

# PTEN

PROFESSIONAL TOOL & EQUIPMENT NEWS

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Volume 33, Number 1

ENDEAVOR  
BUSINESS MEDIA



**TOOL BRIEFING:**  
DO YOU HAVE  
THE RIGHT TOOLS  
FOR AN EV  
REPAIR JOB?  
**PAGE 44**

**CATEGORY  
SPOTLIGHT:**  
OVERVIEW OF BATTERY  
SERVICE TOOLS  
**PAGE 52**

## THINKTPMS T109

BY THINKCAR

DETAILS ON THE COVER PRODUCTS  
AND OTHER NEW TOOLS **PAGE 10**



▲ Available in 1/2" or  
3/4" anvil size options



▲ Extendable  
top deck



▲ Independently  
controlled spotlight

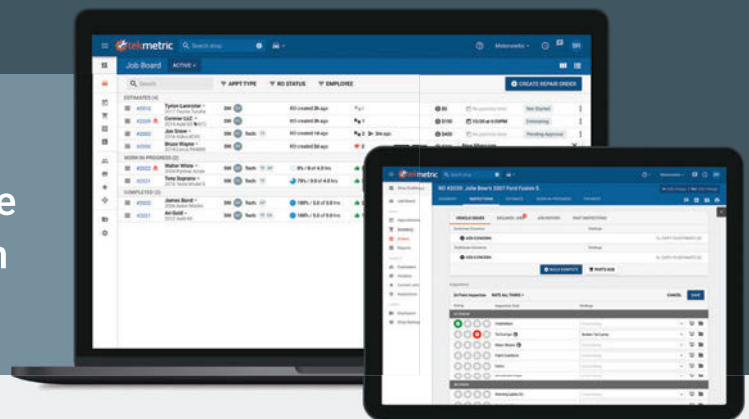


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# 43



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Platinum S20



Platinum HD



Platinum S10



Platinum S8



TPMS T109

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Andrew Kay, Hendrick Honda of Charleston, Charleston, South Carolina

**AUTEL® MAXIBAS BATTERY & ELECTRICAL SYSTEM ANALYZERS**

**BT608**

# TAKE CHARGE

**INTELLIGENT BATTERY SERVICE**

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**AUTEL**  
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**ADAPTIVE LOAD & CONDUCTANCE**



**BMS RESET FUNCTIONALITY**



**SYSTEM DETECTION**

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- 5.5" Touchscreen / Android 9.0 / Wi-Fi Software Updates
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- Test 12 & 24 Volt Cranking / Charging Systems

## FASTER VEHICLE ID: AUTOVIN & VINSCAN

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- Test Battery / Charging System for Proper Function
- Electrical System Reset



**BT508 COMPATIBLE WITH  
MAXISYS MS919**

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## TOP CONTENT OF 2021



We reveal what articles, videos, blogs, and more got the most traction on our website last year.

## INSIGHTS



A recent podcast hosted by WrenchWay reveals four creative ways for shops to engage with students. Getting them at the high school level may be too late.

[VehicleServicePros.com/21251820](https://www.vehicle-service-pros.com/21251820)

## PODCAST



Each month we create a list of must-listen podcasts for the automotive aftermarket. Take a look at our first one of the year here.

[VehicleServicePros.com/21251917](https://www.vehicle-service-pros.com/21251917)

## OPINION



Should automotive repair technicians be licensed? Panelists weigh in as questions remain around who would police the industry and if government is inclined to go this route.

[VehicleServicePros.com/21251114](https://www.vehicle-service-pros.com/21251114)

## VIDEO



The Trainer #121: Testing the engine control module – watch this video by Pete Meier, director of training for *Motor Age*, before you order a replacement.

[VehicleServicePros.com/21251045](https://www.vehicle-service-pros.com/21251045)

## FEATURED PRODUCTS



**STKR**

FLEXIT Pocket Light  
[VehicleServicePros.com/21252330](https://www.vehicle-service-pros.com/21252330)



**TOPDON**

Phoenix Elite Diagnostic Scan Tool  
[VehicleServicePros.com/21242103](https://www.vehicle-service-pros.com/21242103)



**WD-40**

EZ-Reach  
[VehicleServicePros.com/12107119](https://www.vehicle-service-pros.com/12107119)

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# NEW YEAR

# SALE

**Cheetah CH-5  
Bead Seating Tool**  
SKU 6010233

**ON SALE**  
**\$198<sup>95</sup>**



**FREE SHIPPING**

- Tank Size - 5 Gal.
- Max PSI - 120



**Ranger RST-1WS  
Rolling Work Seat**  
SKU 5150514

**ONLY**  
**\$95**



**FREE SHIPPING**



- Steel Tubing - 1"
- Swivel Casters - 2.5"

**Ranger RST-500ES  
Engine Support**  
SKU 5150103

**FREE SHIPPING**

**SALE PRICE**  
**\$188**



- Capacity - 1,500 lbs.
- Adjustable Width - 40" - 63"

**Ranger RH-50PL  
50 ft. Hose Reel**  
SKU 5150211

**ON SALE**  
**\$355**  
~~\$390~~

- Hose Length - 50'
- Fittings - 3/8"
- Air Pressure - 300 psi

**FREE SHIPPING**



**Autel TS508  
All-In-One TPMS  
Service Tool**  
SKU 6010116

**ONLY**  
**\$320**

- OBD II Style with Screen
- OBD II Cable
- Includes 8 Sensors



**SUPER SAVER**

**AUTEL**

**Ranger RJS-2TH  
Tripod  
Jack Stand**  
SKU 5150125

- Capacity - 4,000 lbs.
- Height - 55" - 87"

**ONLY**  
**\$162**

**FREE SHIPPING**



**Ranger RD-9G  
9 Gallon Oil Drain**  
SKU 5150997

- Capacity - 9 gal.
- Height - 32" - 64"
- Funnel Diameter - 18"

**ONLY**  
**\$250**

**FREE SHIPPING**



**Ranger RFJ-3TQP  
3-Ton Floor Jack**  
SKU 5150418

**ONLY**  
**\$270**

- Capacity - 6,000
- Height - 5" - 19.75"
- Chassis Length - 25.5"



**Autel MS906BT  
Diagnostic Tester**  
SKU 6010111

- 8.0" Tablet
- Android Based
- Master Cable Set

**SALE PRICE**

**\$1,425**  
**AUTEL**

**FREE SHIPPING**



**Ranger RCD-1500EX  
GoCart Vehicle Dolly  
EXTENDED (Set of 2)**  
SKU 5150191

**\$405** ~~\$450~~

**FREE SHIPPING**

- Capacity - 1,500 lbs.
- Tire Width Capacity - 13"
- Tire Diameter Capacity - 19" - 37"



**Ranger RP-20FC  
Oil Filter Crusher  
with Stand**  
SKU 5150067

**SALE PRICE**  
**\$1,795**



**Ranger RS-500DS  
STAINLESS STEEL  
Spray Washer**  
SKU 5155051



**SALE PRICE**  
**\$9,365**

**FREE SHIPPING**

**FREE 20-LB.  
Soap Bucket**



- Load Capacity - 500 lbs.
- Tank Capacity - 50 gal.
- Interior Dimensions - 43" x 32"
- Steel Oil Skimming System



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FREE CATALOG**





# This is the year you raise your labor rate

It's 2022. Stop charging less than you're worth.

By **Amanda Silliker**, Editor  
[asilliker@endeavorb2b.com](mailto:asilliker@endeavorb2b.com)

**The work of automotive technicians is highly skilled and sought after. As we are all painfully aware, there is a technician shortage and one way to solve this is to keep these bright, hard-working minds in our industry. Any good HR professional will tell you that pay is not everything, but when we are paying significantly less than other industries, our talented folks are sure to be lured away or never even consider our industry to begin with. How do we pay them what they deserve? We increase our labor rates and pass that cost along to the consumer.**

I know this can be a scary thought, but it's time to move past just thinking about it and rip off the Band-Aid. I think Maylan Newton said it best when he was speaking at AAPEX: "They're paying \$30-, \$40-, \$50-, \$100-thousand for a car, and we are still offering \$19 oil changes. That just baffles me," he said. "We need to get out of the idea that we are the bottom feeders of our industry and start charging what we're worth."

Pete Rudloff, a member of the *PTEN* advisory board, pointed out that now is the

time to raise labor rates since the automotive repair industry is in boom times.

"I don't care if they are already the most expensive in their area, it's a really booming time for auto repair right now which makes it an ideal time to thin out the shop's client base of clients that are price sensitive," he said. "Higher labor rates will do this; the shop will net more profit even if they work on fewer cars."

Sure, your customers might be able to find a similar service slightly cheaper down the street, but they are unlikely to leave if you consistently provide quality work on their vehicle and excellent customer service. Rick White, president of 180Biz, said service advisors are key to ensuring stand-out customer service. They need to understand their role in the shop's success, be well-trained, build relationships with your customers, and be passionate about delighting the customer every day.

"Recently, I was listening to an advisor saying, 'I can email this document over to you.' That seems fine but what if the advisor said, 'It would be my pleasure to get this over to you,?' White said. "These little things make such a difference in the perception of how we do business."

One tip from Eric Moore, a technician in Columbus, Ohio, and also a

member of the *PTEN* advisory board, is to be over the top with communicating to your customer. Get as many contact options as possible (text, email, phone call, social media messaging apps etc.) and communicate with the customer in their preferred manner.

Now, go take a hard look at your labor rate, refer to your service information subscriptions for guidance, and don't feel bad for a second about increasing your prices — you deserve it and your employees do too. ❌

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# FEATURED NEW PRODUCTS

## AVAILABLE IN 1/2" OR 3/4" ANVIL SIZE OPTIONS

The **Durofix 60V Cordless Brushless Jumbo Impact Wrenches**, Nos. RI60164 and RI60164-6, have two anvil size options: 1/2" (No. RI60164) and 3/4" (No. RI60164-6). The 1/2" impact wrench delivers up to 1,500 ft-lbs of maximum reverse torque and offers three pre-set torque stages (332, 450, and 1,000 ft-lbs). The 3/4" impact wrench has a maximum reverse torque of 1,605 ft-lbs and offers three pre-set torque stages (332, 450, and 1,070 ft-lbs). Both feature a built-in LED light and battery power indicator. **>>18**



**K**icking 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.



## COMBINES TPMS SERVICES WITH OBD-II DIAGNOSTIC FUNCTIONS

The ThinkTPMS T109 from Thinkcar combines TPMS services with OBD-II diagnostic functions. With rugged, easy-to-hold housing and an internal power supply, the T109 is ideal for a variety of tire shop functions such as reading sensor data including pressure, temperature, battery life, and id number; TPMS sensor activation, programming and relearning; TPMS health check; reading/clearing TPMS trouble codes; generic OBD-II functions with DTC lookup and reset; I/M test readiness test for emissions test prep; as well as O2 sensor and EVAP testing. The T109 provides coverage of 98 percent of import and domestic passenger cars and trucks with a capacity up to 1 ton. **>>21**

SPONSORED BY THINKCAR



## EXTENDABLE TOP DECK

The **Stan Design Engine and Transmission Lift Table**, No.

TA2600, is designed to safely and efficiently remove entire engine assemblies as well as remove or install transmissions. It has a 2,600 lb capacity and measures 30" by 51". With an air/hydraulic design, the lift table reaches a maximum height of 75" and a minimum height of 23". It features an extendable top deck, locking casters, dual hydraulics, pull handle, and a drilled and tapped surface for mounting fixtures. The deck angle is also adjustable. Optional features include a remote operated pump unit and a fixture kit. **>>19**

## INDEPENDENTLY CONTROLLED SPOTLIGHT AND FLOODLIGHT

The **Fenix Lighting HM65R Rechargeable Headlamp** features both an independently controlled spotlight and floodlight for a combined maximum 1,400 lms of neutral and white light. Powered by the included 3500mAh battery, the headlamp is USB-C rechargeable and includes a battery level indicator. It's made of a magnesium alloy for strength and is impact resistant to 6.6', with less weight. Additionally, it's dust-proof and waterproof to 6.6'. **>>20**





FOR MORE INFORMATION ON THESE PRODUCTS,  
CLICK ON "PTEN E-INQUIRY"  
at [VehicleServicePros.com](http://VehicleServicePros.com)  
OR CIRCLE THE NUMBER ON THE CARD.

**NEW PRODUCTS** 



### 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 as well as a Flexzilla hose assembly for maximum durability in all climate conditions. Additionally, the unit has an in-line regulator that limits inlet pressure to 94 psi to prevent air bypass. The bottle jack reaches a maximum height of 18.5" (minimum height of 9.7"). **>>22**



### 3-IN-1 UNDERHOOD TELESCOPING LIGHT, NO. KTIXD5039C

The **KTI 3-in-1 Underhood Telescoping Light**, No. KTIXD5039C, fits hood widths from 48" to 77" and has two detachable worklights, emitting a total of 1,500 lm. Made from lightweight aluminum, the light weighs 4.4 lbs. Additionally, the underhood light has a run-time up to six hours and can be folded to stand as a floodlight. **>>23**

### GUIDES TECHNICIANS THROUGH FIVE DIAGNOSTIC MEASUREMENTS

The **Collision Alignment System** from **Hunter Engineering Company** features a diagnostic workflow designed specifically for collision shops. At the heart of the Collision Alignment System is Hunter's WinAlign17 software. Collision Alignment automatically guides the technician through a workflow of five essential diagnostic measurements, blueprinting the full alignment before work begins. The five measurements are toe out on turn, maximum steer, ride height, suspension body dimension audit, and steering axis inclination. **>>24**



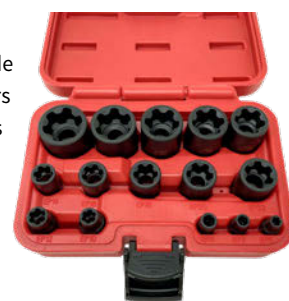
### OFFERS IDEAL DUST PARTICLE COLLECTION

The **Dynabrade Mini-Raptor Vac Standard Packs**, Nos. M1004SP and M1002EX, are designed to provide a mobile sanding solution for dusty shops, fending off dust and creating a safe, efficient work environment. Featuring a small footprint, the mobile vacuum systems offer ideal dust particle collection via its ergonomic 1" by 20' vacuum hose assembly. The M1004SP comes with the Dynorbital-Sprite Random Orbital Sander, No. 59182, and the M1002EX comes with Dynorbital Extreme Random Orbital Sander, No. X61VHS. A standard HEPA filter and HEPA bag also included. **>>25**



### INCLUDES A WIDE RANGE OF SIZES

The **CTA 15-pc Torx Plus Socket Set**, No. 5420, offers a wide range of sizes to service elliptical-shaped Torx Plus fasteners found on many vehicles where standard Torx or Ribe designs will not fit these fasteners. The set includes: EP6, EP7, EP8 (1/4" drive); EP10, EP12, EP14, EP16 (3/8" drive); and EP18, EP20, EP22, EP24, EP26, EP28, EP30, EP32 (1/2" drive). Packed in a blow molded case for easy storage. **>>26**



### PATENTED IMPACT MECHANISM REDUCES TOOL VIBRATION

The **Matco Tools 16V Cordless Infinium 1/2" Drive Stubby Impact Wrench**, No. MCL1612SIK2, features a brushless motor capable of high torque and extended durability.

The impact wrench measures 5" in length and offers 300 ft-lbs of breakaway torque. It has a glass filled nylon housing with over-mold to provide all day comfort, a patented impact mechanism that reduces tool vibration, and dual element LEDs to light the work area. The kit includes tool, two batteries, MCL16CHRG charger, and a carry bag. **>>27**



## NEW PRODUCTS



### VAPOR-BLASTED TIPS FOR ADDED PROTECTION AGAINST CORROSION

The **Mac Tools 12-pc Soft-Grip Combination Screwdriver Set**, No. SDB12DG-S, features a 360-degree ergonomic, textured soft grip for comfort for high torque applications. The nylon-alloy soft-grip handle is chemically resistant to gasoline, disk brake cleaner, brake fluid, motor oil, hydraulic fluid, ethylene glycol, and acetone. Each tool has a molded tip ID for easy recognition of tip type in the vertical position. The tips are also vapor-blasted for added protection against corrosion and improved gripping force. The screwdrivers feature a high-quality alloy-steel bar with hex bolster for additional torque application. The set includes six slotted and six Phillips screwdrivers. **>>28**

### APPLICATIONS

#### How to use Vividia VA-455i on a smartphone or tablet

**>> Step 1:** iPhone or iPad—Search for “Finder borescope” in the App Store or scan the QR code in the manual to download and install the app.

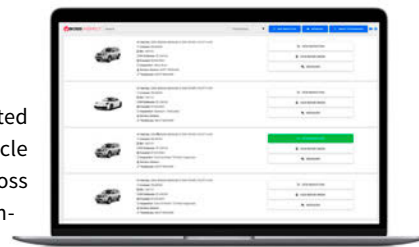
Android device—Search “Finder Borescope” in Google Play store, or scan the QR code in the manual to download and install the app. The app can be downloaded from [apkpure.com](http://apkpure.com).

**>> Step 2:** Put your phone or tablet on the holder, and connect to your phone with connecting cable.

**>> Step 3:** Press the power button for three seconds to turn the scope on. And open the app on your phone.

### PROVIDES DIGITAL VEHICLE INSPECTION FUNCTIONALITY

The **BOSS Inspect** from **Shop Boss** is an integrated tool that gives shop owners more digital vehicle inspection (DVI) functionality within the Shop Boss cloud-based application. The tool delivers a comprehensive inspection and accompanying reports, enabling technicians to evaluate, estimate, and communicate vehicle repairs more efficiently. Additionally, it offers two-way customer communication via the Shop Boss DVI; flexibility to add notes, descriptions, and images to the digital report; comprehensive inspection reports that include images and estimates; and digital invoice and payment acceptance with BOSS Pay. **>>29**



### TRACKS TOOLS AND EQUIPMENT

The **Milwaukee Tool ONE-KEY Bluetooth Tracking Tag** can easily be attached anywhere, allowing users to track their tools and equipment from a computer, tablet, or smartphone. By leveraging the ONE-KEY network and Bluetooth technology, the Tag provides information on the last seen date, time, and location of a tool when within 300' of any ONE-KEY device. The Tag features a built-in speaker to help locate tools when not in sight and a built-in NFC and scannable QR code to identify a specific item even when the One-Key app is closed. With a compact design, the Tag can securely attach to anything through glue, screw, rivet, or zip tie. **>>30**

### AVAILABLE IN 3/8”, 1/2”, AND 3/4”

The **Lock Technology Kentucky Kicker Shockkit Driver Kit**, No. LT1940, is air hammer powered and available in 3/8”, 1/2”, and 3/4” sizes. Each kit includes four tools: short throw Shockkit driver, long throw Shockkit driver, low profile drive plug, and a plug breaker bar. The low profile drive plug allows for use in tight spaces with an air hammer and the plug breaker bar allows breaker bar and air hammer simultaneous operation. By repetitive hammering, users are able to remove stubborn nuts and bolts. The tools must be used with Shockkit Punches (sold separately) for maximum performance and warranty coverage, the company says. **>>32**



### FEATURES A TWO-WAY PIVOTING 5.5MM PROBE CAMERA

The **Oasis Scientific Vividia VA-455i USB Flexible Smartphone Two-Way Articulating Inspection Camera Borescope** is an ideal diagnostic inspection camera for auto mechanics and technicians. It features a 5.5mm diameter, 1m long flexible probe that is covered with a durable and water-proof polymer tube. The VA-455i has bright LEDs, two-way pivoting 5.5mm probe camera, and can be directly connected to an iPhone iPad or Android phone or tablet via a USB data cable. The inspection camera is suitable for many applica-

tions, such as looking into engine cylinders, behind instrumental panels, or inside brake systems. Note: Some Android devices may not work due to the restriction of the Android developers. **>>31**



FOR MORE INFORMATION ON THESE PRODUCTS,  
CLICK ON "PTEN E-INQUIRY"  
at [VehicleServicePros.com](http://VehicleServicePros.com)  
OR CIRCLE THE NUMBER ON THE CARD.



## IDEAL FOR THE COLLISION REPAIR INDUSTRY

**Opus IVS DriveSafe + IVSTrio** is a diagnostic tool ideal for the collision repair industry. IVSTrio includes QuickScan, an aftermarket vehicle scan that delivers results in two to four minutes; True-OE, authentic OE scans and OE scan reports run by Opus IVS expert technicians using OEM-licensed software; and IVSRepair, a full aftermarket multi-brand diagnostic software with live data, bidirectional controls, system tests, and ADAS calibration functions. **»33**



## REMOVES SHEPPARD PITMAN ARMS

The **Specialty Products Company Class 8 Pitman Arm Popper**, No. 73140, is designed to remove Sheppard pitman arms for short sector and long sector shafts with a bolt or nut attachment. The heat-treated pusher screw features fine threads and a ball bearing tip to make removal easier without damaging expensive steering box components. **»34**

## NEW PRODUCTS



## LASER ETCHED FOR EASY IDENTIFICATION

The **Titan Professional Tools 17-pc Impact Adapter Set**, No. 81483, are heavy-duty impact grade and made of heat-treated chrome-molybdenum. They're coated in corrosion resistant black phosphate and are laser etched for easy identification. The components also feature quick change spring-loaded detent balls to ensure a tight, secure fit. The set includes 1/4", 3/8", and 1/2" universal joints; 1/4", 3/8", and 1/2" wobble extension bars in various lengths; and 1/4", 3/8", and 1/2" adapters. The set comes packed in a convenient organizer tray for storage. **»35**

# STREAMLIGHT BEARTRAP®

## The Ultra Positionable Worklight.

When your job takes you to some dark places, reach for the powerful BearTrap®. No matter where you go, you can clamp it, hang it or stand it and keep it charging while you're working. Light your way all day and know you won't leave any scratches behind.



2000 LUMENS

CLAMPS VIRTUALLY ANYWHERE

SPOT/FLOOD

RECHARGEABLE



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**BendPak Deluxe  
Alignment Turnplates  
Set of 2** SKU 5700236

**SALE PRICE**  
**\$975**

**FREE  
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**BendPak** • Size - 18.5" x 18.5"  
• Free-Floating 360° movement

**Ranger  
Wheel Weight  
Dispenser  
Stand Kit** SKU 5150028

**ONLY**  
**\$260**

**FREE  
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**INCLUDES:**  
• Dispenser Stand  
• Wheel Weights Combo

**Ranger**



**Ranger  
Wheel Weights  
Combo Set  
(Black & Silver)**  
SKU 5150230

**ONLY**  
**\$149**

**Ranger**  
**FREE  
SHIPPING**



**Danmar  
DT-50A  
Tire Changer**  
SKU 5140157

**SALE PRICE**  
**\$3,535**

**FREE  
SHIPPING**

- Int. Rim Clamping - 14" - 26"
- Ext. Rim Clamping - 12" - 22"
- Max. Tire Diameter - 47"

**DANMAR**



**Danmar DB-70  
Wheel Balancer**  
SKU 5140159

**ON SALE** ~~\$2,475~~  
**\$2,230**

**FREE  
SHIPPING**

**SUPER  
DEALS**

- Max. Tire Diameter - 49"
- Wheel Diameter - 10" - 28"
- Wheel Width - 1.5" - 20"

**DANMAR**



**Ranger RL-8500  
Brake Lathe  
with Bench**  
SKU 5150066

**SALE PRICE**  
**\$8,260**

**FREE  
SHIPPING**

**INCLUDES  
Tool Package**



- Max. Rotor Thickness - 2.5"
- Max. Rotor Diameter - 17"
- Max. Drum Diameter - 28"

**Ranger**



**SUPER  
DEALS**

**BendPak  
TSP-580V-601  
5 HP Air Compressor**  
SKU 5179111

**ON SALE**  
**\$2,780**  
~~\$3,065~~

**FREE  
SHIPPING**

- Tank Size - 80-Gallon
- Max. CFM - 17
- Phase - 1-Phase
- Hertz - 60 Hz
- Voltage - 208-230 VAC

\*\*\*MADE IN THE USA\*\*\*  
**USA**

**BendPak**

**Branick 7600  
Strut Compressor**  
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**ONLY**  
**\$945**

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**Branick**  
Since 1917



- Compression Capacity - 3,000 lbs
- Spring Diameters - 3.5/11.5

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**SALE PRICE**  
**\$6,145**

**INCLUDES:**

- (1) R980XR Tire Changer
- (1) DST2420 Wheel Balancer
- (1) Tape Wheel Weights

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SAVE!**



**Ranger**

# NEW YEAR

# SALE

**MEGA SAVINGS**

**Dannmar DLR-6**  
6K Capacity  
Low-Rise Lift  
SKU 5175330

**SALE PRICE**  
**\$2,455**

**FREE SHIPPING**



- Height - 4" - 29"
- Overall Length - 82"
- Overall Width - 70.5"

**DANNMAR**

**Dannmar DMR-6**  
6K Capacity Portable  
Mid-Rise Lift  
SKU 5175328

**SALE PRICE**  
**\$3,077**

**FREE SHIPPING**



- Height - 4.75" - 48"
- Overall Length - 81"
- Overall Width - 41.5"

**DANNMAR**

**BendPak HDS-14**  
Standard Length  
Four-Post Lift  
SKU 5175170

**SALE PRICE**  
**\$7,550**

**FREE SHIPPING**



- Max. Rise - 70"
- Overall Width - 110.25"
- Overall Height - 88"

**BendPak**

**BendPak LR10000**  
Low-Rise Lift  
SKU 5175232

**FREE SHIPPING**

**SALE PRICE**  
**\$4,405**

- Capacity - 10,000 lbs.
- Max. Rise - 23"
- Width - 85"
- Length - 82.65"



**BendPak**

**SALE PRICE**  
**\$249<sup>99</sup>**

**Frame Cradle Pads**  
for BendPak 2-Post Lifts  
Set of 4 / 60 mm Pin  
SKU 5175761



**Dannmar D4-12**  
12K Capacity  
Four-Post Lift  
SKU 5175317

**SALE PRICE**  
**\$5,905**

**FREE SHIPPING**

- Capacity - 12,000 lbs.
- Max. Rise - 68.75"
- Drive-Thru Clearance - 98"



**DANNMAR**

**Dannmar D2-10C**  
10K Capacity  
Two-Post Lift  
SKU 5175314

**SALE PRICE**  
**\$4,701**

**Dannmar D2-10A**  
10K Capacity  
Two-Post Lift  
SKU 5175313

**SALE PRICE**  
**\$4,713**

**Dannmar D2-12C**  
12K Capacity  
Two-Post Lift  
SKU 5175312

**SALE PRICE**  
**\$7,639**

**FREE SHIPPING**



**INCLUDES Adapter Set**

**DANNMAR**

**Dannmar D4-12A**  
12K Capacity Alignment  
Four-Post Lift  
SKU 5175318

**SALE PRICE**  
**\$7,295**

**FREE SHIPPING**

- Capacity - 12,000 lbs.
- Max. Rise - 68.75"
- Max. 2 Wheel Alignment - 163.5"



**BendPak**

**BendPak XPR-10S**  
10K Capacity Symmetric  
Two-Post Lift  
SKU 5175395

**SALE PRICE**  
**\$5,090**

**FREE SHIPPING**

- Max. Rise - 69"
- Overall Height - 145" / Width - 132" or 145"

**BendPak XPR-10AS**  
10K Capacity Asymmetric  
Two-Post Lift  
SKU 5175397

**SALE PRICE**  
**\$5,150**

**FREE SHIPPING**

- Max. Rise - 69"
- Overall Height - 145" / Width - 137" or 145"

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Prices valid until March 31, 2022

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## NEW PRODUCTS



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### APPLIES ADDITIONAL FORCE TO THE WHEEL HUB

The **ProMAXX Tommy Rail** is crafted from solid, hard-coated American aluminum and attaches to the outside of the lower push flange, creating a powerful structural link similar to an automotive rear-end four-bar linkage setup. It's designed to work with the company's Tommy Wheel Bearing Puller, allowing technicians to apply even more force to the wheel hub to make any wheel bearing removal quick and easy on select Ford and Subaru Models. The tool is made in the U.S.A. >>>38

### NO TOUCH AUTOMATIC DISPENSER

The **Moldex Pura-Fit TouchFree EcoStation Starter Kit**, No. M6835, from **Magid** provides a hygienic solution to ear-



plug dispensing, making hearing protection easier to access. Simply place hand under the automatic dispenser and a pair of Pura-Fit earplugs will drop, preventing users from taking more than one pair at a time. The unit comes equipped with 500 pairs of Moldex Pura-Fit earplugs.

Sealed refills install quickly and easily. All Moldex hearing protectors are independently tested to ANSI S3.19-1974. >>>40

### FEATURES AN LED WORKLIGHT



The **Marson BT-5 Battery Powered Riveter** from **Howmet Fastening Systems** is designed to deliver reliable performance at a valuable price point. The BT-5 is lightweight and offers an ergonomic grip. It also features an LED worklight and has a stroke length of .866". The Marson BT-5 kit includes nose tips for 1/8", 5/32" and 3/16" rivet diameters. An optional nosepiece allows users to install 3/32" rivets, as well. >>>41

### FOR USE ON MACK AND VOLVO SUSPENSIONS

The **ESCO Leaf Spring Socket**, No. 40309, is designed for use on Mack and Volvo suspensions. The socket is machined with precision to ensure accuracy and consistency and is finished with an anti-corrosive black oxide finish to increase corrosion resistance. It's compatible with a 1/2" drive. >>>42



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Choose the TPMS tool that works with virtually every sensor.

Get the ability to perform TPMS service with virtually any OE or aftermarket TPMS sensor along with best-in-class vehicle coverage. Don't settle for a TPMS tool that locks you into one brand of aftermarket sensor. Choose the enhanced features of the Autodiagnos™ TPMS D Tool or the efficient Autodiagnos™ TPMS SE Tool, and get Continental's OE TPMS systems experience.



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**Autodiagnos TPMS D Tool**  
Diagnostics, TPMS service and tire service in one unit.

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## OFFERS INCREASED VISIBILITY OF TANK FLUID LEVELS

The **Pulse Level Tank Monitoring System** from **Graco** allows shops to track tank levels, capture and apply data, and allocate inventory quickly, accurately, and confidently. Shops can use the data to simplify procurement, improve profitability, and assess the overall performance of crews and technicians, the company says. Compatible with LTE networks, available in Wi-Fi configurations, and easy to use, shops can choose from multiple tank-level monitoring technologies. **>>43**



## 18V LXT HIGH-PRESSURE CORDLESS INFLATOR

The **Makita 18V LXT High-Pressure Cordless Inflator** features a high-volume pump with up to 160 psi, making it ideal for use on larger tires, or those with higher psi requirements. With an auto-stop function, the unit automatically stops inflation when the preset air pressure is obtained. There are three speed settings: high, medium, and low. The inflator also features an air-release button, high visibility pressure gauge display with backlight, built-in LED to illuminate the work area, and a 25-1/2" hose length for a better reach. Its compact and lightweight design allows for easy portability and convenient storage. **>>44**

# Lisle NEW TOOLS



### 89500 89510 BUCKET BRUSHES

ATLASTA®, ATLASTA® SoftTip Parts Washer and Detail Brush — "Bucket brushes" are designed for hand use in a parts washing sink or solvent container. Cleaning is achieved by pressing the solvent-filled Trialoy® bristles against the dirty surface. A tough brush that will last and last. 89510 is similar to our popular Atlasta® parts cleaning brush but with softer filament that won't scratch chrome or polished metal. Both have innovative bullet-shaped tips that resist mushrooming. Durable injection molded handle with ribbed design for firm grip. Long-lasting, stiff Trialoy® polyester filament can be used in either solvent- or water-based cleaning solutions.



### 89520 89530 89540 89550 89680

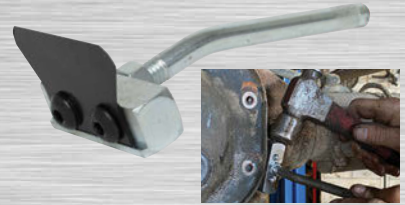
#### FLOW-THRU BRUSHES

ORIFLO®, ORIFLO® SoftTip, are flow-thru brushes designed for parts washing sinks with circulating solvent systems. Designed for industrial parts washers with solvent circulating pumps. 89520, 89530, 89540 ORIFLO® flow-thru parts washer brushes deliver a continuous stream of solvent through the bristle. 89530 includes a 28" Buna N (nitrile rubber) tube. 89680 STRAIGHT SHOOTER incorporates a push button flow control valve. Bullet-shaped tip resists mushrooming. Durable, injection-molded handle with ribbed design for firm grip. Long-lasting, stiff Trialoy® polyester filament can be used in either solvent- or water-based cleaning solutions.



### 81990 1-1/4" CARBIDE SCRAPER, 8"

Designed to remove gasket residue from steel and aluminum heads and manifolds, along with carbon build-up and even rust. The carbide scraper features a double-dip grip handle for comfort. Can be used to clean disc brake caliper slides. The Tungsten carbide tip is brazed to the steel blade. The tip remains very sharp and is precision ground. Use caution when using scraper on aluminum to avoid scratching the surface.



### 50210 GASKET SEPARATOR

For use on any application with a gasket seal such as oil pans, transmission pans and differential covers. Drive tool between the gasket and then use a hammer from the side to separate the pan from the gasket. Blade is made from hardened carbon steel. Replacement blade available separately.



### 20580 INLINE SPARK TESTER W/ COIL-ON-PLUG WIRE

Gives a visual check of spark energy for coil-on-plug or standard ignition systems. Connect the tool between the spark plug and the plug wire. The tool wire is double ended to offer a straight boot and a 90-degree boot on one tool. With the engine running, the tool flashes a mirror image of the ignition spark. The additional 7" extension plug wire is used on coil-on-plugs that are recessed and hard-to-reach.



### 61460 H.D. END CAP WRENCH SET, 21 PC

Hardened steel plates are wire and spot welded for strength. A collection of 21 end cap filter wrenches for use on the most popular domestic and import vehicles, including four new sizes.



### 17300 FLEXIBLE HOSE CLAMP TOOL

24" flexible cable allows access to clamps difficult to reach with other tools. Specially designed cable assembly with spring helps prevent cable breakage from over tightening. Tool is very strong and will work on even the most stubborn clamps. For use on clamps found on radiator hoses, heater hoses, and fuel lines. Simply squeeze the handles to expand and hold hose clamps in any open position. Expands hard-to-reach flat-band and Mobeate-type hose clamps safely and easily.

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## NEW PRODUCTS

### DETACHABLE TO BECOME A HANDHELD FLASHLIGHT

The four-mode **XPH30R Headlamp** from **Coast** offers up to 1,000 lm on Turbo Mode. Coast's patented Pure Beam technology with a Twist Focus optic enables seamless transitions between the Ultra View flood beam and Bulls-Eye spot beam. This headlamp's dust-resistant and stormproof aluminum body rolls in its bracket for dynamic directional lighting—and can also detach to become a handheld flashlight with a built-in magnetic tail cap and real-time power indicator. Featuring Coast's rechargeable Dual Power system for versatility on the job, the headlamp runs on a Coast Zithion-X rechargeable battery (charging cable included) or CR123 lithium batteries (purchased separately). **>>46**



FOR MORE INFORMATION ON THESE PRODUCTS, CLICK ON "PTEN E-INQUIRY" at [VehicleServicePros.com](http://VehicleServicePros.com) OR CIRCLE THE NUMBER ON THE CARD.

### MOBILE AND FEATURES A SMALL FOOTPRINT

The **Car-O-Liner CDR1 Workstation** contains the equipment and materials needed to perform light-to-medium collision damage repair quickly and efficiently. The CDR1 is mobile and has a small footprint. It features the CR235 Combi Spotter which has two separate guns for easy switching between steel and aluminum welding operations. Available in three versions, the Level 1 cart includes the CR235 Combi Spotter, plus separate drawers with steel and aluminum repair tools, and the Level 2 cart features an additional drawer for glue pull repairs. The Level 3 cart includes a drawer for pneumatic push pull repairs, plus another drawer for holders. **>>49**



### PROVIDES LIVE ACCESS TO EXTENDED VEHICLE DIAGNOSTIC DATA

The **Continental Autodiagnos Drive** is a remote vehicle data solution designed to deliver advanced diagnostic information that service providers, fleet managers, and repair facilities can use to maximize their data-driven services. The easy-to-install, plug-and-play technology provides users with live access to extended vehicle diagnostic data for all popular makes and models of passenger cars, light trucks, and commercial vehicles. Autodiagnos Drive helps customers increase productivity, reduce downtime, enhance customer service, and gain better insights into the condition of the vehicles they service or manage. The system will also help them to quickly provide vehicle owners with reliable and up-to-date information about their vehicle's health and performance parameters. **>>47**



## LTI HAS THE TOOLS TO GET THE DIFFICULT JOBS DONE!

### LT1350 Lug Ripper II

Patent #10,549,355 B1

Don't torch frozen/damaged lug nuts off - just drill out the lug nut threads and the wheel stud ONLY in 11 minutes or less. Easily replace damaged lug nut and wheel stud without damaging rim. LT1350-8 Water Bladder is NOW AVAILABLE AGAIN.



Scan to see NEW drill bit work!



**NEW & IMPROVED LT1350-6 16mm STEP UP COBALT DRILL BIT**

Drills out the lug nut threads and the wheel stud only!



### LT1900 10 Piece SAE Shockit Crows Foot Set LT1910 10 Piece Metric Shockit Crows Foot Set LT1920 13 Piece SAE Shockit Line Wrench Set LT1930 12 Piece Metric Shockit Line Wrench Set

Patent #7,677,143

Uses the force and vibration of an air hammer. Indexed holes keep Shockit Punches from slipping off crows foot & line wrench. Shockit Crows Foot Sets loosen hydraulic fittings on tractors, forklifts & heavy equipment. Shockit Line Wrench Sets loosen steering rack, brake, A/C & fuel system fittings. Punches sold separately - see Shockit Punch Kit section.



Scan to see!



**AIR HAMMER POWERED**



### LT855-AH Texas Twister™ Bidirectional Air Hammer

Use as a hammer or use as a puller - double duty air hammer. Just install the included air lock plug into quick release chuck in front of air hammer to convert to pneumatic puller. Works with LT855A Texas Twister™ Air Hammer Pulling Kit accessories. Unlimited applications in automotive, aircraft, marine repair, farm implement maintenance, manufacturing industries.



Scan to see!



Air Lock Plug



In use w/855-2A seal remover (not included)

Patent #7,036,211



### LT855A Texas Twister™ Air Hammer Pulling Kit

Now you can convert your air hammer into a pneumatic slide hammer. Pull axles, seals, diesel injectors, bearings, pulleys, harmonic balancers, axle pinion flanges, old distributors & much, much more. NO MORE SLIDE HAMMERS! Connect to your specialty pullers and Vise grips. Patent #7,036,211.



Scan to see!



Texas Twister™ = PULLING POWER

air hammer not included



### LT886 Radiator Rocket Coil & Line Cleaner

Patent Pending

Clean cooling coils for radiators, transmission lines, oil and fuel lines, air aftercoolers, condensers, evaporators and much more. IDEAL FOR TRANSPORT, MUNICIPAL, AGRICULTURE, INDUSTRIAL AND HD TRUCKS. Can be configured in 3 foot, 2 foot, or 1 foot lengths. Eliminates need for vehicle jacks or lifts to access buried coils. Designed for shop and field use. CAN ALSO BE USED WITH WATER.



Scan to see!



**THIS ROCKET RUNS ON AIR POWER!**



REMOVABLE BRUSH BAR

4" AIR SLOT

### LT994 Shockit Socket O2 Sensor Removal Kit

Patent #7,677,143

Shockit Sockets to easily access, loosen, and remove frozen and obstructed O2 sensors. Works when ratchets, wrenches and regular sockets don't fit. No more catalytic converter removal or dropping motor mounts to access O2 sensors. Includes LT1910P non-slip self centering air hammer powered offset 11" Standard Shockit Punch for limited access applications. Additional Shockit Punch sizes available - see Shockit Punch Kit section.



**AIR HAMMER POWERED**



Scan to see!

### LT1940 Series Kentucky Kicker Shockit Driver Kits

Apply air hammer hyper sonic vibration and torque to any impact socket. Drive Plug Breaker Bar allows breaker bar & hammer simultaneous operation. Low Profile Drive Plug allows for use in tight spaces with an air hammer. Indexed holes designed to keep Shockit Punches from slipping off driver. 3 sizes available Punches sold separately - see Shockit Punch Kit section.

**AIR HAMMER POWERED**

Patent #7,677,143



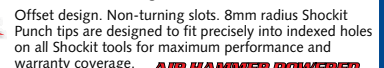
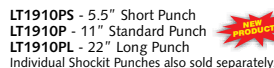
Scan to see!

### LT1910PK Shockit Punch Kit

Patent Pending

LT1910PS - 5.5" Short Punch  
LT1910P - 11" Standard Punch  
LT1910PL - 22" Long Punch  
Individual Shockit Punches also sold separately.

Offset design. Non-turning slots. 8mm radius Shockit Punch tips are designed to fit precisely into indexed holes on all Shockit tools for maximum performance and warranty coverage. **AIR HAMMER POWERED**



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## PROTECTS THE SYSTEM FROM CONTAMINANTS

The **Yellow Jacket BULLET DC Vacuum Pump** features a brushless DC (BLDC) motor, capable of providing high torque and high efficiency. The unit functions in extreme low voltage conditions and is field rated to 25 microns. The easy-to-carry, lightweight design is available in 7 cfm to handle most residential and commercial applications. Pulling down to less than 25 microns, BULLET DC protects the system from contaminants and non-condensable gases, which can damage components, reduce efficiency, and cause system failure. **>>50**



## DETECTS HIGH-LEVEL FAULTS ON VARIOUS ELECTRICAL COMPONENTS

The **Launch Tech O2-1 Scopebox** is an automotive oscilloscope that detects high-level faults on various electrical components such as sensors, actuators and various circuits. The O2-1 is able to deliver accurate and conclusive diagnostic findings through waveform analysis, leading to efficient and precise repairs for the shop and technician. By integrating with a X-431 series diagnostic scan tool, the O2-1 aids in troubleshooting high-level electrical faults by depicting on screen electro-waveform activity. The O2-1 features an ergonomic design and upgraded hardware. **>>52**

## HAS A LIFTING RANGE FROM 6" TO 22"

The **OTC 5-Ton Service Jack**, No. HDJ5, features a durable long chassis and is ideal for lifting step vans, bucket trucks, and smaller work vehicles. A built-in safety overload feature prevents users from using the jack beyond its rated capacity. The jack has a lifting range from 6" to 22" and has a reach of 47". It also features a convenient foot pedal to speed the lifting operation and handle lock and release controls that are located on top of the 40" spring-loaded handle. The handle can be locked into any position from vertical to horizontal. Meets all five ASME PASE-2019 safety standards for service jacks. **>>53**



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The Battery Chargers Professional Technicians TRUST

## ESS6100 Smart Charger



### JUDGES COMMENTS:

"Great charger/maintainer that will keep a battery charged whether it is being stored, or is low and needing a charge. Works to keep a vehicles battery level where it needs to be during diagnostic procedures, or module programming."

"Very versatile small charger."

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- OE Approved Smart 12V Battery Charger and Diagnostic Support Unit
- Supports up to 100 Amps for Vehicle Diagnostics and Re-Flashing using 15A 120VAC
- 100% Connected and 100% Customizable via USB
- 4 Operating Modes: Charging, Diagnostics, Showroom, Tester
- Extends Life and Performance of Vehicle Batteries



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## NEW PRODUCTS

### UNIVERSAL FOR LIGHT- AND HEAVY DUTY DIESEL ENGINES

The **Mueller-Kueps NOX Sensor Thread Restorer Kit**, No. 506 021, is designed to allow technicians to professionally restore



the NOX sensor hole thread without damaging the exhaust system.

The kit is universal for light duty and heavy duty diesel engines. It features an alignment guide at the front of the restorer to ensure proper angle and is extra short, enabling it to be used with a socket or ratchet spanner for narrow spaces. The time-saving tool can also be used for the diesel particulate filter as well as any exhaust sensor, even those located in a catalytic convertor. Available in sizes M20 x 1.5 and M22 x 1.5. **»54**

### NOW OFFERS DOT TIRE REGISTRATION

The **Autel MaxiTPMS ITS600** tablet now offers DOT tire registration via an integrated CIMS E-Tire registration feature, enabling ITS600 users to quickly complete the TIN registration for its customers directly from the tablet. A CIMS subscription is required. The ITS600 DOT app also allows technicians to perform additional tire safety inspections on installed vehicle tires, including determining tire age and recall status. The tablet uses optical recognition with its camera to identify the tire age and to check the TIN against the tire recall database. The ITS600 is an Android-based wireless touchscreen tablet that performs complete TPMS service from activation and diagnostics to 1-Sensor programming and sensor ID relearn. **»56**



### FEATURES A 6-POINT DESIGN



The **ATD Tools 7-pc Filter Socket Wrench Set**, No. ATD-5232, is for use on vehicles equipped with cartridge-type filters to unscrew the housing without damage and access/replace the cartridge element inside. It provides multiple contact points to engage the housing cap securely for maximum removal torque. The filter socket wrenches have a 6-point design with a 3/8" square drive for use with a ratchet or extension. They are made from chrome vanadium (CR-V) steel for strength and corrosion resistance. Applications include BMW, Buick, Cadillac, Dodge, Ford, Mercedes, Mini Cooper, and SAAB. Sizes include: 24mm, 27mm, 29mm, 30mm, 32mm, 36mm, and 38mm. **»57**



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The **KNIPEX Tools CutiX Universal Snap Knife**, No. 90 10 165 BKA, features an extendable stabilization bar that keeps the blade from bending for quicker cutting. The stabilization bar can be engaged or retracted based on application, and allows the user to apply more pressure directly on the blade. The CutiX also features a hardened steel pin to secure the blade. Constructed with a lightweight magnesium housing, the knife has non-slip gripping surfaces and two separate sliders - one for the blade and one for the stabilization bar. Suitable for all 18mm snap-off blades, the CutiX comes with two blades that have seven cutting points, stored in the handle. **>>58**

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is effective for cleaning metal parts including carburetors, chokes, air intakes, throttle bodies, brake drums, rotors, and calipers. The parts cleaner and degreaser is 50-state VOC compliant and meets SAEJ2784 and ASTM D1353 standards. **>>59**

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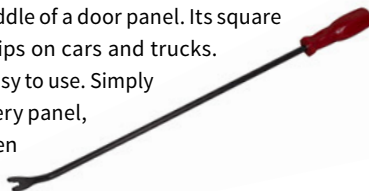


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The **Lisle Corporation Long Door Panel Tool**, No. 35600, measures 19.75" in length, making it ideal to reach upholstery clips in the middle of a door panel. Its square notch design removes both plastic and metal clips on cars and trucks.

The tool helps eliminate broken fasteners and is easy to use. Simply place the tool under the edge of the door upholstery panel, insert into the fastener as far as possible, and then simply pry up. Heat treated for durability. **>>61**



**INCLUDES HEAVY DUTY QUICK CHANGE CHISEL RETAINER**

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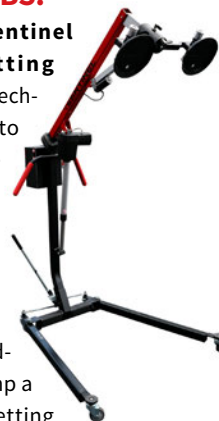
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### PROFESSIONALLY CALIBRATED DIGITAL PRESSURE GAUGE

The **Performance Tool HD Digital Tire Inflator Kit**, No. M526, features a professionally calibrated digital pressure gauge for accurate readings between 0 to 150 psi with resolution of 0.1 psi within  $\pm 1$  percent and pressure monitoring system. It has a large backlit LCD gauge that is easy to read and will automatically shut off after 20 seconds of inactivity to preserve battery life. The kit includes an inflation gun, digital gauge, 20" by 1/4" rubber lead hose, heavy brass air chucks (clip-on, screw-on, right angle, and presta valve), four rubber valve seals, and two AAA batteries. **>>65**



### WELDS MATERIAL FROM 22 GAUGE UP TO 3/8"

The **ESAB EM 210 MIG/Flux Cored Welder** weighs 29 lbs and delivers up to 200A of MIG welding power. It features an easy-to-read LED digital display, professional-grade arc characteristics, and full-featured digital controls which enable fine-tuning of the arc performance to deliver ideal welds. The inverter-based power source is small in size, yet delivers professional-grade power and performance for most auto/truck repair and restoration work. The EM 210 welding system has a 30-200A output and welds material from 22 gauge up to 3/8" in a single pass. The unit accepts 4" and 8" diameter wire spools.

**>>66**

### FEATURES ONE-HAND REVERSE SYSTEM

The **Chicago Pneumatic 1/2" Cordless Impact Wrench**, No. CP8854, is lightweight and compact, weighing 5.51 lbs with a length of 7.44". The CP8854 is ideal for tire changing and quick service wheel applications on light vehicles including cars and vans. Technicians can easily use the wrench to remove wheels quickly for access to brakes, suspension, and shock absorbers, and thanks to a built-in shut off feature, can then pre-tighten wheel nuts with no risk of overtightening. In addition, the tool features Chicago Pneumatic's one-hand reverse system (CP Side2Side) for ease of use and a bi-material handle that gives a comfortable grip. **>>67**



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The **AFF 22-Ton Air Assist Truck Axle Jacks**, Nos. 565F and 565F1, are ideal for heavy duty truck and trailer shops, rail and bus work, farm vehicles, industrial equipment, and more. Their engineered high-speed air motor delivers fast and efficient operation while the compact and low-profile design easily fits between tandem wheels. The jacks feature a fully welded hydraulic pump and cylinder, heavy-duty wiper seals, large 8" diameter rubber wheels, and a built-in overload and bypass safety valve. The handle also locks in three different positions from 90 to 180 degrees. The 565F comes with a two-piece handle, whereas the 565F1 comes with a one-piece handle. **>>70**



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The **Bosch ESI[truck] 2021/4 Software Update** offers additional vehicle coverage including new makes, models, wiring diagrams, fault codes, electronic control systems, and diagnostic capabilities. A new feature included in the update, Search Server for New System Variants, connects to the Bosch server to search for new system variants if the vehicle (or system) users are connected to is not fully recognized by the ESI Truck system. If the server has an update for the particular system, it will be downloaded to the tool. Additionally, VIN and mileage data will automatically be populated if the connected vehicle provides this information in the available data stream. **>>71**

## 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, making it capable of lifting cars and vans with a total weight of up to 6.5 tons. The two-post lift offers triple safety thanks to its spindle nut package with self-locking thread, "giraffe" (patent-pending) nut breakage detection, and motor brake. It also features an intuitive, LED-based operation, plug and play installation, and high-quality 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 facilitate the removal and installation of vehicle batteries. **>>72**



## HAS AN ONBOARD AIR PRESSURE GAUGE

The **Ingersoll Rand 3/4" Impact Wrench**, No. 2146Q1MAX, features an air gauge that indicates whether it is operating at, below or above the tool's maximum rated air pressure of 90 psi. The onboard air pressure gauge is situated on the back and monitors the air pressure ranging from 60 psi to 120 psi. The tool delivers up to 2,000 ft-lbs of nut busting torque, has the ability to quickly dial-in optimal power settings, has a six-vane motor to remove stubborn bolts reliably, and is built to withstand tough use. Also available with a 1" drive (No. 2146Q2MAX). **>>73**







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The **TRANSLIGHT 555 + Premium Auto Darkening Helmet** from **Jackson Safety** features the company's 370 series Easy Grip Turn ratcheting mechanism and a 12.47 sq. in. viewing area. The viewing area offers switching speeds of 1/25,000 sec. to increase comfort and keep eyes less fatigued. It also has a True Color ADF 1/1/1/1 optical clarity rating and four arc sensors to provide ideal coverage when welding out of position. The helmet's proprietary external shade adjuster finely tunes in .2 increments or +/- 1 full shades for visual precision. Additionally, it has an external grind button to allow users to switch modes with ease. **>>74**



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The **Free All Deep Penetrating Oil with Precision Straw** from **FedPro** allows users to spray penetrating oil in a wide-aim nozzle or through the straw-nozzle for pinpoint accuracy. Free All penetrates rust, scale

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The **ZX10 Android Tablet** from **Getac** is a fully rugged tablet and versatile 10" device



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# Advanced diagnostics: a diesel engine mechanical fault

Use a capable lab scope and pressure transducer to see the changes in pressure of the exhaust system.

By **Brandon Steckler**, Technical Editor

**N**ot a heavy duty diesel tech? That's fine; neither am I. But one tried-and-true method of acquiring new knowledge is to implement the tools we've learned to trust and invest some time in some research. This combination has served me well in developing hypotheses and proving them out through experimentation.

### THE TASK AT HAND

The subject of the day, a huge Caterpillar 14.7L 3406e diesel engine situated in a Kenworth W900 dump truck. The truck comes to us with the complaint from the operator that the powerplant's compression brake doesn't seem to slow the vehicle as it has in the past. With a little research and input from my brilliant HD tech friend and instructor, Brent Delfel of Advanced Diagnostic Consulting, I'd like to show you what I have learned from him.

The compression-brake system assists in slowing the tremendous vehicle in two ways. First, utilizes the compression stroke of the large diesel engine to slow the crankshaft down. At the top of the compression stroke, the highly pressurized cylinder charge is then "wasted". Just at the point when combustion of the diesel fuel would normally occur, the delivery of the fuel is canceled and the exhaust valve is momentarily allowed to open. As a result, compression is shed on the exhaust stream.

A moment later, the exhaust valves are allowed to close, sealing the cylinder once again. The piston will continue to descend on what would normally be a power stroke. Instead, as it's descending a negative pressure (or "vacuum") is created in the cylinder, on top of the piston. This vacuum in the combustion chamber is what also assists in slowing the crankshaft down. Engine-braking occurs when there is no accelerator input and the clutch engages the engine and the transmission. As long as the engine is mechanically connected to the transmission and road wheels, the vehicle will slow as well. This is why it's called an "engine brake."

There are three levels of engine braking (low/medium/high). In low, only two cylinders have engine-braking capability (cylinders

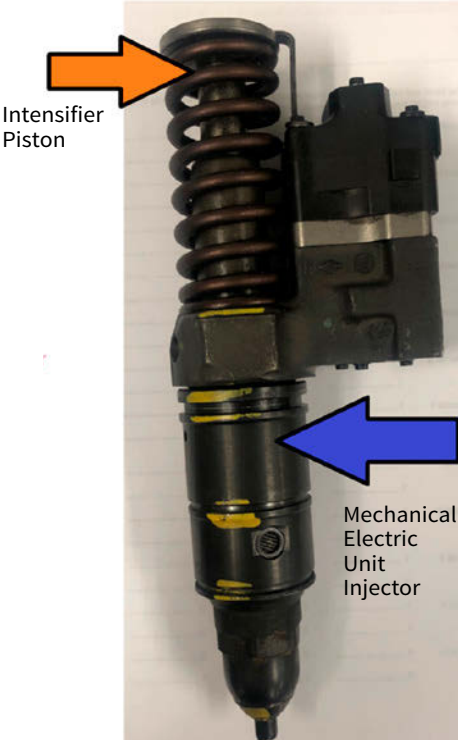
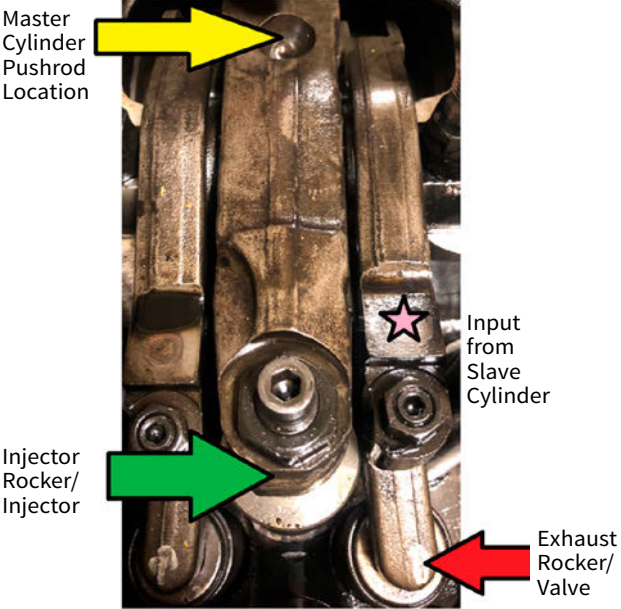


Figure 1: The camshaft-driven rocker arms (top) for a single cylinder. The center rocker arm operates the MEUI injector (bottom).

3 and 4). Medium allows for four of the cylinders to provide engine-braking capability (cylinders 1, 2, 5, and 6). High allows for all six cylinders to provide engine braking.

## HOW IS THE GOAL ACCOMPLISHED?

Now that I have an understanding of the system's goal, I can begin to understand how that goal is carried out. The first thing we have to understand is that this Caterpillar uses mechanical electronic unit injectors (MEUI). The engine's camshaft has an additional lobe (for each cylinder) to operate an intensifier piston on top of the injector itself (Figure 1). The ECM will command the injector solenoid on/closed to trap the fuel in the injector. The cam lobe will operate the rocker/piston and with the injector solenoid energized the trapped fuel will be pressurized and delivered to the combustion chamber. When the solenoid is off, fuel is not trapped but vented from the injector to a return fuel circuit.

It's this same rocker that is used to operate the injector piston that is also used to operate the engine brake system. As the rocker is driven by the camshaft, it pivots on a fulcrum, like any other rocker. The camshaft-side lifts and the injector-side travels down (like a seesaw). It's the upward motion of the rocker that drives a pushrod connected to a master hydraulic cylinder. This system diagram is drawn in a state of "engine-brake operation" and demonstrates only one cylinder's circuit but functionality is the same for all six cylinders.

## SYSTEM OPERATION

Pressurized oil is supplied from the engine. During normal operation of the engine, the oil is vented back through the oil drain circuit via the de-energized solenoid control valve. However, when engine-braking is called upon, the solenoid control valve is energized by an ECM and allows supplied oil to reach the hydraulic control valve which is being held closed by a spring.

As the pressure of the supply oil overcomes the spring tension of the hydraulic control valve, the valve begins to shuttle and unseats the check-ball as well. Supply oil is then allowed to fill/feed the hydraulic circuits of the master and slave cylinders. This will cause the master cylinder pushrod to extend and come into contact with the injector rocker at the camshaft (as indicated by the yellow arrow in Figure 1).

The motion of the cam lobe operates the injector rocker and drives the pushrod of the master cylinder up. As a result, the oil in the feed circuits is displaced, and the check-ball in the hydraulic control valve seats. Pressure begins to increase in the hydraulic circuits as the oil is now trapped and the master cylinder pushrod is displaced by the rocker.

The movement of the master cylinder pushrod is transferred in the hydraulic circuit to the slave cylinder and it extends to operate the exhaust valve rocker (as indicated by the pink-colored star in Figure 1). Compression is vented to the exhaust stream and the valve will close as the lobe of the injector rocker rotates past its apex.



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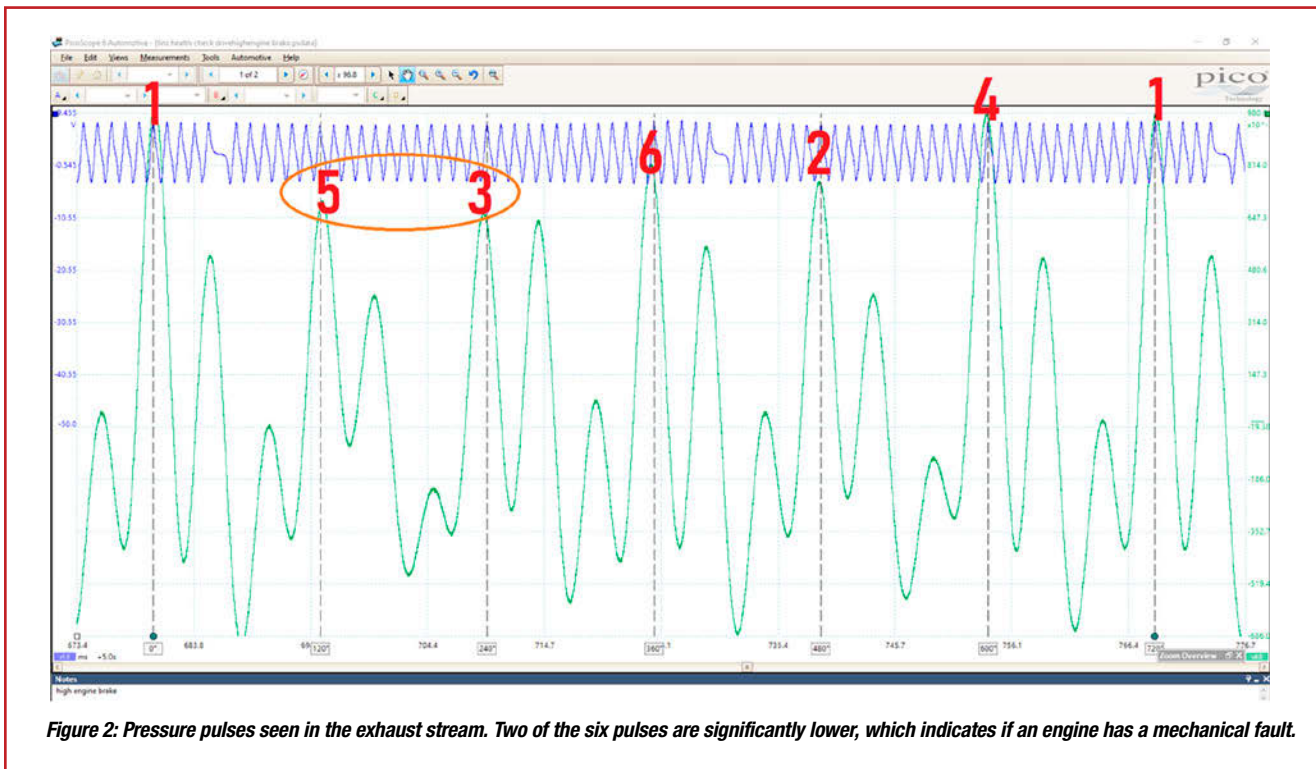
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**Figure 2: Pressure pulses seen in the exhaust stream. Two of the six pulses are significantly lower, which indicates if an engine has a mechanical fault.**

When the ECM de-energizes the solenoid control valve, the supply oil is vented. Spring tension forces the hydraulic control valve to close and the high-pressure oil in the master/slave cylinder circuits is vented to the top of the hydraulic control valve. Normal engine operation is restored.

### WATCHING THE SYSTEM IN ACTION

So, how can we use tools to monitor this system? A better question may be “Why would we want to?” Seeing a system in operation will allow us to determine what “normal” looks like. And, as I always say...

“If we know what ‘Normal’ looks like, ‘Bad’ sticks out like a sore thumb.”

Using a capable lab scope and pressure transducer, in this case a PicoScope and WPS500, we can not only see the changes in pressure of the exhaust system but we can also correlate these changes to specific cylinders. In plain English, it can help us determine why the engine-brake system may not be functioning as it should and which cylinder(s) are at fault.

With what was described above, we are now aware that the compression pressure harnessed in the cylinder is then vented to the exhaust stream. This event occurs just before the top of the compression stroke. Meaning, a pressure spike should be visible at this time, in the exhaust stream. All pressure spikes should be visible from each engine-braking cylinder and they should all be similar in amplitude (pressure-value).

Look at the capture (Figure 2). The channels are as follows:

- BLUE= CKP sensor signal
- GREEN=Exhaust system pressure pulses

This capture was taken during a deceleration event, in “high” mode (all cylinders were commanded to provide engine braking). Referencing service information, the firing order for this engine was determined to be 1-5-3-6-2-4. In a known-good capture, it was determined that the #1 fuel injector (fired near TDC of the compression stroke) was occurring at four CKP pulses to the left of the CKP sync pulse. On the screen is two full engine rotations (one complete engine cycle) representing 720 degrees of crankshaft rotation.

The waveform was partitioned equally in six ways to associate the pulses with each of the six cylinders. As can be seen, two of the six pulses are considerably low compared to the other four. This lack of engine-braking contribution can likely be attributed to low cylinder compression.

A relative compression test was performed and it was determined that multiple cylinders had a loss of integrity but cylinders 5 and 3 were the worst offenders. The point is not that the vehicle requires repair. It’s not even the fact that we can see the variances in the exhaust pressure waveform. The true point is that we can take what we know from our past experiences and the results of the tests we have grown to trust, and apply them to what we are trying to now understand. I think we’ve proven that as a success in this case.

The shop was instructed to carry out the next step of a cylinder pressure leakage test in cylinders 5 and 3. I don’t have a conclusion for you at this point as the truck is awaiting further testing but again, that wasn’t the point of this article.

Being familiar with the tools we choose to implement, taking the time to educate ourselves on the systems we face and the components of that system, we can capitalize and learn testing



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**PicoScope 4823**  
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techniques that you will likely never see published in service information.

The best part is these same tools and techniques will likely yield you the information you desire with far less time and energy invested than that which is published in service information and so heavily relied upon throughout the rest of the industry. Be different, take a new approach and learn how to learn. It will serve you well for the rest of your days, I can promise you that! ❌



**BRANDON STECKLER** is a technical editor for *PTEN*. He has worked in the field for more than 18 years and holds ASE certifications A1-A9, X1, L1, L2 and L3 and C1, and specializes in driveability and diagnostics. He also teaches for both CarQuest Technical Institute and WorldPAC.  
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# Why ALI Certification Matters When Buying Car Lifts

**W**hile you'll find a number of different lift styles, sizes, designs and capacities out there, it's important to consider purchasing an Atlas lift certified by the Auto Lift Institute (ALI). Of course, there are uncertified lifts on the market, too, so why does that ALI stamp of approval mean so much?

## What is ALI?

ALI (Automotive Lift Institute) governs the safety standards for automotive lifts in the United States. ALI Certified lifts must all pass the exact same testing, material and operational standards. This testing covers the structural integrity, proper control function and even overloading the lift beyond its rated capacity. The procedures are PASS/FAIL. Either you get the ALI Certified sticker, or you do not. All brands of Certified Lifts are all subject to the exact same ALI production and testing standards.



## Why is ALI Certification Important?

Certification is a system in which an independent, third-party organization determines that a manufacturer can produce a product that complies with a specific set of standards. Program participants such as Atlas are required to be audited quarterly to ensure continued compliance with ALI's standards. This ensures consistency in design and peace of mind for the shop owner or technician.

## What Does Testing Involve?

ALI rigorously tests all the lifts sponsored by manufacturers. Testing involves pushing the lift to 1.5 times its weight capacity to ensure complete structural strength. It also involves cycling the lift load several times at 150% beyond capacity.

It's all about ensuring that lifts live up to their capacity claims, and that a 10,000-lb.-capacity lift should be able to lift and hold a vehicle weighing 10,000 lbs. without



bending or breaking. It's about protecting against damage to the lift, damage to the vehicle on the lift, or injury or death to the mechanic using the lift.



## Why Does Atlas Certify Their Lifts?

- Safety – Safety – Safety!
- Gives technicians peace of mind while working under vehicles
- Shop owners/technicians understand the quality enhancements of ALI Certified lifts
- A world-wide comprehensive set of standards have been established. This guarantees top quality and safety
- ALI Certification standards must be met each time/each lift to ensure consistency
- Additional engineering for better built lifts with safety in mind
- ALI Certification standards require Atlas lifts to be engineered/built to stand-up to tough treatment and to last longer
- Better/longer warranty options

Atlas Automotive Equipment is proud to offer a full line of ALI Certified lifts. Visit our website to find out more: [www.atlasautoequipment.com/product-category/lifts/ali-certified](http://www.atlasautoequipment.com/product-category/lifts/ali-certified)

## ATLAS AUTOMOTIVE EQUIPMENT

6278 W 300 N,  
Greenfield, IN 46140  
(866) 898-2604

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product-category/lifts/ali-certified](http://www.atlasautoequipment.com/product-category/lifts/ali-certified)



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ATEAP-PVL9BP  
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**9,000 LB. CAPACITY**  
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## TWO POST LIFTS

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**2-Post Lift**

ATEATTD-APEX8  
**8,000 lb Capacity**  
**ALI Certified**  
**4-Post Lift**



ATEAPEX9  
**9,000 lb Capacity**  
**ALI Certified**  
**4-Post Lift**



ATEAP-PVL14  
**14,000 lb. Capacity**  
**ALI Certified**  
**4-Post Lift**

ATEAP-PVL14OF-EXT  
**14,000 lb Capacity**  
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# LAUNCH X-431 Throttle III – One Is Enough

**A** Wi-Fi-enabled, super-advanced diagnostic scan tool with an upgraded all-in-one Smartlink VCI, the X-431 Throttle III is designed for versatility, efficiency and usability. In line with its slogan, ONE IS ENOUGH, this single tool can be used to better diagnose, troubleshoot and repair all types of vehicles, from cars and hybrids to light- and heavy-duty trucks.

Designed to save time and aid in diagnostics and repairs the X-431 Throttle III comes packed with features for the automotive aftermarket. The scanner is IP65-rated water- and dust-resistant, with a dual-band Wi-Fi architecture providing a more reliable tool-to-VCI connection. It is based on the Android 9.0 platform and is equipped with an octa-core 2.0GHz processor, 8GB of memory and 256GB of storage. The scan tool's 13.3-inch full-fitting sunlight-readable Gorilla Glass screen boasts a vibrant 1080p resolution, and charges from 0 to 100 percent in just 2.6 hours thanks to quick charge technology.



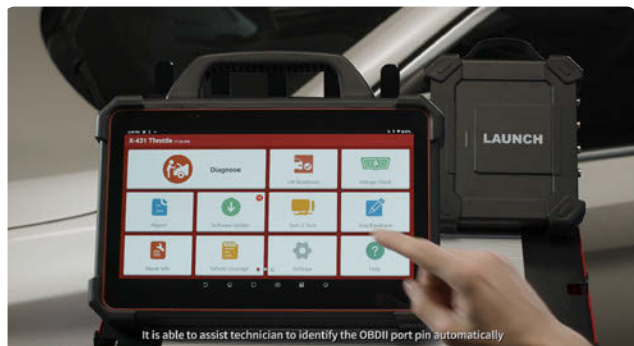
The X-431 Throttle III includes a four-channel Oscilloscope that was previously sold as an add-on module for better value and function. Customers can also choose to extend multiple functions with additional add-on modules, such as ADAS calibration, TPMS, video scope, sensor box, IMMO functions, Wi-Fi printing, battery tests, and more.

The X-431 Throttle III includes mainstay functions such as VINSCAN, remote tech-to-tech consulting and collaboration diagnosis, and an extensive repair library with intelligent functionality and Code Assist supported by Identifix. As a result, the scan tool is capable of performing the most standard shop processes such as quick scan health reports, detailed diagnostic troubleshooting, maintenance analysis, and full-on high-level bi-directional diagnostics.

For more information about products, prices, services, or other inquiries, customers can get in touch directly with local LAUNCH distributors across the United States. The full list of distributors can be found at <https://www.launchtechusa.com/distributors> ■



▲ *Topology mapping*



▲ *X-431 Throttle III*

Featuring a streamlined software platform that includes automotive diagnostics, optional heavy-duty diagnostics and access to the FCA Secure Gateway (SGW) module, just a single tool is suitable for most repair shops that offer services related to truck diagnostics, remote diagnostics, OE-level vehicle diagnosis, and more. In addition,

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Ontario, CA 91761

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# Smarter Diagnostics Extended Capability



## X-431 Throttle III

- 13.3" Full Touch Screen
- 8GB+256GB Storage Memory
- Pre/Post Scan & ADAS Calibration
- 8 Expanded Modules Diagnostic
- Passenger Cars & Heavy-Duty Vehicles Repairs

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## 4 Channels O2-1 Scopebox

- Up to 100 MHZ BANDWIDTH
- Up to 50MS BUFFER MEMORY
- 1GBPS MAX SAMPLES
- Record & Playback Waveform Data

### IDEAL FOR

Fix Complex Electrical Faults on OE Level Diagnostics

INCLUDED



O2-1 Scopebox



X-431 Throttle III



Smartlink

# Fast-Track® Intelligent Diagnostics



Snap-on has a Fast-Track Intelligent Diagnostics solution for every Technician

**F**ast-Track® Intelligent Diagnostics from Snap-on® is revolutionizing the business of diagnostics. When a vehicle pulls into the bay, technicians are likely to encounter interdependent fault codes, live data points, graphs, flow charts and diagrams. With so much information available, the biggest challenge is to find and follow the right clues to a solution. Fast-Track Intelligent Diagnostics, exclusively from Snap-on makes it possible for technicians to be more efficient by bringing tests and information related specifically to a diagnostic trouble code (DTC) to one place.

Intelligent Diagnostics provide pre-filtered information:

- Technician service bulletins (TSB), recalls and campaigns
- Scanner data, custom data lists and smart data automatically configures the display to show PIDS relevant to the fault code
- Functional tests
- Guided component tests\*
- SureTrack® real fixes, tips and top repair charts

With Intelligent Diagnostics and a step-by-step diagnostic process, technicians can power through their workload.

**STEP 1:** Check for codes. DTCs are still the best source to narrow the search. Once it's known if there's a code, go to step two and use the code or symptom to determine a likely cause. Identifying a code opens up the possibilities of putting the Fast-Track Intelligent Diagnostics software to best use.

**STEP 2:** Search factory TSBs. Intelligent Diagnostics narrows them down to only those for that code. They are a great companion to fault codes and SureTrack. Most technicians use a repair information system like ShopKey® Pro or ProDemand® for all-makes TSB access. Intelligent Diagnostics takes users directly to the TSBs related to the DTC they're investigating.

**STEP 3:** Intelligent Diagnostics smart data filters unrelated PIDs so technicians only need to look at what is relevant to the code. It automatically sets PID triggers which flag PID red or blue, out of limits or within limits.

**STEP 4:** Check SureTrack for real world answers. SureTrack take the clues: vehicle, code, symptom and shows the most common parts used to repair similar vehicles and problems. It's based on experience from millions of successful repair orders, so it provides the actual parts used to complete the repair.

**STEP 5:** Use functional tests or component tests to pinpoint and verify the problem. Guided Component Tests take technicians to the specific information they need, showing what to test, how to connect and what results to look for. Directly testing the suspected component can verify a component before replacement.

The diagnostic process may vary depending on personal workflow and the job at hand, but with the power of Fast-Track® Intelligent Diagnostics, technicians save time and receive a confident solution. ■



[snapon.com/TD10-review](http://snapon.com/TD10-review)

**Snap-on**

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\*Available on ZEUS® and TRITON® platforms only

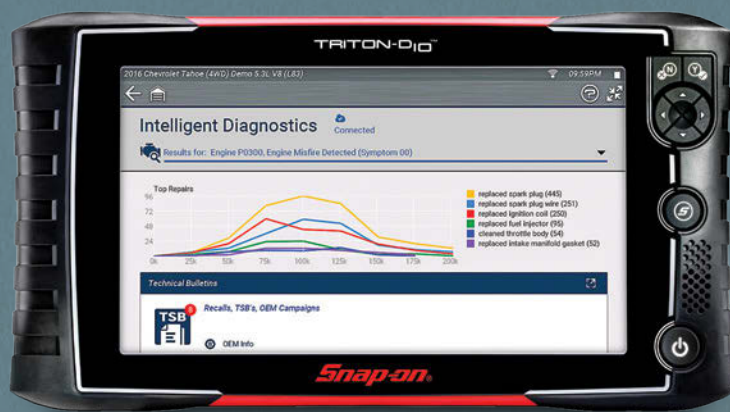
# FASTER THAN ANY OTHER TOOL IN ITS CLASS.

Driven by Fast-Track® Intelligent Diagnostics from Snap-on®, the **TRITON-D10™** features the quickest path from boot-up to full system code scan of any tool in its class.

Dig deep into the systems of a vehicle and evaluate performance with comparative data, systematically eliminating the unnecessary to help you make repair decisions on *that* exact vehicle under *those* exact circumstances.

Always-on, always-reliable access to dynamic repair information. Sophisticated, intuitive diagnostic testing and component verification. All from a single source.

Everything you need, and nothing you don't. For complete confidence in your ability to make fast, accurate decisions on every complex repair.



SAY 'HELLO' TO THE NEW TRITON-D10.

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Fast-Track® Intelligent Diagnostics from Snap-on.  
Available on the APOLLO-D9™, TRITON-D10™ and ZEUS™

Smarter. Faster. Fixed.



# Smoke Machines Make It Easy to Identify EVAP System Leaks



**W**hile smoke machines have been around for a while, they have only recently become a common piece of equipment in a shop. In fact, many mechanics have worked in shops for years without ever using one. A smoke machine is a fairly simple tool to use and it may just become your favorite diagnostic tool.

The first step in diagnosing an issue with a vehicle's EVAP system is to connect your OBD II scanner and download the error codes. If it turns out either a minor or major emissions system leak, you can use a smoke machine to quickly and efficiently uncover the leak, especially if there is not an obvious problem with the gas cap or its gasket.

## How do smoke machines work?

Smoke machines can be connected to the emissions hose running to the rear of the vehicle; be sure to block the line by crimping it closed with vice grips. The smoke machine can connect right to the car's battery terminals using its clamps to draw operating power. You simply fill the machine with the smoke-producing material based on what kind of machine you have. Many machines, like the

K-Tool XD 600T Turbo, use either ordinary mineral or baby oil; other machines may use air or colored dye rather than oil to create smoke. You'll also need access to your shop's air lines or nitrogen machine. Finally, connect the machine to the EVAP purge solenoid. The smoke machine will inject smoke/air into the EVAP system, allowing you to locate the leak.

Leaks will be visible by smoke issuing from the cracked line or failed fitting. Once you've made the necessary replace, clear the codes and test drive the vehicle.

## Meet the K-Tool XD Smoke Machine Turbo

The KTIXD600T Smoke Machine Turbo is two machines in one. With a built-in air compressor that makes the unit totally portable, it can be used for regular cars as well as light-duty trucks. With a push of a button, switch the machine to turbo mode to test single- and twin-turbo as well as supercharged vehicles. It offers a dual-testing mode for smoke and air, along with redesigned bladder blockers and a patented ceramic heater. The K-Tool XD Smoke Machine Turbo is the best way to locate leaks fast, in as little as 1 to 5 minutes, saving time and money.

Learn more about K-Tool International and its full line of shop tools and equipment at [ktoolinternational.com](http://ktoolinternational.com). ■

## K-TOOL INTERNATIONAL

45255 Five Mile Road

Plymouth, MI 48170

Phone: 800-762-6002

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# PROFESSIONAL GRADE LIFTING EQUIPMENT. HEAVYWEIGHT QUALITY AT A KNOCK OUT PRICE.

## FLOOR JACKS



Part Number	Capacity (tons)	Min. Height	Max Height	Special Features
KTIXD63105	2	2.75"	24"	45.25" long pump handle. 8 pumps to max height (under no load)
KTIXD63133	3.3	3.5"	21.375"	8 pumps to max height (under no load)
KTIXD13002	3.5	3.5"	21.4"	Only 4 pumps to max height (under no load)
KTIHD63155	5	5.75"	22"	45.75" long pump handle with release knob works independently of handle position. Raise the saddle quickly to the load with additional foot pedal.
KTI63197	22	8.8"	13.5"	Air Hydraulic Truck Jack; Ram Travel: 4.7"; Air Pressure 100-120 PSI; Extension Screw travel 4"; Release Knob At the Top of the T Handle Works At Any Handle Position

## JACK STANDS

- Ratchet action design with ductile iron support column
- Durable and lightweight design is safe and easy to position
- Complies With Asme Pase/2014 Safety Standards



Part Number	Capacity (tons)	Min. Height	Max Height	Special Features
KTIXD61202	3	11.63"	16.75"	
KTIXD61205	6	15.75"	24"	
KTIXD61211	12	19.7"	29.2"	Safety locking pin for added security. Meets or Exceeds 2019 ASME/PASE
KTIHD61222	22	11.825"	19.75"	Steel plate and structural tubing for added strength and stability. V-shaped saddle to cradle axles and other truck components.

## BOTTLE JACKS

- Ram extension screw adjusts low height to get full use of ram travel
- Load-limiting and bypass valves prevent against over loading and over extension
- Ductile iron hydraulic base for added strength



Part Number	Capacity (tons)	Min. Height	Max Height	Special Features
KTIXD63214	12	7.48"	13.78"	
KTIXD63224	20	7.25"	13.39"	
KTIHD63250	50	11.8"	18.8"	Three-piece snap-fit pump handle for easy pumping and storage.

## PORTABLE RAMS

- Basic attachments, .5 ton spreader ram, and five extension tubes included
- Snap-fit design for quick attachment and tube connections

Part Number	Capacity (tons)	PSI	Ram Length	Stroke
KTIXD63703	4	7,250	10.5"	4.75"
KTIXD63709	10	8,050	12.6"	5.12"



K-Tool lifting products carry a **Two Year Warranty** on material and workmanship.

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Shop the full line of K-Tool products at [www.Tooltopia.com](http://www.Tooltopia.com)



# Service any electric or gas-powered vehicle with new BendPak lift system

**N**ew electric vehicles are announced regularly and are gaining traction in the marketplace. While this technology is new and exciting, it's important for the professionals who will inevitably have to repair these vehicles to have the right tools and equipment to do so safely and effectively. Thankfully trusted equipment manufacturers like BendPak are providing solutions for electric vehicle repair.

BendPak recently introduced a patent-pending new SL24EVT EV battery pack and powertrain lifting system that helps technicians safely and efficiently remove, service and install heavy battery packs from a wide range of electric vehicles. Recognizing that internal combustion vehicles will continue to dominate roads for years to come, BendPak designed the SL24EVT to do double duty as a powertrain lift for internal combustion vehicles.

The SL24EVT is compact and portable, with a pallet-jack type steering wheel and oversized urethane casters engineered to provide low rolling resistance and unparalleled maneuverability anywhere in the shop, even in tight spaces. With a press of the button on the pendant controller, the SL24EVT elevates to more than 6 feet in less than 20 seconds. The lift table securely supports an industry-leading 2,400 pounds on its oversized 40 x 60-inch cushioned rubber platform, providing stability for handling bulky EV battery packs.

Like the electric vehicles it supports, the SL24EVT EV battery pack and powertrain lifting system is battery-powered. It uses a maintenance-free 12-volt deep-cycle battery featuring proprietary, high-density grid technology precisely engineered to deliver outstanding performance. A fully automatic three-stage battery charger offers connect-and-forget operation to protect against overcharging. An integrated thermal sensor detects ambient temperature and adjusts the output to prevent overcharging in hotter areas and undercharging in cold climates.



The SL24EVT is designed for durability and low maintenance with features like high-performance sleeve bushings



and thrush plate bearings at every pivot point and polished pins for premium load strength and long life. Structural cross-members at every scissor joint minimize leg deflection, while the durable ¼ inch thick steel platform minimizes deck deflection, maximize load stability and extends the lifting platform life.

The SL24EVT is not only useful for servicing EV batteries and powertrains, but through available add-ons, the lift can handle a variety of different components. To support heavy and awkward components there is a telescoping arm kit. A multi-point adapter can support components like axles, transfer cases and bumpers. There is also a tilt deck when a more precise alignment is needed, and other fixtures and other adapters to expand the use of the lift. ■

## **BENDPAK**

1645 Lemonwood Drive  
Santa Paula, CA 93060 USA  
(800) 253-2363

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Bead Seating Tool  
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**FREE SHIPPING**

- Tank Size - 5 Gal.
- Max PSI - 120



**Ranger RST-1WS**  
Rolling Work Seat  
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**FREE SHIPPING**



- Steel Tubing - 1"
- Swivel Casters - 2.5"

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All-In-One TPMS  
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**SUPER SAVER**

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- OBD II Style with Screen
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- Includes 8 Sensors

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Jack Stand  
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- Height - 55" - 87"

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SKU 5150997

- Capacity - 9 gal.
- Height - 32" - 64"
- Funnel Diameter - 18"

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3-Ton Floor Jack  
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- Capacity - 6,000
- Height - 5" - 19.75"
- Chassis Length - 25.5"



**Ranger RS-500DS**  
STAINLESS STEEL  
Spray Washer  
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**FREE 20-LB. Soap Bucket**



- Load Capacity - 500 lbs.
- Tank Capacity - 50 gal.
- Interior Dimensions - 43" x 32"
- Steel Oil Skimming System



**Ranger RCD-1500EX**  
GoCart Vehicle Dolly  
EXTENDED (Set of 2)  
SKU 5150191

**\$405** ~~\$450~~

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- Capacity - 1,500 lbs.
- Tire Width Capacity - 13"
- Tire Diameter Capacity - 19" - 37"

**Ranger RP-20FC**  
Oil Filter Crusher  
with Stand  
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# CAN-FD protocol: Can your diagnostic tools keep up?

**I**t's a well known fact modern vehicles have become increasingly complex with an ever increasing number of sensors and control modules. As the number of sensors has increased, so has the amount of data flowing between modules. In addition, Advanced Driver Assistance Systems (ADAS) which are common in many vehicles require very fast communication between sensors and modules to prevent collisions.

To be able to keep the existing two wire hardware of the vehicle Controller Area Network (CAN) and improve communication, the CAN FD communication protocol was released in 2012. This upgraded communication protocol has been slowly adopted by vehicle manufacturers over the last decade and is currently common with new passenger cars & light trucks. The main advantages of the CAN FD protocol are data transmission rates of up to 5 times faster compared to standard CAN and larger amounts of data to be transmitted on the same vehicle wiring. This is achieved by increasing the message size from 11 bits with standard CAN to 29 bits. The message payload is also increased from 8 to 64 bytes allowing more data to be communicated. To maximize the speed and amount of data, moving across the CAN, the CAN FD protocol can rapidly switch between high & low data rates depending on demand. To maintain data integrity and detect errors, the CAN FD protocol includes 5 different elements.

Data transmitted using CAN FD is in a different configuration than standard CAN and therefore diagnostic tools need to be able to read this new protocol. To complicate matters, diagnostic tools must be able to determine if the data is in either standard or CAN FD and interpret both protocols. Diagnostic tools manufacturers spend considerable time & resources on keeping pace with new data protocols. Higher quality scan tools will be able to communicate with hundreds of vehicle brands from all over the world ranging from model year 1996 and newer.

To ensure its tools keep pace with new diagnostic protocols, THINKCAR employs over 300 engineers to develop new tool software & communication devices. "Tool hardware such as screen size, amount of memory & processor speed are all important aspects of a tool's capacity," Eric Wang, Technology Director notes. "However, the software makes the difference between being able to communicate with a vehicle or not," says Wang. "We are currently working on technology and software which will not be released for 6 to 12



months after extensive field testing on hundreds of live vehicles. A recent example of this is our new Platinum S10TVCI which was specifically developed to support CAN FD and is available via Cornwell Quality Tool dealers and Advance Auto Parts. The tool was under development for 9 months plus months of field testing to ensure the software and upgraded Vehicle Communication Interface (VCI) unit would accurately and efficiently communicate with a wide variety of vehicles."

The VCI is equally important as the tool software as it provides the physical connection between the diagnostic tablet & the vehicle using the OBDII port. The VCI must be able to precisely interpret data from various protocols and relay them back to the tablet.

As modules to accommodate electric powertrains and battery packs are introduced the need for even faster protocols will continue to grow. When selecting a new diagnostic scan tool, it's important to select a model which can support new diagnostic protocols. ■

## THINKCAR

720 S Rochester Ave. Unit B  
Ontario, California 91761  
Office: 833-692-2766

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# THINKCAR

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# Give Your Customers a Cost-Effective Oil Consumption Solution

**B**ar's Leaks® Professional Oil Seal™ Engine Oil Burning & Leak Repair (P/N OS-1) is a unique combination of synthetic polymers combined with premium seal-restoring additives to create a long-lasting repair. This professional-grade formula, made in the U.S.A, is a single-solution fix guaranteed to permanently stop all engine oil loss caused by leaks, over-consumption and burning.



Bar's Leaks Professional Oil Seal Engine Oil Burning & Leak Repair's no-hassle formula can be added when the oil is low or during an oil change and starts to work within 15 minutes of driving or idling the vehicle. In most cases, the oil leak will be repaired with a single dose. An on-package \$5 rebate is available with purchase and more details can be found at [autocarerewards.com](http://autocarerewards.com). ■

The cost-effective product is designed to work with all types of motor/engine oil, including regular petroleum, high-mileage, synthetic blends and fully synthetic formulas. One 16.9 oz. bottle solves the most common oil consumption problems in all gasoline and diesel engines in cars, trucks, vans and SUVs, including turbocharged, EcoBoost, hybrid and even racing engines. It is also effective in a wide range of other motor applications such as tractors, boats, RVs, motorcycles (including wet clutch), ATVs and lawn equipment.

## Bar's Leaks

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SPECIAL ADVERTISING SECTION



## Stop Leaks. Not Life.

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- Antifreeze Compatible, No Flushing Required



Part #HG-1

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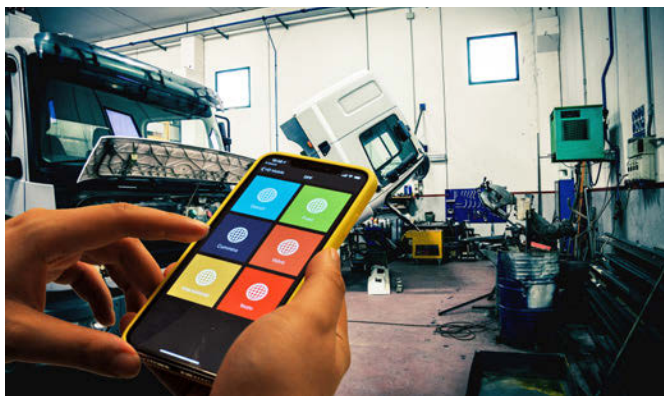
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# CanDo Covers the Whole Spectrum of Diagnostics

In 2008, CanDo International Inc. was formed as a division in a much larger automotive aftermarket tools corporation and was responsible for manufacturing and private labeling diagnostic tools for companies such as JS Products, Napa and Autozone. Fast forward to 2012 and 2013 when C.A.R.B. mandated after-treatment systems for trucks and the A.R.B. mandated On-board Diagnostics for class 4 thru 8 vehicles. A resulting boom for diagnostics for commercial vehicles ensues and CanDo Diagnostics Inc. is born. Today, we are based in Los Angeles, CA. with research & development networks located around the globe.

To this day, there is still no true Right-to-Repair for the commercial vehicle and off-highway equipment market. Furthermore, little to no standardization exists for diagnostic protocols. Manufacturers of such vehicles and equipment are still trying their best to keep repair information proprietary. Dedicating over 90% of our resources to the development of cost-effective and easy-to-use Diagnostic solutions for this market enables us to have the widest, deepest and, most importantly, the most up-to-date coverage in our tools.

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The modern internal combustion engine has seen rapid changes in the last few years. As emissions standards tighten, major manufacturers have changed the way engines maximize their efficiency. Some of these techniques are not new in principle, like forced induction, while others are new to the automotive and light duty market like direct injection. The bottom line is all these methods are designed to get more power with less emissions from the same size or smaller powerplants. What does that mean for those whose job it is to repair these engines? It means less space to work and harder to access components.

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# Do you have the right tools for an EV repair job?

Variable voltages and currents with dozens of interconnected modules make repairing these systems much more dependent on the proper selection and utilization of tooling.

By *Christopher Groff*, Contributing Editor



▲ *Figure 1 - Multimeter and accessories.*

**H**ybrid and electric vehicles (EV) are becoming a larger share of the vehicle market, meaning repair facilities are handling more routine service and repair work. There is no doubt that they can be a viable profit center for an appropriately trained and equipped business.

Understanding system operation and safety precautions have never been more critical with the high voltages found in EVs and hybrids. While a conventional vehicle's electrical system is operated entirely on a 12V DC system, today's electrified vehicles may produce five or more different circuit voltages, ranging

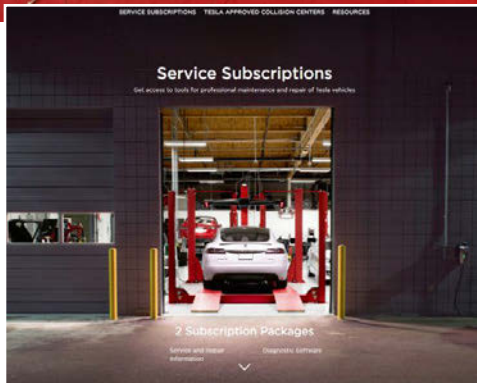
from 12V to 650V. We can expect to see both AC (alternating current) and DC (direct current) within these voltage ranges. Combining these variable voltages and currents with dozens of interconnected modules makes diagnosing and repairing these systems much more dependent on a healthy level of education

## »»» TOOLS USED:

- Snap-on VERUS Edge
- Snap-on Pass-Thru Pro IV
- Launch X-431 Pad II AE
- Autel MaxiSYS Ultra
- Cornwell and Snap-on multimeters & accessories
- Snap-on Depinning Tool Set, various crimpers, Milwaukee Tool Cordless Soldering Iron



▲ **Figure 2 - Autel, Launch, Snap-on scan tools and J2534 Pass-Thru devices**



▲ **Figure 3 - Tesla service and diagnostics portal**

faults and perform proper repairs. There are well-known aftermarket SI providers such as ALLDATA, Mitchell, and Motologic, and OEM information systems available through subscription-based models, most extremely affordable, especially if your shop does a high volume in specific brands. These sources will walk you through proper high voltage (HV) disconnect and isolation procedures, along with the theory of operation and repair procedures.

Now that we've got a handle on education and SI and where to access it, let's focus on one of the essential tools in a modern repair shop: a digital multimeter and a lab scope, depending on the measurements being taken.

## DIGITAL MULTIMETER AND LAB SCOPE

What do we need to know about the multimeter (Figure 1) we use on hybrids and EVs? The most critical baseline for choosing a meter is its rating. Meters are rated for different voltages on a scale from CAT I to CAT IV. When working with HV systems (generally defined as anything over 50V), there are a couple of rules to remember, with the most important being having a meter, leads, and rubber insulating gloves, which must all have a voltage rating over the highest voltage contained within a system. This requires a CAT III or CAT IV meter rated for at least 600V input. Keep in mind that any accessory kits, such as back probes or alligator clips, should also be rated appropriately for the voltage they will be used to measure. These accessories will have a stamping or marking indicating their CAT rating. Alligator clips are especially useful in HV work as a means of adherence to the "one-hand rule," which states that only one hand at a time should be in contact with a lead or a ground point while working on HV systems to prevent potential electrocution. Depending on the level of diagnosis being undertaken, a milliohm meter and insulation tester will also be required.

A quick reminder: Always check your meter and leads before verifying the ➡

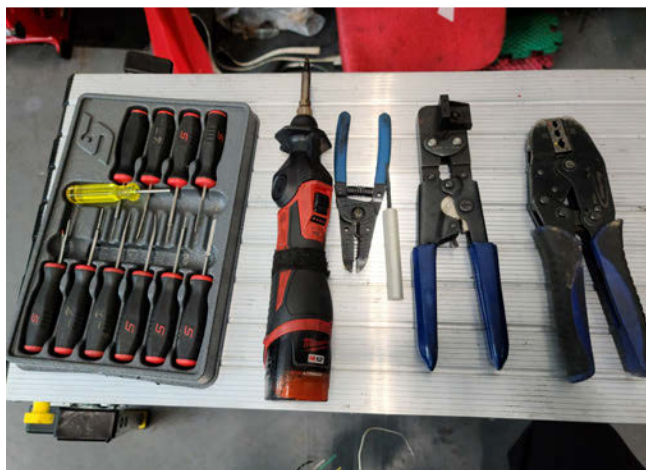
and the proper selection and utilization of tooling.

## EDUCATION AND SERVICE INFORMATION

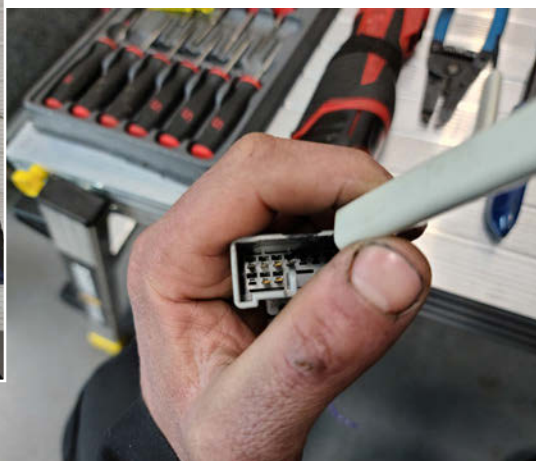
Those currently on the dealership side have access to OE training, which provides in-depth product-specific training not generally available to those on the independent side. Some manufacturers, including Toyota, Honda, and Ford, allow the aftermarket to access online training as part of service information subscriptions or at an affordable price. This is a significant first step in building your knowledge base, but continuing education is needed regard-

less of being a dealership or independent technician. This is where aftermarket training comes in, be it national training events such as the Vision Hi-Tech Training event, smaller state, or local events such as our own Super Saturday here in Pennsylvania, along with classes presented by companies such as CarQuest Technical Institute (CTI), WorldPAC Technical Institute (WTI) and the Automotive Training Group (ATG). The information gleaned from these classes, books, and instructors are invaluable.

Once you have a strong understanding of the basics needed, you are in a much more suitable position to search and analyze service information (SI) to diagnose



▲ **Figure 4 – Assortment of crimping, de-pinning and soldering tools.**



▲ **Figure 5 - Practicing de-pinning a connector.**

proper disconnect of the high voltage systems. Turn your meter to the “Volts DC” setting and measure a known low voltage source, usually the 12V battery of the vehicle. This proves the correct operation of the meter and leads, preventing us from experiencing a false “zero” condition that could be potentially hazardous.

## AFTERMARKET OR OE SCAN TOOL

An OE or professional level scan tool is an absolute must when dealing with modern vehicles, and as such, there are few shops left without at least one scan tool. Modern hybrid and electric cars were designed in such a way as to nearly eliminate the need for direct measurements of “hot” high-voltage circuits. What does this mean for technicians? It means there is an abundance of data available at our fingertips which will allow proper evaluation and pin-pointing of various faults directly from the driver’s seat with minimal need to interact or disassemble components. A scan tool that can be trusted is our gateway to this information.

The hardest part is choosing the “best” scan tool for the job. I’ll be honest here; there is no single best scan tool – each has its strengths and weaknesses. Thankfully,

there are a variety of options available in the aftermarket which allow one to build an excellent base to cover a wide range of vehicles and needed functionalities with many high-level tools now coming equipped with a J2534 or J-Box communications device. This allows for Pass-Thru (Figure 2) programming utilizing OE diagnostic software, which is available via subscriptions. After all, many repairs to modern vehicles can be made by reprogramming their operating code in any given module. OE scan tool hardware is also available to the aftermarket, generally at affordable prices, due to Right to Repair legislation allowing near-complete OE level diagnostics and programming.

For instance, if a shop focuses heavily on Toyota, especially hybrids, it would be most cost-effective to invest in the factory hardware and a yearly software subscription. In Toyota’s case, the Mongoose-Plus cable is priced at just under \$500 at the time of writing and available through multiple sources such as AESwave.com. A yearly professional level subscription to Toyota Information System (TIS) will cost \$1,295 for the year, allowing you factory level capabilities for under \$2,000, assuming you already have a laptop available that meets the hardware and software requirements.

Recently, Tesla opened up access to their Toolbox 3 Diagnostic Software (Figure 3), which includes a standalone HV battery evaluation tool, in addition to their already available service information subscription. This is priced at \$2,000 a year for the diagnostic software, which requires specific cables built or purchased through companies such as AESwave (part # atl-Conn-TESLA for the Autel specific cables). The service information subscription comes in at \$3,187 for the year, with other time frame purchase options available: hourly, daily, and monthly. This opens up a new segment for many repair shops, as even total electric vehicles require routine services to perform optimally.

## EVALUATING AND REPAIRING WIRING DAMAGE

Every market and area has different failure types that they see more or less than others. I run into a large number of damaged wiring harnesses and connectors. Some of that is from mice and other animals nesting and feeding during the colder months. Others from previous repairs that were completed less than optimally, which resulted in pinching or rubbing unsecured harnesses and broken connector locks. The proper techniques and tools

for repairing wiring harnesses could cover a few articles themselves, so we'll focus on what is most important to those evaluating harness damage in hybrid and EVs, including those in body shops.

A search through service information will yield the manufacturer's recommendations and procedures for wiring harness repair and should always be consulted. That being said, the general rule across all OEMs is that any damaged HV (such as your orange cables) wiring or connectors should be replaced, not repaired.

Any wiring damage must be looked at in terms of location, level of damage, ability to repair, and availability of parts (something that has become an increasing concern with supply chain shortages). Presently, a harness repair may be the only option to promptly get a vehicle back on the road, as many parts, including harnesses and connectors, are on indefinite backorder. This can call for some creativity

and knowing where to source components such as connectors and terminals other than the dealer or local parts warehouses.

Regarding lower voltage components (those under 50V), standard best practices for wiring repair and terminal or connector replacements still apply. Ensure there is enough flexibility in the repaired section, that the solder joints or crimps are correctly made and insulated, and the wires are in otherwise good condition. Having an assortment of crimping and de-pinning tools is a must in this case (Figure 4).

For those just getting started in wire harness repairs, I recommend taking a trip to your local wrecking yard and acquiring some old harness sections. Take your time learning to de-pin the connections (Figure 5), prep wires, and perform proper crimping and soldering. The effort you put into this will more than pay for itself as you find yourself able to perform wiring repairs more efficiently.

The automotive world is changing rapidly, and the best way to succeed is to continue your education and the development of both your tools and techniques. Each shop and technician will differ on the level of education and tooling needed. Still, all should develop and maintain a baseline competency with evolving technology to provide the best service possible to their customers. ✕



**CHRIS GROFF** is a technician with lykon automotive in pennsylvania and runs the science of diagnostics channel on youtube. groff

began in the industry 15 years ago with an independent repair shop before attending the pennsylvania college of technology for caterpillar diesel. after working with heavy duty trucks and john deere equipment, he was drawn back to the automotive repair segment by adas and the continued advancement of technology.

[cgroff@scienceofdiagnostics.com](mailto:cgroff@scienceofdiagnostics.com)

## »» RELATED TOOLS

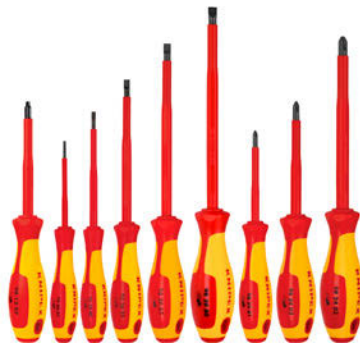


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# Lisle Relay Pro 12V and 24V Relay Tester

Reviewed by Ken Elzinga, diagnostic technician and owner of Hilltop Auto Service in Byron Center, Michigan.

## PRODUCT DESCRIPTION:

The **Lisle Corporation Relay Pro 12V and 24V Relay Tester**, No. 60150, tests relays by simply clipping the test leads onto the relay terminal pins using a 12V or 24V DC power source. It tests a wide range of four and five pin relays including shielded, non-shielded, relays with different pin sizes, and four pin normally closed relays that other testers may incorrectly show fail, the company says. The tester automatically determines the relay configuration, allowing the fully insulated gator clips to be connected in any order. Its 45" power leads with heavy duty gator clips provide a secure connection to the power source.

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## THE REVIEW:

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

**A:** The tester was time-saving because with this tool we were able to quickly give a pass/fail result to a suspect relay. This tool allows the tech to make that decision quickly and with confidence instead of relay swapping or hooking up jumper wires and a battery to try to test it.

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

**A:** We encountered many intermittent A/C compressor relay faults. This was the most used example of the tool. We also used it on some ride control compressor relays and a few fuel pump relays.

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

**A:** No real setup of the tool was necessary. Technicians just have to understand the different terminals of the relay and hook up the tool accordingly.

**Q: How easy was it to use?**

**A:** The tool was easy to use and comes with good instructions for hooking the tool up to test a relay.

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

**A:** Packaging was appropriate for this tool; all needed accessories were included. This means that the necessary terminals



were included to hook up to various relays that would be tested.

**Q: Was there a manual included?**

**A:** There was a manual included and it gave good instructions for hook up and performing the test. It was easy to understand for a tech that is fluent in electrical testing.

**Q: What features did you like?**

**A:** I think the ability of the tool to test a relay under a load and multiple times is helpful in identifying faulty or intermittently failing relays. This is the most valuable function of this tool given the many systems that are controlled by relays and the intermittent nature of relay failures.

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

**A:** There are new electronic relays that are starting to be used in our industry. Possibly an updated tool to test these

relays would be helpful. Some of these relays are pulse width controlled and are difficult to test. A tester that would give a pass/fail would be helpful.

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

**A:** I would give it a 10. Lisle continues to come out with innovative tools to help the techs who are working on today's cars, and this is a good but inexpensive tool for anyone who does electrical diagnosis.



**KEN ELZINGA** is a lifelong auto tech, starting in the business in 1978 and today working as a diagnostic tech and owner of Hilltop Auto Service in Byron Center, Michigan, a 24-bay shop

with 12 technicians that opened in 2003. Elzinga worked at a Lincoln-Mercury dealership for 24 years, gaining knowledge and experience, eventually becoming a Ford master tech. He says he has enjoyed working in this industry and serving his customers with their vehicle repairs.

\*Note: This product was given to the reviewer free of charge from the manufacturer.





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# Makita LXT 1/4" and 3/8" Cordless Ratchets

Reviewed by Eric Moore, fleet manager at  
Griffin Pavement Striping in Columbus, Ohio.

## THE REVIEW:

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

**A:** Makita was one of the first manufacturer's whose cordless products I sought out and purchased. I remember when my 7.2V cordless drill was the new kid on the block and once the other techs had used mine, many more in the shop appeared. The LXT lineup is the current top dog by Makita. This ratchet is great for mobility and functionality. The versatility to use either 1/4" or 3/8" greatly increased the range of jobs it can be used for. No dragging air lines around, or losing time in tight spaces where a traditional hand ratchet wouldn't have range of motion. It's slimmer profile helps it get into more restricted places.

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

**A:** Once you remove it from the packaging, you need to plug in the charger and fully charge the included 18V LXT battery. Then, select the adapter for the size of drive needed and away you go.

**Q: How easy was it to use?**

**A:** With a charged battery, the LXT ratchet is pretty much point and shoot. Place the desired socket on the adapter, apply it to the fastener, select a direction, and pull the trigger.

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

**A:** We used the LXT ratchet for removal of panels and heat shields on several pieces of equipment. One tech used it for valve cover gasket replacement on their personal vehicle, a Hyundai Sonata. We used it for tightening the front cover fasteners on a John Deere industrial engine in one of our air compressors.

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

**A:** It was packaged in a branded cardboard box. The LXT ratchet comes with the tool, rapid charger, one battery, 1/4" and 3/8" interchangeable adapters, and a branded canvas carry bag.

**Q: What features did you like?**

**A:** The Makita LXT ratchet's slimmer profile than other cordless ratchets make it easier to use in tighter spaces. We really appreciated how the battery mounting is in line with the overall profile.

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

**A:** If Makita is going to stick with the interchangeability of the drive heads, I'd

## PRODUCT DESCRIPTION:

The **Makita USA 18V LXT Cordless 3/8" / 1/4" Sq. Drive Ratchet Kit** (XRW01SR1) is a dual-purpose ratchet with two interchangeable anvils (3/8" and 1/4") that can be quickly changed out. It has 35 ft-lbs of fastening torque, yet it can deliver up to 800 rpm. It has variable speed with forward and reverse settings and an electric brake for increased convenience. For added efficiency, it can be used as a manual ratchet when the motor is not engaged. It's powered by the same fast-charging 18V batteries that are compatible with over 275 LXT cordless products.

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like to see a positive locking feature and a good secure storage option for the remaining drive head. Maybe make the heads opposing, so have 1/4" on one side, and the 3/8" on the flip? It would make the trigger possibly awkward on the flip, so maybe allow for the head to be flipped and indexed? I know of traditional hand ratchets like this out there.

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

**A:** With the thin profile, interchangeable heads, higher RPM, and overall balance we feel confident that this tool rates a solid nine.



**ERIC MOORE** began his career working on cars at several franchise dealerships. Initially, he leaned towards smaller vehicles, settling into Powersports vehicles, where he stayed for over 20 years. Then, Moore went in the opposite direction, landing at a medium and heavy duty truck dealership and eventually, moving into management. Currently, he is the fleet manager at Griffin Pavement Striping.

\*Note: This product was given to the reviewer free of charge from the manufacturer.

# Plymovent FumeCaddie

Reviewed by Mario Rojas, lead diagnostic technician at Autobahn Performance in Oakland Park, Florida.

## PRODUCT DESCRIPTION:

The **FumeCaddie** from **Plymovent** is designed to capture exhaust fumes at the source, emitted by any vehicle or apparatus running indoors. The portable exhaust fan removes the fumes through a suction hose and delivers the fumes to the outside of the structure through the exhaust hose. It's directly connected to the vehicle or apparatus tailpipe with an easy-to-use nozzle. The extractor consists of a 3/4hp 115V fan assembly, 33' of extraction hose on the standard FumeCaddie, and 41' of hose on the two hose with Y adapter FumeCaddie, an easy-to-use nozzle, and a 9' power cord. It's all assembled on an easy-to-maneuver, ergonomic cart. **»108**



## THE REVIEW:

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

**A:** Jobs where you are required to keep the vehicle running to troubleshoot a fuel-related misfire. For example, a stuck open injector. Without this tool, I'd have to either work outside or with the shop door fully opened, letting out all of that sweet shop A/C.

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

**A:** The extractor came in on a pallet. We used a forklift to relocate it from where it was dropped off to where the shop was (across the street). The blower came bolted onto the caddy already, and the hoses and accessories were not already installed, due to packaging. It did require some assembly but for us automotive technicians, what doesn't, right?

**Q: How easy was it to use?**

**A:** It was a little more difficult to maneuver than I anticipated, but that is more likely a result of our particular shop layout rather than the product itself.

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

**A:** Packaged like a fortress. It came with one giant hose.

**Q: Was there a manual included?**

**A:** It did come with a manual, but honestly, I skimmed through it rapidly, as the unit was self-explanatory in its assembly.

**Q: What features did you like?**

**A:** I liked the suction power very much. On an opposite dual exhaust system, it had enough suction to prevent exhaust from exiting out of the opposite "open" exhaust.

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

**A:** Maneuverability. The casters had locks on them that required a good kick to release. If somehow that caster was in a bad position, the frame of the caddy would make it difficult to access that disengagement tab, since the locks not only prevent the rotation of the wheel but also its ability to swivel. Two rigid casters at the rear of the caddy, along with two swivel casters in the front may be a better setup.

I would also include a "Y" attachment as a standard, and lengthen the power cord.

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

**A:** I would rate this a nine. I think it's a great unit, and the shop owner is now interested in buying it as well. As a product that is meeting the needs of shops of all shapes and sizes, I think it's a rock-solid unit, built for a lifetime, and simply does exactly what it's supposed to do.



**MARIO ROJAS** is an L1 ASE Master certified Diagnostic Technician from Miami, Florida. He first began working on cars as a way to supplement his income until finally stepping into the industry full-time in 2013. He's now working at Autobahn Performance, a shop that specializes in European vehicles. Rojas also shares some of his work on his YouTube channel, Super Mario Diagnostics.

\*Note: This product was loaned to the reviewer free of charge from the manufacturer.



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## PRODUCT DESCRIPTION:

The **Thexton Wire Insertion Tool Kit, No. 926**, is ideal for installing wires for audio electronics, aftermarket lighting, alarm systems, remote start, and more. The long steel tube provides enough access to feed wires through the other side of the firewall. With a sharp point and solid handle, the tube allows the user to easily pierce through firewalls, rubber grommets, and panels. The 3/8" tubing comes with a 35-degree bend for more direction and control of the pull-through wire. In addition, the supplied tubing lets the user feed the tubing through the tool, allowing technicians to crimp the new wire onto the pull-through tubing, eliminating electrical tape bunches and messes.

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# Thexton Manufacturing Wire Insertion Tool Kit

Reviewed by Lou Fort, lead technician at K.A.R.S. Inc. in Huntingburg, Indiana.

## THE REVIEW:

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

**A:** I used the tool to pop a hole in a floor pan grommet on my own 2007 Tacoma for a planned camera install. The Thexton tool made the punch quick, painless, and a very clean hole. I have also experimented with a bunch of different styles of crimps. My favorite is the non-insulated crimp.

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

**A:** Yes, but they are self-made tools. The tools that I have made don't have handles and I have been using vacuum hoses whereas Thexton's kit has handles and use rigid plastic tubing.

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

**A:** It didn't for me only because I have been using a set of self-made tools for years that are similar. However, there is a huge time saving difference when doing this type of work using a kit like this.

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

**A:** There really isn't any set up.



Although, some may consider deciding on the size and length of tubing needed as part of the setup.

**Q: How easy was it to use?**

**A:** I found the Thexton 926 Wire Insertion Tool Kit easier than the tools that I made.

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

**A:** The kit comes in a nice, hard plastic clear case. They didn't skimp with the case locks either, they are top shelf.

**Q: Was there a manual included?**

**A:** No, a manual wasn't included. However, the instructions are on the back of the label that can be easily read once the lid is opened.

**Q: What features did you like?**

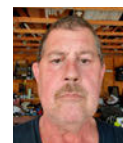
**A:** The handles on the tubes and the rigid plastic tubing that you can crimp! It had never occurred to me to use plastic tubing. It's not something we have used much of, or had around the shop, for it to have crossed my mind.

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

**A:** Instead of a hard plastic handle, I would suggest a more modern soft one. Also, having a split shaft version or to include some split tubing and heat shrink in the kit. This would make running performed end wires securely and safely through grommets.

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

**A:** Thexton's Wire Insertion Kit is a rock solid 10. The handles are comfortable, and the inclusion of plastic tubing was an eye opener.



**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.

\*Note: This product was given to the reviewer free of charge from the manufacturer.

# CATEGORY SPOTLIGHT

## BATTERY SERVICE TOOLS

With winter in full swing, it's no doubt you've seen a fair number of battery issues at your auto repair shops. If you live in an area of the country that gets the four seasons, you know the need for jump starters, battery testers, and chargers/maintainers when the temperature starts to drop. Here, we've compiled the latest battery equipment that you might need to complete this valuable service.



### PERFORMS ADVANCED BATTERY AND ELECTRICAL SYSTEM DIAGNOSTICS

The **Autel MaxiBAS BT608** is a comprehensive battery and electrical system diagnostics tool featuring Adaptive Conductance technology to identify low-capacity batteries, reducing battery misdiagnosis. The Android-based, Wi-Fi touchscreen tablet displays a quick battery health status, enables an automatic battery registration, and offers advanced AutoVIN and ScanVIN functionality for quick vehicle identification and battery specifications. The tool also features shop manager application and a built-in thermal printer. **»110**



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### 3,000A PORTABLE POWER SOURCE WITH JUMP START FUNCTION, NO. VERSAPRO3

The **Matco Tools 3,000A Portable Power Source** with Jump Start Function, No. VERSAPRO3, is designed to jump start cars, trucks, motorcycles, boats, ATVs, and more. It offers built-in safety features such as short circuit protection, reverse polarity protection, over discharge protection, and overheat protection. It includes a four-function flashlight and is IP65 rated water-resistant. The portable power unit also has fast charge capability to quickly and easily charge electronic devices including cell phones, tablets, and computers. A DC power supply and extra-long 20" cables are included. **»111**



### INSTANTLY JUMP STARTS DIESEL ENGINES UP TO 16L

The **Vanair Start-All Jump-Pack 10,000A Li-ion Jump Starter and Power Pack**, No. JP-12-10000, features 1332005S joules and delivers maximum battery capacity and initial starting power to start Class 8 engines on demand. It is equipped with proprietary technology for instantaneous energy transfer to the battery the moment the cables are properly connected for quick and safe operation. The unit starts a dead semi-truck and charges phones, digital cameras, tablets, laptops, and portable gaming devices with its multiple power ports. **»112**



### FINGER SAFE CONNECTIONS FOR ALL CABLES

The **Midtronics High-Voltage Hybrid Vehicle Rescue Charger**, No. xRC-3363, enables technicians to quickly, efficiently, and safely jumpstart hybrid vehicle high voltage batteries to a state of charge capable of turning over the engine. The charger features a 5" color touchscreen with navigational pad, on-screen guided cable connections, and a compact footprint for mobility within the shop. It offers a maximum voltage of 336V and a charging current of 3A. With BMIS integration, the charger supports automated over-the-air software updates and analytical reporting. It can also email results via built-in Wi-Fi. The charger measure 9.37" in height and weighs 37 lbs. **»113**





### FEATURES 1,100 PEAK AMPS

The **Duracell Lithium-ion Jump-Starter** is app-enabled and features 1,100 peak amps of power to start 4, 6, and 8-cylinder gasoline engines with up to 6L of displacement and up to 3L on diesel engines (up to 40 jump-starts a single charge). The convenient 2.4A USB port allows users to quickly charge their smartphone (up to three smartphone recharges per charge). With an IP65 weatherproof construction, it's designed for use in all weather conditions. The integrated 200 lm LED worklight is essential for jump-starting in the dark and features low, high, and SOS modes.

»114

### UP TO 12 CHARGING PROFILES AVAILABLE

The **Associated Equipment High Power Smart Charger**, No. ESS6100, charges all 12V battery types allowing users to keep a 12V lead acid, enhanced flooded, or lithium battery at a stabilized voltage during diagnostic phases. With four operating modes — charging, diagnostics, showroom, and tester — it will deliver the charging cycle recommended for the maintenance of the vehicle. With USB-connectivity, the charger is fully customizable. The ESS6100 is OE vehicle manufacturer approved, versatile, and has a low profile of 5.1" in height. It supports up to 100A for 12V batteries in the diagnostic phase, requiring a standard 120VAC receptacle for use in all shop environments (optional 120A/240VAC available).

»115



### SUPPORTS ECU PROGRAMMING

The **TOPDON Tornado 90000 Power Supply and Smart Battery Charger** is a professional-grade smart charging tool suitable for all types of 12V and 24V lead-acid batteries, with a wide capacity range from 5A to 90A. It comes with six charging modes, two adjustable charging currents, and supports ECU programming. The Tornado 90000 provides safety features including built-in protection against reverse polarities, reverse charges, short circuits, overheating, and over-voltages.

»116



### PROVIDES OPTIMAL BATTERY VOLTAGE ON STORED OR SEASONAL VEHICLES

The **Snap-on 4A 12V Battery Maintainer + LiFePO4 Capability**, No. EEBM500B, is able to charge 12V lithium LiFePO4 vehicle batteries, in addition to conventional lead-acid batteries: STD, maintenance-free, AGM, gel, and deep-cycle. Adjustability allows for optimal battery voltage on stored or seasonal vehicles, including cars, trucks, boats, SUVs, motorcycles, lawn tractors, reserve power batteries, and more. Accessories include a quick-connect output cord with clamp set, ring terminal set, 12V adaptor output accessories, and convenient hang tag to show all diagnostic information about the charge process and vehicle battery status.

»117



### 23550 MASTER BACK PROBE KIT



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## CATEGORY SPOTLIGHT

Battery Service Tools



### ABLE TO POWER 12V TOOLS AND ACCESSORIES

The **Weego 70 Jump Starting Power Pack** is a compact, 3-1/2 lb jump starter that delivers 700 cranking amps and features a bypass button that allows users to jump a completely dead battery.

It's rated for large gas engines (10L+) and smaller diesel engines (5L+). With advanced voltage detection, the 70 can recognize a lead acid battery as low as 0.5V and provides voltage support to raise and maintain the voltage of the vehicle's battery to a level safe for jump starting. The Weego 70 also doubles as a portable power source for recharging USB devices such as a smartphone or tablet as well as 12V tools and accessories. **>>119**

“ This thing is tiny yet will turn over a 1.6L diesel engine without any problems. I've used it a few times between charges and it still works. A truly amazing piece of technology. ”



### 60W INTERNAL POWER BANK

The **NOCO GBX Series Boost X Jump Starters** feature the company's latest PX Lithium technology, allowing for maximum power output and faster recharge of the unit's internal battery. It has a 60-second timer to conserve power

when jump starting. With its USB-C Fast Charge feature, the GBX is able to deliver more power and can be recharged between each use quickly. Its internal power bank provides 60W of power, both in and out, to power phones, tablets, laptops, and more. The series includes GBX45, GBX55, GBX75, and GBX155. Each jump starter is equipped with a high lumen LED flashlight with various brightness modes, SOS, and emergency strobe. **>>120**



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## STARTS CHARGING AT 0V

The **Schumacher 60A 6V/12V Fast Charger**, No. DSR134, is designed for flooded, AGM, and gel cell including spiral cell and orbital. The unit offers four distinct charging modes, start/stop interface, and a large, easy-to-read display that provides step-by-step instructions. With patented Thermal Runaway protection, reverse polarity and short circuit protection, and overcharge protection, the unit allows fast and safe charging. In addition, the DSR134 has a recovery setting used to automatically recover and charge severely discharged 6V and 12V batteries. The unit has a powder coated steel case for durability and comes with 7' 4GA ultra-flexible cables. **>>>123**



## AUTO-SHUTOFF FEATURE TO CONSERVE BATTERY LIFE

The **Allstart Updated Micro-Boost Jump Starter and Charger**, No. 540, features a new compact and rugged design and offers 15 percent more power than the company's previous 540 model. It's ideal for use on virtually all V6 gas powered engines. The unit weighs under a pound, is able to charge devices fast with a quick charge output, and automatically shuts off to conserve battery life. Additionally, it has jump start clamps with 100 percent copper inserts and anti-spark protection as well as a bright, multi-function LED flashlight. The Micro-Boost power unit includes smart start cables, USB to micro USB cable, carrying pouch, and user manual. **>>>124**



## PROTECTS SENSITIVE VEHICLE SETTINGS

The **CTEK CS FREE** is a portable battery charger and maintainer with adaptive boost technology. This technology analyzes a battery to give it the correct power it needs to safely and quickly charge a battery while protecting sensitive vehicle settings. The multi-functional CS FREE is four products in one portable unit: adaptive boost safe start, battery charger, smart maintainer, and hi-tech power bank. With CS FREE, users have portable charging and power to go wherever it's needed. **>>>126**

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# CATEGORY SPOTLIGHT

Battery Service Tools

## SECURELY SUPPORTS 2,400 LBS



The **BendPak SL24EVT EV Battery Pack and Powertrain Lifting System** is designed to help technicians safely and efficiently remove, service, and install heavy electric vehicle battery packs or internal combustion powertrain components. Compact and portable, it has a pallet-jack type steering wheel and oversized urethane casters to provide low rolling resistance and unparalleled maneuverability. With a press of the button on the pendant controller, the SL24EVT elevates to more than 6' in less than 20 seconds. The lift table securely supports 2,400 lbs on its oversized 40" by 60" cushioned rubber platform. The SL24EVT is powered by a maintenance-free 12V deep-cycle battery and includes a fully automatic three-stage battery charger.

»128



## FEATURES A FULLY AUTOMATIC OPERATION

The **Clore Automotive Updated Pro-Logix 12V 1.5A Underhood Battery Charger/Maintainer**, No. 1002, from Solar combines a fully automatic operation, a permanent mount design, and the ability to properly charge virtually any lead acid battery type, including conventional, AGM, gel cell, spiral wound, deep cycle, and marine batteries. The updated 1002 utilizes advanced microprocessor-controlled logic to deliver a fully automatic, precisely controlled charging routine to optimally charge and maintain each battery serviced. Additionally, it features over-voltage protection, reverse polarity protection, and battery fault detection as well as includes three output options: clamps, rings, or 12V male adapter. »131



## FOR MOST COMMON BATTERIES

The **OEMTOOLS 6-pc Battery Service Kit**, No. 25110, features the tools needed for service and maintenance for most common batteries. The kit includes a battery terminal puller, four-way post cleaner, 5/16" and 10mm battery terminal wrench, battery nut pliers, extended 5/16" battery terminal wrench, and a side terminal brush. All the tools are packed into a heavy duty, roll-up sleeve for easy storage, organization, and transport. »129

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## RATED CAT III 600V

The **Power Probe Amp Clamp AC/DC Meter**, No. PPDCM80, is an 80A, auto-ranging clamp meter designed for the automotive technician. The meter is rated CAT III 600V and can measure volts, amps, ohms, frequency, and temperature. The meter's diagnostic applications include, but are not limited to, parasitic draw and HVAC temperature testing. Additionally, it has a jaw size of .9", a worklight, and a large LCD display backlight. »132





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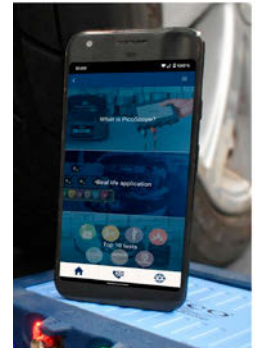
### 1,000 V AC/DC VOLTAGE AND 10A AC/DC CURRENT

The **Lang Tools CAT IV Digital Multimeter**, No. 13811, is a handheld professional multimeter that can measure up to 1,000V AC/DC voltage and 10A AC/DC current. It can also measure resistance, diode, continuity, and mx-Pulse/duty cycle. The multimeter features auto ranging, data hold, and is CAT III 1000V and CAT IV 600V rated. The multimeter includes test leads, batteries, temperature probe, and a manual. **»135**



### OFFERS TIPS ON HOW TO USE PICOSCOPE

The **PicoScope Automotive App** from **Pico Technology** is designed to provide new users everything they need to understand PicoScope no matter the level of their diagnostic experience. The app allows users to learn about the different kits available, the use of their top ten guided tests, and tips on how to use PicoScope. Other key features include how to get started with PicoScope, waveform analysis, popular case studies, training videos, and real-life workshop applications. **»133**



### FOR ELECTRIC AND HYBRID VEHICLES

The **EV Battery + Coolant Leak Detector** from **Redline Detection** is designed to test the integrity of battery enclosures in electric and hybrid vehicles. Durable and compact, the unit connects to the battery enclosure on or off the vehicle, giving audible and visual progress and precise pass/fail indication, specific to that battery and vehicle type, when testing is complete. Data logging and reports can be accessed remotely and the machine is programmable for future battery configurations. **»134**

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# Loyalty from kindness

This technician's toolbox takes up the entire wall of his garage and is packed with Matco tools.

By *Amanda Silliker*, Editor

**W**hen Andrew Kay was a young automotive technician, a Matco Tools mobile tool dealer was one of the many distributors who would come into his shop. Unlike the other guys, Jimmy Smith from Matco was the only one who would talk to Kay. He took a risk with Kay and trusted him, and from there, a lifelong customer was born.

“With my first box, I didn’t have any credit but he got me into my first box and it grew from there. It meant a lot and it’s gone a long ways because I probably have in the neighborhood of a quarter million dollars worth of tools,” says Kay, an ASE certified Honda master technician at Hendrick Honda of Charleston in South Carolina.

That first box was a Matco four-series double bay and then Kay upgraded to a five series double bay with a hutch and side locker. He has since sold that and now has the Matco six series triple bay 28” toolbox with a matching Matco JSC770 roll cart.

The dark green color on his box is now a rarity as this particular shade (called “green envy”) has been discontinued, as has the textured black (called “crinkle black”) that appears on the box.

“Nobody can ever get my color combo again,” Kay says. “It’s a big eye-catching piece.”

And because he was not able to order the roll cart in two tones to match his box, Kay ordered two carts and swapped the drawers.

The top box is actually a half-hutch in the middle with drawers on either side. He custom ordered two side lockers with two sets of sliding shelves and a power strip on each side. All his Milwaukee 18V and chargers are on one side and the 12V and chargers are on the other.

Many years ago, Kay’s shop foreman told him he was organizing his box all wrong



## »»» OWNER

### Andrew Kay

**Shop:** Hendrick Honda of Charleston

**Location:** Charleston, SC

and that he would soon get tired from “bending over 30 times a day to reach the same tool.” Turns out he was right, so now Kay keeps his most-used tools around waist level. In the skinnier drawers, he keeps his wrenches, screwdrivers and flatter tools. The deeper drawers hold his sockets standing up in socket organizers and pliers on plier racks.

“You try to take up as much vertical space as you can in each drawer,” says Kay.

The roll cart usually has the tools he uses the most throughout the day such as his metric wrenches, screwdrivers, torques, socket extension, swivel-foot pry bars, and ratchets. Often found on the roll cart are hammers, pliers, and diagnostic equipment at the bottom.

Kay’s favorite part of his toolbox is the halfhutch.

“A full hutch for me is a waste of space in terms of square footage. I prefer to have doors on either side for organization,” he says. “The halfhutch is big enough that you

can put a laptop, scanner, radio, and stuff that you want to lock away.”

He also finds the power drawers in the side lockers very useful for plugging in battery chargers and tools.

“Battery charging capabilities is a must,” he adds.

Kay’s box has a power drawer, each side locker has a power drawer, and the box comes with “convenience power” on the front of the box with 110V and USB power.

Kay’s loyalty to Matco runs deep and he even had a stint as a Matco dealer himself but ended up selling the franchise once he started having kids. Now, he works at the same Honda dealership that he started out at when he was 17.

When asked if he has plans to add to his toolbox, he is quick to respond “absolutely not!”

“My wife would kill me if I added on to this box,” he says. “It takes up the entire wall of my garage — there’s no room to go up or out.” ❌

*Want to see more photos of Kay's box?  
Visit: [VehicleServicePros.com/21247789](https://www.vehicleServicePros.com/21247789)*



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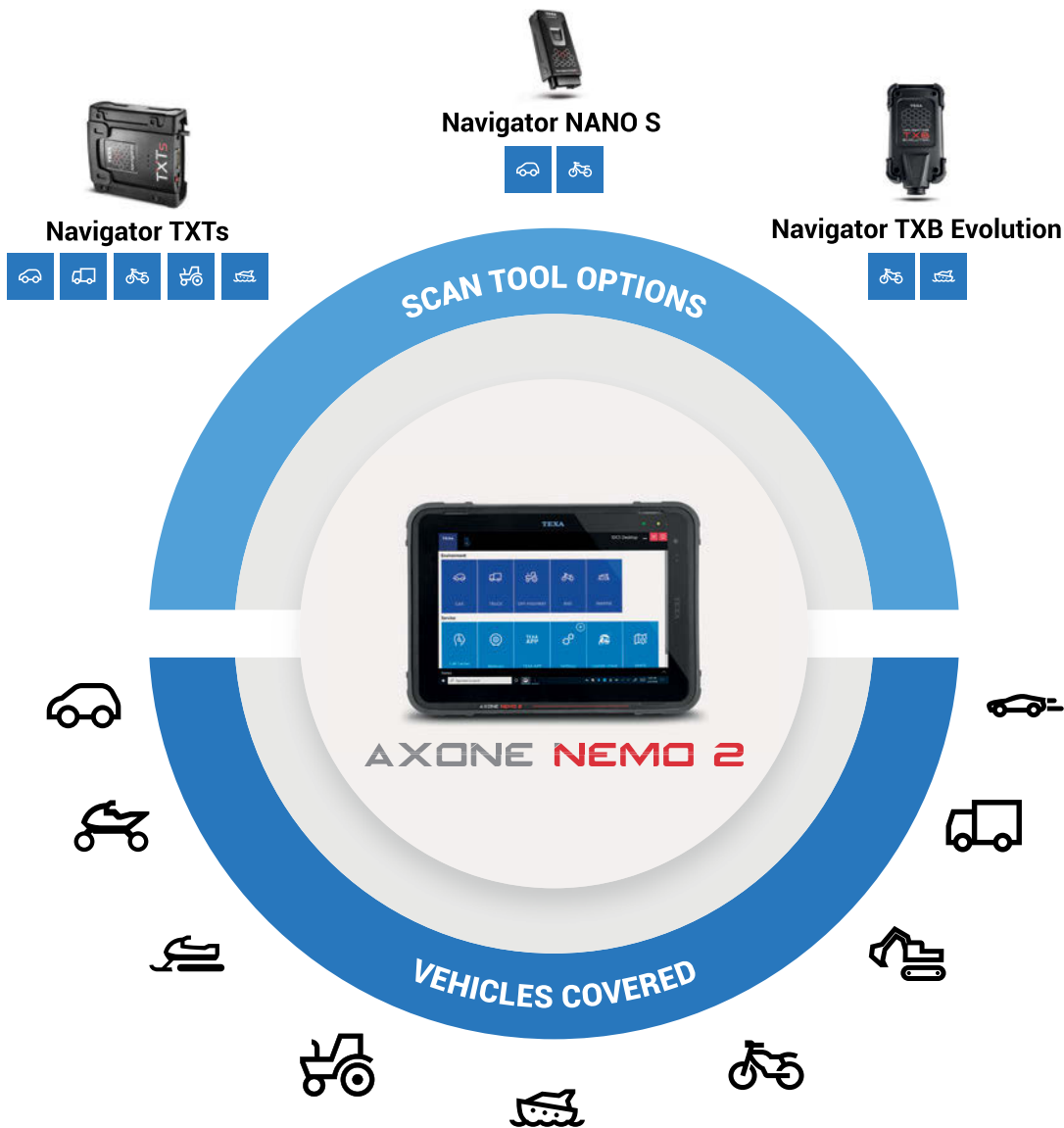
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