes broken bolts and chases the threads, restoring them to factory new. The kit is ideal for diesel repair shops that work on

vehicles such as Cummins-powered tractors, buses, fire trucks, excavators, garbage trucks and even the light duty Dodge Ram 6.7L truck engine.

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DETECTS INTERMITTENT OPEN-CIRCUIT AND SHORT-CIRCUIT FAULTS

The **PhysiCAN SnS GRIP Tester** from **Sital Technology** is a portable USB board that is based on the company's patented Safe and Secure (SnS) technology for CAN bus data buses. By means of enhanced physical layer monitoring, Sital's SnS continuous fault monitoring enables detection and location of intermittent open-circuit and short-circuit faults in cables, connectors, bus terminators, and connected ECUs. The PhysiCAN comes with an app, a graphical user interface (GUI) tool, for real-time CAN bus physical layer fault monitoring, and cybersecurity. The app uses the PhysiCAN SnS GRIP to detect and locate intermittent or continuous electrical faults and indicate its findings as notifications on a diagram of the monitored CAN bus's topology.

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INCLUDES OVER 100 SKUS

Mayhew Tools' Made in the U.S.A. Screwdriver Product Line includes over 100 SKUs and are available both individually and in sets. Notable features include ergonomic acetate tri-lobular handles for maximum strength and torque transfer, ribbed necks for fingertip control and a non-slip grip, and a durable black oxide finish for corrosion resistance. All blades are manufactured using tempered high alloy steel for strength and durability. Each tip is precision CNC machined to industry specifications with tight tolerances for secure and reliable fastener engagement. All screwdrivers are made in the U.S.A. and exceed ANSI, ASME, and government standards (GGG, ISO).

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FOR MORE INFORMATION ON THESE PRODUCTS, CLICK ON "PTEN E-INQUIRY" at **VehicleServicePros.com** OR CIRCLE THE NUMBER ON THE CARD.

Kicking off the New Products section each month, our Featured New Products page includes brand new products showcased on the cover that are available to the automotive market.



ADVANCED INTELLIGENT FULL-SYSTEM VEHICLE DIAGNOSTICS

As vehicles have become more advanced with more electronics and technology, technicians need a more robust multi-diagnostic solution. Introducing the **Torque 5**, the latest diagnostic scan tool in the **Launch Tech X-431** lineup. This tri-function tool is unique as the hardware for the vehicle communication interface (VCI) also serves as the OBD connection, a digital multimeter, and a 2-channel oscilloscope. The bidirectional Torque 5 also includes extensive coverage of European, Asian, and Domestic vehicles, with pre-installed software modules for ADAS, battery testing, immobilizer diagnostics, CodeAssist by Identifix, and much more.

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WRENCHERS™



DRAWERS LINED WITH NON-SLIP PVC FOAM

The **Homak Manufacturing 43" Big Dawg 3-Drawer Service Cart** features a 25" deep design with three drawers and a bottom tray. Tray-to-drawer distance of 12.5" maximizes storage options. Lockable top till includes a power strip for storing electronics or valuables. Lift latch drawer pulls prevent drawers from opening. Each drawer is fully extendable, can hold up to 100 lbs, and is lined with non-slip PVC foam. UV protective high-gloss finish and chrome casters provide a sleek look to the overall design. The caster capacity of 520 lbs keeps all tools convenient and portable.

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EASY TO MANEUVER IN TIGHT SPACES

The **Snap-on Flat-Oval Adjustable Creeper**, No. JCV670, includes a hinge mechanism that allows one-hand height adjustment to make positioning the headrest easier and more comfortable. The frame's flat-oval tubing eliminates uncomfortable corners, the solid plywood core improves strength and durability, and the creeper's caster profile reduces resistance, making it easy to maneuver in tight spaces. The creeper comes with a heavy duty vinyl cover for protection. The products dimensions are 40" length by 17" depth by 4" height. Available in orange.

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EASILY TRANSPORTABLE AND COMPACT

The **JohnDow Industries Static Grounding Reel**, No. JDI-SGR75, is designed to work with fuel products needing a grounding wire. Extended to 75', the easily transportable, compact Static Grounding Reel is ideal for any hazardous areas with potentially dangerous static electricity like refueling stations, aviation refueling, and stationary and mobile fuel delivery trucks among others. Features include slow retraction, a ratchet-locking mechanism, auto-release during wire over-stretching to maintain safety at all times, and three mounting options (ground, wall, ceiling) with a mounting template.

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NOW HAVE SPECIFIC COLOR CASES

The updated **Tool Aid Body Hammer Repair Kits**, Nos. 89450 and 89470, now have specific color cases for less chance of cross contamination. The hammers and dollies are the same, but it is now easier to categorize with the colored storage cases. Additionally, the hammers and dollies within the 9-pc Aluminum Body Repair Kit, No.89450, were red but are now metallic. Red bands have been added to the hammer and spoon handles, and red stickers have been applied to the dollies. The hammers and dollies within the 9-pc Body Repair Kit, No. 89470, were blue but are now black. Blue bands and stickers have been added as well, similar to the 89450.

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FOR SERVICING HYBRID AND ELECTRIC VEHICLES

The **Rotary Lift LT33A Air-Hydraulic Lift Table** is designed to service batteries on hybrid and electric vehicles. The LT33A single section scissor lift design has a wide, stable base to help technicians securely and efficiently remove and install heavy vehicle components from electric battery packs, engines, and transmissions. The lift platform extends an additional 8" allowing the table to shift in sections, eliminating the need to move the entire table for multi-positioning of larger loads. Additionally, the rear of the table can tilt up to 1 degree, the tabletop can shift side to side by 1", and it features air system controls, air released mechanical locks, foot pedal controls, and multi-directional casters.

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REMOVES EGR VALVE ON SELECT MAXXFORCE, N9 AND N10 ENGINES

The **OTC EGR Valve Puller**, No. 5865, is designed to remove the EGR valve on 2010 MaxxForce, N9, N10, and DT engines as well as 2013 N9 and N10 with SCR. The tool is similar to Navistar OE tool No. ZTSE4941. Made in U.S.A. with global materials.

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TRANSFORMS A SMARTPHONE INTO AN IR THERMAL CAMERA

The **TOPDON TC001 Device** is a TC Series device designed to transform a smartphone or computer into an infrared (IR) thermal camera. Offering image rotation, enhancement, and an ultra-high IR camera resolution of 256x192, the device provides users with ideal image quality to assist in diagnosing a wide variety of issues within a vehicle. With the ability to pinpoint hurdles ranging from electrical components not properly working, accessory belts failing, drivetrain and suspension diagnostics, exhaust system leaks, heating and cooling surface issues, and more, the device helps to streamline diagnostics and troubleshooting. Compatible with Android phones, tablets and Windows devices, the small and portable tool can be plugged directly into the device's USB-C plug in.

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FEATURES A 19.25" CARBON FIBER HANDLE

The **H&S Autoshot PDR Blending Hammer**, No. UNI-7804, features a 19.25" carbon fiber handle that has ideal weight/balance for knocking down high spots or blending panels. The anodized aluminum head keeps the hammer light but also ensuring durability in the shop. Includes two nylon tips and two stainless steel interchangeable tips with a storage case.

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SOFT RUBBER COATED HANDLES

The **SP Tools USA 6-pc Premium Plier/Cutter Set with EVA Foam**, No. SP32916, contains six commonly-used pliers, including 10" quick-snap, 8" combination, 6" and 7" HD diagonal cutters, 8" HD long nose, and 8" bent nose precision pliers. The set features soft rubber coated handles for limited slippage, multi-positioned channels for more gripping power, and is made from chrome vanadium electric steel that has been forged and multi-stage oil-hardened. The quick-snap pliers also offer "self-gripping" teeth to prevent slippage. The set comes in a custom-cut foam insert carrying case for easy organization and mobility.

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CUSTOMER REVIEW:
 “The soft grips and high-quality metal is unbeatable and worth every penny. To make it even better, the custom foam storage helps tremendously with storage. These aren't your typical hardware store pliers.”



CLEANS AND DRIES HEAVY MULTI-PORTED PARTS

The **Renegade I-Series 4824 Pass-Through Wash, Rinse, Dry Parts Washer System** is designed to deliver multi-stage continuous cleaning efficiency to clean and dry heavy multi-ported parts transported via inline conveyORIZED operation. Each wash and rinse stage compartment contains a 512k

BTU gas immersion heater and spray manifolds with strategically placed nozzles to deliver high-pressure force and high-temperature cleaning. The 225k BTU gas heated dry stage contains dual zones with a 15hp air blower in zone one to remove residual water from even hard to reach cavities and two 2hp heated recirculating blowers in zone 2. The wash zone measures 48" by 24" and has a 750-lb conveyor belt weight capacity.

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Watch this product in action here:
VehicleServicePros.com/21295387

FEATURES A SIMPLE TWO BUTTON INTERFACE

The **Bosch EV3000 30kW DC Fast Charger** is ideal for commercial, workplace, fleet, and public charging. Compact and wall mountable, the charger is also weatherproof and suitable for indoor or outdoor installation. With its simple two button interface, users can plug in and begin to charge, just like a standard Level 2 charging station. The EV3000 Series is also capable of being a connected charging station, following OCPP network protocol, allowing owners to select a private charging network or open the station publicly. Compatible with vehicles using the SAE J1772 Combo connector found on most electric vehicles in North America.

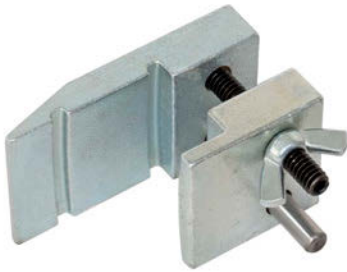
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NEW PRODUCTS



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PREVENTS DAMAGE TO THE BELT

The **Lisle Corporation Stretch Belt Installer for Double Pulleys**, No. 59350, is designed to install the main stretch belt on extra-deep double pulleys. Works on 2011 and newer Ford 3.5L EcoBoost and 3.7L engines, as well as 2019 and newer GM 5.3L and 6.2L engines. Inside of the tool is engineered to fit securely on the front side of the pulley. The tool holds the belt on the pulley as the engine is rotated clockwise to install the belt. It helps prevent damage to the belt or pulley during installation.

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Watch this product in action here:
VehicleServicePros.com/21287186



REMOVES SPOT WELDS, RUST, AND MORE

The **Ingersoll Rand 360 Series Pneumatic Belt Sanders**, Nos. 360-313 and 360-418, are designed to make quick work of material removal and deliver smooth finishes. Featuring a 0.6hp motor, the tools are ideal for removing spot welds, rust, deposits, and burrs, as well as fine-tuning a finished surface. The tools offer tool-free belt changes (the 360-313 uses 3/8" by 13", while the 360-418 uses 1/2" by 18") that make switching from one abrasive to the next quick and convenient, as well as a tool-free articulating arm that ensures every nook and cranny is easily reached.

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OIL-AND-SLIP-RESISTANT RUBBER OUTSOLE

The **KEEN Utility Reno Work Boot** delivers a lighter, faster work boot steeped in outdoor tradition, but designed for the demands of the modern job site. The versatile boot features KEEN.Bellows Flex technology, to offer multidirectional flexion making bending, squatting, kneeling and knee-down work up to three times easier, the company says. Other highlights include a KEEN.ReGEN midsole that returns energy, a KEEN.KonnectFit heel capture system to lock the heel down for sure-footed stability, and an ankle-height engineered mesh upper and KEEN.DRY waterproof, breathable membrane to provide dependable performance. The Reno also offers asymmetrical carbon-fiber toes and an EH-rated, oil-and-slip-resistant rubber outsole. Available for both men and women in several colorways and collar heights.

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FEATURES A 2" JAW OPENING

The **Channellock 10" WIDEAZZ Adjustable Wrench**, No. 10WCB, features a 2" jaw opening, providing 72 percent wider jaw capacity than standard wrenches of the same size—all in a lightweight, compact 10" adjustable wrench supporting larger nuts and bolt sizes, says the company. The combination of a smart and comfortable tapered handle design with Code Blue grips, a 4-thread knurl, and minimal head width improves performance in confined spaces. The Channellock adjustable wrenches are made in Spain and forged from rugged chrome vanadium steel.

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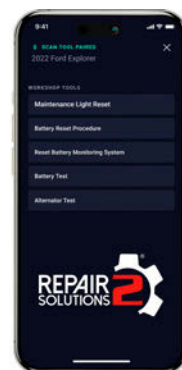
OFFERS 1,250 FT-LBS OF LOOSENING TORQUE

The **AIRCAT 1/2" Composite Impact Wrench**, No. 1125, weighs 3.8 lbs and offers 1,250 ft-lbs of loosening torque and 1,000 ft-lbs of maximum torque. Other notable features include a twin hammer mechanism, a patented ergonomic handle design, a patented quiet-tuned exhaust that reduces noise level to 87 dBA, an easy-to-use forward/reverse power management lever, and a low-weight, durable composite housing with a magnesium hammer case. The tool measures 7.1" in length.

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INCLUDES EXPANDED MODEL YEAR COVERAGE

The **Innova Electronics OBD2 Scanner Tools and Dongles Software Update** includes coverage and support for vehicles through model year 2022, added functionality, and enhanced RepairSolutions2 app features. Expanded tool functions include more active test and special function capabilities, such as battery reset, battery initialization, battery and alternator test and maintenance light reset supporting popular vehicle makes, including GM, Chrysler, Ford, Honda, Hyundai, and Nissan. The update also brings several enhancements and new features for compatible dongle tools, including



maintenance and oil light reset, battery reset procedures, battery initialization for compatible BMW, Ford, and Volvo vehicles, as well as the ability to perform battery and alternator tests.

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4-DEGREE ARC SWING

The Milwaukee Tool 3/8" Drive 9" Flex Head Ratchet has a 4-degree arc swing that provides technicians the adaptability to work in spaces with different angles. The ratchet head can be locked into nine unique positions or left unlocked for free movement during use. The slim profile head and flush directional and locking levers offer accessibility in tight spaces. The all-chrome finish makes cleaning the flex head ratchet easy. Also available in 12".

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FOR TIMING SERVICE AND REPAIR

The CTA Manufacturing BMW/Mini Timing Chain Tool Kit - N12, N14, and N16, No. 3770, features specialty tools required to perform timing service and repair, including camshaft locking blocks, flywheel locking pin, timing chain tension block, and upper chain tension locks. With the kit, users are able to accurately locate TDC for servicing and repairing the head gasket and timing chain. The tools service R55-R61 models 2007 to 2016 (Cooper, Paceman, and Countryman).

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BATTERY OR MANUAL DRIVEN

The Vessel Rechargeable Ball Grip Screwdriver with 25-pc Bit Set, No. 220USB-25U, is ideal for working in tight areas. The cordless screwdriver can be used manually for higher torque or breaking screws loose or electric powered for quick tightening. The screwdriver charges in one hour and includes a USB cable for recharging. Also included is an extension for the bits. The kit comes in a solid plastic case.

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FEATURES A MAXIMUM GLOVE OPENING OF 4.5"

The **Oni Tools Sheppard M110 Gear Box Pitman Arm Puller**, No. ONI349T, is designed to easily remove pitman arms on Sheppard M110 steering boxes with its high-strength steel casting design made for high capacity pulling. Featuring a maximum glove opening of 4.5", the pitman arm remover eliminates dangerous hammering or cutting torch methods, and can be used with up to a 3/4" air impact wrench, hand ratchet, or breaker bar. Engineered to fit for Volvo, Mack, Kenworth, Peterbilt, Freightliner, Mack, and other Class 6 to 8 transportation trucks and equipment.

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IDEAL FOR COOLING AND WASHING

The **Exair 3/8 NPT HollowStream Cone Liquid Atomizing Nozzle** provides a hollow cone spray pattern for pressurized liquids. The nozzle is ideal for cooling, cleaning, dust suppression, sanitizing/degreasing, and lubricating. Its right angle design is compact and can fit in small areas. With the HollowStream nozzle, the liquid is supplied into the body of the nozzle creating a swirling action within a vortex chamber. This vortex produces the hollow-cone spray pattern when the precision nozzle breaks the liquid surface tension as it exits the orifice and into a controlled spray angle. The nozzle is CE compliant and available in a variety of flow rates.

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EQUIPPED WITH BOTH COLD AND HOT GLUE PULLING OPTIONS

The **Dent Fix Equipment GLUEMAX Glue Repair Station**, No. DF-GM/DXE, is a pulling station equipped with both cold and hot glue pulling options to repair damage in automotive steel and aluminum panels while preserving OEM coatings and interior integrity. The station can be used for application from heavy duty glue GPR pulls to cosmetic PDR corrections. With an enclosed and lock-able cart, the GLUEMAX Glue Repair Station protects its tools from the shop environment.

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OFFERS NINE LOCKED AND UNLOCKED POSITIONS

The **GEARWRENCH 120XP Locking Flex Head Ratchet** is designed to access hard-to-reach fasteners. The locking flex head allows nine locked and unlocked positions for adjustable angled access that provides the ideal balance of use. The double-stacked pawls engage a 60-tooth gear to give 120 positions that deliver a 3-degree swing arc to turn fasteners in tighter confines. Additionally, the 120XP Locking Flex Head Ratchets exceed ASME torque performance requirements and provide extended reliability when used in high-torque applications.

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SERVICES BOTH R-134A AND R-123YF

The **TEXA Konfort 780 Dual Gas Touch A/C Recovery Machine** is designed to allow users to alternate services on vehicles equipped with refrigerants R-134a and R-123yf, since it has two tanks and two separate circuits for recovery, recycling, and recharging. The service process is automated. Other notable features include airtight oil bottles, a scale locking/unlocking device, a refrigerant weight accuracy check system, and an automatic cleaning device for all the hydraulic ducts. The Konfort 780 Dual Gas Touch also sports a 10" color multi-touchscreen display, Wi-Fi connectivity, and a Bluetooth module which allows users to connect the station with several accessories such as an A/C efficiency kit, built in thermal printer, dedicated phone app for remote access, and more.

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The **GEDORE GDA Solution Cordless Bolting Tool** is ideal for smaller bolting needs. Compact in size, the bolting tool features a sunlight-readable color display, brushless technology, consistent peak power until battery is completely discharged, accident prevention, and an automatic switch-off when torque is achieved. With a repeatability of +/- 3 percent in first gear, torque selection is stepless. The second gear can be used as a non-torque accurate high-speed gear. Additionally, the tool offers 54 rpm, 1/2" drive, a torque range from 51.5 ft-lbs to 185 ft-lbs, 78.7 dBA, and can be calibrated to higher torque upon request. Straight and angled versions are also available.

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PALM COATING ADAPTS TO MOST ENVIRONMENTS

Magid VersaTek Work Gloves feature a palm coating engineered to read the environment and adapt to amplify the worker's grip when working in wet, dry, slick, abrasive, or oily conditions. Along with the intelligent coating technology, VersaTek gloves are also designed for maximum comfort and flexibility so workers can maintain natural hand movements and precision when handling small parts. VersaTek is available on select Magid AeroDex and DX+ Technology styles.

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FOR TWO OR THREE-HOLE APPLICATIONS

The **Performance Tool Harmonic Balancer Puller**, No. 160, is designed to remove balancers, pulleys, and gears. It features four slots in the yoke, allowing for two or three-hole applications. The puller is constructed from drop forged heat-treated alloy steel for strength and durability. It bolts to the balancer with the center screw on the end of the crankshaft. Contains 10 bolts: two 3/8-16 by 4", two 5/16-20 by 3-3/18", three 3/8-24 by 2-1/4", and three 5/16-18 by 2-1/8".

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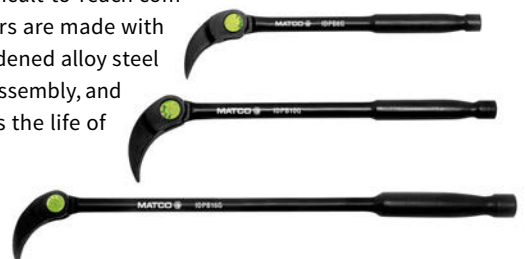
The **Cat Footwear Impact Waterproof Work Boot** is designed for the modern-day worker. Made with ReVive Tech, the work boot is engineered to provide comfort and support with lightweight cushioning that is durable. Its SRX slip-resistant rubber outsole is abrasion resistant, performing against oil and water as well as providing ideal traction on slippery surfaces. Additionally, the soft toe work boot is waterproof and offers electrical hazard protection against open circuits up to 600V in dry conditions.

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INCLUDES THREE LENGTHS: 8", 12", AND 16"

The **Matco Tools 3-pc Indexing Pry Bar Set**, No. IDPB3G, is optimal for engine bays and chassis work. The set includes three lengths: 8", 12", and 16" and sport a green highlight. With up to 180-degree blade adjustment with multiple locking index points, the pry bars allow for improved access on difficult-to-reach components. Built to last, the pry bars are made with quality components through hardened alloy steel handles, blades, a locking spline assembly, and a steel push-button that extends the life of the pry bar.

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CAPABLE OF LIFTING UP TO 4,000 LBS

The **BendPak Mobi-EVS EV4000SL EV Battery and Powertrain Lift Table** is a push-around full-rise scissor lift table that is ideal for EV service and battery pack replacement. The 40" by 60" platform is capable of lifting up to 4,000 lbs. With a press of the button on the pendant control, the space-saving lift platform elevates to more than 6' in less than 20 seconds, the company says. Other notable features include full-length utility trays on both sides, a stowable tow bar, a heavy duty 12V DC power unit with deep cycle battery, an onboard battery charger, manual floor locks, and zero-throw casters. The lift also meets or exceeds the standards prescribed by ASME PASE 2019.

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The **Mueller-Kueps Multi-Cleaner**, No. 460 300, is a universal cleaning tool ideal for brakes, exhaust, and more. Kit includes one handle, one 40 by 110mm cleaning pad, and one 50 by 110mm cleaning pad.

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ADDITIONAL FOOT OF LEAD WIRE

The **Thexton Extended Back Probe Spoons**, No. 914X, are designed to access electrical circuits from the rear of the connector to prevent piercing wires and possibly damaging the circuit. The 914X is ideal when space is limited for back probing. The additional foot of lead wire offers flexibility and ensures a good connection with a voltmeter. Made in the U.S.A.



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NEW PRODUCTS



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LARGE BACKLIT LCD DISPLAY

The **Mastercool Black Series Compact 2-Way Digital Manifold Gauge Set** performs pressure and temperature calculations for up to 91 different refrigerants, including R-134a and R-1234yf refrigerants. The compact manifold provides an automatic shut-off, offers unit conversions, and displays alarm indications (over range, Celsius or Fahrenheit designation, and low battery warnings) directly on its large backlit LCD screen. It also features easy-to-grip knobs, a large sight glass for quick visual refrigerant checks, an accuracy of +/- 0.5 percent FS, and a resolution of 0.5 psi.

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ENHANCED 23MY COVERAGE

The **AutoEnginuity Giotto Version 21.0** for the Windows platform offers enhanced 23MY coverage and improved general support. Other highlights include new enhanced domestic support for Chrysler, GM, and VAG coverage. Examples include added Global-B support for MY22.5 GMC Sierra and Chevrolet Silverado trucks, added module address detection specific for Jeep Wagoneer and Grand Cherokee L models, and added basic settings and output tests for Audi e-Tron vehicles.

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PROVIDES UP TO 100A WITH REAL CCCV FOR ECU RE-FLASH

The **E-XTEQ 1012EVO Battery Charger and Maintainer** is an automatic 12V charger with quick diagnostics for flooded, AGM, EFB, deep cycle, and more batteries. It provides up to 100A with real constant current constant voltage (CCCV) for ECU re-flash. Other notable features include an intuitive 4.3" LED touchscreen display, an engine start auto detection, a self-protected reverse polarity indicator, and an ARGOS cloud-based user interface for data collection. The 1012EVO is built to last in a workshop environment with its aluminum body and anti-scratch mounting magnets with rubber coding and shock proof silicon shell.

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The **JET Tools JLA Compact Lever Hoist Series** include three models: 0.75-ton, 1.5-ton, and 3-ton. All feature a compact design, allowing users to get into tight areas. With safety at the forefront, the hoists are backed by an auto-engage clutch that allows for easy load chain adjustment while protecting against accidental freewheeling under load. Each model also offers a fused brake for low maintenance safety, Zinc-plated Grade 100 load chain, cast steel latches, a western-style double pawl system for added safety, and a short handle to get into tight areas.

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The **Titan Professional Tools Non-Aerosol Sprayer** is designed to help eliminate dangerous or harmful propellants. It features an operating pressure of 80 to 150 psi and is refillable. The eco-friendly sprayer is not recommended for use with paint products and is not to be used with flammable propellants. Available in orange, green, and black.

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The **CTEK CS FREE Solar Panel Charge Kit** works with the CS FREE 4-in-1 portable charger without connecting to a power outlet, so you can charge and maintain your vehicle battery wherever you are. Made from super-tough fiberglass, you simply unfold it and connect it to your CS FREE in seconds, giving you the ultimate freedom from power outlets. Waterproof, weather-resistant, and durable, the Solar Panel Charge Kit includes a convenient carry case with an adjustable kickstand for flexible 180-degree positioning.

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Tools for servicing **A/C systems**

Modern vehicle air conditioning systems now have several different configurations and can be damaged if the proper procedures, refrigerants, and oils are not utilized.

By Ross Colket, Contributing Editor



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It will soon be that time of the year when we will be breaking out our A/C machines regularly to service our client's vehicles. There are so many variations on vehicles these days that when servicing these systems, you must consult your service information before working on a vehicle's A/C system.

When working on hybrid or electrified vehicles, you will most likely be working with a three-phase alternating current A/C compressor that typically runs on several hundred volts. You will see your typical high voltage (HV) orange cabling running to the compressor to let you know you are working with a high-voltage system. Yes, those voltage levels are extremely dangerous, so make sure to follow manufacturer service directions.

Other concerns for EVs include the correct compressor oil and even specific dye for the HV compressors. If either the wrong oil or dye is used,

they can set HV circuit isolation faults, shutting the A/C system down. We use Tracer Products Fluoro-Lite because it meets manufacturer specifications for the HV system requirements (having high dielectric properties). If the wrong oil is used, most of the manufacturers do not have any service procedure to correct the contamination other than replacing all the system's components. Keep in mind, for vehicles that the compressor is driven directly (without a clutch), you cannot run them without a refrigerant charge. You risk internally damaging the compressor.

When working on a modern A/C system, you must have a professional-grade scanner to look at the HVAC system information. It can give you access to system pressures, temperatures, flow valves, and much more. In fact, the modern A/C systems on many Chrysler vehicles can take all the system data and self-diagnose.

You will also need the scanner to have bidirectional controls to operate system

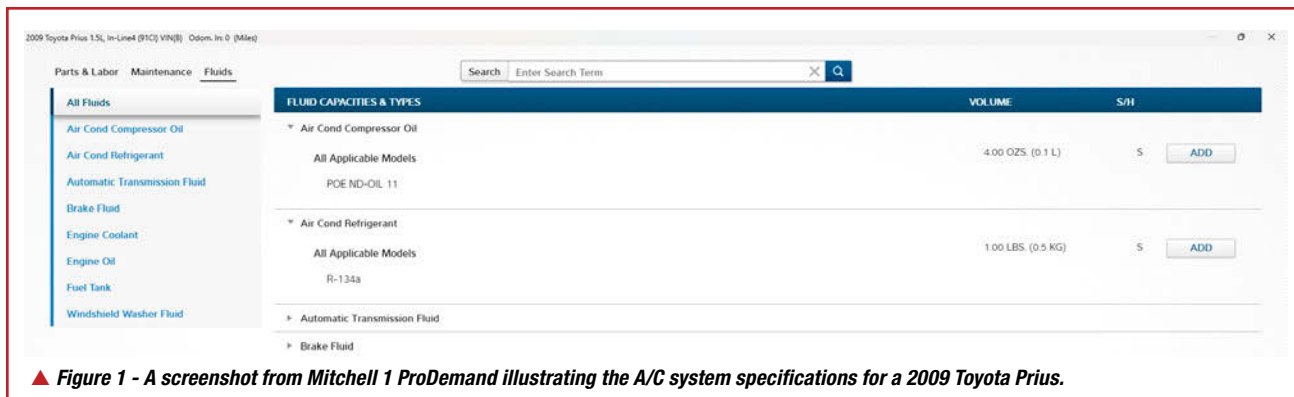
components (such as the flow valves, actuators, and clutches). One thing to remember is that the air conditioning system really is conditioning the air (removing heat and moisture). An example of this would be a vehicle in that the A/C system is working normally, but the air coming out of the vents is 90 degrees F. Remember that in the HVAC box, all of the air goes through the evaporator first, but the air is redirected through the heater core if warmer cabin temperatures are desired. If you have a malfunctioning temperature door or actuator, it is possible to have 90 degrees F coming out of the vent, with colder cabin temperatures desired. Even with a properly operating A/C system refrigerant loop, since the air is not being directed away from the heater core, it will be heated.

REFRIGERANT OILS

We started with mineral oil as a lubricant in the R-12 systems, and it worked well, but the problem arose when those systems were converted to R-134a. The R-134a refrigerant would not carry the mineral oil molecules and, therefore, could not lubricate the compressor.

When doing R-134a retrofits, the systems were to be flushed and then filled with either Polyalkylene Glycol (PAG), or ester oil, both being synthetic oils. The problem with both PAG and ester oil is that they are both hygroscopic, meaning they will absorb water. If this occurs, the mixture will create hydrofluoric acid and damage the internal components of the A/C system.

Also, keep in mind that it is important to use the correct weight of PAG oil. There are three different weights typically used in the automotive industry (46, 100, and 150). Where 46 and 100 are the most common,



▲ Figure 1 - A screenshot from Mitchell 1 ProDemand illustrating the A/C system specifications for a 2009 Toyota Prius.

GM did use 150 in the 1990s and early 2000s. PAG oil is also used with R-1234yf refrigerant. Use your repair information to research the correct oil (and amount) along with the correct refrigerant charge for the vehicle that you are servicing. You can see the required specifications from Mitchell 1 ProDemand for a 2009 Toyota Prius (Figure 1). Remember that when replacing A/C components, they should be drained of all oil, and the collected oil

should be measured to ensure the correct amount of oil is put back into the system. Either too little or too much oil can potentially damage the compressor.

For servicing R-134a, we've used a Robinair 34788 machine for the past 15 years (Figure 2). It has serviced hundreds of vehicles throughout its life. We have been religious about machine maintenance by changing the compressor oil and the internal filter. However, we did run into a

problem with the internal solenoid valves sticking. The machine got damaged due to servicing a vehicle that had stop-leak (a system sealing fluid) installed in the A/C system (that we were not aware of until after the fact). We typically avoid servicing those vehicles if we know the customer has used a "stop-leak" type product.

There is one drawback to this A/C machine, it cannot flush the A/C lines. As a result of this, we do not use this machine to



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▲ **Figure 2 - Robinair R-134a machine**



▲ **Figure 3 - Ecotecnics Dual Gas A/C machine**

charge hybrid vehicles. We use Ecotecnics Dual Gas A/C machine for that (**Figure 3**). Before purchasing this machine, we would use Snap-on ACTR4151A refrigerant gauges, a Matco Tools AC98210A refrigerant scale, and a virgin tank of R-134a to charge the hybrid A/C systems. This ensured that we did not contaminate these A/C systems. For R-1234yf systems, we purchased a Robinair AC1234-6 A/C machine, which has a built-in flushing feature to ensure that contamination does not happen (**Figure 4**).

There are many options for A/C machines on the market. Do your homework to see which one is right for you. I prefer separate machines for each refrigerant. In the event the machine breaks, you are not shut down on both refrigerants. However, if space is a concern, a dual machine can be quite convenient.

DIAGNOSTICS

When it comes to diagnosing A/C system performance, most technicians will look at the system pressures and the vent duct temperature. I strongly suggest starting with a full vehicle scan of the car. Remember that when you push the A/C button, you are not turning on the A/C directly. You are asking the vehicle to turn on the air

conditioning. There may be other faults in the vehicle that are keeping the vehicle from operating the A/C system.

A complete visual inspection should be made under the hood. Look for anything that is out of the ordinary. Check the engine cooling fan for proper operation and that there are no restrictions to the airflow through the condenser. I have run across vehicles that had accumulated quite a bit of debris between the radiator and condenser. This condition caused poor performance symptoms in the A/C system and higher than normal system pressures (as the refrigerant wasn't being cooled enough).

The most effective way to properly diagnose the operation of the system is to take temperature measurements at multiple points through the A/C system's refrigerant loop. The measurements will be taken at the inlet and outlet ports of the A/C components. This can then be considered to determine the actual cause of the failure. The main concept of temperature measurement comes from the fact that refrigerant temperatures directly correspond to their pressure. By taking these measurements, you can see the specific pressure in the system at each location and not just at the service ports.

Remember, the key to the air condition-

ing system is the evaporation and condensing of the refrigerant. The air conditioning isn't blowing cold air. It absorbs the heat energy from the cabin air and transfers it to the condenser, where the refrigerant then transfers the heat to the atmosphere.

To learn more about temperature testing of the A/C system, Jim Cokonis, an instructor and curriculum developer for Carquest Technical Institute, wrote a great article on enthalpy charts. (The article can be found on PTEN's website, vehicleservicepros.com/21220569).



▲ **Figure 4 - Robinair R-1234yf machine**

TOOLS USED:

- TRACER PRODUCTS UV DYE
- ECOTECHNICS DUAL GAS A/C MACHINE
- SNAP-ON REFRIGERANT GAUGES
- MATCO TOOLS REFRIGERANT SCALE
- ROBINAIR R-134A AND R-1234YF A/C MACHINES

Enthalpy charts detail the performance of the refrigerant as it moves through the refrigerant system. Learning to use an enthalpy chart will lead you to the fastest and most accurate way of diagnosing a system failure.

In closing, if you experience a compressor failure and debris has traveled through the entire system, not only must you replace the receiver/dryer or accumu-

lator, but you should plan on replacing the condenser. Today's condensers have much smaller tubes for better heat transfer. As a result of the smaller tube size, it's nearly impossible to flush out the debris entirely from the condenser as it will become stuck in the tubes.

The evaporator should be replaced as well for the same reason, but in many vehicles, it's not practical for the required time. Make sure to thoroughly flush the evaporator and the rest of the A/C system. If enough of that debris stays in the system, you will ultimately damage the new compressor.

Many of our suppliers have begun selling A/C kits that will include most of the parts needed to repair the A/C system properly after a major failure. Don't forget to replace the orifice tube as well when dealing with a compressor failure. A good A/C job will also include the replacement of the receiver/dryer or

accumulator anytime the system has been opened to the air. There are desiccant bags that will absorb moisture while the system is open and will negatively affect system performance if not replaced.

Like anything else, performing a proper A/C system repair requires patience and a thorough approach. Taking shortcuts and skipping some of the suggested items above can ultimately lead to a comeback, more damaged components, and overheated customers. ❌



ROSS COLKET is the owner of Colket Automotive Technical Services in Lansdale, Pennsylvania. He is an ASE Certified Master Technician with over 30 years of experience as both a technician and educator. As a former CTI instructor, he believes in the importance of training and giving back to the industry. Ross fully supports and believes in Motor Age's mission to "advance the automotive professional."



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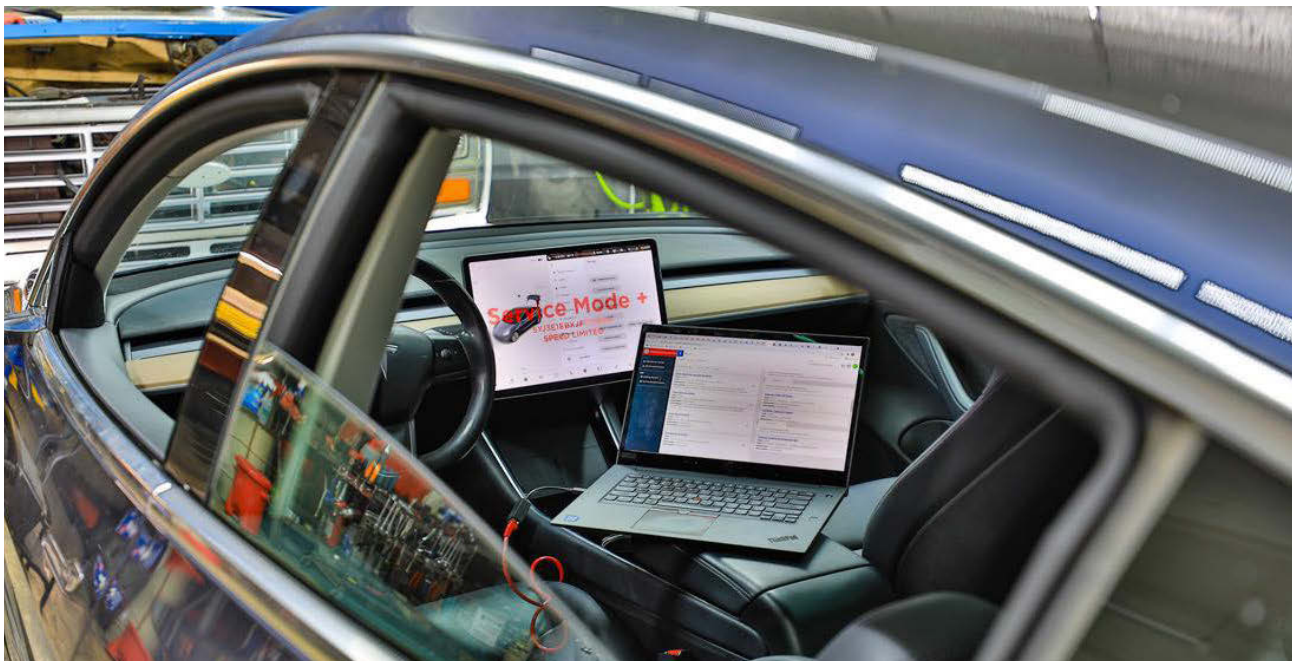
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Tesla service and repair

Experience the cutting-edge technology of Tesla vehicles and prepare to deliver proper service and support.

By **Scott Brown**, Technical Editor



Tesla 'Service Mode'

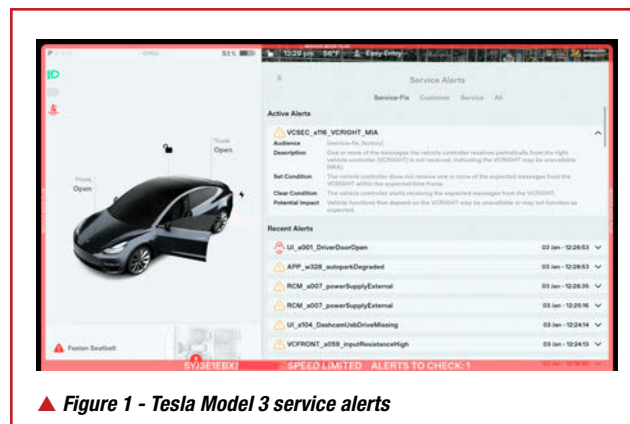
Tesla vehicles have been in the market for several years now and you may have already had one or more visit your service facility. Nevertheless, there are about 1.7 million EVs on the road in the U.S. and according to *Electrek.com*, over two-thirds of those are Teslas. I strongly believe that these vehicles are revolutionizing the way cars are built and serviced, but it's all not positive. As an owner of one of these machines, I've seen some interesting trends and feature changes with these vehicles. So, let's dive in and take a closer look.

As far as service goes, Tesla vehicles are generally considered to be relatively easy to work on. They are designed with long-term reliability and minimal maintenance in mind, and many of the maintenance tasks that are required can be done by using a few basic tools.

There are also more complex maintenance tasks that may be required, such as diagnosing and repairing issues with the electrical system. These tasks may require specialized tools and knowledge, which is where the service professional comes in. On a side note, most Tesla owners are more connected and aware of

how their vehicles operate. Anyone considering stepping in to provide service on these vehicles will greatly benefit from possessing a higher level of knowledge of Tesla vehicles. Hopefully, this article will provide a jump start and encourage you to learn more about these cool cars.

Overall, the level of difficulty in servicing a Tesla vehicle depends on the specific task that needs to be performed, as well as the skills and experience of the technician doing the work.



▲ Figure 1 - Tesla Model 3 service alerts

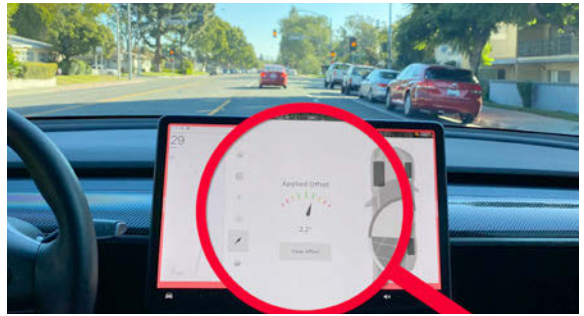
Before you dive in, note that Tesla's new car warranty currently offers the following for its vehicles:

- The battery pack and electric drive components are covered for eight years or 100,000 miles (160,000 km), whichever comes first.
- The remaining vehicle components are covered for four years or 50,000 miles (80,000 km), whichever comes first.
- The paint and finish are covered for four years with no mileage limit.
- Corrosion perforation (rust-through) is covered for six years with no mileage limit.

Keep in mind that these warranties may vary depending on the specific model and location and are subject to change. It is always a good idea to consult Tesla's website for the most up-to-date information on warranty coverage.

SERVICE MODE - HOW TO ACCESS THE DATA WITHOUT ANY SPECIAL TOOLS

Tesla recently opened access to the basic service mode within their vehicles to anyone via a hidden activation feature. Prior to this, access was geo-fenced, meaning that it could only be activated when the vehicle was within a specific geographic area such as a Tesla service center. This is good news for independent



▲ Figure 2 - Tesla wheel alignment offset



▲ Figure 3 - Properly prepping a Tesla for wheel alignment

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UNIVERSAL BALL BEARING EXTRACTOR

The Beta Tools 1547/C6 Universal Ball Bearing Extractor is a must-have for mechanics.

It is designed to remove ball bearings ranging from 25mm-135mm without damaging the surrounding components. This (Universal) dummy ball-bearing extractor will make your job easier with its simple design and easy use.

The 1547/1 comes with extension pullers 205mm long, 3 pairs of bearing removal tips for 5, 6 & 8mm. The 1547/2 comes with extension pullers 102mm and 2 42 & 112mm adapters, 3 pairs of removal tips for 9, 11, and 12.5mm bearings. Tools are kept in a foam tray with a metal case.



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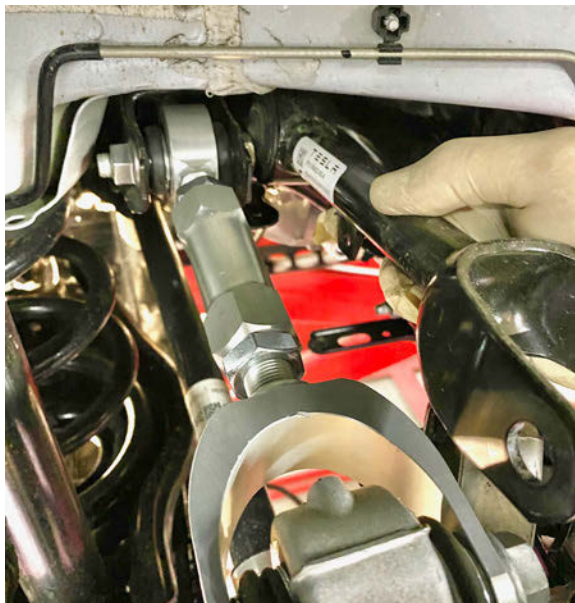
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▲ Figure 4 - Aftermarket camber adjustment link

shops because this was a significant barrier for anyone attempting to properly perform a task such as a wheel alignment.

One thing to remember is that although one has access to these options, special care should be taken in order to avoid something going wrong. I recommend that if you're going to carry out actions, you do so with advanced knowledge acquired through study and attending technical training.

Additionally, activating 'Service Mode' does not provide access to all service modes. You will need to have a subscription to the Tesla Toolbox Software that will allow you to activate 'Service Mode Plus,' which will provide access to additional resources. Access to service information, however, is now available at no charge, all you need to do is sign up on Tesla's website at service.tesla.com.

To enter service mode from the software page, "long-press" on the vehicle model name for about five seconds. Once you release, you'll be presented with a login screen. Enter 'service' and then you'll be presented with a warning screen you'll need to acknowledge in order to activate. Once you're in you'll see a red border added to the display screen with various options.

If there are issues to address, you'll see a message at the bottom of the screen with the number of active service alerts you should be aware of. Touching the 'Service Alerts' button will present you with a list and their visibility levels (Figure 1).

WHEEL ALIGNMENT

Did you know that a Tesla vehicle can alert the owner or service technician if it requires a wheel alignment? The Tesla vehicle's onboard computer continuously monitors the performance of various systems, including the suspension and steering, to detect any issues that may need

attention. If the vehicle's wheels are out of alignment, the computer may detect unusual tire wear or handling characteristics and alert the owner or service technician through the vehicle's onboard diagnostics system or via the Tesla mobile app.

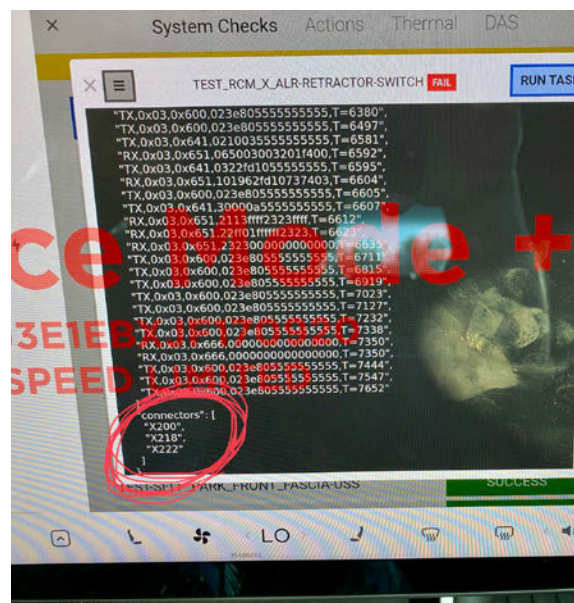
However, when you are in service mode you can pull up the chassis tab and have a look at the overall applied offset, which is what the system has arrived at after monitoring certain data parameters to detect a vehicle tracking issue. You will not receive a notification until there is a very large offset. I've inspected several vehicles and have found many of them in the 2-3 degree range as shown in Figure 2. I've personally aligned many of these cars and have taken the learned offset inside of 0.4 degrees.

Performing a proper alignment should be done as recommended by the service manual, which is with 300 lbs of ballast added to the vehicle and adjusted to achieve the ride height specifications (Figure 3).

As with most vehicles today, not all angles are adjustable through conventional means however the service manual states the following:

"The Model 3 and Model Y vehicles do not have dedicated adjustment points for camber and caster. Instead, camber and caster are adjusted by manipulating the suspension lash and slop. The real-world accuracy of these adjustments is achieved by installing ballast bags to simulate the presence of a driver and front passenger. Performing this service procedure without ballast bags compromises the real-world accuracy of the adjustments."

There are options as some aftermarket companies are now offering solutions for achieving proper alignment angles. We have begun installing components offered by a company called



▲ Figure 5 - Connectors of interest

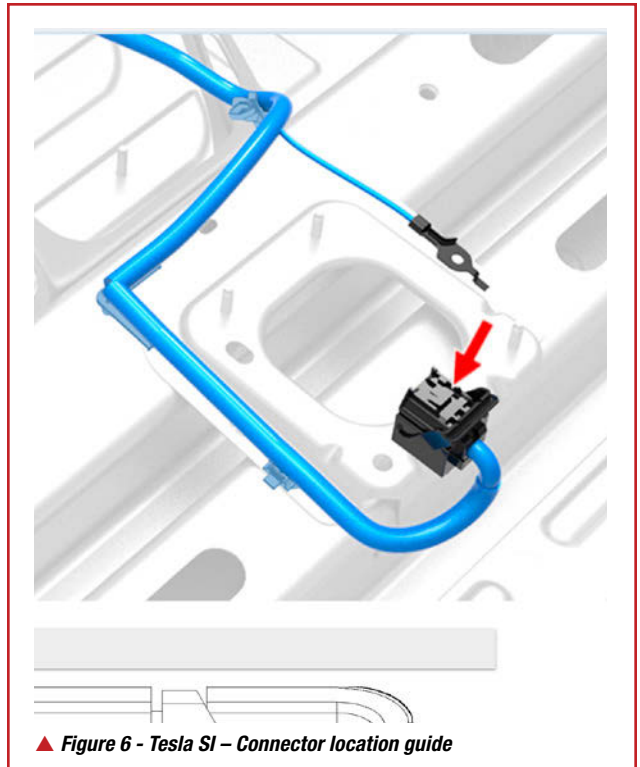
Unplugged Performance located in Los Angeles. We've seen a few Model 3's and Y's requiring rear camber adjustment and their replacement control links work well (Figure 4).

DIAGNOSTICS

From what I've observed thus far, Tesla's service information doesn't really have any diagnostic flow charts. However, when you're chasing down a service alert and running actions, you may be presented with connector numbers (Figure 5) where you would then look at service information, wiring diagrams, and connector locations (Figure 6).

Tesla's wiring diagrams may take a little getting used to. I recommend taking some time to study the initial pages on any of their current diagrams to learn more about the legend. A lot of information is shared there that can help you navigate the wiring diagrams with more efficiency.

When you're within the Toolbox application running on your PC or laptop, oftentimes you'll find contextual links taking you right into the service information. However, there are features within service information that (as of the writing of this article) are not available to the aftermarket, such as the 'Interactive Schematic Tool.'



▲ Figure 6 - Tesla SI - Connector location guide

CASE STUDY

I own a 2018 Model 3, and I recently had a service issue related to the thermal management system. I was never alerted to the issue via the publicly visible notifications. When I entered 'Service Mode,' I was presented with the following error shown in Figure 7.

I proceeded to look in 'Service Information' for any testing info and there was none. The only support provided was in the description shown on the screen, "Check coolant valve harness and/or replace actuator."

I checked the harness connector, and all looked fine, so I ordered a new actuator and replaced it. After replacement, I performed a cooling system bleed procedure where the five-way valve went through a calibration routine resulting in the error message disappearing. I decided to do a post-mortem on the five-way valve and found the failure (Figure 8).

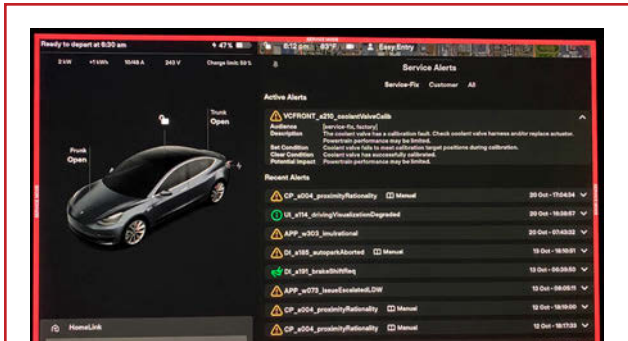
HIGH VOLTAGE SYSTEMS

Hybrids have been around for about two decades and high voltage (HV) training has been available for quite some time, so I will suggest that if you haven't had

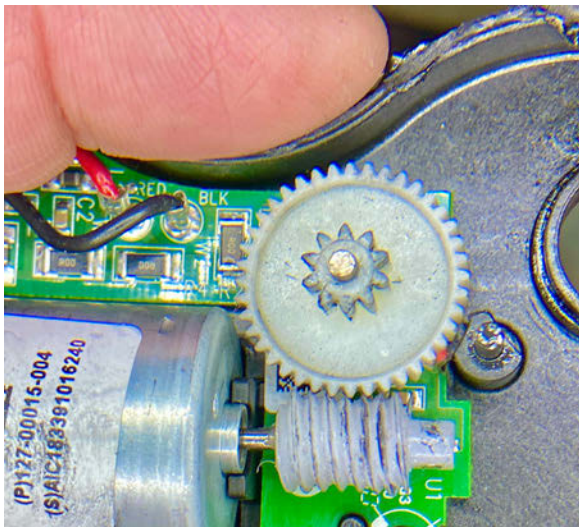
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Cat. No. 21200
Originally designed to allow a lone technician to test for voltage drop on top battery posts; its handsfree operation is a useful diagnostic tool when a third hand is needed.

- Works with standard 4mm banana plugs
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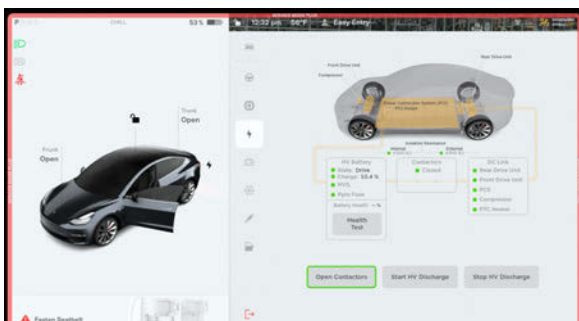
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▲ Figure 7 - Five-way coolant valve calibration failure



▲ Figure 8 - Five-way coolant valve stripped gear

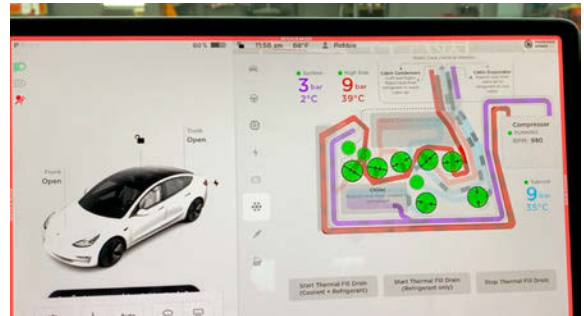


▲ Figure 9 - High voltage information

proper HV training you do so ASAP if you're going to be servicing any of these systems. The HV tab in 'Service Mode' offers quite a bit of information about the HV system (Figure 9). Always refer to the latest service information when performing service on Tesla vehicles.

COMFORT SYSTEMS

Tesla vehicles use either R-134a or R-1234yf for their refrigeration systems with newer vehicles utilizing a heat-pump system which brings a new level of complexity to the refrigeration loop. Performing system service on these systems will require



▲ Figure 10 - Model 3 with heat pump



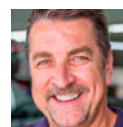
▲ Figure 11 - TEXA AIR2 SAN Ozone Sanitizer

the technician to enter 'Service Mode' and prepare the system for service. As mentioned earlier, reference the latest service information before service. Regarding the heat-pump system, a recent software update to the 'Service Mode' menu provides a highly verbose view of the overall system where the technician can operate various modes and observe the refrigerant flow, temperatures, and pressures (Figure 10).

Cabin air filters are a service item we perform regularly not only on Teslas but all vehicles. In addition to that, we also recommend performing an ozone sanitization treatment service using the TEXA AIR2 SAN unit (Figure 11). This is a service we sell a lot of and is highly effective. All my employees also perform this service on their own vehicles as well.

GET TRAINED

Although we've touched on several areas, there's still a lot more to be aware of on these vehicles. However, service training and knowledge will go a long way in developing a higher level of awareness of Tesla vehicles. ✖



SCOTT BROWN is an ASE Master Certified L1 Technician and has over 37 years of professional service industry experience. He is an independent shop owner in Southern California and is engaged at various levels within the industry. He has a deep understanding of the challenges technicians experience at the service level and is continuously striving to move the industry forward through education and networking. Brown found Diagnostic Network (diag.net) after 22 years of service at iATN, where he is retired as company president in 2018.

sbrown@vehicleservicepros.com

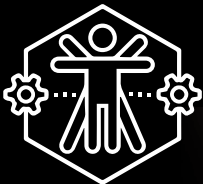
WORK MEETS COMFORT



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Matco Tools 5-pc Air Hammer Socket Sledge Set

Reviewed by Brian Culotta, shop foreman/master technician at Dave's Auto Care in Willoughby, Ohio.



Q: How did the tool function as far as saving you time?

A: This air-hammer socket wrench was a great tool to add to my arsenal of tools needed to get hard-to-reach nuts and bolts loose.

PRODUCT DESCRIPTION

The **5-pc Hammer Socket Sledge Sets, Nos. MSTSBMHM5R and MSTSBAHM5R** from **Matco Tools** can quickly and easily break loose stuck fasteners, allowing users to save on time by breaking loose fasteners without removing components on the vehicle. The sets come in either a manual or air hammer option. The kits contain the five most common and requested sizes for suspension, frame, engine, transmission, and component bolts.

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Living in the "rust belt," it is not uncommon to need unconventional tools to accomplish certain tasks.

Q: How has using this tool impacted your shop's profitability?

A: Often, in automotive repair, technicians may find themselves needing to remove unrelated components to be able to access the component in need of replacement. This tool can potentially be a solution to access "hidden" hardware that would typically be inaccessible. Shortcuts that do not degrade service quality are a key factor in a shop or technician's success. Efficiency ultimately equals profitability.

Q: Is there any way you could think to improve or add to this tool?

A: More sizes! The first opportunity I had to use the tool, I needed a 15mm which is not included in the set. I hope there will be an expansion set in the future to fill in the missing sizes. Also, it would be nice to have a

universal tool in this style that would accept a conventional socket. This could be a solution to needing additional sizes or socket depths.

Q: How easy was it to use?

A: The tool can be a little tricky to use due to the complexity of angles, the length of the tool, and having to hold an air hammer at the same time. That, however, is not a complaint but more so the "nature of the beast." Specialty tools often provide similar experiences.

Q: What features did you like?

A: The long reach of the tool was great, along with its articulating head, which provided access to fasteners I couldn't reach with conventional tools. I do like that the "hex" end of the tool is a 6-point. This prevents the tool from causing damage to the fastener while "hammering" it loose. This tool set can also save your conventional tools (including your own body parts) by keeping you from striking your conventional tools, yourself, or a coworker with a hammer.

Q: What types of jobs/repairs did you use this tool for?

A: The first time using the tool, I used this to loosen the upper control arm bolts on a GM truck to perform an alignment. This offered a quick "zap" to the nut to break it loose. I've also used the tool to break turbo-flange nuts loose. I don't think I could have broken them loose without having to remove other components out of the way had I not had this tool.

Q: On a scale of 1 to 10, how would you rate this tool overall?

A: An eight – my only complaint was I want more sizes. I feel 15mm and 18mm should be included in the kit. ☹️



BRIAN CULOTTA is a graduate of the Universal Technical Institute in Chicago, Illinois. After graduating, he started working for an independent car dealership as a lead technician for seven years. He then moved to a new job at an independent repair shop where he stayed for three years. He now works at Dave's Auto Care in Willoughby, Ohio, as the shop foreman and ASE Master L1, L3 technician.

This product was given to the reviewer free of charge from the manufacturer.



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TOPDON Phoenix Lite 2

Reviewed by Michael Robinson, a technician at Mobile Auto Solutions in Lansing, Mich.

Q: How did the tool function as far as saving you time?

A: Quick and easy setup, and it was very easy to get the scan report and to share. Somewhat quick scan time for complete vehicle.

Q: How has using this tool impacted your shop's profitability?

A: Coverage is fantastic for the low cost of the scan tool, allowing for savings on more expensive units.

Q: What kind of setup was involved before using the product?

A: Basic information for registration. Also, needed to perform software updates. Both processes were quick and painless to perform.

Q: What features did you like?

A: Love the battery life on the unit so far and how easy different functions are



PRODUCT DESCRIPTION

The **TOPDON Phoenix Lite 2** generates diagnostic reports in a short amount of time in order to assist shops in completing jobs faster and more efficiently. The diagnostic tool is best utilized for basic functions, including ECU lookup, reading and clearing fault codes, and reading data streams. The scanner offers OE-level full system diagnostics for 200+ vehicle makes, and offers 28 different maintenance services such as oil resets, and more, for major vehicle brands.

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to find depending on what you're trying to accomplish.

Q: Is there any way you could think to improve or add to this tool?

A: This tool is impressive in what it can perform. That said, compatibility with all protocols would be nice. I did have an issue where it didn't detect all modules on a '21 Ford Transit 150. With constant updates, I wouldn't be surprised if this is taken care of on a future update.

Q: What types of jobs/repairs did you use this tool for?

A: I used this for scanning a '21 Ford Transit 150, '21 Subaru Eyesight (driver assist) data capture of auto adjustment after static was completed, and a Ford Escape parameter reset options, which does require a code to be obtained.

Q: How was its packaging? Did it come with any accessories?

A: Packaging was some of the best I have seen for a scan tool. It came with adapt-

ers for different applications like BMW underhood connection on older models to ensure compatibility.

Q: Have you used a previous version of this tool?

A: This was the first TOPDON scan tool that I used but not the first aftermarket scan tool I have used. This tool is very impressive for price and will handle repairs that higher-end scan tools may not.

Q: How would you rate this tool overall?

A: I would rate this tool a 10 due to the low cost of the tool and the impressive coverage it has so far. I doubt anyone will find a more capable scan tool for less. ✖



MIKE ROBINSON is a Master Certified Technician with ASE, State of Michigan, and service vehicles all across Michigan. Robinson has been an automotive technician for over 23 years.

He was also a professional welder and fabricator and has a passion for metalwork. Robinson is a member of Trained by Techs and fully believes in continuous training.

This product was given to the reviewer free of charge from the manufacturer.

Rislone Cat Complete Fuel, Exhaust, and Emissions System Cleaner

Reviewed by Lou Fort, Lead Technician,
K.A.R.S. Inc., Huntingburg, Ind.

Q: How did the product function as far as saving you time?

A: Rislone Cat Complete is hard to classify as a “time saver,” but I suppose it could be if it works as intended.

Q: What kind of setup was involved before using the product?

A: Proper setup only involves following the directions for use, primarily by knowing how much fuel is in the tank.

PRODUCT DESCRIPTION

The **Rislone Cat Complete Fuel, Exhaust, and Emissions System Cleaner** helps customers pass emissions smog tests, turn off check engine lights, clear OBD codes, improve vehicle performance, and save gas. The cleaner is added to a half-tank of gas to clean the vehicle’s entire fuel, exhaust, and emissions system. The product uses a proprietary blend of heavy duty detergents and solvents to remove contaminants, soot, carbon build-up, and oily residue from the fuel injectors, combustion chambers, and more. Other chemical ingredients react with the gases created in the combustion process to remove remaining inorganic deposits.

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Q: How was its packaging?

A: Rislone has covered the box with promises/claims of what the enclosed bottle of elixir can do. It has usage instructions clearly listed, and four of the main codes its intended use may solve. There’s a promise of your money back if it doesn’t work for you.

Q: What features did you like?

A: I like that it’s a detergent and a cleaner in one.

Q: What features didn’t you like?

A: While it won’t be Rislone’s fault, I wonder how many will follow the instructions as they are given, as it will make a big difference, I’m sure.

Q: What types of jobs/repairs did you use this product for?

A: I tested the Rislone Cat Complete on four different vehicles to best judge its effectiveness. The first one I tested was a 2004 Tacoma with over 500,000 original miles. For the past year, we have been resetting a pesky P0420 on it about once a month. My second test vehicle was a 2012 Honda Odyssey that we replaced the head gaskets on. It had a P0420 set just prior to the bad head gasket diagnosis. The third test was with a 2009 Ford Focus, this one had been extremely neglected. My last test vehicle was a 1999 Ford Taurus with just under 400,000 miles on the clock.

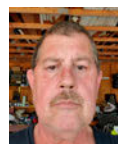
After a few weeks of checking up on my subjects, I can report a success rate of 50 per-



cent. This is and isn’t a surprise. The Tacoma would set the P0420 prior to using this product anytime it was test-driven in check mode. After two treatments, one week apart, it did not set the P0420 when tested in the third week. The Honda has also not reported a check engine light issue since the repair. As for the neglected Focus and old Taurus, both still suffer cat codes. Given the Taurus is known to use oil and the Focus is in rough shape, I would have been surprised if it had cured these codes.

Q: Have you used other similar versions of this product?

A: Yes, I have used several professional fuel/exhaust treatments over the years, going all the way back to the MotorVac. Only two of my previously used treatments yielded better results than Rislone’s Cat Complete. Both of those products involved an extensive, time-consuming application, though. These were easily five times the expense, too. ❌



LOU FORT has worked in the automotive industry for 47 years and is the lead technician at K.A.R.S. Inc. in Huntingburg, Indiana. Throughout his career, he has worked for Ford, GM, and

Chrysler dealerships, but the majority of his time has been spent on the independent side. Fort holds an associate’s degree in applied science, along with a year spent studying mechanical engineering.

This product was given to the reviewer free of charge from the manufacturer.



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Vessel

IMPACT BALL Torsion Bit 10+1-pc Set

Reviewed by Matt Fanslow diagnostic tech/shop manager at Riverside Automotive, LLC in Red Wing, Minn.



Q: What features did you like?

A: The bits are designed to be used with an impact gun. We have used non-impact bits in the past and eventually they break. We've had this set for review for much lon-

ger than typical products for review, so we've had AMPLE time to break them. We have yet to do so over the last six months.

Q: How did the tool/equipment function as far as saving you time?

A: In the long-term, it saves time by not needing to go grab, or buy, another bit that shattered from being used with an impact gun.

Q: What kind of setup was involved before using the product?

A: Zero set-up was required.

Q: Is there any way you could think to improve or add to this tool?

A: This tool had no features that I didn't like, but more sizes and different lengths, would be great. Though those are probably available on their website.

Q: How easy was it to use?

A: Extremely.

Q: What types of jobs/repairs did you use this tool for?

A: The vast majority of repairs we used this for were under hood and interior work.

Q: How does this tool compare to other tools you've used like it?

A: The other tools were not "impact-friendly."

Q: On a scale of 1 to 10, how would you rate this tool overall? Why?

A: I would rate this a 10. I mean, it's maybe not the most exciting review, but they do what they say they do, and they've held up to our abuse over a really long period compared to most bits I've used. I put these in all of our tech's hands and they've used them daily. How can they not be rated a 10? ☒



MATT FANSLAW is the shop manager for Riverside Automotive, an all makes/all models independent repair shop in Red Wing, Minnesota. He has over 27 years of experience in the automotive industry and is an ASE Master Certified Technician (A1-A8) and an L1 Automobile Advanced Engine Performance Specialist. He also has his own podcast, Matt Fanslow Diagnosing the Aftermarket A to Z, that provides a wide-open perspective on all aspects of the automotive aftermarket from a working diagnosticians' point of view.

This product was given to the reviewer free of charge from the manufacturer.

PRODUCT DESCRIPTION

The **Vessel Tool IMPACT BALL Torsion Bit 10+1-pc Set**, No. IB11P02U, comes in a pop-up case. The product includes +1, +2, +3, SL6, SQ2, T10, T15, T20, T25, T30, and 1/4" hex bit holders with C-ring retainers. The set also features magnetized tips, high wear-resistance, durable bits made from VoHA material, and the highest hardness (62 HRC) created by in-house optimum heat treatment.

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CATEGORY SPOTLIGHT

LIGHTING

Lighting may be one of those things that gets overlooked at times. It's not until you find yourself in an awkward position under the hood or vehicle squinting trying to see the task at hand – or, worse yet, left in the dark completely – to look at investing in proper lighting. Here are some worklights, headlamps, and flashlights worth checking out to give you the illumination you need.



INCLUDES A TWO-POSITION BODY CLIP

The **Fenix Lighting PD25R Rechargeable Flashlight** produces a maximum 800 lm from an included 16340 rechargeable Li-ion battery. The flashlight features a tail cap switch for on/off and a momentary-on function, and a side switch on the head for mode selection. It offers five brightness levels, plus a strobe. The two-position body clip holds the light securely to a pocket. The PD25R measures 3.62", is IP68 rated for dust and water, and includes a battery, charging cable, lanyard, two spare O-rings, and a body clip.

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CUSTOMER REVIEW:
"I especially love the external charging port. There's a rotating ring that covers the port and you twist it one full rotation to expose the port. Awesome feature."



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UP TO 360 DEGREES OF LIGHTING

The **STKR TRiLIGHT ShopLight V2** combines the features of a shop light with the benefits of a drop light. It quickly transforms from a 360-degree 5,000 true lumen drop light into an omni-directional shop light, and any light pattern in-between. The three aluminum LED heads function as a heat sink, ensuring the LEDs always operate at the lowest temperature possible. The base includes a hook to hang the shop light from the hood of a car. The TRiLIGHT ShopLight V2 can be utilized as a handheld inspection light, propped up on the LED heads as a free-standing light, or hung for handsfree use.

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OFFERS HANDSFREE MOUNTING

The **Philips Xperion 6,000 LED Work Lights** from **Lumileds** feature 6,000 K color temperature and resistance to impact, water, and solvents. Equipped with integrated magnets and 360 degree rotating hooks, the handheld worklights can simply and securely attach to a metallic surface or suspended above the work area. The line includes five models: Pillar, UV Pillar, Slim, Line, and Pocket. The Xperion Multi Dock Station is an accessory for the Xperion 6000 LED worklights, serving as both a cordless charging station and a convenient storage point. A USB charging cable and adapter are included.

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PRACTICAL EVERYDAY CARRY FLASHLIGHT

With its sleek silhouette and integrated pocket clip, the **Coast PM50R Rechargeable Work Light** is both versatile and practical as an everyday carry. The flashlight is built to IP54 stormproof specifications and features multiple lighting and positioning options. Use the 105 lm BULLS-EYE



Spot Beam for longer-distance tasks and the two-mode 185 lm COB side area light for up-close work. A magnetic tail cap creates a handsfree mounting option, and the ruler etched into the handle comes in handy for quick measurements. A full charge powers the flashlight for up to 9 hours. Users can monitor the battery charge indicator for real-time power status.

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EXTENDS FROM 49.5" TO 79.75"

The **BendPak LITESTIX** is a bright, versatile LED worklight powered by a rechargeable lithium battery to offer complete portability. It uses dual 90-degree swivel handles equipped with magnetic ends to mount on any flat or off-angle metallic surface. The lamp's all-steel telescoping cradle frame can extend from 49.5" to 79.75" in length and can secure to the underside of a vehicle hood with the help of grabbing hooks attached at both ends of the frame. With high and low settings, the worklight provides up to six hours of continuous use between charges. Designed for a long life of heavy duty use, LITESTIX features an impact-resistant polycarbonate housing.

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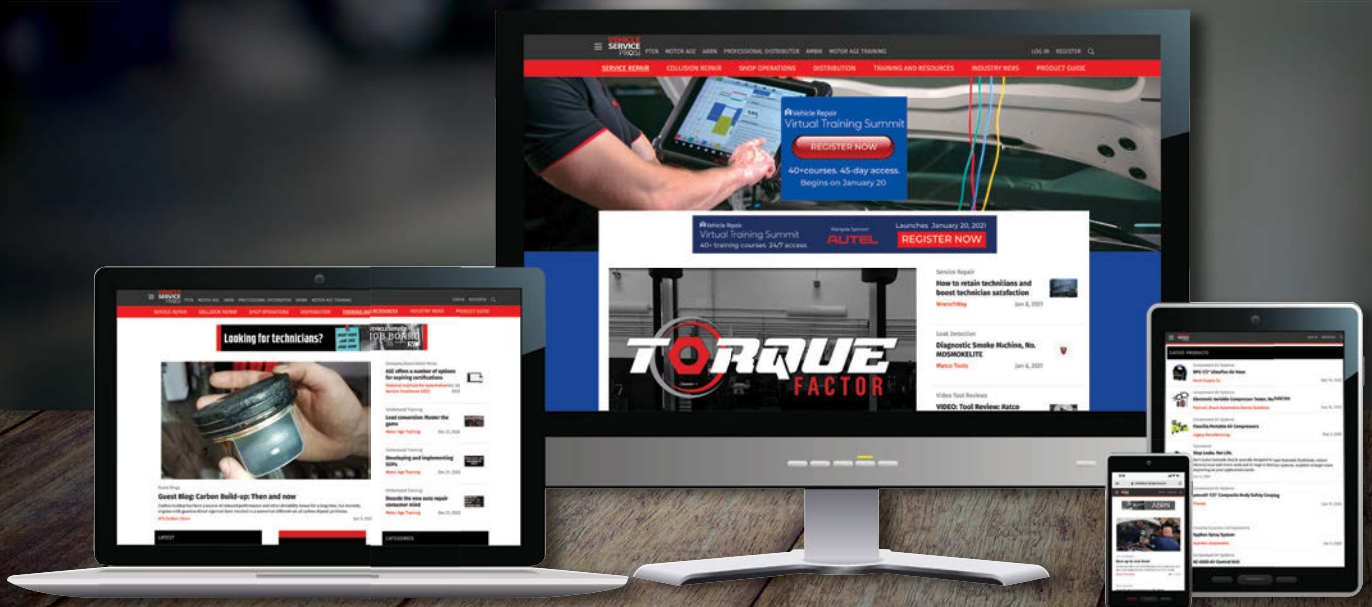


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CATEGORY SPOTLIGHT

Lighting



DETACHABLE MAGNETIC BASE

The **Mac Tools Pro Spot 5,000 lm COB LED Rechargeable Area Light** provides five adjustable lumen outputs ranging from 500 lm to 5,000 lm. It features a 180 degree rotating bracket, detachable magnetic base with anti-slipping rubber pad, and a foamed PU bumper for easy handling and impact protection. The battery provides up to 10 hours continuous use. The area light is IP67 dust and water resistant.

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ADJUSTABLE DUOFOCUS BEAM

The **Performance Tool 350+LM Firepoint X Li-ion Duo-Light**, No. W2677, features a heavy duty design with improved thermal efficiency. The duo-light includes a side-emitting worklight for a wide flood beam of light. With an adjustable DuoFocus beam, the flashlight is able to go from a spot to flood flight. The light is housed in anodized tactical aluminum and includes a Li-ion battery. The flashlight emits 196 lm on high with a 2.5 hour run-time, the worklight emits 375 lm and has a 1.5 hour run-time.

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FEATURES A 360-DEGREE FULL SWIVEL HEAD

The **SP Tools USA Compact COB LED Work Light**, No. SP81448, is ideal for any workspace with its 360-degree full swivel head and magnetic base. The high-powered 100 lm to 700 lm COB LED provides lighting in hard-to-reach areas, while its 360 degree full-swivel head allows users to direct the light exactly where they need it. The worklight offers three LED modes and has a maximum 14 hour run-time.

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**DO IT FASTER
DO IT BETTER
DO IT SAFER**



LUG NUTS



STRUTS



O2 SENSORS

The **Venom HP** is the highest powered Mini-Ductor handheld induction heater available at **1800** watts of power. Allows users to heat metal components faster than ever before!

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BUILT-IN POWER BANK

The **Davinci 8000 Rechargeable Flashlight** from **NEBO Tools** is constructed from anodized aircraft-grade aluminum and emits up to 8,000 lm. The rechargeable light is IP67-rated and has a built-in power bank to allow users to charge their phone or other USB devices. Featuring optimized COB technology, the DAVINCI 8000 has five light modes, including: Turbo (8,000 lm), high (4,000 lm), medium (2,000 lm), low (80 lm), and strobe. It also offers Smart Power Control, Smart Temperature Control, and a magnetic mode select dial to easily cycle through all the modes. It also has an adjustable 4x zoom to go from a floodlight to a spotlight and vice versa.

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MAGNETIC BASE ALLOWS FOR HANDSFREE USE



The **K-Tool International 650 lm COB Wireless Inductive Charging Work Light**, No. KTIXD5534, is a dual mode light that uses COB technology to provide a clear, bright light with a wide illuminated area. The magnetic base allows for flexible, handsfree usage. When there is no magnetic surface available, users can pull out a rotating hook to hang the light. The light can be charged using the company's KTIXD5523 wireless charger (inductive charger not included). The worklight measures 8" in length. The front light emits 650 lm while the top light emits 80 lm. Includes USB Type C cable.

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MAGNETIC BASE SECURES TO MOST METAL SURFACES



The **Grote Industries BriteZone Handheld LED Work Lamp**, No. BZ421-5, features a digital readout that lets users know precisely what battery charge level is left. The magnetic polymer base secures the lamp to most metal surfaces. The work lamp emits up to 1,800 lm and offers three light patterns (100 percent, 50 percent, and SOS). The rechargeable light charges in 3-1/2 hours and has a run-time of three hours.

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NOW AVAILABLE IN GREEN AND YELLOW

The **Cornwell Quality Tools blueION COB Skinny Rechargeable Worklight** is now available in green and yellow. The 1/2" ultra thin light emits three-way light functions: Full power (500 lm), half power (250 lm), and a SMD top light (65 lm). The light has a three hour run-time on full power and six hours on half power. The swivel magnetic accessory allows for the light to be mounted to metal surfaces. The light also has a direct plug to recharge via a Type-C USB, is IP66 rated, and has overcharge and over discharge protection.

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DELIVERS A WIDE AND BRIGHT LIGHTING AREA

The **SABER 500 Lumen Foldable Thin Light**, No. 80448, delivers a wide and bright lighting area. The light features a rotary switch that provides variable brightness of 100 to 500 lm. The memory function records setting after five seconds, and that setting is recalled the next time device is activated. The light wand folds 180 degrees and pivots 180 degrees to focus light on work area. It features an automatic shut-off and overcharge protection for optimal battery life. It also includes USB-C charging cord and 5V AC wall adapter.



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EMITS UP TO 1,100 LM

The **Ledlenser P7R SE (Special Edition) Flashlight** takes the company's P7R Flashlight and gives it more illumination power (1,100 lm), a further beam distance (200m), and a longer run-time (40 hours). It still features the Ledlenser Advanced Focus System, allowing users to quickly focus the light beam as a spot or flood, without losing quality of light. With its floating charge system, the P7R SE charges back up quickly in its wall-mounted charging cradle and has the ability to also use alkaline batteries when no power source is available. The flashlight also features a pocket clip, a temperature control, and an end cap switch for easy use.

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THREE LIGHTS IN ONE

The **NextLED Undercar Light**, No. NT-6648, is designed to work in low-profile situations. With its compact design, it allows users to place it under any vehicle or crawl space. The unit is equipped with three lights: a 500 lm white LED flood light that measures 10" in diameter to grant wide and clear vision, a 18" flexible shaft detailing light (zoomable) to allow users to check on tighter space, and a UV light to help detect leakage. Its detailing light and flood light/UV light can be turned on at the same time, making it ideal for multi-tasking.

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PADDED 4.8" HOOKS

The **Snap-on 3,000 Lumen Underhood Slim Light**, No. ECUHE300, is an extendable, low-profile light built with accessibility and versatility. With padded 4.8" hooks and a 48.4-80" extension range, the underhood light is ideal for a wide variety of vehicles. Its low profile provides technicians more accessibility and with up to 3,000 lm it provides uniformed lighting across the entire engine compartment. Its durable design protects it from water sprays or dust particles and with only 3.5 hours of charging time via USB or rechargeable battery needed, technicians have up to 15 hours of run-time for hard-to-see jobs.

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UP TO 14 HOURS OF ILLUMINATION

The **Makita USA 40V Max XGT Cordless Work Light**, No. ML009G, delivers bright illumination, versatility, and convenience. The ML009G has three modes of operation that provide 10,000 lm on high, 4,000 lm on medium, and 2,000 lm on low. The ML009G offers up to 14 hours of continuous illumination with two 4.0Ah 40V Max XGT batteries on low. The worklight is dust and water-resistant (IP65 rated), and can be mounted on an optional tripod light stand individually or with two worklights. A convenient carrying handle folds down when needed.

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Watch this product in action here: VehicleServicePros.com/21290284

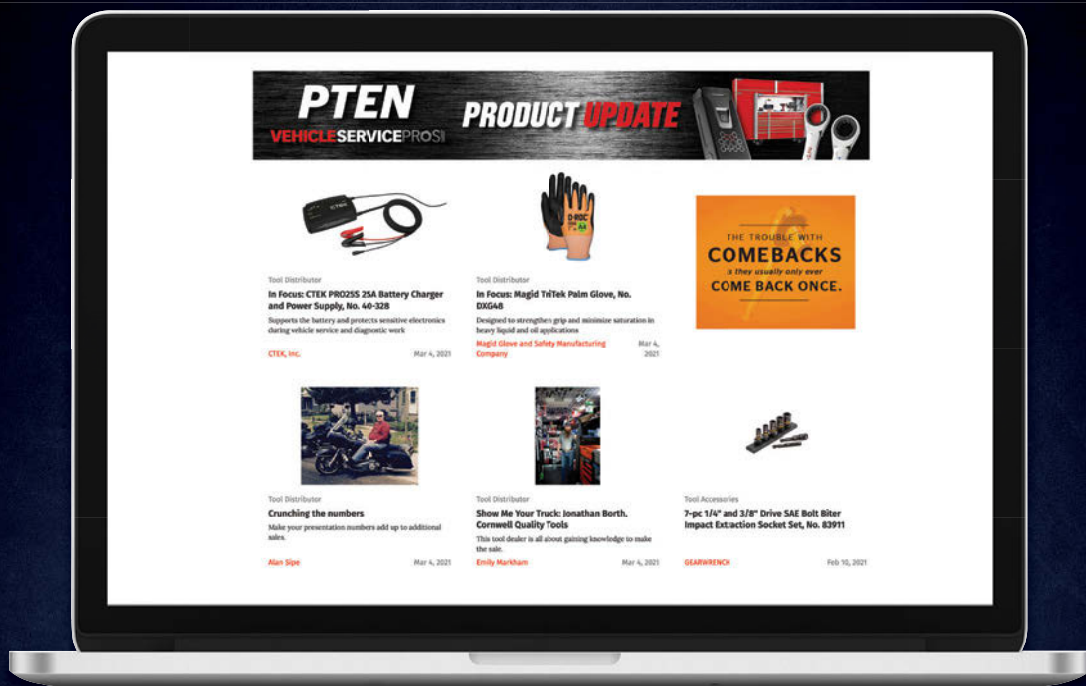
HAS A 3X ZOOM LENS

The **Mueller-Kueps LED Penlight**, No. 904 980, features a 3x zoom lens for wide or narrow beams. With a 40m beam spread and ability to emit up to 260 lm, the penlight is ideal for under the hood or under the vehicle applications. It's also rechargeable via USB, has a red/green charge indicator, and is made of aircraft aluminum.

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CATEGORY SPOTLIGHT

Lighting



THREE-WAY LIGHTING CAPABILITIES

The **Maxxeon LumaStik 10" and 12" Folding Inspection Lights**, Nos. MXN01010 and MXN01020, are rechargeable and offer three-way lighting capabilities for versatility, including: Front and back floodlights and spotlights on the tips. The folding lights have integrated magnets, are made from durable, high-impact plastic and aluminum construction, and have LED charge indicators. LumaStik 10 emits up to 400 lm and measures 5.8" when folded. LumaStik 12 emits up to 800 lm and measures 6.3" when folded. Both lights include a Type-C USB charging cable.

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FOLDS COMPLETELY IN HALF

The **Matco Tools Pro-Charge Wireless Rechargeable Folding 850 lm Worklight**, No. PCFOLD, is a versatile worklight that offers three light sources, including a 400-850 lm main light, 400 lm back light, and a UV top flashlight for leak detection. The light folds completely in half with its 400 lm light and top UV flashlight still functional while folded. The worklight can easily recharge wirelessly using the company's Single or Dual Smart Charge Pads (sold separately) or charge with a USB-C cable (not included). Once charged, the battery will last from 2.5 to 5 hours of use. The worklight features three battery level display lights, an extendable hanging hook, a strong base magnet, and rear charging pad locating magnets.

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USES 90 CRI LED FOR LOW LIGHT CONDITIONS

The **Streamlight Stinger Color-Rite** is a rechargeable LED flashlight that uses a high color rendering index (90 CRI) LED for enhanced visualization under low light conditions, allowing users to see the color spectrum as they would in natural light such as to match and identify colors in auto applications. The compact light offers three variable lighting modes plus a strobe: high (500 lm, 17,500 candela, 265m beam distance); medium (275 lm, 9,000 candela, 190m beam distance), and low (140 lm, 4,500 candela, 134m beam distance). Run times range from five hours on the low setting to 1.5 hours on high. The light is anodized against corrosion and is IPX4 water-resistant.

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IDEAL FOR INSPECTION WORK

The **Milwaukee Tool REDLITHIUM USB Neck Light**, No. 2117-21, is ideal for delivering lighting for inspection work and general tasks, providing durability and adaptability with complete light head adjustability. With the ability to aim the light in different directions, the REDLITHIUM USB Neck Light provides lighting for those hard-to-see places. Featuring a press-and-hold power button, the neck light offers three output modes delivering up to 400 lm of Trueview high-definition output and two-and-half hours of run-time on high. It also features a sweat-resistant band and is IP54 rated.

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OTC's CA7149 Ball Joint Connected Adapter Starter Kit

Q&A with Justin Fissette, senior product manager at Bosch Aftermarket and OTC Tools.



Q: How did this ball joint adapter starter kit idea come about internally?

A: While the original ball joint kit and C-frame have worked great for many years, setting up the tool was always a bit frustrating. Cups and adapters didn't stay put, and it could be time-consuming, especially on horizontal jobs. Our team worked on various ways to secure cups and adapters to the C-frame and decided that spring-loaded ball bearings would secure the cups and allow enough play to maneuver around suspension components.

Q: How have technicians who've purchased this rated it?

A: Based on our feedback, technicians who've purchased the starter kit have rated it very highly and are enjoying the array of vehicle applications the kit has.

Additionally, technicians appreciate that the adapter kit is fully compatible with existing OTC ball joint kits – citing that this allows them to easily expand their vehicle applications and makes removing and installing ball joints and suspension components faster and easier.


Q: What is the main problem this tool solves for technicians?

A: Having to balance cups and adapters on a C-frame under a vehicle and chasing those adapters around the shop after removing ball joints. It saves time and eliminates frustration during ball joint removal and installation.

Q: Do you plan to offer other kits with more adapters or a larger set in the future?

A: We are continuously assessing our existing ball joint kits to expand the tool's capabilities and applications. Additionally, we are looking at new applications, including 3/4-ton and 1-ton trucks and service vehicles, off-road vehicles, and new suspension setups in electric vehicles.

Q: How does it help technicians save time?

A: The included locking cups and adapters are set up seamlessly and quicker than comparable kits, giving technicians a free hand to perform other tasks simultaneously. A tech can hold the C-frame with one hand and use an impact wrench to start driving the forcing screw during removal or installation. 

PTEN is the only publication to feature the prestigious "Innovation Awards." Every year since 1999, the Innovation Awards highlight the newest and most innovative products introduced to the automotive aftermarket. For 2022, *PTEN* received 121 submitted product entries in 23 categories. We will be featuring each category winner in a monthly video on our YouTube channel *PTEN (Professional Tool & Equipment News)*. To view a full list of winners online, visit: VehicleServicePros.com/2022IAWinners.



The Innovation Awards honor companies that take their products to another level and offer unique features that make a technician's job easier. If you would like to submit a product to be considered for the 2023 Innovation Awards, entries are now being accepted. Visit: VehicleServicePros.com for more information.



Wrenching in paradise

After 35 years, this tech still loves what he does, where he works, and his aged-yet-grand toolbox setup.

By *Kayla Nadler*, Associate Editor

For some techs, a toolbox must have the latest technology and features. However, that is not the case for **Scott Pinner**, shop foreman and director of service at **Wheaton's Service Center in Key Largo, Fla.**

"A \$100 worth of tools and a \$10,000 toolbox is a waste of money, but \$10,000 worth of tools in a \$1,000 box is the way to go," is what Pinner tells the young techs.

A technician for 35 years, Pinner's grand setup consists of two Snap-on KR1000 double-bay cabinets, a Snap-on KR7100 roll cabinet chest, a Snap-on KRA2007 Heritage Series roll cab with KRA2055 5-drawer top chest, a U.S. General 5-drawer cart, and a couple of Snap-on utility carts.

The two KR1000's were built in the early 1990s and, as Pinner describes, "are

OWNER

Scott Pinner

Shop: Wheaton's Service Center

Location: Key Largo, Fla.

tanks." Pinner bought one alongside his dad. When his dad retired, he gave the box and all the tools within to Pinner. Since Snap-on never made hutches for those boxes, he decided to make his own.

The KR7100, also known as the Coca-Cola box because it has a small locker built into the side, is a rare toolbox.

"They only built that box for three years and I had wanted one ever since I saw it new back in the '90s," he notes. When he ran across it 15 years ago, he had to have it.

His favorite thing about it is having a built-in locker and hutch. It allows him to

keep all his diagnostic, electrical, and AC equipment all in one spot.

Having multiple carts is necessary for Pinner. From one end of the shop to the other is roughly 100 yards. He has smaller carts for quick repairs, a larger cart for repairs that he knows will take a couple of days, and a diagnostic cart to store all five of his scan tools, scopes, and laptops.

ORGANIZATION

From wrench racks and socket grids to screwdriver racks and other organizational tools, Pinner is keen on keeping his tools in order.

Each drawer is also dedicated to specific tooling. For example, he has a drawer for 3/8", 1/4", and 1/2" sockets, a drawer for wrenches, one for pliers, one for hammers, one for compression testers, one for oversized drive sockets, and the list goes on.

"Everything is organized so that I don't have to guess what is where," he states.

HERE TO STAY

Before starting at Wheaton's Service Center four years ago, Pinner moved around and worked for various dealerships and shops. He even owned a shop at one point. After being stationed in the Florida Keys back in 1989, he knew this was the place to be.

"I love what I do," he says. "I've been all over and worked all over and built up a number of certifications over the years, but down here is the place that I have felt the most at home and most appreciated for the job that I do."

ALWAYS ADDING

Although in the market to expand, Pinner refuses to buy anything new.

"I want it to be a '90s model Snap-on KR box so that I can park it next to my others and it'll look like it belongs," he says. "If I could find another KR7100 box that would be the ultimate toolbox." ❌

Want to see more photos of Scott Pinner's box? Visit: [VehicleServicePros.com/21293105](https://www.vehicleservicepros.com/21293105)

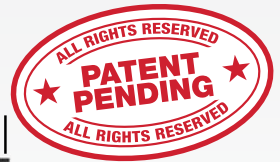


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Latest Lifts Elevate Profits
Are you turning away
business because of
your lift? **Page 8**

Evolving for EVs
Lift manufacturers creating
new equipment to meet
industry needs. **Page 16**

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Uplifting your shop

As the landscape of vehicles on the road evolves, so, too, do your shop's equipment needs.

By **Brendan Baker**, Editor, *PTEN*

In this special supplement to *Professional Tool and Equipment News (PTEN)* and *Fleet Maintenance*, we dive into the deep end to look at what lifting equipment shops need today and what may be down the road a little further.

But before you do any heavy lifting, the issue of safety should always be front and center. We reached out to the foremost lift safety experts for advice on the subject and talked to some lift manufacturers for their feedback on safety. All of the manufacturers we spoke with are members of the Automotive Lift Institute (ALI), which, for more than 75 years, has ensured the safety of vehicle lifts for every technician's benefit.

As the landscape of vehicles on the road evolves, so too do your shop's equipment needs. It's difficult, at best, to work on vehicles without the right equipment, and a lift is one of the essential pieces to your shop's success. With EVs on the rise in the years ahead, lifting these vehicles will require redesigned equipment to raise them up to do standard brake and suspension jobs and remove the battery packs.

Goldman Sachs recently forecasted that EVs will make up 61 percent of worldwide car sales at about 73 million units in 2040, up from 2 percent, or around 20 million vehicles, in 2020. In many developed countries, Goldman analysts expect that percentage to be as high as 80 percent or more. So clearly, shops need to get ready to service EVs.

Lifting EVs can be tricky because their high-voltage batteries are usually underneath the vehicle, taking up most of the real estate. As a result, the OEM-recommended lifting points are often on the far edges of the frame and can be challenging to reach. New lifts offer more extension and retraction to reach these points.

EVs are also heavier than their internal combustion engine counterparts, so lift manufacturers are taking this into account and beefing up areas where the most strength is needed and adding more versatility to their products in the process.

Our experts say the lifespan of a lift can vary depending on factors such as usage, maintenance, and quality of the lift. But in general, vehicle lifts are typically replaced after 10–15 years of use.

Shops that keep up with the trends and have the right mix of equipment to handle the needs of their customers are typically more successful. If your shop has been contemplating a new lift, read on so you can purchase one that fits your needs. 🚗

3 WELCOME

Uplifting your shop

An introduction to the Vehicle Lift Guide, brought to you by *Fleet Maintenance* and *PTEN* magazines.

6 SAFETY

Safety gets boost from ALI's digital Lifting Points Guide

For the first time, ALI's guidance on vehicle lifting points is available digitally, which should lead to a safer shop environment.

8 COVER STORY

Latest lifts to elevate shop profits

Are you turning away business because you don't have a lift compatible with the vehicles coming to your shop for service?

16 EV LIFTING

Evolving for EVs

With electric vehicles rising to prominence, lift manufacturers have been modifying and creating new shop equipment to meet the industry's needs.

18 INSPECTIONS

A closer look at lift inspections

Lift inspections are an important aspect of technician efficiency and shop safety, so shops need to be sure that they're ready to pass with flying colors.

20 PRODUCTS

The latest in lift equipment.

On the cover: *BendPak*

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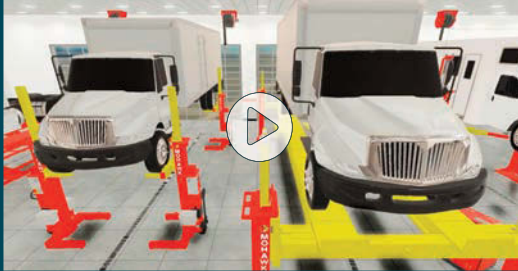
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ARTICLE



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ARTICLE



BENDPAK FOUNDER REFLECTS ON CAREER LIFTING UP THE VEHICLE REPAIR INDUSTRY

Don Henthorn founded BendPak as an aerospace machining shop in 1965 and built it into a world-class shop equipment manufacturer. Here, he reflects on his career. **To read more, visit:** FleetMaintenance.com/21281244

TECH TIP



KEEP YOUR FLOOR JACKS FROM GETTING JACKED UP

Like all equipment, floor jacks should be inspected regularly for damage and kept clean. Here are five tips to keep your floor jacks from getting jacked up. **To read more, visit:** FleetMaintenance.com/21206811

TECH TIP



KNOWING THE LIFT YOU WORK UNDER

Not every vehicle lift is the same, so it's important to read the manual and familiarize yourself with everything you need to know about the lift. **To read more, visit:**

VehicleServicePros.com/21266897

VIDEO



BLEEDING A CYLINDER

HOW TO PROPERLY BLEED A HYDRAULIC CYLINDER ON A TWO-POST LIFT

In this video, Challenger Lifts demonstrates how to properly bleed a hydraulic cylinder on a two-post lift. **To read more, visit:** VehicleServicePros.com/21264912

ARTICLE



6 STEPS TO SAFETY DURING A VEHICLE LIFT

Stertil-Koni recommends shops follow this 6-step approach to ensure technician safety. **To read more, visit:** VehicleServicePros.com/21255602

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Images: Automotive Lift Institute

Safety gets boost from ALI's digital Lifting Points Guide

For the first time, ALI's guidance on vehicle lifting points is available digitally, which should lead to a safer shop environment.

By **John Hitch**, *Editor-in-chief, Fleet Maintenance*

As more and more technology, such as tablets and laptops, enter the typical automotive shop, now is the perfect time for more training and safety materials to also be accessible digitally. That is the big reason why the Automotive Lift Institute (ALI) has made its most recent Lifting Points Guide for MY2000-2023, *Vehicle Lifting Points for Frame Engaging Lifts*, available for purchase as a PDF (\$15 for online access on three devices) at autolift.org/shop/.

The guide covers cars, SUVs, vans, light-duty trucks, and electric vehicles, and any facility with frame-engaging lifts to service these vehicles needs one nearby.

The industry safety standard for lift operation, inspection, and maintenance, ANSI/ALI ALOIM: 2020, requires shops to make lifting points information available to technicians. The lifting points are provided by the OEMs. It includes more than 250 undercarriage illustrations as well as suggestions for safely lifting vehicles.

The layout and content mirror the paperbound version, with a few handy benefits. For starters, the guide is always on hand, and the technician merely has to click on the link via their smart device or computer. There's also no risk of paper pages being damaged by grease blots, coffee spills, or other shop messes.

Second, the document works like any PDF, and has a search bar to quickly find the right make and model to ensure the correct schematic and lifting points are being used. And the login can be shared among three individual devices, so the guide should be accessible for anyone operating the lift.

Whether paper or digital, having the latest guide is crucial, as the lifting points can change during a vehicle redesign as well as when electric models come out.

"As far as fleet managers' safety responsibilities go, updating your lifting point guide every single year is absolutely one of the best practices," notes Steve Perlstein, president of Mohawk Lifts. He stresses that incidents are likely to occur when a two-post lift's arms are positioned in the wrong place. Another issue is technicians factoring in total vehicle weight, and not axle weight.

"I don't know how many times a guy has called us up and said, 'My 13,000-lb ambulance has bent the arms on this 15,000-lb lift,'" Perlstein notes. "But the rear arms' capacity and the rear end of the ambulance are what matter. Don't overload the arms!" To calculate the correct capacity per swing arm, he advises to divide the weight per axle by two. Perlstein also adds that the center of



ALI made its Lifting Points Guide available as a digital PDF.

gravity will change if the 800–1,000-lb engine or transmission is removed.

DROPPING DOWN NEAR MISSES

ALI doesn't track specific lift-related injuries and fatalities, but the organization maintains that incorrectly positioning a vehicle on a lift is a leading cause of lift-related accidents. Anecdotally, ALI President Bob O'Gorman says if he's giving a presentation to a crowd of 150 automotive professionals and asks how many have experienced a lift-related loss-of-life scenario, "one or two hands might go up."

But when he asks how many have seen a vehicle shift or cause damage or injury, what one may classify as near-misses, "that turns to a very large percentage of people in the room," he notes. "You can go to technical conferences, and you will talk to people who've been there when the vehicles dropped, or dropped the vehicle themselves."

The ALI's goal is to someday soon get the number of hands raised after the near-miss question to only a few, which would, in turn, make lift-related fatalities and severe injuries a relic of the past.

O'Gorman cites lack of training and lack of operational understanding of specific lifts as the root cause for "the largest percentage of those incidents." Planned maintenance on these lifts and annual inspections also ensure the equipment

"is in the same condition that the manufacturer intended it to be used in."

"Safety does not happen by accident," O'Gorman says. "It's a conscious decision to pursue safety for your employees, for your shops, and reputation. And really for your customers, as well."

And as far as meeting that goal, having the recommended lift points on hand goes a long way.

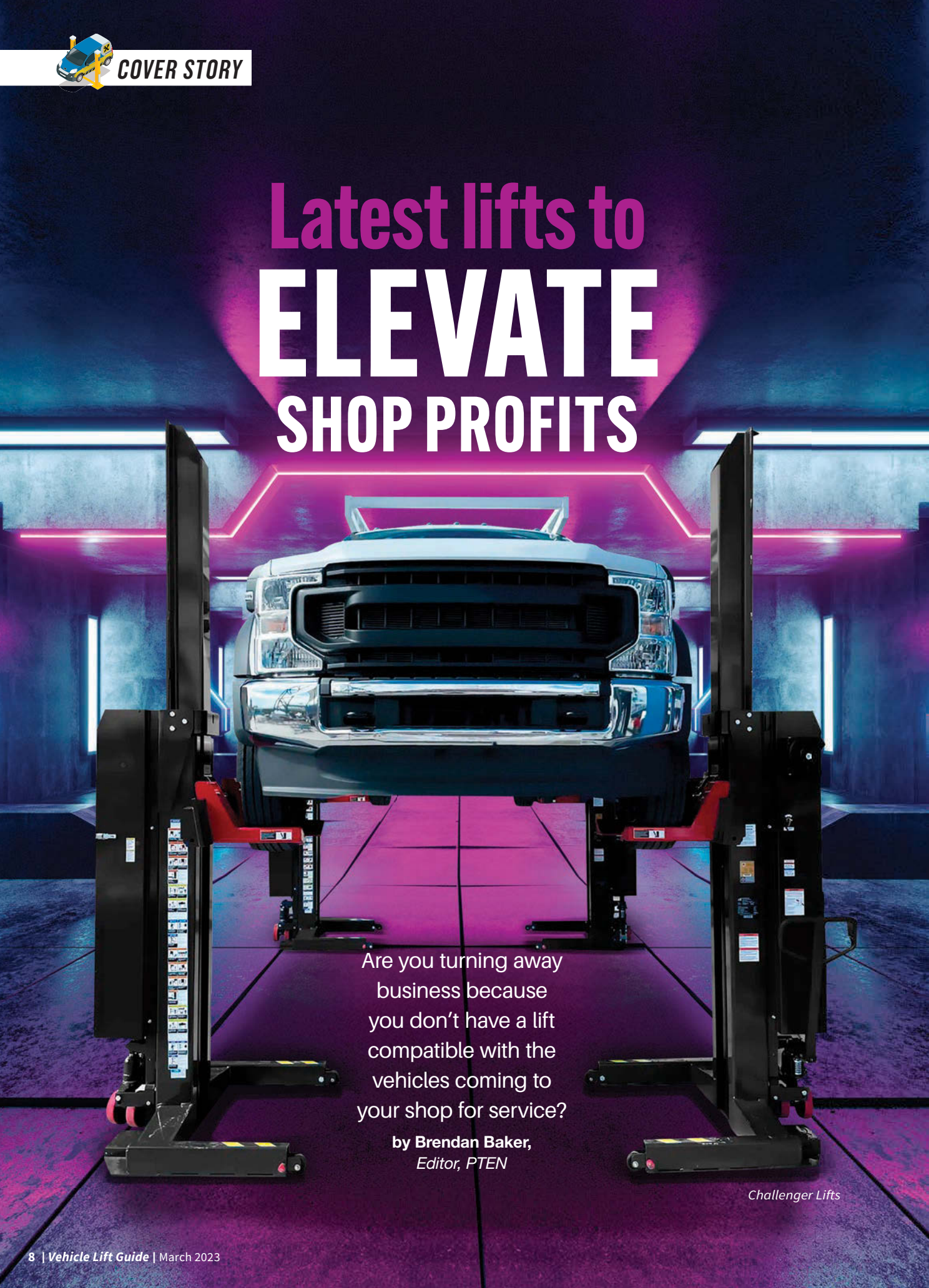
"Any time you're raising a vehicle for service, whether at home or on the job—there's more riding on that lift than a car or truck. Your safety is riding on it," O'Gorman adds. "Taking a minute to find the recommended lifting points so you can properly pick up the vehicle could save your life."

The ALI also has the Lifting It Right online course available through its website, which takes users through the proper way to lift and lower a vehicle without injury or property damage. This includes guidance on spotting and lifting vehicles, prepping the bay, maintaining load stability, and maintenance. The course costs \$16 per participant (\$24 for the Spanish version) and takes on average less than an hour to complete. A certificate of completion is provided at the end.

O'Gorman notes that in 2022, ALI also released an updated safety manual to reinforce what's covered in the course. This is also available digitally. ●



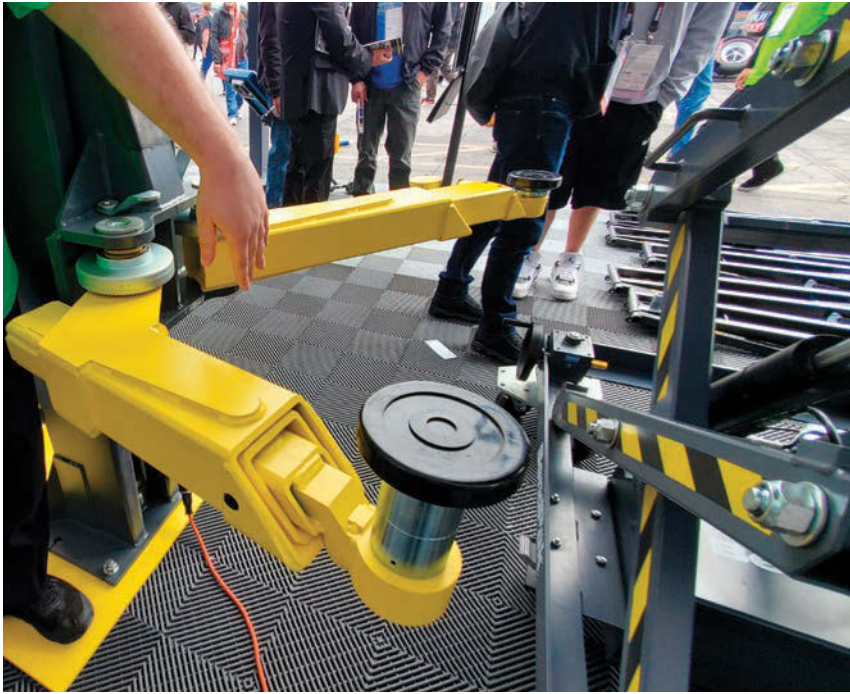
Latest lifts to ELEVATE SHOP PROFITS



Are you turning away
business because
you don't have a lift
compatible with the
vehicles coming to
your shop for service?

by **Brendan Baker**,
Editor, PTEN

Challenger Lifts



BendPak's two-post lift arms are redesigned for a lower profile and to reach in further.

How often does your shop have to turn away business because you don't have the right tools or equipment? This likely has happened with various makes' advanced driver assistance systems, or other new or niche components, because it's often too costly to stock such tools and equipment that don't have a promising ROI. That said, if you don't have adequate lifts to service customer vehicles in your area, you may be missing out on jobs that will not only provide a nice return on the lift, but create plenty of return customers as well.

Rotary's wide two-post lift and table.



For instance, if your shop typically services light-duty and consumer vehicles, but you have the space and labor to accommodate medium-duty as well, maybe your next lift

should have a 14,000-lb capacity. This will allow your shop to accommodate more of the growing last mile segment, which, due to the start/stop nature of the route, requires more tire and brake maintenance.

There is one big caveat: Lifts should typically last at least a few decades, and in the next 10 years electric vehicles, which are heavier than fossil-fuel-powered models, will be more prevalent in both the consumer and commercial space. This means you should not just spec for the business you have today, but what you want tomorrow as well.

To help you do that, here are some updates from several of the leading lift manufacturers.

WHAT'S NEW?

Jason Matthews, product manager, automotive lifts, for Rotary Lifts/VSG, says they have some new alignment lifts for shops that are tighter on bay space. "The XA12 is an alignment lift that's specifically designed for small bays. Our XA14 is a large scissor alignment lift. It can accommodate a wide range of vehicles, but not everybody has the space for a large lift like that. The XA12 is a perfect solution for an owner who has a small bay but still needs to do alignments on cars and trucks."

Matthews says that Rotary's model numbers typically correspond to the capacity. "The [XA12] is a 12,000-lb capacity scissor lift. It works really well with cars and other unibody vehicles, all the way up to smaller trucks."

The XA12 can handle trucks up to F-250 and F-350s (unloaded), according to Matthews. But due to the big feature of this lift, even though he says it has the largest four-wheel alignment wheelbase range in its class, there are some limitations based on the size of the bay area. "The maximum wheelbase for two-wheel alignments is 166". So, if you have a truck that had a longer wheelbase than that, then I mean, that would be the only concern. But the really long wheelbase trucks are the exception, not the rule. The vast majority of vehicles are going to fit on [the XA12]."

Matthews says that if your shop works on a lot of vehicles with longer



wheelbases, then it would make more sense to move up to the larger XA14, 14,000-lb scissor lift that has much longer runways. But you need to have a lot more bay space for these lifts. The small lift still takes up a 13' by 28' bay. And that includes using Rotary's aligners, which are more compact.

"What's unique about [our aligners] is that they don't have the towers with the cameras that go in front of the lift," Matthews explains. "Our cameras actually mount to the side. So you don't have to have that extra space in front of the lifts to do alignments. Our 1090 and 1065 aligners help save space and enable someone that doesn't have a lot of space or a small bay to be still able to perform alignments and earn revenue on these jobs."

Matthews acknowledges that lift companies have become more safety conscious with all of the testing and inspections that are part of the industry today. He says that Rotary is one of the founding members of ALI, so they are very much in favor of these certifications, but they only test the strength or capacity of the lift. What is not covered in the certification process is the durability of the lift.

"Longevity and low cost of ownership are really important," says Matthews. "Those are all things the company is passionate about, and we make sure that technicians and shops are able to use our lifts and earn money with them for a very long time."

Durability testing is one of the most important aspects of Rotary's lifts besides its safety certification, Matthews explains. "We cycle our lifts 20,000 times with full load. It's akin to what an automotive manufacturer does when they're designing a vehicle. There's a lot of strength testing, which is what goes into that Gold Label testing. With durability testing, that's the determinant of longevity that the lift is going to last for a long time."

With over 150 new electric vehicles that are out now or will be coming out



BendPak's AP series lift is ideal for EVs.

Twenty to 30 years ago, your grandfather's Cadillac, weighing 4,500 lbs, was the largest vehicle being lifted. Today, we lift 25' long four-door dually trucks that weigh 12,000 lbs. We also saw the introduction of the unibody vehicle, where there was no frame on which to lift.

Brian Spikes, vice president and general manager, Challenger Lifts

in the next two to three years, shops will need to start preparing for this new technology that many techs have not seen before, and it will require some new equipment to handle them properly.

"There will be a lot of new things that a technician will have to worry about," Matthews says. "Shops will have to make sure they have the right equipment. The lift, for example, must be able to reach in and contact the specific pickup points that are right next to the battery underneath the vehicle."

According to Brian Spikes, vice president and general manager of Challenger Lifts, they launched several products for new automotive technologies (i.e., EVs) at the 2022 SEMA Show last November. "Our EnviroLift wide series in-ground lift offers an industry-leading distance between cylinders, providing more room for battery removal and the width required to service today's wide-bodied or exotic vehicles."

Spikes says they have two new models of battery lifting tables designed to safely remove a battery of up to 3,300 lbs from underneath a lifted electric vehicle (EV). And Challenger also introduced an adjustable 12K two-post lift, which can be installed in three widths and heights – a feature available on their 10K, 16K, and 20K models.

"All 12K through 20K offerings serve the heavy-duty market," says Spikes. "We also launched medium-duty 5K mobile columns. These will allow shops with limited space to have the flexibility of a mobile column system in a more compact form and at a lower price point."

Finally, Spikes says Challenger added a new feature to their popular four-post lifts: hot-dipped, galvanized runways. "These rust-resistant runways are perfect for shop environments that encounter melting snow and ice and the

road salt that is usually associated with those conditions.”

Lifting has evolved with the changing needs of vehicles, notes Spikes. “20 to 30 years ago, your grandfather’s Cadillac, weighing 4,500 lbs, was the largest vehicle being lifted. Today, we lift 25’ long four-door dually trucks that weigh 12,000 lbs. We also saw the introduction of the unibody vehicle, where there was no frame on which to lift.

“To accommodate those vehicles, we went from a two-stage arm to a three-stage arm, allowing more length and retraction to hit frames and pinch welds. We also offer wider lift options on all commercial two-post and in-ground lifts with three-stage arms to add more flexibility in reaching the lift points.” This trend continues today with the new EV vehicles, requiring changes to lifts to accommodate the addition and placement of the batteries.

In-ground lifts were once the only equipment available for lifting. They were a great product back in the day and lasted for years, according to Spikes. However, the issue, discovered later in their life cycle, was that they were not environmentally friendly. “These lifts were fully hydraulic and filled with numerous gallons of oil. If they leaked, oil went into the ground.”

As environmental awareness evolved, Spike says Challenger and the industry have grown to offer environmentally friendly in-ground options. Their 10K, 12K, and 15K in-ground lifts are now low oil, high-pressure, and encased in an environmentally-friendly cassette, so if there are any leaks, the oil cannot



Hunter four-post pit ramps use wider runways for a variety of wheelbases and widths.

reach the soil. The change to a cassette also allows the lift to be serviced without digging the lift out of the ground. In fact, Challenger is now building their new, wide in-grounds similarly.

TWO-POSTS ‘REIMAGINED’

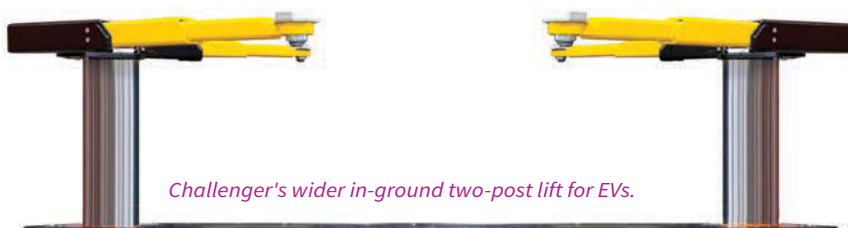
“Two-post models are the most popular car lifts in the world,” says Jeff Kritzer, BendPak president and CEO. “But just because something has been around a long time doesn’t mean it can’t be improved.”

Subsequently, BendPak’s AP Series lifts are the company’s most customizable, versatile two-post lifts ever. The

Most heavy-duty shops are not strictly heavy duty. They are typically commercial shops that likely have fleet vehicles with independent rear suspensions. So we have wide (30”) runways.

Pete Liebetreu, vice president of marketing for Hunter Engineering

new lifts can fit most bays with either a wide or narrow configuration, and their redesigned swing arms enable both symmetric and asymmetric lifting from a single lift. Each AP Series lift comes with a standard adapter package for compatibility with a wide range of vehicles in one of three 10,000-lb capacity models.



Challenger’s wider in-ground two-post lift for EVs.

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Two-Post Lift

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10AP SERIES

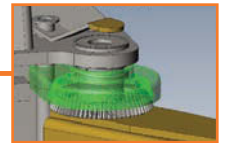
As the shift from gas engines to EV's grows, so does the need to safely handle the increased weight and EV-specific jacking points. Our newest 10AP two-post lift offers a generous 10,000 lb. lifting capacity combined with newly patented Bi-Metric™ triple-telescoping arms that are perfectly suited for EV service and more. Super-strengthened arm restraints make sure the adjustable lift arms stay put.

Mobi-EVS™ EV4000SL

Our revolutionary Mobi-EVS™ full-rise battery powered lift table is perfectly suited for EV battery pack replacement and powertrain service. With its compact design, this space-saving scissor lift can be easily transported anywhere in the workplace, making it ideal for multi-bay facilities or workplaces with confined areas. The Mobi-EVS lift table is multi-functional and features multiple recessed anchoring locations for accommodating a variety of modular fixtures, adapters and accessories for servicing transmissions, gas tanks, transaxle assemblies, and more!



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4,000 lb.
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10AP SERIES

- Bi-Metric™ & Low-Pro™ Swing Arms
- Industrial-Grade Hydraulic Cylinders
- Automatic Arm Restraints
- Configurable Wide Or Narrow Installation



EV4000SL

- Utility Trays
- 12V DC Power System
- Floor Locks
- Tri-Casters
- Slip Plate
- Remote Controller
- Twin Hydraulic Cylinders



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The standard 10AP has 73" of lifting height and an overhead beam height of 145" for shops with lower ceiling clearances. The 10AP-168 has the same 73" of lifting height plus a crossbar that's positioned two feet higher to accommodate high-roof cargo vans. The 10APX is a high-rise model – great for taller technicians – offering 79.5" of lifting height with a 157" top beam. The 10APX-181 maintains 79.5" of lifting height and increases the top beam height to 181".

"We put more than 50 years of experience into reimagining the two-post lift to make it more efficient, safer, and easier to use," Kritzer adds. "We're really proud of the results and hope our customers love it, too."

HEAVY-DUTY ALIGNMENT RACKS

Pete Liebetreu, vice president of marketing for Hunter Engineering, says they introduced two new lift options recently. "We have a large 35,000 lb four-post lift that is already optimized for alignment. Up until the L494HD, there were no purpose-built racks for wheel alignment. There were some build-to-order variations, but nobody had an off-the-shelf solution until now. We also have

Servicing EVs will require a lift table for battery management.

Photo: Challenger BT3300



Some racks offer wider alignment runways and galvanized surfaces for rust resistance.

pit variations of the same runway set for those who'd like to go that route."

Liebetreu also notes their new slip plates for lighter-duty vehicles are completely unique to Hunter. "Most heavy-duty shops are not strictly heavy duty. They are typically commercial shops that likely have fleet vehicles with independent rear suspensions. So we have wide (30") runways. This seems like something simple, but it really adds to drive-on ease and safety that is not well represented in the heavy-duty world today. The galvanized runway surfaces also add to

the longevity of this equipment in the harshest environments."

MOBILE COLUMN LIFTS

Mobile lifts are certainly an option for shops that may not have the space or ability to install in-ground lifts. But lift experts say shops must be sure the concrete is level and able to hold the weight of the vehicle they are lifting. One tool that can help is Mohawk's slope indicator tool. This tool works with AC and DC

mobile column lifts. Since these lifts can be moved and placed anywhere in or outside of the shop, Mohawk has designed this tool with technician safety in mind. Simply place the indicator on the mobile column, and it will indicate the floor slope in degrees. Mohawk's mobile columns can be used safely for up to three degrees of floor slope. The slope indicator ensures the safety of the lift, vehicle, and, most importantly, the technicians from a potentially unsafe lifting situation.

IN-GROUND LIFTS

Oftentimes, lifting points guidance from the OEMs come from light-duty manufacturers, who are a lot more proactive in getting those out, according to Carl Boyer, Midwest regional sales manager, Steril-Koni.

Boyer says that many of the commercial vehicles that shops work on today are using a modified chassis that the manufacturer doesn't typically know how it will be up-fitted. "Some people may take the same chassis, and one will be made into a crane body and another into a service truck. At that point, I think one of the more important things on the commercial truck side is the weight differentials front to back.

"Some techs may look at a lift and say, 'my truck doesn't weigh 16,000

lbs,' but the problem is the way it is loaded. They could have 10,000 lbs in the back and 6,000 lbs up front. That's not really a safe lifting application. So, it's a little bit different on our side, perhaps, than it would be on the light-duty side."

Boyer explains that heavy-duty repair shops have a lot of options when it comes to purchasing a new lift. It really depends on factors such as budget, space, type of facility, and even the groundwater level for those looking at in-ground lifts.

"I think in a perfect world, everybody would probably have an axle-engaging in-ground lift," says Boyer. "But some facilities are rented or leased, and they can't put things in the ground or permanently mount them to the floor. Other issues are going to be budgetary. There's really no distinct disadvantages to an in-ground lift, with the exception of cost and modifying the floor, where you have to cut into the floor if you don't already have an existing lift that you're replacing."

Boyer notes there are a lot of compromises with whether it is better for a certain shop to go with an above-ground lift or perhaps a mobile column lift. "They all have trade-offs. With mobile column lifts, you have two steps - an additional step to remove wheels because you're picking them up from the wheels. You have to pick the vehicle up, set a jack stand, and use a high lift wheel dolly to remove a tire and wheel before you can do brake work, for example."

But a mobile column lift also costs less, according to Boyer. "It's going to cost half or a third of what it costs to put in an in-ground lift. That's where customers have to start making a trade-off. How much am I willing to give up from a convenience standpoint or a throughput standpoint vs. the money you have to spend on a lift?"

Tim Kerr, engineering sales support manager for Stertil-Koni, says shops that opt for a mobile column lift over an in-ground lift have more things to worry about. For example, he says you need to think about if the floor is level and whether the rebar structure in the concrete is sufficient enough to lift one of these vehicles.

Kerr explains that there are a lot more steps involved in doing brake work, tire work, and hub work on a mobile column lift. "Any time you add additional steps, you're just adding the possibility for human error. So with an in-ground lift, obviously, there's an added cost, and it's more complicated than mobile columns, but you eliminate a lot of those additional steps. And each one of those steps has the element of human error that can be involved."

One thing is for certain; the industry is changing along with the new vehicle technologies. Shops in the market for a new lift must be prepared to handle this new fleet of vehicles, whether it is a gas, diesel, EV, or commercial truck. ●

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TWO POST LIFTS



FOUR POST RUNWAY LIFTS



MOBILE COLUMN LIFTS



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No matter what vehicle you're lifting, Mohawk has the vehicle lift or automotive equipment you need to get the job done safely and easily. Mohawk offers environmentally safe above-ground service lifts, with capacities ranging from 10,000 to 240,000 pounds.

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Evolving for EVs

With electric vehicles rising to prominence, lift manufacturers have been modifying and creating new shop equipment to meet the industry's needs.

By Emily Markham, Editor, PTEN

The auto landscape is changing, with more and more EVs entering the scene. That means shops need to investigate if their equipment still meets the needs of all their customers' vehicles. This is particularly important regarding lifts and lift tables, as EVs such as the Ford Mustang Mach-E SUV weighs 33% more than the gasoline version, while the Ford F-150 Lightning can weigh one ton more than a traditional F-150. But capacity is just the start, and lift manufacturers have been busy retooling designs to not only meet the needs of new EVs, but the shops that service them as well.

TO UPGRADE OR NOT TO UPGRADE?

Whether your shop should or shouldn't upgrade depends on this one very important question: What are you using the equipment for? If you've set up your shop in a less populated rural area, chances are you're not seeing many, if any, electric vehicles. However, if your shop is in Southern California, servicing EVs is a certainty.

Even so, this doesn't mean your shop needs to upgrade, as certain jobs can be outsourced. But, if you're looking to expand your shop's range of jobs, then you'll need to ask yourself the next most important question—what's the wheelbase of the vehicles you service?

Carl Boyer, Midwest regional sales manager for Stertil-Koni, says prospective lift customers should consider the range

The EV4000SL has a 4,000-lb capacity and the capability to elevate to more than 6' in less than 20 seconds.

of their vehicle wheelbases and weight. "Typically, they want to maximize their lift to get the widest variety of vehicles on the lift," he advises.

To find the right lift to suit their customer's needs, Boyer notes, they want to know the customer's shortest and longest wheelbase vehicles. From there, they also take a look at what work the shop will be doing on the lift – oil changes, quick maintenance, etc.—as that also factors into the decision of which style of lift the shop will need. However, Boyer cautions that not every lift manufacturer will have what's best for your shop's needs. Each company can only speak to the styles of lifts they manufacture, so it is in your best interest to do all of the research before settling on which lift to purchase.

LIFT MODIFICATIONS

As mentioned previously, EVs are much heavier than the average car. With the battery alone weighing around 1,000 lbs, EV lifts must have an increased lifting capacity. The battery location has also created a need for lift modifications.

“The lift market is expanding to meet unique EV needs,” says Brian Spikes, vice president and general manager at Challenger Lifts. “OEs have made lifting points more specific to accommodate delicate wiring and EV battery locations.”

It’s important the lift can hit those specific points, otherwise the equipment could cause interference with the vehicle’s battery, notes Jason Matthews, product manager, automotive lifts for Rotary Lift. This interference could lead to vehicle damage or an inability to do the required repairs.

Lift manufacturers trying to stay ahead of the curve are working on modifying their lifts and lift accessories to cater to the electric vehicle market. Here are four EV lift manufacturers creating products to help shops prepare for the future of the industry.

BENDPAK

Announced at the 2023 NADA Expo, the BendPak Mobi-EVS EV battery and powertrain lifting system family includes the upgraded EV2400SL and the new EV4000SL.

“Mobi-EVS lift tables can handle high-voltage battery packs from a Tesla Model 3 to a Ford F-150 Lighting all the way up to a GMC Hummer EV1,” says Jeff Kritzer, president and CEO of BendPak. “They protect technicians by eliminating manual lifting, lowering, and positioning of heavy battery packs and making it easy to ergonomically move them around the shop.”

Both models feature full-length utility trays on both sides for keeping tools within reach, a stowable steering handle, zero-throw tri-casters, and an integrated slip-plate deck that enables side-to-side shifting up to 1.5" along both axis for adjustability. The EV2400SL has a 2,400-lb capacity, while the EV4000SL has a 4,000-lb capacity and the capability to elevate to more than 6' in less than 20 seconds.



CHALLENGER LIFTS

Recently introduced at SEMA 2022, Spikes says, Challenger Lift’s medium duty 5K Mobile Columns “will allow shops with limited space to have the flexibility of a mobile column system in a more compact form and at lower price point.”

As a set of four, the wireless mobile columns are able to lift 20,000 lbs and can lift vehicles from the wheels. This gives technicians total undercarriage access on both electric and larger vehicles.

Challenger also offers two EV lift tables—the BT3000 and the BT3300. Though both lift tables can be used to install and remove EV batteries, battery packs, transmissions, etc., the BT3000 offers a higher maximum height at 79.5" and has a rechargeable battery. On the other hand, the BT3300 can be easily maneuvered with its pallet-jack-style handle and extending, adjusting, and tilting top plate.

ROTARY LIFT

One of Rotary Lift’s newer lifts, the Wide Smartlift, allows better accessibility to EV batteries. Though Matthews notes that their lifts have always had clearance, he says “the difference between that and our standard Smartlift is that the plungers are farther away from each other. And that provides the clearance needed to be able to remove electric batteries.” He explains

Rotary Lift Wide Smartlift



that previously if a shop had an in-ground lift, the way they were constructed typically would have interfered with the electric battery.

To complement the Wide Smartlift, Rotary Lift has the LT33A Air-Hydraulic Lift Table. The table can shift in sections with the lift platform extending an additional 8", which eliminates the need to move the entire table when multi-positioning larger loads. Additionally, the tabletop can shift side-to-side by an inch and can tilt up to 1 degree. The variety of adjustments helps technicians easily line up vehicle components during installations. Rotary’s lift table also features foot pedal controls.

STERTIL-KONI

With EVs becoming more and more prevalent in the market, many lift manufacturers, such as Stertil-Koni, are looking at the equipment they currently offer and trying to find ways to adapt it, so it not only works with electric vehicles but also the legacy vehicles on the road and the vehicles being transitioned from internal combustion to electric.

Just as important as the EV lift itself are the EV lift tables used for lowering the battery from the vehicle. Getting the vehicle off the ground is just step one – shops need additional EV lift accessories to finish the job, such as Stertil-Koni’s SKTJ Hydraulic Transmission Jack.

“What we have right now is actually a transmission jack that’s on swivels, and it has its own hydraulic piston that would come up to meet the batteries, and then lower [them] down safely,” says Tim Kerr, engineering sales support manager for Stertil-Koni. “So that’s currently what we’re trying to work on and expand the capabilities [of].”

Kerr notes that they are looking to potentially add a large battery table to the jack, and with the equipment’s 3,500-lb capacity, it would be able to handle lifting and lowering any EV battery. ●



A closer look at lift inspections

Lift inspections are an important aspect of technician efficiency and shop safety, so shops need to be sure that they're ready to pass with flying colors.

By Alex Keenan, Associate Editor, Fleet Maintenance

While they may disagree on what manufacturer or type of lift is superior, one thing all vehicle lift experts can agree on is the need for annual inspections, as an improperly maintained lift can lead to vehicle damage and, even worse, serious injury or fatality.

"It's not a matter of if a lift is going to fail, but a matter of when," warns Bob O'Gorman. "It's a mechanical device, and all mechanical devices have got to be properly maintained and inspected."

And Jason Matthews, product manager at Rotary Lifts, notes that along with safety and longevity, there's revenue at stake. At the very least, it will cost a shop "over \$1,000 a day that's lost when a lift is down," he offers. That alone is good reason to get a certified inspector into the shop every year to inspect them.

"The American National Standards Institute standard [ANSI/ALI ALOIM 'Safety Requirements for Operation, Inspection and Maintenance'] says, and has always said, that vehicle lifts are to be inspected annually. Period," emphasizes Steve Perlstein, president of Mohawk Lifts. And he agrees that "an experienced lift inspector" should complete the task.

ALI'S NEW APPROACH

ALI produces its own certified inspectors, who a shop can hire to perform an ALI-certified inspection. Last March, ALI launched a more comprehensive version called the Check360 Certified Lift Inspection. This was created using feedback from 100 experts, according

to O'Gorman, and includes the ANSI/ALI standards, mechanical and electrical examinations, and a review of training logs, operating instructions, and safety materials. A passing lift receives an exclusive Check360 Certified Lift Inspection label that features the ALI Certified Lift Inspector hologram, a serial number matching the lift inspection report, and the inspector's individual four-digit ID.

PREPARATION MAKES PERFECT

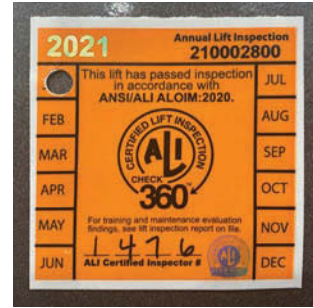
It's important to note that shops must do a little prep work to ensure the inspector can get in and out as quickly as possible. First off, the shop should perform the necessary maintenance on lifts to ensure they pass.

Part of this process includes ensuring that each lift is properly labeled with its capacity label and safety placard before an inspection. Even if labels aren't available, keeping the lift's bill of sale or owner's manual on hand can work as an apt substitute, notes Buck Gasner, a certified lift inspector for DEKRA North America

This element is particularly critical, as Gasner estimates that many lifts that fail their inspections do so not because of any technical problems, but because of improper documentation.

"People sometimes get angry when we say they fail for lack of a capacity label, but it's [really] simple," Gasner says. "How can I tell you if the lift is doing what it's supposed to do if I don't even know what the lift is supposed to do?"

Adding insult to injury with an improperly labeled lift is the process



of reinspecting the equipment once its documentation has been corrected. With some inspectors traveling to shops within a specific timeframe, scheduling a reinspection can be more costly in time and money than a shop would prefer.

Additionally, making sure that all the necessary documents, including manuals and training records, are organized and accessible is a critical time saver, though one inspectors wish was followed more often.

"We ask for all these materials, and 99 out of 100 times, it's the end of the day and the shop is still digging through filing cabinets," Gasner says. "If they take the time the day before to have that ready, that helps everything go much smoother as well."

"We get asked a lot of times, 'Can you mail me the label after I fix it?' No, no, we cannot," Gasner clarifies. "Those labels are treated like gold and serialized... So, the number one way to get recertified would be to come back and do a reinspect."

If bringing an inspector back around to the location is not an option, a shop must be able to build a watertight paper trail to prove their compliance. This means having the first lift inspection that displays any problems and then the invoice or work order for the part or label that needed replacement.

"And at that point in time, if an AHJ (authorities having jurisdiction) has a question, [the shop] can say, 'Yes, here's my inspection report that showed [the lift] had this deficiency, here's documentation that this deficiency was taken care of.' And at that point, you're covered," Gasner says. ◉



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Atlas WB41

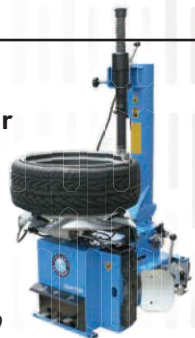
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HAS A LIFTING CAPACITY OF 10,000 LBS

The **Atlas Automotive Equipment Platinum PVL10 Two-Post Lift** is an ALI certified commercial-grade lift that accommodates many vehicles seen in commercial repair shops. The PVL10 features three-stage telescoping front arms, double screw-up adaptors with truck height extensions, rubber pads mounted to the carriage, and a single-point lock release. Its maximum lifting height (with adapters) is 81-1/2" and has a lifting capacity of 10,000 lbs.

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IDEAL FOR SMALL SERVICE BAYS

The **XA12 Alignment Scissor Lift** from **Rotary Lift** is ideal for service bays with a minimum bay size footprint of 12' by 23'. With a 78" to 164" four-wheel alignment wheelbase range and 12,000-lb lifting capacity, the XA12 was engineered with space and flexibility in mind. It features adjustable radius gauges and comes standard with two 6,000-lb capacity air-operated rolling jacks, longer rear slip plates, and its hinged ramps automatically self-check and drop down when the lift is raised.

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MULTIPLE PIN HOLES FOR QUICK AND EASY ADJUSTMENTS

The **AFF 22-Ton Pin-Style Truck Stand Set**, No. 6422, is designed for supporting trucks, trailers, and equipment in fleet garages, agricultural, industrial, and construction environments. Sold in pairs, the truck stands are made from heavy-gauge steel to provide strength and durability. They have pin holes to allow for quick and easy adjustments, large v-shaped saddle cradles for axles and other components, a large base to provide a stable working platform even on rough terrain, and a carrying handle for convenience and positioning.

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FEATURES POWDER COATED STEEL CONSTRUCTION

The **ATD Tools Vehicle Door Jack Lift**, No. 6557, features a powder coated steel construction that provides strength, durability, and corrosion resistance. The Vehicle Door Jack Lift has 4" polyurethane casters (two swivel and two with brake) for easy maneuverability. The support size is 30" length by 24" width. The support pads height adjusts from 7" to 30", and the width adjusts from 8" to 20". The lift weighs 44 lbs and can hold up to 300 lbs.

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EASILY REMOVES AND INSTALLS CALIPERS AND ROTORS

The **Gray Manufacturing Disc Brake Dolly**, No. DBD-200, allows technicians to easily remove and install both calipers and rotors. It holds and lifts components for removal and installation and allows the user to rotate the component for servicing and realignment. All adapters can be stored on the dolly and may be interchanged quickly by pinning and unpinning the adapter to the post. Includes rotor adapter and three caliper adapters. Made in the U.S.A.

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IDEAL FOR LOW CEILINGS

The **AMGO LR10 Low-Rised Portable Lift** has a lifting capacity of 10,000 lbs and is ideal for low ceilings. It provides a good working height for tires, brakes, and body repairs. The LR20 features automatic safety locks and a lock release, a minimum height of 4-1/8", and a lifting height of 23-5/8". The portable unit is easy to move around the shop with the power unit stand. Standard rubber pads are included.

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SIMPLE PLUG AND PLAY INSTALLATION

The **MAHA USA MA STAR 6.5 Two-Post Lift** features stable and torsion-resistant columns of edged H-section steel, and it can lift cars and vans with a total weight of up to 6.5 tons. The two-post lift offers triple safety due to its spindle nut package with self-locking thread, “giraffe” (patent-pending) nut breakage detection, and a motor brake. It also features an LED-based operation, plug and play installation, and powder coating. Additional options are available, including lighting and wheel engaging supports for special and electric vehicles. The latter allows unrestricted access to the underside of the vehicle and thus facilitates the removal and installation of vehicle batteries.

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FEATURES A DOUBLE PUMP DESIGN

The **Ascot Supply 4-Ton Floor Jack** features a double pump design for quick lifting and improved efficiency. Its heavy steel construction ensures maximum durability and longevity. It also has a foot pedal for handsfree positioning. With a lift range between 4-3/8” and 20-1/4”, it’s ideal for many vehicle types. Includes a one-year limited warranty.

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IDEAL FOR THE REMOVAL AND INSTALLATION OF VEHICLE TRANSMISSIONS

The **OTC High-Lift Transmission Jack, TJH10**, is ideal for the removal and installation of vehicle transmissions. The jack has a capacity of 1,000 lbs and features a universal saddle with large, easy-to-grip knobs to adjust the head. A foot-operated pump and lowering pedal allows for ease of control when positioning or removing a transmission. The hydraulic system features flash-chromed rams to prevent rust from entering the system, prolonging jack life. A built-in safety overload system prevents the jack from being used beyond its rated capacity. Two locking casters help keep the jack in position during use.

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BACKED BY AN AUTO-ENGAGE CLUTCH

The **JET Tools JLA Compact Lever Hoist Series** includes three models: 0.75-ton, 1.5-ton, and 3-ton. All feature a compact design, allowing users to get into tight areas. The hoists are backed by an auto-engage clutch that allows for easy load chain adjustment while protecting against accidental freewheeling under load. Each model also offers a fused brake for low maintenance safety, a zinc-plated grade 100 load chain, cast steel latches, a western-style double pawl system, and a short handle to get into tight areas.

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AVAILABLE IN TWO LENGTHS

The **John Bean 15k 4-Post Alignment Lift** comes equipped with safety devices to protect both the operator and the vehicle. With open-front columns, ultra-wide 26” runways, and integrated 100”-long rear slip plates, the lift is sturdy and can handle heavy duty, dual-rear-wheel trucks as well as accommodate standard, four-wheel alignments on passenger vehicles. Available in two lengths, standard and extended, the lift is certified to the industry’s leading ANSI/ALI automotive lift standard. Other notable features include: Enhanced rear slip plates, dimpled ramps, cable lock brake, and an adjustable air-hydraulic jack beam.

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QUICKLY LIFTS CARS AND LIGHT TRUCKS

The **OEMTOOLS Mechanical Vehicle Positioning Jacks, No. 24793**, feature a durable ratcheting system to lift any car or light truck in seconds providing instant mobility in any direction, the company says. Upgraded heavy duty swivel casters with needle bearing allows for effortless movement through the shop, rolling in any direction. A foot pedal provides handsfree operation, while the side handle makes it easy to carry the jack. May be used on vehicles weighing up to 6,000 lbs (requires four jacks).

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LIFTS BOTH INTERNAL COMBUSTION AND ELECTRIC VEHICLES

The **BendPak AP Series Two-Post Lifts** are designed to make lifting internal combustion and electric cars, trucks, and vans safer, easier, and more efficient. The series offers nested arms, an automatic swing arm restraint system, and an automatic safety lock system. The AP Series includes three 10,000-lb capacity models. The standard 10AP has a 73" lifting height and an overhead beam height of 145". The 10AP-168 also has 73" of lifting height plus a crossbar that's positioned 2' higher to accommodate high-roof cargo vans. The 10APX is a high-rise model, offering 79.5" of lifting height with a 157" top beam. The 10APX-181 has a 79.5" lifting height and increases the top beam height to 181". All are ALI certified.

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FOR MEDIUM AND HEAVY DUTY TRUCKS

The **AME International JACKZILLA Premium 20-Ton Air/Hydraulic Bottle Jack**, No. 14455, is designed for tire changing applications on commercial fleets, agricultural, construction, and maintenance equipment. It comes with a 10" by 10", 50-ton jack plate for optimal weight displacement on uneven or non-compacted surfaces.

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MAXIMUM LIFT HEIGHT OF 38"

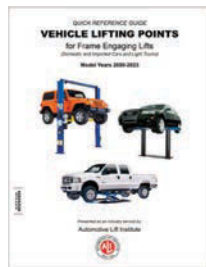
The **LiftMaster 7000** from **LiftWise** allows users to lift or lower a variety of parts into position for maintenance or other needs. Featuring a high lift capacity with a compact and maneuverable design, the hydraulic lift table provides easy operation for demanding operational tasks. The LiftMaster 7000 has a lift-off capacity of 5,500 lbs and a full capacity of 7,000 lbs. A pump handle is used to precisely raise/lower the table with a maximum lift height of 38". The lift is 32" wide and 72" long with the handle raised. The handle can be folded for a storage height of just 10.5". An optional bolt-on transfer top is available.

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AIMS TO PREVENT CAR LIFT ACCIDENTS

The **Automotive Lift Institute Digital Vehicle Lifting Points Guide** (2023) covers cars, SUVs, vans, light duty trucks, and EVs from model years 2000 through 2023. It helps prevent car lift accidents by making it easy to quickly look up OEM-



recommended lifting points. Lifting points are showcased in more than 250 undercarriage images. The digital version has the same content and layout as the familiar print guide. Users can find a vehicle quickly via a keyword search function and are able to highlight or make notes as needed.

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EXTRA-WIDE DRIVE-THROUGH CLEARANCE

The **Challenger Lifts EW1020 Wide In-ground Lift** features a lifting capacity of 10,000 lbs and an extra-wide drive-through clearance for servicing wide-bodied and electric vehicles. The hydraulic in-ground lift comes standard with True three-stage front and rear arms and double-telescoping screw pads. Bench-mounted controls are optional. Each arm has a capacity of 2,500 lbs and each screw pad adjusts from 4" to 6.125". The EW1020 has a rise height of 78", an overall width of 118", and a drive-through clearance of 88".

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MAXIMUM LIFTING HEIGHT OF 78"

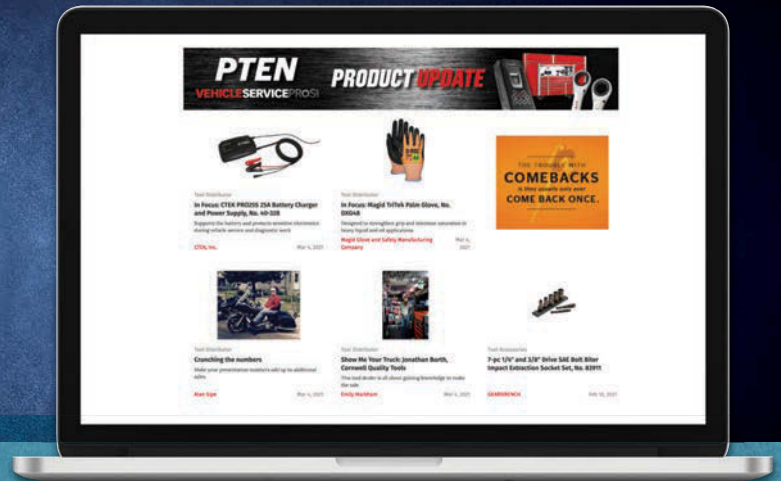
The **Dannmar D4-12A Alignment Lift** can be used to perform two- or four-wheel alignments and general service work on cars, SUVs, and light trucks weighing up to 12,000 lbs. The ALI-certified lift comes with free-floating, heavy duty turnplates and rear slip plates built into the runways for maximum convenience. The lift has a maximum lifting height of 78" and features an automatic leveling system with multiple auto-leveling locking positions in each column and a push-button safety release. The non-skid runways adjust for various tread widths. The D4-12A runs on an electric/hydraulic power system with a single hydraulic cylinder mounted under a runway for convenience and protection.

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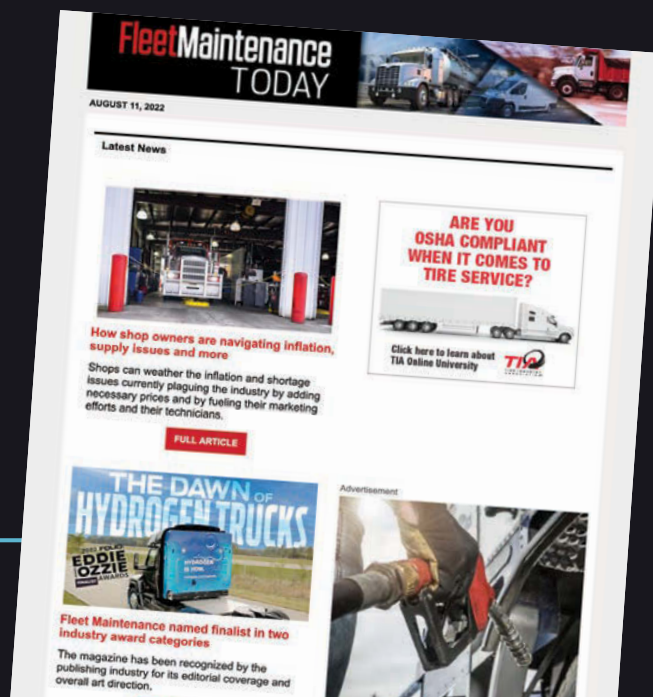
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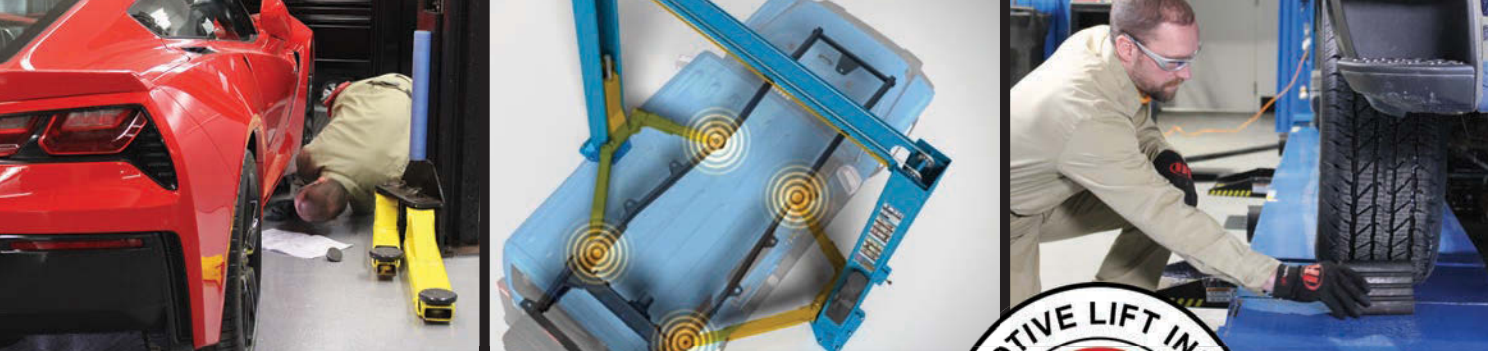
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3 ACTIONS

1 GOAL



LIFT SAFETY

1 BUY only ALI Certified Lifts

If you want the peace of mind that comes from knowing your lift has been third-party tested and independently certified to meet industry safety, construction, and performance standards as required by the International Building Code, look for the ALI Gold Label.



2 TRAIN all technicians with ALI's Lifting It Right™ online course

The world's best-selling lift safety program, Lifting It Right covers basic lift operating principles to help prevent accidents. Train technicians anywhere anytime in under an hour. It's the only lift safety course developed and supported by the technical experts from leading lift manufacturers and ALI.



3 DEMAND Annual Check360™ Certified Lift Inspections

All lifts must be inspected by a qualified lift inspector at least annually. Ensure the inspection you get meets all national safety standard requirements by hiring an ALI Certified Lift Inspector and demanding a Check360 Certified Lift Inspection – the only lift inspection backed by ALI.



YOUR SAFETY IS RIDING ON IT!™



Check the ALI Directory of Certified Lifts, order Lifting It Right online and other lift safety materials, find an ALI Certified Lift Inspector in your area, and get tips on being a smart lift buyer and operator at autolift.org.

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