

# PTEN

Professional Tool & Equipment News

The Independent Tool Authority



## VT56 TPMS Tool By ATEQ

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and other new tools pg 10

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A common sense approach pg 34

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Includes maneuverable gear  
ratchets



# STEELMAN<sup>TM</sup> *PRO*

39 PC. STRUT AND SHOCK INSTALLATION / REMOVAL KIT

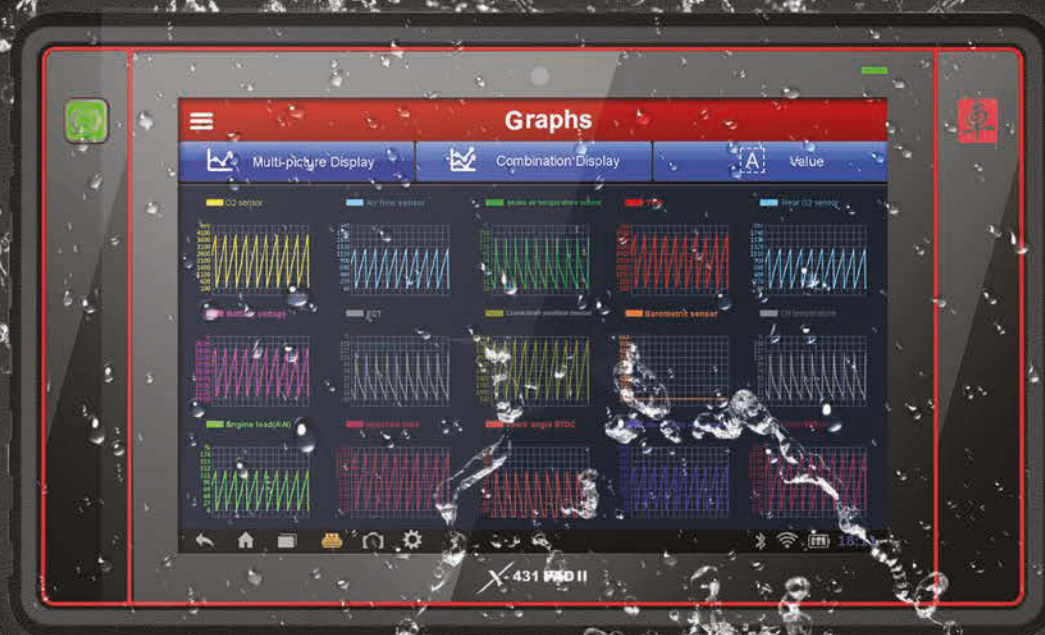


Steelman<sup>TM</sup>PRO's Strut and Shock Installation/Removal Kit is designed to save technicians time, money, and frustration when dealing with struts and shocks. The set works with all standard struts and shocks. Simply select the bit and corresponding socket for the vehicle. When used together with a combination wrench and ratchet with a socket, the removal of struts and shocks becomes a breeze. When you need one kit to remove them all, be a pro...Steelman<sup>TM</sup>PRO!



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# MAY

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Name: Don Sutton

Employer: Austin, Texas city garage

Location: Austin, TX

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Watch for  
Round 2 of  
the 2014  
PTEN  
Innovation  
Award  
Nominees







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Todd Michalski, vice president of sales and marketing for Gray Manufacturing, talks with Managing Editor Erica Schulz about advancements in vehicle lifting technology, like mobile column lifts and touchscreen operation capabilities. To watch the video, visit: [VehicleServicePros.com/11395945](http://VehicleServicePros.com/11395945)

## Featured Products



### Indestructible Hammers

Westward - Exclusively from Grainger

[VehicleServicePros.com/11121422](http://VehicleServicePros.com/11121422)



### Glow Plug Reader

CanDo

[VehicleServicePros.com/11290293](http://VehicleServicePros.com/11290293)

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## PTEN Innovation Awards

We didn't have  
room for  
all of the  
products  
in this  
issue, but  
you can  
view the  
full list online.

For product details on all 92 PTEN  
Innovation Awards nominees, visit:

[VehicleServicePros.com/2014IANominees](http://VehicleServicePros.com/2014IANominees)



## Tech Tips Video



Jeff Minter of AR&D provides insights on  
how to choose the correct scan tool for  
hybrid vehicle diagnosis. To watch the full  
training video, visit:

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# Reflashing:

## The aftermarket's next big challenge

**I**f keeping up with the changing capabilities of aftermarket tools wasn't demanding enough nowadays, another class of tools – powertrain control module (PCM) reprogrammers – are emerging as yet another area that will separate the leaders from the pack.

Service procedures for many cars nowadays require updating the PCM. In some cases, a “reflash” alone will correct a car's problem.

When a customer recently brought a stalling 2003 PT Cruiser to Buddy's Automotive in Independence, MO,



**Elliot Maras, Editor**

the car's computer was shutting down, causing the vehicle to stall and preventing the PCM from communicating with modules. After replacing the PCM with a used unit, the techs hooked the Drew Technologies' J2534 pass-through device to the PCM. A J2534 pass-through device acts as a gateway between a vehicle's onboard computer and a PC or laptop. Jeff Bly, the shop's master tech, was then able to reprogram the PCM in 25 minutes. Once the PCM was reprogrammed, the car's fuel injection worked fine.

Without the J2534 device, the shop would have needed an OE factory scan tool, a hefty investment.

“J2534 is a game changer to equalize what a shop can do to compete with the dealers,” Bly said. But getting into reprogramming is not for the inexperienced. Bly noted that shops need a thorough understanding of what they are doing when reprogramming a PCM. They also need a dedicated reflashing laptop, a constant power source, an OE-compatible operating system and a reliable Internet connection. He emphasized that techs need to be well prepared before they perform a reflash since most reflashes cannot be reversed.

At present, most aftermarket shops are content to send reprogramming work to OE dealers. But this is changing. Forward-thinking shop owners are realizing they need to be able to reprogram vehicles if they want to win their fair share of an increasingly competitive marketplace.

Being able to reflash saves a shop the time and expense of sending a vehicle to an OE dealer. Not to mention the boost it gives the shop's reputation.

In the near term, J2534 proficiency allows an aftermarket shop to win reprogramming work from other shops since most shops can't do it.

It's a safe bet that this window of opportunity will last for several more years at least. No one knows for sure how long it will be before most aftermarket shops can successfully respond when a technical service bulletin calls for a reflash.

J2534 tools will become more versatile as carmakers continue to support aftermarket reprogramming. Aftermarket shops, meanwhile, must get up to speed on what OEs require from them to reflash vehicles and what aftermarket tools will allow them to provide this service. **PTEN**



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**The engine runs rough.**

**Sets misfire code P0304.**

2010 GMC Yukon SLT 5.3L comes in with a misfire on acceleration. Engine compression is low on one cylinder. Traditional failures like a burned valve or leaking compression rings aren't the cause of the problem.

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This valve lifter has an unconventional design as a part of GM's Active Fuel Management System, which has the ability to provide maximum fuel economy by deactivating four of the engine's eight cylinders. A valve that does not open properly can cause weak or no compression, resulting in a misfire. Replacing the valve lifter restores engine performance so it runs smoothly without misfiring.

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# FEATURED New Products

**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.



## Includes maneuverable gear ratchets

**Mueller-Kueps XS Bit Kit** is able to work in very narrow areas because of the maneuverable gear ratchets. The two ratchets can be moved back and forth or sideways and can also be locked once in the desired position. The handle is designed to provide a firm grip without slipping. The kit

includes 21 short bits (20mm in length) of various shapes for high versatility and universal use for almost any type of vehicle. All pieces and ratchets come in a sturdy metal box, including an item chart to keep the set organized and well maintained.

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## Graduated torque setting dial

**Florida Pneumatic Torque Controlled 1/2" Impact Wrench, No FP-745TCI**, is the first torque-controlled 1/2" impact wrench to incorporate a graduated torque setting dial where the operator can select four specific torque settings in the forward direction. The FP-745TCI has built-in indicator lights to show when the correct torque level is reached, and a digital display showing the actual torque level achieved. The FP-745TCI provides 800 ft/lbs maximum torque in the reverse direction, and features an easy change-of-direction bar. The FP-745TCI incorporates a hard-hitting, twin-hammer mechanism and a high-energy, six-vane, 8,500-rpm motor.

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## Gripping capacity up to 3-1/2"

**Knipex Alligator XL Water Pump Pliers, No. 88 01 400**, feature a forged, box-joint design for high stability, an 11-notch adjustment for a gripping capacity up to 3-1/2", and hardened teeth to increase gripping capability. The hardened teeth mean the pliers won't slip off the work piece and they require low hand force. The pliers have a thin head and joint area, which enable it to fit into tight, hard-to-reach places. The 16" pliers weigh less than 3 lbs and offer a built-in pinch guard to prevent injury to hands or fingers and plastic-dipped comfort handles.

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## Easy-to-use, icon-based navigation

**ATEQ VT56 TPMS Tool** is a multi-function TPMS tool with an optional wireless printer and docking station. The VT56 features a soft, eight-button, ergonomic keypad and provides a modern and easy sensor-triggering and programming experience. The VT56 features a high-resolution, 4.3" color display, and adapts to technician needs with advancements such as icon-based navigation to easily scroll through multiple menus and features. The ATEQ VT56 offers trouble-free updates on a fresh platform.

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## Master impact socket set

Grey Pneumatic offers a 3/8" Drive, 81-piece, Fractional & Metric Master Impact Socket Set, No. 1281. This set contains the most popular 3/8" drive, 6-point sockets and universals with extended range metric sizes up to 22mm. Also included is a 3" extension, universal joint and 1/4" hex to 3/8" square adapter for use with hex drive impact tools. This set is packed in a compact, low-profile, blow-molded storage case which can be used as a toolbox organizer when the cover is removed.

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## Available in floor or wall mount

Herkules Equipment Corp. Vise and Grinder Stands can swivel up to 360 degrees and lock into position, allowing the vise or grinder to be placed into any position and then moved out of the way when not in use. The Vise and Grinder Stand is available in a floor mount or a wall mount. The wall mount allows for mounting at any desired height. The floor mount is 34" high. The stand securely bolts to either the floor or a wall for stability, and has a 150-lb capacity. Any size vise or grinder can be attached to the 8" by 8" by 1/4" steel base plate.

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## Aircraft-grade stainless steel laces

Wolverine Drillbit Oil Rigger Boot is designed for long work days and offers comfort and convenience, according to the company. The Boa aircraft-grade stainless steel laces provide a smooth, even closure for a secure and comfortable fit that can be adjusted throughout the day. The Drillbit also features waterproof leather and a 1000 Denier nylon upper with a Wolverine ArmorTek overlay to reduce wear and tear on high-use areas of the boot. The Drillbit has Wolverine's PC Dry waterproof membrane to keep feet dry in wet conditions and wave mesh lining to wick away excess moisture. An Ortholite footbed provides cushioned comfort, while a lightweight, oil- and slip-resistant rubber lug outsole provides dependable traction.

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## Automatic shut-off

Santech Industries portable Refrigerant Recovery Machine, No. MT1732, provides technicians an efficient, safe and reliable solution for refrigerant recovery. The MT1732 is both industrial HVAC- and ARI-700-certified to handle CFC, HCFC, HFC and R410A refrigerants. All units are equipped with an oil-less compressor operation from 1/3hp to 1hp. The MT1732 is supplied with an oil separator and automatic shut-off when refrigerant recovery is completed.

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## Continuous software upgrades

Snap-on Ethos+ Technician Plan is the worry-free way to get an Ethos+ scan tool, continuous software upgrades and full-warranty coverage for one weekly payment. The flexible two- or three-year ownership program is specially tailored to technicians who need their own diagnostic tool with predictable payments. With the Ethos+ Technician Plan, software upgrades are included so techs always have the latest coverage. Subscribers get comprehensive data for domestic, Asian and European late-model and older vehicles, including thousands of new vehicle systems, trouble codes and live data parameters.

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## Up to 10,000 psi

Porter-Ferguson Line of Jacks offers several choices of powerful and rugged remote-control manual or pneumatic-powered hydraulic models. Each jack comprises either a hand- or air-powered hydraulic pump, a hydraulic hose, a quick-connect coupler and a ram. The five pump options range from 7,000 psi to 10,000 psi and all can be used with a variety of ram sizes and types. All pumps feature a steel, drop-forged broad base, ensuring stability even in awkward positions and are able to withstand years of hard use. The jacks are made in the U.S.A.

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### LT991 HOLLOW END LINE TAPS

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- Repair female couplers and save high pressure lines
- Retap female coupler threads



IN USE



NEW PRODUCT

### LT1800 OFFSET IMPACT DRIVER SET

- Use with air hammer to drive out inaccessible bolts around springs, struts, shocks and front end work



IN USE

(Impact hammer chisel not included)



NEW PRODUCT

### LT830 UNIVERSAL HUB SHOCKER

- Use with 5 lb. hammer to knock frozen hubs out of axles
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IN USE

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## New Products



### TPMS torque tools

Dill TPMS Torque Tools are designed to easily install the hex nut on the valve stem. The torque values are preset, eliminating the need to adjust a torque wrench before and after install. Using the Torque Tools will save technicians time and minimize the chance of an error during the installation process. Dill 4065 contains two preset Torque Tools and is a stand-alone kit for the shop that already has a basic TPMS installation toolkit. The Torque Tools are also available in Dill's updated Master TPMS Toolkit (No. 8200) that includes all the components to service most sensors and service kits on the road today.

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### Holster for parts or small hand tools

V8 Tools Clip-on Magnetic Parts Dish, No. V8 3803, saves technicians time by helping to prevent the loss of missing e-clips, bolts or drain plugs. To use, technicians clip the V8 3803 anywhere onto themselves as a holster for parts or small hand tools. Three powerful, rare-earth magnets hold the dish securely. The dish is specially designed to hold long parts and tools. It is made of a strong and durable plastic.

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## New Products



### Color-coded probes

**Global Parts Distributors Temperature Tester**, No. 5811585, allows technicians to easily and quickly measure the temperature performance of an automotive air conditioning or heating system. It can also be used to detect restricted condensers and heater cores. The screen displays inlet and outlet temperatures and the differences between them. The Temperature Tester probes are color-coded blue and red and the clamps are designed for easy attachment, even in difficult-to-reach areas. Easy-to-follow instructions are included as a reference guide.

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### Visually inspect large particles



### Billet Connection See Through Oil Filter Assembly

is designed for technicians who want to filter dust and microscopic particles out of oil and be able to visually inspect the larger, filtered particles. This assembly allows visual inspection of the condition of the oil, and inspection of the filter element and contaminants that were filtered out, even when filtering non-transparent engine oil. This is done without unbolting or loosening any fasteners or fittings and without draining, leaking or losing any oil. This filter helps determine if particles are normal or if they are from components excessively wearing in the engine supplying the filter.

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### Rechargeable up to 300 times



### Streamlight Rechargeable Stylus Pro USB

includes a USB recharging port, accessed by sliding back a water-resistant sleeve. The 6.15", 1.9-oz compact light features a white C4 LED to provide 70 lumens and 630 candela peak beam intensity over a run time of 3.5 hours, and a beam distance of 50m. Highly durable, the Stylus Pro USB has a machined aluminum case with an anodized, abrasion-resistant finish. It features a convenient tail-cap switch for easy, one-handed operation of the light's momentary or constant on modes. The Stylus Pro USB uses a Li-ion battery that is rechargeable up to 300 times. The light comes packaged with a USB cord, removable pocket clip and holster.

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# BATTLE TESTED



**TERRY MCMILLEN TOP FUEL NHRA**  
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- TEST FOR BAD GROUNDS

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for automotive technicians  
and battery specialists

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## New Products



### For use on the 2015 Ford F-150

Car-O-Liner's Line of MIG Pulse Welders includes three welders which can be used to repair the 2015 Ford F-150. The CMI300II MIG/MAG Pulse Welder was developed for modern car body work including a variety of steels, aluminum and MIG brazing. The AUTOMIG 273i Pulse Boost MIG Welder is ideal for entry-level welding requirements and includes a four-wheel wire feed system that uses a single torch and synergic, pre-set welding programs. The AUTOMIG 273i Pulse Duo Boost MIG Welder precisely feeds soft wires like aluminum, but includes two torches, making it an efficient tool when there is a need for easy switch over between welding and brazing operations.

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on VehicleServicePros.com



### Perform offset notches without shim kit

JMR Tubing Notcher, No. TN1000, from Trick Tools has a 2-1/2" O.D. capacity, which is a positive zero point for a centered notch, and is capable of notching in a 210-degree arc. Angle changes can be made effortlessly due to a thrust bearing at the pivot point and offset copes can be performed with ease. This design has been engineered to perform offset notches without the use of a shim kit. Users will loosen the two allen bolts on the bottom of the shaft housing, raise the housing to a desired height up to 1" and start notching.

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### 12V digital fault-detector for A/C systems

Supercool Cooltest A/C Diagnostic Tool is an easy-to-use, 12V, digital fault detector that does not require extensive training and saves time in troubleshooting vehicle A/C systems. The Cooltest detects and digitally displays both low- and high-pressure readings and the following nine faults: gas leakage, low compression, no compression, expansion valve choked, gas overcharge, dirty condenser panel, receiver drier choked, electric fan not working and low pressure choked. The built-in hook allows for convenient hanging under the vehicle hood.

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### Easy-to- read color LCD display

Magneti Marelli Smart is a stand-alone unit with full diagnostics that include parameters, statuses, error codes, activations, encoding of components and reports. Domestic, European and Asian coverage is included. The Smart has a clear, easy-to-read, color LCD display and is updated monthly. Special functions for the Smart include the OK function, which is a simple and efficient activity selection; and the Plus + function, which provides reference data for technicians so they may compare their results with the correct parameters.

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# TIME-SAVING TOOLS FROM OTC



6980

## Brake Drum and Rotor Puller

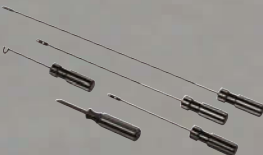
Designed for frozen or corroded rotors with rugged construction and heavy duty forcing screw for use with air-impact tools. Rated at seven tons, the 6980 is easily setup, featuring specially engineered puller legs fit between drum and backing plate or behind rotor. Put away the pry bars, torches or maul and get the right tool.



6918

## Ford Spark Plug Remover Kit, Triton 3V

Staring down a broken spark plug in a Ford engine? OTC's tool removes the full plug, without breaking, thanks to a design locking the plug porcelain core to the plug hex allowing it to turn as one complete unit.



4462

## Wire Loom Threading Kit

Keep wiring harnesses clean with OTC's set of wire fishing tools, ideal for installation or replacement of gauge packs, sound systems, cameras, sensors and lighting on a vehicle. The 5-piece kit will save you time and frustration by easily adding wires to existing looms and fishing wire through tight spaces.



5752

## Wheel Loader & Tipper

Lift, tip and move heavy wheels around without the risk of back injury. Innovative design features dual notches to tip wheels on their side while the unique shape and foot pad help easily lift aluminum or steel wheels into and out of truck beds.



5789ID-1032

## 10 lb. Tire Service Hammer

A drop-forged head induction-hardened for long life is specially designed for breaking tire beads, tipping wheels and dragging a tire into position. The tire wedge features a convex shape for effective bead breaking and an indestructible handle with Lifetime Marathon Warranty guaranteeing replacement.



otctools.com

800-533-6127

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## New Products



### Adjustable-pressure industrial spray gun

**Lisle Heater Core Backflush Tool**, No. 60900, is an adjustable-pressure industrial spray gun with a stepped-tip design for easy heater core flushing. The tip fits 1/2", 5/8" and 3/4" hose fittings. Water pressure can be easily controlled with one hand by squeezing the handle of the heavy duty spray gun. The insulated handle protects hands when using hot water to flush the cooling system. The spray gun attaches to a standard garden hose. The product is made in the U.S.A.

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### High-resolution, 8" display

**Snap-on Vantage Ultra** graphing multimeter and high-speed, two-channel lab scope provides fast and reliable tests to verify failed components before starting vehicle repair. With a boot-up time of only five seconds, the large, 8" display shows test results with high-resolution clarity for more detail and better insight. Techs can control everything with simple icon and menu navigation, using the four-way keypad or touchscreen, even while wearing gloves. Guided component tests automatically configure the meter settings for the chosen test. For complete control, techs can customize the settings with one touch. The high-speed, two-channel lab scope displays live signals for two wave forms in real time.

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### Use on most aftermarket locking lug nuts

**JS Products/Steelman Pro 16 Piece Locking Lug Master Key Set**, No. 78537, includes keys for most aftermarket locking lug nuts. This means when a customer comes into the shop and doesn't have their lug key, technicians can easily remove the key without damaging the wheel. The keys are made of chrome vanadium steel and finished with black oxide to hold up to a lifetime of use.

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GEARWRENCH RATCHETS

## SUPPORT YOUR NEEDS.



GearWrench has earned its reputation by building high quality, innovative tools. With the addition of our 3-degree swing-arc 120XP Series and revolutionary new Gimbal Ratchets, GearWrench now has the biggest selection of ratchets ever. Guaranteed for life, GearWrench ratchets help you GET IT DONE.™



## New Products

### Adjustable handles

#### Rennsteig Ratcheting Action Cable

Shears, No. D38, are designed for cutting single-strand, multi-strand, fine-wire aluminum and copper cables. The ratchet action and low weight make for comfortable use. These shears have a forged cutting head and high-strength aluminum tube arms. The two-component handles can be adjusted based on working conditions from 15-1/2" to 23-1/2". These shears feature a replaceable cutting head and they are not suitable for steel wire.

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### 1,000 lbs of overall storage capacity

Matco Tools JSC450 and JSC480 service carts come welded, assembled and ready-to-work. They feature an ergonomic push handle and four 6" by 2" casters, giving users double the load-bearing capacity of other carts, according to the company. Slides can each carry 50 lbs more, and the design of the JSC480 offers 1,000 lbs of overall storage capacity. The JSC450 and JSC480 have over 16,500 cubic inches of total capacity that is protected by the TuBar lock. Both service carts come with a one-year warranty and are available in five colors to match Matco's line of toolboxes.

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## Brilliant In Every Respect!

### TRACERLINE® OPTI-PRO™ Plus Leak Detection Flashlight

This super-compact, rechargeable leak detection flashlight features a high-output true UV (violet light) LED that causes dyes to fluoresce far more brilliantly and with greater contrast compared to conventional blue light lamps. Works with all universal/ester and PAG A/C dyes, as well as most popular fluid dyes. Provides 4 hours of continuous inspection between charges!



- Power comparable to high-intensity 125-watt lamps!
- Inspection range of 20 feet (6.1 m) or more!
- Convenient on-board recharging
- Powered by one rechargeable lithium-ion battery (included)
- Comes complete with smart AC charger, fluorescence-enhancing glasses and lanyard



**Also available in the TP-8656 EZ-Shot™ OEM-Grade A/C Leak Detection Kit**  
Kit includes EZ-Shot™ caulk gun-style A/C dye injector, R-134a hose/coupler with purge fitting, 8 oz (237 ml) BigEZ™ R-134a/PAG multi-dose A/C dye cartridge, GLO-AWAY™ dye cleaner, smart AC charger, fluorescence-enhancing glasses and rugged carrying case.



**TP TRACER PRODUCTS**  
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or visit [www.tracerline.com](http://www.tracerline.com)

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### 1,600 ft/lbs of torque

Sunex Tools 1" Compact Super-Duty Impact w/ 6" Anvil, No. SX4360-6, offers power while only weighing 15.9 lbs. Despite the low weight, the SX4360-6 produces 1,600 ft/lbs of torque. The ergonomic back handle tilts upward, offering a more comfortable working grip in the drop position and eliminating contorted wrists and aching backs, according to the company.

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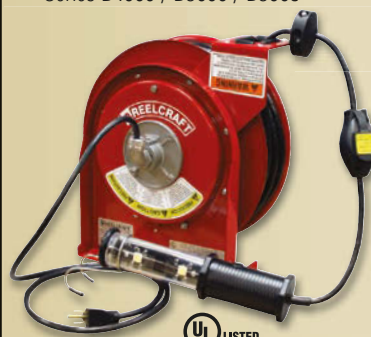
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Hose Reels**  
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## New! Premium Duty Hose Reels

**New ratchet latch  
system now available!**

Series B4000 / B5000 / B5005



## LED Light Cord Reel

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The power pod delivers portable  
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## New Products



### Prevents sticking calipers

Phoenix Systems BrakeShot brake fluid additive is designed to fight corrosion induced by the harmful effects of copper. BrakeShot prevents sticking calipers, ailing master cylinders and other ABS braking troubles brought about by corrosion and high copper levels in the brake system. A 1-oz shot of BrakeShot treats up to 1L of brake fluid, which is the average capacity of a vehicle's braking system. Cheaper and quicker than a brake flush, BrakeShot is universal and works on all foreign and domestic vehicles. BrakeShot comes packaged in a case of 12.

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### Ergonomic, all-steel clamps

Anglo American Tools Adjustable all-steel L-Clamps from Turnus feature the popular model of adjustable malleable cast iron clamps. These clamps include a two-component grip for effortless clamping, as well as fixed and moving arms on a hollow profile rail with a galvanized grooved slide. The trapezoidal threaded spindle is burnished for smooth operation. The handle can be adjusted to a 90-degree angle for maximum torque and increased clamping pressure.

The trapezoidal threaded spindle is burnished for smooth operation. The handle can be adjusted to a 90-degree angle for maximum torque and increased clamping pressure.

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### Free 30-day software subscription

Hickok NGS PC On Demand diagnostic scan tool, No. 90069, gives techs the ability to turn their Windows-based PC into a Ford, Lincoln and Mercury diagnostic scan tool for vehicles from MY 1996-2013. The one-time hardware purchase includes a free, 30-day software subscription. Three subscription renewal options provide flexibility to use billable diagnostic time to purchase software, effectively increasing diagnostic capabilities. NGS PC performs power balance misfire diagnostics; retrieves all DTCs and active commands; performs PATS key programming, automated EVAP monitor testing and more.

NGS PC performs power balance misfire diagnostics; retrieves all DTCs and active commands; performs PATS key programming, automated EVAP monitor testing and more.

Enter 59 at "e-inquiry" on VehicleServicePros.com







## Three male and three female probes

**Jumperkits Micro 64 square probes** can be used for various applications, including automotive, commercial vehicles, engine-management systems, powertrain-control systems, ABS systems and airbag systems. These Micro 64 probes are available in packs of three male and three female probes. The male pin measures 0.64mm. These probes fit terminals found in the various models of Buick, Cadillac, Chevrolet, GMC and Pontiac vehicles.

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## Compact, tear-drop head

**Powerbuilt by Alltrade Tools 3-Pc Ratchet Set, No. 649967**, conforms with ANSI standards and includes 1/4", 3/8" and 1/2" drive gear-to-gear, tear-drop head ratchets. The ratchet's compact head is about 50 percent smaller than a typical ratchet and it has less play between the 72 teeth, according to the company. This set is made of chrome vanadium steel construction and is drop forged and heat treated for maximum durability. The mirror polished chrome finish prevents corrosion. The ratchets are organized in a high-end, EVA foam tray that slides into the drawers of a toolbox.

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## Seven color-coded adapters

**CTA 9-Pc Oil Filling System, No. 7470**, allows for fast and spill-free oil filling on a wide range of Asian, European and domestic makes and models. As many new oil cap and filter designs require special funnels, this oil-filling system allows the use of one funnel with seven color-coded adapters. A unique aluminum swivel-extension arm allows for hard-to-reach, low-clearance and angled applications.

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# The Professional Technician's Choice



## Model 6033

- ◆ Hand-held 125 Amp load tester that checks condition of battery under load
- ◆ Provides CCA rating of the battery after test (like an EKG)
- ◆ Checks and displays alternator output voltage
- ◆ Large digital display and clamp adaptors
- ◆ Easy to use and automatic



## Model 12-1015

New Digital Battery Electrical System Analyzer Starter, Alternator, Ground and Battery Test with Built-in Thermo Printer and USB Port



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A/C • Fuel • Oil  
Cooler • Transmission  
Power Steering



The KLEDGE-LOK™ can now be used in all systems under 1800 psi for steel, copper, and nickel-copper tubing.

Tube-to-Tube Repair



*"The repair was very successful and system recharged without an issue."*  
— KLEDGE-LOK™ Customer



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Most Innovative  
New Product



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## New Products



### Spring-loaded joints

**Monster Mini Pliers Set**, No. MST97608, is a 9-pc set featuring encapsulated spring (ESP) technology with spring-loaded joints for superior ergonomics in tight spaces. This pliers set is machined to precise tolerances and bolstered by solid-joint construction. High alloy steel and precision heat-treating ensure sharper cutting edges and optimum strength and durability. It features double-dipped, chemical-resistant grips for comfort and control. This set includes bent long nose, long nose with cutter, diagonal cutter, end cutter, needle nose, long-reach bent nose (22 degrees), long-reach bent needle nose, long-reach diagonal cutter and long-reach long nose with cutter pliers for a wide range of applications.

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VehicleServicePros.com



### Reduce fastener rounding

**Gearwrench 51-Pc 1/4" Drive 120XP SAE/Metric 6 Point Standard & Deep Socket Set**, No. 80300P, features the Double-Stacked Pawl technology of the 120XP ratchet. The 120XP delivers 120 positions in 360 degrees for an ultra-narrow, three-degree swing arc while delivering 180 percent of ASME torque performance. The 120XP ratchet has a tear-drop, low-profile head and a flush-mounted on/off switch for improved access. The sockets feature surface drive technology to reduce fastener rounding. The set includes full-polish chrome sockets with large, hard stamp-size markings, knurled, full-polish extensions and a storage case.

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### Clone sensors in seconds

**Standard Motor Products TechSmart Cloning Tool**, No. T55000, is



designed to be used with Standard and Intermotor cloneable TPMS sensors. The T55000 cloning tool enables technicians to clone the ID of the existing sensor to the new cloneable sensor. To install, technicians will locate the ID on the original sensor and type it into the cloning tool. They then place the new cloneable sensor in the T55000 and hit "enter." The new sensor is cloned in seconds. The cloned ID can be written on the included sticker, affixed to the new sensor and installed, with no relearn time.

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### Thousands more trouble code descriptions

**AutoEnginuity ScanTool 12.1** for the Windows platform features improved Audi- and VW-enhanced coverage by adding thousands of trouble code descriptions and even more defined tables. Some important features include: improved Nissan Leaf 2013 coverage, which includes Stroke Sensor Zero Point Learning, improved Mazda body controller 2013 coverage; added Dodge Dart 2013 coverage; added GM Injector Coding for 6.6L LML and 6.6L LGH engines; and added Subaru CrossTrek model coverage and 2012 and 2013 power steering coverage expansion.

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## Heavy duty spring motor

### Hannay Reels N500

Series high-pressure, low-maintenance spring rewind reel is designed for efficient hose handling in applications such as hydraulics, air and water, and chassis grease for all machine and implement needs. A compact frame and narrow base allows for easy installation in almost any location. The N500 features a heavy duty spring motor with self-contained rewind power, four-way roller assembly and a declutching arbor to prevent against damage from reverse winding. A non-sparking ratchet assembly locks the reel at the desired length of hose payout and a pull on the hose unlocks the reel for the spring motor to retract it.

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## Reduce removal time by 60 to 70 percent

Ajax Tools Pneumatic Brake Pin and Bushing Driver Kits, Nos. A1166 and A954, are used to remove anchor pins and install bushings on trucks, trailers and buses between 16,000 and 30,000 lbs. These kits eliminate the need to heat seized pins and bushings during the removal process and reduce removal and installation time by 60 to 70 percent. The A166 is a 0.401 shake-brake, pin-bushing driver set that consists of one A1114 and A1115, and the A954 is a 0.498 set that includes one A956 and A957. The overall length of drivers is 10-1/4".

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## Three lighting modes

Cal-Van Tools Boost portable power source, No. 550, features a 12V emergency start, LED flashlight, USB port for device use and charging, a durable carrying case and jumper cables. The Boost uses a 12,000m, Ah high-capacity, high-power battery that has low self discharge. The 1.9-lb power source has built-in safety features and three lighting modes, which include standard, strobe and SOS.

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# TA500 Coil on Plug Ignition Tester

## SmarTach+COP

**GTC** General Technologies Corp.



For diagnostics of:

- ▶ Non-starts
- ▶ Misfires
- ▶ Defective coils and modules
- ▶ Fouled or damaged spark plugs

Easy and quick to use, it measures:

- ▶ Spark Burn Time
- ▶ Spark Peak Voltage
- ▶ RPM

Works with Coil on Plug, Coil near Plug, D.I.S. (waste spark) and conventional ignition systems



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This instrument is protected by one or more U.S. and Canadian patents. 'SmarTach+' is a trademark of GTC

No special adaptors, cables or scope required.

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## New Products

### Avoid unwanted spilling

**Telescoping Marksman Spout**, from WD-40's 3-In-One brand, provides 6" of extra flexibility when applying multi-purpose oil for applications such as lubricating moving parts, penetrating rust, and cleaning and protecting tools and equipment. The Telescoping Marksman Spout is useful when precise control is required, even in hard-to-reach places, and its on-and-off twist tip helps avoid unwanted spilling. The compact size fits in toolboxes, pockets and tool belts, and the clear product-fill indicator makes it easy to see when the bottle of oil is empty.

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### Breathable nitrile foam coating

**Ansell HyFlex Glove Series**, Nos. 11-818 and 11-840, ultra-durable and light duty work gloves incorporate Fortix Abrasion Resistance Technology that applies a thin, resilient and breathable nitrile foam coating to knitted gloves. A seamless, 15-gauge nylon-spandex liner (11-840) and 18-gauge nylon liner (11-818), combined with ultra-thin, palm coating, provides protection equal to heavier gloves, yet the comfort of a barehand-like feel to users. These gloves are equipped with ZONZ, an innovative knitting technology that uses varying stitch designs around stress areas to tailor glove fit and enhance hand movement for higher dexterity and reduced fatigue.

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### Solve rough starting problems

**CRC Industries, Inc. GDI IVD Intake Valve Cleaner** is designed to remove harmful deposits from all types of gasoline-powered engines. The GDI IVD Intake Valve Cleaner achieves this by delivering COzol directly to the valves at 150 times the concentration of any other premium fuel system additive on the market, according to the company. Technicians can simply spray past the MAF sensor through the air intake every 10,000 miles to increase power and torque, stabilize rough idles, solve rough starting problems, reduce emissions and improve fuel economy.

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## PALM IMPACT WRENCH

### SP-1850 [3/8"] SP-1850S [1/4"]



*Baby Butterfly*

**Only 1lb**

**Small, Lightweight and Very Powerful**

**ACTUAL SIZE**

**72ft-lbs.**

**Double Hammer Clutch**

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## Retractable bit cartridge

**General Tools Multi-Pro Screwdrivers** offer a retractable bit cartridge in the handle. The **15-in-1 Multi-Pro Standard Driver**, No. 8140, includes seven double-ended bits, providing the 14 most popular standard bits. The **15-in-1 Multi-Pro Tamperproof Driver**, No. 8141, contains seven double-ended tamperproof bits, including the most popular security bits. The **14-in-1 Multi-Pro HVAC Screwdriver**, No. 8142, features six double-ended bits and one single-ended bit to fit most HVAC applications. All screwdrivers include the Palm Saver Cap, the EZ-Guide Collar, an alloy steel shaft and an engineered nylon/ABS handle. The shaft opening also serves as a 1/4" hex driver.

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## HEPA-quality, 110-gal vacuum

**Exair Heavy Duty HEPA Vac** is a 110-gal, HEPA-quality, industrial vacuum cleaner. The prefilter stops larger particles, while the HEPA filter removes the smaller matter. All filters are tested for minimum 99.97 percent filtration at the 0.3 micron level to meet HEPA standards in strict accordance to IEST-RP-CC-007. The vacuum produces only 82 dBA of sound. The system comes complete with the Heavy Duty Dry Vac, lever lock drum lid, shutoff valve, pre-filter, HEPA filter, 10' (3m) static-resistant hose, hose hanger, 1/2 NPT quick connects coupling, 20' (6m) compressed air hose, pressure gauge, heavy duty aluminum tools, tool holder, drum dolly and 110-gal drum.

**Circle 219 on card, or enter at "e-inquiry" on VehicleServicePros.com**

## Remove oil filters

**Beta Tools' Adjustable Oil Filter Wrench**, No. 1491, comes as a metal band-style tool. This allows the technician access in tight locations as he or she slips the band over the filter, tightens the nut and spins the filter off. This tool works on all different sized filters.

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# Innovation AWARDS nominees

## Part 1



### **GearWrench/Apex Tool Group**

120XP Flex Head Ratchet

**CATEGORY:** Hand Tools

For product information, visit:  
[VehicleServicePros.com/10893051](http://VehicleServicePros.com/10893051)

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**W**e're very excited to present this year's *PTEN* Innovation Awards nominees! We had a record year, with 92 submitted products (the most ever!). In this first round of nominees, we feature a number of innovative tools presented to the market over the last year. Keep an eye out for the second round of products in the June issue. For details on each nominated product, visit:

[VehicleServicePros.com/2014IANominees](http://VehicleServicePros.com/2014IANominees)



### **OTC, Bosch Automotive Service Solutions**

Brake pad gauge, No. 6596

**CATEGORY:** Brake Service

For product information, visit:  
[VehicleServicePros.com/10819689](http://VehicleServicePros.com/10819689)

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### **Lock Technology, Inc.**

LT276 Self Locking Door Wedge

**CATEGORY:** Specialty Tools

For product information, visit:  
[VehicleServicePros.com/11384241](http://VehicleServicePros.com/11384241)

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### **ATD Tools Inc.**

SABER 3W Strip Light plus UV Top Light, No. 80305

**CATEGORY:** Lighting

For product information, visit:  
[VehicleServicePros.com/11306044](http://VehicleServicePros.com/11306044)

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### **Snap-on Diagnostics**

MODIS Ultra multi-function scan tool

**CATEGORY:** Scan Tools

For product information, visit:  
[VehicleServicePros.com/11176534](http://VehicleServicePros.com/11176534)

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### **Matco Tools**

1/2" Impact Wrench, No. MT2769

**CATEGORY:** Air Tools

For product information, visit:  
[VehicleServicePros.com/11282792](http://VehicleServicePros.com/11282792)

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## INNOVATION AWARDS NOMINEES Part 1



### Robinair, Bosch Automotive Service Solutions

AC1234-6 RRR A/C Service Machine

**CATEGORY:** Air Conditioning

For product information, visit:  
[VehicleServicePros.com/11374630](http://VehicleServicePros.com/11374630)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Hunter Engineering Co.

Hunter Revolution tire changer

**CATEGORY:** Tire, Wheel Service

For product information, visit:  
[VehicleServicePros.com/11239181](http://VehicleServicePros.com/11239181)

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### Mac Tools

Mac-Grip Screwdrivers line

**CATEGORY:** Hand Tools

For product information, visit:  
[VehicleServicePros.com/11149774](http://VehicleServicePros.com/11149774)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Automotive Test Solutions Inc.

Bullseye Leak Detector

**CATEGORY:** Leak Detection

For product information, visit:  
[VehicleServicePros.com/11176338](http://VehicleServicePros.com/11176338)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Snap-on Tools

BK6500 New Generation

True Digital Video Borescope

**CATEGORY:** Inspection Tools, Lab Scopes

For product information, visit:  
[VehicleServicePros.com/10888989](http://VehicleServicePros.com/10888989)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Master Appliance

Master ProHeat STC heat gun, No. PH-1600

**CATEGORY:** Body Shop

For product information, visit:  
[VehicleServicePros.com/11234534](http://VehicleServicePros.com/11234534)

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### Associated Equipment

Digital Battery Tester, No. 12-1015

**CATEGORY:** Electrical Systems

For product information, visit:  
[VehicleServicePros.com/11384387](http://VehicleServicePros.com/11384387)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Schley Products Inc.

Extender Arm for 11000A and

11000 hydraulic presses, No. 11015

**CATEGORY:** Shop Equipment

For product information, visit:  
[VehicleServicePros.com/11145642](http://VehicleServicePros.com/11145642)

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on [VehicleServicePros.com](http://VehicleServicePros.com)



### Redline Detection LLC

Easy Intake

**CATEGORY:** Leak Detection

For product information, visit:  
[VehicleServicePros.com/11376405](http://VehicleServicePros.com/11376405)

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on [VehicleServicePros.com](http://VehicleServicePros.com)

# INNOVATION AWARDS NOMINEES Part 1



## OTC, Bosch Automotive Service Solutions

Ford Spark Plug Removal Kit, No. 6918

**CATEGORY:** Engine Service and Repair

For product information, visit:  
[VehicleServicePros.com/11374433](http://VehicleServicePros.com/11374433)

Circle 75 on card, or enter at "e-inquiry" on [VehicleServicePros.com](http://VehicleServicePros.com)



## KNIPEX Tools LP

Rennsteig Double-Edged Bolt and Screw Extractors

**CATEGORY:** Hand Tools

For product information, visit:  
[VehicleServicePros.com/11355316](http://VehicleServicePros.com/11355316)

Circle 76 on card, or enter at "e-inquiry" on [VehicleServicePros.com](http://VehicleServicePros.com)



## AirSept Inc.

Smart Splice Ultimate Line Repair Kit

**CATEGORY:** Air Conditioning

For product information, visit:  
[VehicleServicePros.com/10915490](http://VehicleServicePros.com/10915490)

Circle 77 on card, or enter at "e-inquiry" on [VehicleServicePros.com](http://VehicleServicePros.com)



## Snap-on Tools

Semi-Deep Flip Sockets, No. S6810

**CATEGORY:** Hand Tools

For product information, visit:  
[VehicleServicePros.com/10931835](http://VehicleServicePros.com/10931835)

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## Electronic Specialties, Inc.

688 True RMS Low Current Clamp Meter

**CATEGORY:** Electrical Systems

For product information, visit:  
[VehicleServicePros.com/11303607](http://VehicleServicePros.com/11303607)

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## Launch Tech USA

GLO app

**CATEGORY:** Scan Tools

For product information, visit:  
[VehicleServicePros.com/11384626](http://VehicleServicePros.com/11384626)

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## Chief Automotive Technologies

LaserLock Live Mapping System

**CATEGORY:** Body Shop

For product information, visit:  
[VehicleServicePros.com/11369893](http://VehicleServicePros.com/11369893)

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## ToolLodge

ToolLodge Tool Drawer Organizer

**CATEGORY:** Tool Storage

For product information, visit:  
[VehicleServicePros.com/11346538](http://VehicleServicePros.com/11346538)

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## Snap-on Tools

14.4V MicroLithium

Drill No. CDR761

**CATEGORY:** Power Tools

For product information, visit:  
[VehicleServicePros.com/11355583](http://VehicleServicePros.com/11355583)

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## INNOVATION AWARDS NOMINEES Part 1



### Extreme Tools, Inc.

41" Extreme Deluxe Portable Workstation and Roller Cabinet Combination, No. PWSRC4129TX

**CATEGORY: Tool Storage**

For product information, visit:  
[VehicleServicePros.com/11372733](http://VehicleServicePros.com/11372733)

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### Snap-on Equipment

John Bean V3400 Wheel Alignment System

**CATEGORY: Tire, Wheel Service**

For product information, visit:  
[VehicleServicePros.com/11355595](http://VehicleServicePros.com/11355595)

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### Lang Tools

Universal Seal Puller Kit, No. 850

**CATEGORY: Specialty Tools**

For product information, visit:  
[VehicleServicePros.com/11384291](http://VehicleServicePros.com/11384291)

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### Snap-on Tools

Emergency Parking Brake Tool, No. BT20

**CATEGORY: Brake Service**

For product information, visit:  
[VehicleServicePros.com/11355457](http://VehicleServicePros.com/11355457)

**Circle 133 on card, or enter at "e-inquiry" on VehicleServicePros.com**



### Vacutec

WV622N Nanotube Fiber N2 Smoke Machine

**CATEGORY: Leak Detection**

For product information, visit:  
[VehicleServicePros.com/11376672](http://VehicleServicePros.com/11376672)

**Circle 134 on card, or enter at "e-inquiry" on VehicleServicePros.com**

### Bar's Products

Bar's Leaks Cooling System Repair, No. 1150

**CATEGORY: Chemicals**

For product information, visit:  
[VehicleServicePros.com/10854106](http://VehicleServicePros.com/10854106)

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### Automotive Lift Institute (ALI)

ALI Lift Inspector Certification Program

**CATEGORY: Education and Training**

For product information, visit:  
[VehicleServicePros.com/11356914](http://VehicleServicePros.com/11356914)

**Circle 136 on card, or enter at "e-inquiry" on VehicleServicePros.com**



### OTC, Bosch Automotive Service Solutions

Tire Service Hammer

**CATEGORY: Tire, Wheel Service**

For product information, visit:  
[VehicleServicePros.com/11374920](http://VehicleServicePros.com/11374920)

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### Lumen LED

The DropLED Pro

**CATEGORY: Lighting**

For product information, visit:  
[VehicleServicePros.com/10894365](http://VehicleServicePros.com/10894365)

**Circle 138 on card, or enter at "e-inquiry" on VehicleServicePros.com**

## INNOVATION AWARDS NOMINEES Part 1



### OTC, Bosch Automotive Service Solutions

Stainless Tip Blow Gun,  
No. 2423

**CATEGORY:** Air Tools

For product information,  
visit: [VehicleServicePros.com/11374899](http://VehicleServicePros.com/11374899)

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"e-inquiry" on VehicleServicePros.com



### Schley Products Inc.

Duramax Water In Fuel Sensor Wrench, No. 13100

**CATEGORY:** Engine Service and Repair

For product information, visit:  
[VehicleServicePros.com/11357180](http://VehicleServicePros.com/11357180)

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"e-inquiry" on VehicleServicePros.com



### Redline Detection LLC

HD PowerSmoke

**CATEGORY:** Heavy Duty

For product information,  
visit: [VehicleServicePros.com/11376595](http://VehicleServicePros.com/11376595)

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"e-inquiry" on VehicleServicePros.com



### Mac Tools

ET6500 Mentor Touch scan tool

**CATEGORY:** Scan Tools

For product information, visit:  
[VehicleServicePros.com/11356857](http://VehicleServicePros.com/11356857)

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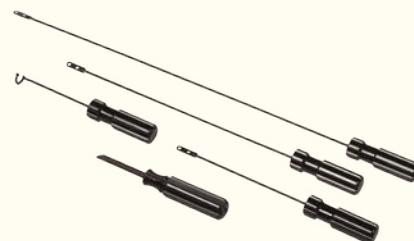
### Brown Line Metalworks, LLC

Digital Angle Gauge

**CATEGORY:** Tool Accessories

For product information, visit:  
[VehicleServicePros.com/10946817](http://VehicleServicePros.com/10946817)

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"e-inquiry" on VehicleServicePros.com



### OTC, Bosch Automotive Service Solutions

Wire Loom Threading Kit, No. 4462

**CATEGORY:** Electrical Systems

For product information,  
visit: [VehicleServicePros.com/11374703](http://VehicleServicePros.com/11374703)

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"e-inquiry" on VehicleServicePros.com

### Actron, Bosch Automotive Service Solutions

U-Scan

**CATEGORY:** Scan Tools

For product information, visit:  
[VehicleServicePros.com/11374178](http://VehicleServicePros.com/11374178)

Circle 145 on card, or enter at  
"e-inquiry" on VehicleServicePros.com



### New Pig Corp.

PIG Rapid Response Drainblocker Drain Cover

**CATEGORY:** Shop Equipment

For product information, visit:  
[VehicleServicePros.com/11357278](http://VehicleServicePros.com/11357278)

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"e-inquiry" on VehicleServicePros.com



### Snap-on Tools

14.4V MicroLithium Cordless Ratchets,  
Nos. CTR725 and CTR761

**CATEGORY:** Body Shop

For product information, visit:  
[VehicleServicePros.com/11355441](http://VehicleServicePros.com/11355441)

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"e-inquiry" on VehicleServicePros.com



## INNOVATION AWARDS NOMINEES Part 1



### Elektron Inc.

MultiTool Aluminum Dent Repair Station

**CATEGORY:** Welding

For product information, visit:  
[VehicleServicePros.com/11369614](http://VehicleServicePros.com/11369614)

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"e-inquiry" on [VehicleServicePros.com](http://VehicleServicePros.com)



### Hennessy Industries Inc.

Coats X-Series Tire Changers

**CATEGORY:** Tire, Wheel Service

For product information, visit:  
[VehicleServicePros.com/11223134](http://VehicleServicePros.com/11223134)

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"e-inquiry" on [VehicleServicePros.com](http://VehicleServicePros.com)



### Snap-on Tools

KRSC33APB0 Heavy Duty Diagnostic Cart

**CATEGORY:** Heavy Duty

For product information, visit:  
[VehicleServicePros.com/11355524](http://VehicleServicePros.com/11355524)

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# Tool Briefing

## Air suspension issue: a common sense approach

By Jason Smith, Contributing Editor

**W**hen it comes to vehicle diagnostics and repairs, it's almost an unwritten law that suspension work is "gravity work." In other words, all muscle with minimal technical thinking involved. However, once you get into electronic suspension, front-end technicians tend to not want to get too involved, especially tire and suspension specialty shops. They often feel it is a task for an electrical or drivability technician.

With the right tools and knowledge of how to use them, electronic suspension can be your bread and butter as well. Earlier Ford air suspensions had multiple issues and failures. In recent model years, Ford has been putting out a great product. But anyone who says their earlier models were trouble-free would be blowing more air than the suspension's compressor. The tools used for fixing a 2000 Ford Expedition with a suspension failure were the Autel Maxidas DS708, the Power Probe Hook, a multimeter, a laptop computer and Mitchell 1 Pro Demand service information.

First and foremost, when working with air suspension, safety is key. Make sure you are wearing eye protection. It



### TOOLS USED:

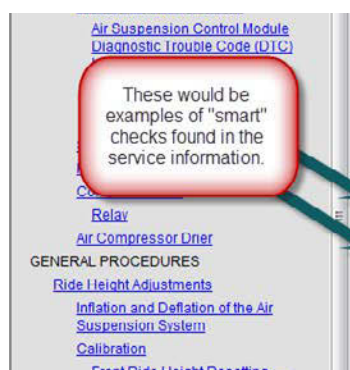
- Scan tool
- Power Probe Hook
- Multimeter
- Laptop computer
- Repair information service

is equally important that you make sure those around you are aware of the type of suspension system you are fixing. Not only can this keep anyone from getting hurt, there is a side benefit. Once they are aware of the job, your team may be able to warn you if they catch something out of place in

the shop or on the car that you don't see. For best safety, always be aware of what you are doing and what the technician next to you is doing as well.

### DO THE 'SMART' CHECKS FIRST

Next, try to make it a point to do what I call the "smart" checks. These include the simplest checks that people often overlook; those that could have saved large amounts of time had you done them first; those checks that, when they are revealed as the problem after an hour of diagnostic time, get you thinking to yourself, "Wow, I am a dummy! How do I justify spending this long on a customer's car when all it was..." Like I said, the "smart" checks.



A solid state relay is used in the air suspension system for compressor control. The relay incorporates a custom power metal oxide semiconductor field effect transistor (MOSFET) and ceramic hybrid circuitry. The relay switches high current loads in response to low power signals and is controlled by the logic of the air suspension control module.

The compressor solid state relay is energized by the air suspension control module to have high current flow from the battery to the compressor motor

#### Control Module

**NOTE:** The 4WAS control module is also used for the RAS system. The internal processor recognizes external circuitry to determine if it is installed in a 4WAS or a RAS system.

**NOTE:** The air suspension control module is calibrated with information from the air suspension height sensors. A new or swapped air suspension control module requires the ride height adjustment calibration process to be performed.

A microcontroller-based electronic air suspension control module controls the air compressor motor (through a solid state relay) and all system solenoids. The air suspension control module also provides power to front and rear height sensors. The air suspension control module controls vehicle height adjustments by monitoring the two height sensors, vehicle speed, a steering sensor, acceleration input, the door ajar signal,

▲ The Identifix repair information gives examples of "smart checks" for this vehicle.



On this model, the first “smart” check is the on/off switch. Is the air suspension even turned on? Next of the “smart” checks: Is the door ajar? Many “smart” checks I find, especially if I am not familiar with a model vehicle, are in the service information. They are almost always in bold print at the heading and outlined in yellow, so you can’t miss them.

The service information for this one says when a door is ajar, the suspension

will go inoperative. Last and always on the “smart” checks are the technical service bulletins (TSBs). Are there any TSBs on the vehicle? In this vehicle’s case, no there are not. Still, this opens up a good opportunity for preventive maintenance.

If you are already at the computer looking up TSBs, you may notice TSBs regarding customer satisfaction or recent updates in software. Either way, jot them down as notes. It’s always good to be proactive. Mitchell 1 recently released Pro Demand. It is a more convenient electronic service information site than was the company’s OnDemand5, and it really has the technician in mind in regards to browsing ease, and makes getting your service information and TSBs more time-efficient.

## SCAN THE MODULES

The next step in a diagnosis like this one is your scan tool. In the case of the Ford Expedition, I like using the Autel MaxiDAS DS708, although any scan tool with factory level software should suffice.



▲ The Autel MaxiDAS DS708 identifies the vehicle by deciphering the VIN pulled from the Mode \$09 data. For more information on this tool, go to: [VehicleServicePros.com/10176527](http://VehicleServicePros.com/10176527)

▼ The CT8027 digital multimeter from General Technologies can perform a voltage drop across the relay control circuit. For information on this tool, visit: [VehicleServicePros.com/10264420](http://VehicleServicePros.com/10264420)



The MaxiDAS does a good job of identifying the vehicle by deciphering the VIN pulled from the Mode \$09 data. It not only saves time by not having to punch in all the vehicle data, but it also saves you from the chance of data entry errors. I like to start out

(Continued Page 36)

**VEHICLE APPLICATION:**  
2000 Ford Expedition

**CUSTOMER CONCERN:**  
Air suspension failure



▲ The Fluke 88 V Multimeter can perform a voltage drop across the relay control circuit. For information on this tool, visit: [VehicleServicePros.com/10100019](http://VehicleServicePros.com/10100019)

with an auto scan of all modules. Not only will this show you which modules you are able to communicate with and are on the bus, but it will also show you codes from all modules and help identify if there are any system malfunctions or communication codes that may affect the suspension from activating.

Once again, you want to keep an eye out for “door ajar switch” codes, as this would prevent activation of the system. If all passes well, it’s time to run an “On Demand Self Test.” In this case, the self test returned a code C1830 Air Compressor Relay Circuit Fault.

At this point in a repair, I like to use the “Remote Desk” function of the MaxiDAS, as I am going to need to use the scanner while I am physically involved with the car. The “Remote Desk” lets you access the scanner wirelessly from your computer. In this case, I got my service cart and laid out my Power Probe Hook, my Snap-on EEDM604C Multimeter and my laptop.

In the first step, if you are testing electrical circuits, you should look at the system’s wiring diagram and familiarize yourself with how the circuit operates. Make sure there is power at the light blue and pink wire.



## STEPS TESTS/PROCEDURES

- 1 Safety checks
- 2 Basic checks (TSBs, switch, doors ajar)
- 3 Scan tool tests
- 4 Physical tests

### PERFORM A VOLTAGE DROP

Next, perform a voltage drop across the relay control circuit. To do this, you need to use your multimeter. The Snap-on EEDM604C is a great tool. Not only is it a full-functioning multimeter with auto-ranging, it also has capabilities of high-voltage testing for your hybrid electric vehicles as well as plug-in electric vehicles. It comes with high-voltage test leads as well for maximum protection, making it a great all-around multimeter.

Touch the positive side of the control circuit (dark blue/yellow wire) with your positive lead, and the negative side (light green/red wire) with your negative lead.



► The Mitchell 1 ProDemand makes it easy to get the TSBs. For information on this product, go to: [VehicleServicePros.com/10451541](http://VehicleServicePros.com/10451541)



▲ The Genisys Touch from Bosch OTC displays the appropriate vehicle information when the user has read the code and taps on the DTC to show the AutoDetect results. For information on this tool, go to: [VehicleServicePros.com/10820435](http://VehicleServicePros.com/10820435)



## Tool Briefing



▼ The AESWave uActivate Ultimate Circuit Breakout Box can perform a voltage drop across the relay control circuit. For information on this tool, visit: [VehicleServicePros.com/10920530](http://VehicleServicePros.com/10920530)

Using your “Remote Desk,” choose the “Air Compressor On” test and command it on. You should have a voltage drop near battery voltage.

### TEST THE RELAY

The third step is testing the removed relay. For this, I like to use the Power Probe Hook and my Snap-on EEDM604C Multimeter. First, I connect the multimeter to the switch side of the relay and choose Ohms testing. There should be infinite Ohms at this point. Next, connect the green Power Probe lead to one terminal of the control circuit part of the relay and touch the probe tip to the other terminal for the control side and apply power. You may hear an audible click, and you should see the Ohms resistance drop down to near zero. In my case, I found the relay to be faulty.

Once you are this far into it, though, you want to ask yourself, did the relay just fail on its own? Or did something cause it to fail? Having the relay out, you are already at the main hub for the whole system; it can really help you to go the extra mile to test it.

At this point, The Hook is a miracle worker. Here's how: Apply power to the compressor side of the circuit. The compressor should start working. The thing you want to watch, though, is the screen of The Hook. It calculates the Ohms resistance while applying power to the circuit.

This is great for anything you may suspect of going bad once it heats up

from current. If the circuit is faulty, you can watch the resistance rise as the circuit is being powered up by The Hook. Once you have confidence in the fact that the rest of the system is okay, replace the relay and run an “On Demand Self Test” again to verify your repair.

### TEST DRIVE THE CAR

Now it's time to go test drive the vehicle and bring those TSBs noted earlier to your customer. This is your opportunity to impress. By presenting the customer a fixed vehicle, but also mentioning other issues they probably noticed but didn't mention, you establish yourself as an expert. Even more, letting them know that you already know the fix for the other issues not only builds customer satisfaction, but also builds trust.

The techniques used for the Ford air suspension can also carry over to other air suspensions of different model Fords, different manufacturers and different model years. With these tools and techniques, the repair of electronic suspension will become routine and a regular component of your auto service. **PTEN**



#### About the Author:

Jason Smith is an ASE certified technician for brake and lamp adjustment and smog. He operates Consultants for Auto Repair, an automotive education firm based in San Clemente, CA.

## MOHAWK...



**System I**

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## Tools for the local automotive aftermarket authority

**SHOP:** Mattingly's Auto Service Center

**LOCATION:** Bradenton, FL

**OWNER:** Chuck Mattingly

Chuck Mattingly opened Mattingly's Auto Service Center in 2003 in Bradenton, FL after managing and owning gas stations for 16 years. His reputation for being well-informed about automotive repair has earned impressive coverage in the local media. He was recently interviewed by a local newspaper on the Right to Repair law. Here are his top 10 tools.

By Elliot Maras, Editor

1

**ALLDATA**  
REPAIR MANAGE MARKET COLLISION

### ALLDATA Pro information system

"It (ALLDATA repair information) has all the information on what you need to repair any car that comes in the shop. It's a very important piece of equipment," Mattingly says. The shop has instant access to a single source of accurate, up-to-date OE-direct diagnosis, repair and maintenance information. Available online 24/7 and automatically updated, the database covers more than 33,000 vehicles. For information, go to: [VehicleServicePros.com/11319826](http://VehicleServicePros.com/11319826)

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2



### Bosch OTC Genisys Touch

"I can get into the (Genisys Touch) and get the information I need. It has all the information; not just for domestic vehicles. It has the Asian and European vehicles, too. And it's very user-friendly." The Genisys Touch is a PC-based tablet diagnostic system with an included J2534 reflash device. The system alerts the technician if there are on-tool or Internet repair solutions available for the year, make and model. For information, go to: [VehicleServicePros.com/10820435](http://VehicleServicePros.com/10820435)

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### Motorvac 1000 Motor Carbon Cleaner

"It (the carbon cleaner) solves a lot of drivability issues by cleaning the fuel injectors." MotorVac's CarbonClean 1000 Fuel System Cleaning machine, combined with its MV-5 and MV-6 fuel system cleaner and engine decarbonizer fluid, is an all-in-one fuel system cleaning service. For more information, go to: [VehicleServicePros.com/10655856](http://VehicleServicePros.com/10655856)

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4



### Power Probe III

"I love it for the ease of use. It powers-up the circuits when I need it to." The unit features an easy-to-read, backlit voltmeter for reading voltage at the tip. It is 42V-ready and has rugged, gold-plated connectors for more secure connections. A standard 4mm cap ensures full compatibility with the company's Gold Series leads, as well as other 4mm leads, plugs and jacks. For information, go to: [VehicleServicePros.com/10167639](http://VehicleServicePros.com/10167639)

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5



### Snap-on John Bean Prism Pro 42 alignment machine

"I do a lot of tires and alignments. It's a great little machine." The system leverages a wireless communication system with Bluetooth technology, cordless pods powered by Li-ion batteries, and components made from lightweight magnesium. For information, go to: [VehicleServicePros.com/11374664](http://VehicleServicePros.com/11374664)

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▲ Chuck Mattingly has been using some of his top 10 tools ever since he opened the business in 2003



## 6 Streamlight Stinger LED flashlight

"It's rechargeable and very bright, very light and easy to lift. It's very easy to use." The Stinger LED delivers up to 80 lumens of bright white light. The three-watt, super high flux LED works with Streamlight's proprietary, deep-dish parabolic reflector to provide an even, highly-usable light spread, and the microprocessor-controlled LED offers three variable light modes. For information, go to:

[VehicleServicePros.com/10128781](http://VehicleServicePros.com/10128781)

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## 7 Rotary Lift four-post lift, No. SM123

"The quality and ease-of-use is great. The finish is also very nice. And it has rolling jacks. It's a well-made piece of equipment." The SM123 is a predecessor to the current SM14 from Rotary Lift and can handle cars, vans and trucks. Its hydraulic cylinder is located under one of the runways, so there are no overhead obstructions that could damage doors and mirrors. The SM14 is ALI-certified. For information on the model-equivalent SM14, go to:

[VehicleServicePros.com/11362733](http://VehicleServicePros.com/11362733)

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## 8 Rotary Lift two-post lift, No. SP0A1

"I like it for its ease-of-use and its quality. We use it to lift cars to do brake jobs where we can get the wheel off of a car." This lift's design places the vehicle's center of gravity in an optimal location and allows technicians to fully open doors for interior access. For more information on this two-post lift, go to:

[VehicleServicePros.com/11362736](http://VehicleServicePros.com/11362736)

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## 9 Makita cordless impact, No. BTD 142

"I use it for taking out bolts and quick little jobs. It's quiet and easy to use. I use it for installing radiators and taking off engine cowlings." The impact's four-pole motor delivers 1,280 in/ lbs of max torque. The variable speed design covers a wide range of fastening applications. The unit is 5' 3/4" long and weighs only 2.9 lbs for reduced operator fatigue. For information, go to:

[VehicleServicePros.com/11361525](http://VehicleServicePros.com/11361525)

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## 10 E-Z Red spline ratcheting wrench

"I like it because it is extra long. It has a flexible head. You can go forward or in reverse with it." The wrench is part of a 5-pc extra long flex head spline ratcheting wrench set, No. NR5M, from E-Z Red. The ratcheting wrench has extra-long spine with 180-degree flex heads. For information, go to:

[VehicleServicePros.com/11362716](http://VehicleServicePros.com/11362716)

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# Tool Q & A



▲ OTC's TPR TPMS Reset Tool works on all known TPMS sensors through 2010. For information on this tool, go to: [VehicleServicePros.com/10983323](http://VehicleServicePros.com/10983323)

## Q ■ Why is TPMS service advantageous in California?

**A:** In 2010, the California Air Resources Board's Tire Pressure Regulation came into effect, declaring that all automotive service providers must set a vehicle's tire pressure every time they touch a car, then record their findings on the invoice. The tire pressure gauge must also be accurate within 2 psi above or below actual pressure.

This gives techs free rein to inspect tires and TPMS systems! Either way, you are going to have to approach tire pressure with the customer, so why not use it to your advantage? This is where customers will see that not only did you follow the law and record their set tire pressure, but you were also proactive enough to go above and beyond to let them know how to take care of their TPMS systems, even if everything checks out fine.

So as much as people try to avoid TPMS, it's clearly here to stay. It's as integral a part of our diagnostics as anything else. Therefore, with proper education and tooling, TPMS can be embraced instead of questioned and shunned.

► The ATEQ VT55 OBD TPMS tool can program all OE and several aftermarket TPMS sensors. See page 10 for the newly available VT56. For more information on this tool, go to: [VehicleServicePros.com/10630381](http://VehicleServicePros.com/10630381)



# Ready to tackle TPMS service?

By Jason Smith, Contributing Editor

**T**here are many topics coming into play in the automotive industry for technicians to be focusing on nowadays. Topics like telematics, greenhouse gas reduction technologies and OBD hacking. Yet even with all of these game changers in front of us, a major buzzword still seems to be Tire Pressure Monitoring Systems (TPMS).

TPMS has been mandated by the Transportation Recall Enhancement,

Accountability and Documentation (TREAD) Act since 2007 and has been in existence since the 1980s.

So how does TPMS work? Sensors inside the tires monitor the pressure and tell an electronic control module (ECM). If a tire's pressure is low, a warning light comes on. Seems simple, right? Yet an idea so simple is a lot more intricate than one would think. The following questions and answers clarify what technicians should know about TPMS.

## Q ■ What are the biggest issues a technician may experience with TPMS systems?

**A:** There are three TPMS issues that a technician will face if he works with tires: relearns, sensor failures and sensor programming.

1) Relearns: You come across these when you do a tire rotation. Many manufacturers have each tire sensor position "learned" so when a sensor fails, the ECM knows which tire to alert you of. Every time you rotate the tires, you need to do the manufacturer-specific relearn procedures in order for the vehicle to learn the new position of the tires. Many times, technicians who skip this procedure end up having it catch up to them in the long-term. For example, let's say the technician does the tire rotation. There is no TPMS light on, so he sends the vehicle on its way. Later down the road, on a busy day (because every technician knows these things only happen on your busiest day),

the customer comes in stating their right front tire is low and would like the technician to put air in it. Guess what that technician gets to do? Check every tire, wondering which one is low. If the customer is observant, he may even ask, "why are you adding air to the right rear tire when it says the right front is low?" Now the technician has to explain that he got lazy on that customer's prized possession the last time they were in. So remember this every time you do a tire rotation. The vehicle may need a TPMS relearn. But remember, it's okay to charge extra for it.

2) Failures: TPMS failures are when you have an issue with the TPMS system. This can be a mechanical failure or an electrical failure. Many failures lead to sensor replacement. Replacing sensors leads to the next issue, sensor programming.

3) Sensor Programming: Just like getting a new ECM in a car requires programming, so do TPMS sensors.



According to TPMS experts, there are two main types of aftermarket replacement sensors for TPMS. One type comes blank and needs the vehicle protocol programmed onto it, while another type comes with all manufacturer protocols built into it, and your reset tool picks which protocol you want it to use.



## Tool Q & A

◀ The Bartec USA TPMS Tool Kit, No. MT104, protects the TPMS sensor by changing the wear items. For information on this product, go to: [VehicleServicePros.com/11406639](http://VehicleServicePros.com/11406639)

### Q: What would I need to be service-ready for TPMS?

**A:** To be fully TPMS capable, you need to start at your parts supplier. They need to have sensors readily available for delivery. You also need to be aware of the types of sensors they have. Are they blank and in need of a protocol programmed into each of them? Or do they have every protocol already programmed and need selecting? The answer to this is critical for the next step.

Remember the old adage, "You gotta have the right tools to do the job." Something we technicians have had

beaten into our brains since day one.

You need to have the tools to diagnose, repair and program the TPMS systems. Manufacturers for TPMS equipment include ATEQ Corp., Bartec USA and Bosch OTC. From the ATEQ Corp. VT55 to Bartec's TPMS Mechanical Tool Kit to Bosch OTC's TPMS reset tool, these companies bring a variety of user-friendly, yet technologically advanced, tools to the table, whether you are diagnosing faults, mechanically repairing sensor parts or programming the sensors. **PTEN**



#### About the Author:

Jason Smith is an ASE certified technician for brake and lamp adjustment and smog. He operates Consultants for Auto Repair, an automotive education firm based in San Clemente, CA.



Have questions? Need answers?  
Email [elliott@pten.com](mailto:elliott@pten.com) to have your questions answered in this column.

If all you wanted to do, is turn this (!) off  
...then any "ole code reader" would do!

But if real diagnostics and fixing the TPMS is your goal...



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# Product Spotlight

ELECTRICAL SYSTEMS, BATTERY SERVICE AND HYBRIDS

**E**lectrical system equipment has become more commonplace with the steady adoption of hybrid and electric vehicles on the road. But even traditional vehicles may, and often do, require some form of battery or electrical diagnosis when they're in a repair shop. Check out the next few pages for product ideas on items to buy for your shop.



## Hybrid and electric vehicle test kit

AIE Hybrid and Electric Vehicle Test Kit has been developed to be the first complete testing solution as outlined by the electric and hybrid industry, according to the company. The digital multimeter performs precision insulation, megaohm and milliohm measurements using a single instrument in concert with the use of specialty test leads included in the kit. The compact DMM can also perform common temperature, frequency and AC/DC voltage measurements. The complete kit includes an orange carrying case for hybrid environment identification. The instrument itself also comes with an orange protective sleeve.

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## Quickly ID short, open circuits

Power Probe's Master Combo Kit, No. PPKIT03, allows technicians to follow and locate short and open circuits without removing molding panels and carpet just to expose wires. Users can activate electrical components by pressing the power switch instead of running hazardous jumper leads all over the vehicle. The technician can see voltage displayed instantly by contacting the probe tip to a circuit, and instantly determine if a contact is a good or bad ground. It also verifies a short circuit or an open circuit. The 4mm banana jacks and plugs make connecting extra leads and adapters quick and easy. The kit includes a complete PPLS01 Lead Set, ECT2000 Kit and a Complete Power Probe III Kit.

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## LED display indicates charge status

Cornwell Turbo Charger Plus, No. ASDESS6007BCW, is a 45-amp/130-amp boost wheel charger and power supply with a dead battery override control, for all 12V standard automotive, deep-cycle, AGM and gel cell batteries. This charger features a program for deep discharge recovery for flooded batteries. It has electrical stability system (ESS) technology that turns the tool into a stable power supply for extended service procedures or reflashes, and patented diagnostics that indicate weak or defective batteries. The three-LED display indicates charge status on an analog meter. It is safe to use in any weather condition and it is made in the U.S.A.

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## With DC voltage digital display

With the Snap-on Digital Display Circuit Tester, No.

EECT400, techs can detect voltage, power, ground and circuit integrity with increased accuracy and ease. The EECT400 incorporates the DC voltage digital display of a multimeter instead of a dimming/brightening indicator light only. This feature provides a "no guess" voltage value of the circuit, which is especially useful in more demanding environments such as testing circuits in sunlight. The backlit LED also indicates red for "power" or green for "ground." The digital display circuit tester provides surge-protected, +0.3V accuracy from 3V to 19.99V, plus the computer-safe <10mA circuit draw allows for confident testing. The one-hand operation of the EECT400 allows technicians to have the other hand free to handle wires, replace a fuse or operate a switch.

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### Diagnose electrical problems

**Lang Tools CAT III DMM, No. 13809**, comes with 19 functions, seven ranges, manual ranging and a protective rubber boot. The tool can check up to a 20-megaohm resistance and has a continuity buzzer. The CAT III-certified, 600V, ETL-approved meter can also complete a diode test, battery test and data hold. With this tool, technicians can diagnose many different electrical problems.

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### Easy-access charging port

**CTEK MUS 3300 Battery Charger System** allows owners to outfit 12V equipment with an easy-access charging port that makes connecting to the charger fast and safe. From cars to lawn mowers to snowmobiles, the MUS 3300 can monitor and maintain all common battery types, including AGM batteries. The MUS 3300 has built-in, short-circuit protection and is designed to be connected to the battery while still in the vehicle without fear of damaging sensitive vehicle electronics. CTEK offers optional accessories, including the comfort indicator and battery status indicator.

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### 48" test leads

**Electronic Specialties Test Leads with Screw-off Alligator Clips, No. 629**, are designed to work with most DMMs currently in use. Connection to the multimeter is made via industry standard, right-angle, shielded banana plugs. The alligator clips screw on and off so that when desired, the test lead can be clamped permanently to the test point. This frees hands for other tasks, like wiggle testing and other diagnostic troubleshooting. The test leads are 48" and CATIII 1,000V safety rated. The maximum test current is 10 amps.

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### Back probe harness connectors

**S & G Tool Aid Corp. 20-Piece Back Probe Kit, No. 23500**, is used to back probe harness connectors, fuel injectors and automotive sensors. The stainless steel probes come in straight, 45-degree and 90-degree profiles in 0.027" and 0.040" diameters. The probes are color-coded for easy identification and are compatible with the standard 4mm plug. Also included with the kit are 12" extension leads, color-coded the same as the back probes for use in recessed areas. All probes easily insert into automotive connectors. The kit is supplied in a durable, plastic storage case.

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### MDX-P300

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##### MDX-P300 Battery & Electrical System Analyzer with Integrated Printer

- Tests 12-volt batteries and electrical systems for cars and light trucks
- Bad cell detection
- Tests batteries from 100 - 1400 CCA



### MDX-650P

#### For High-Volume Shops:

##### MDX-650P Battery & Electrical System Analyzer for 6 & 12 volt Batteries

- All-purpose analyzer for cars, light trucks, motorcycle, marine, lawn & garden, Group 31, Commercial 4D/8D batteries
- 12 & 24 volt charging system testing
- Quick starter analysis without disabling the ignition



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## Use for conductance testing

Midtronics PBT-200 Battery/Electrical System Tester is a safe, fast, simple and portable tester that improves productivity and accuracy. In addition to the features already included on the Midtronics PBT-100, the PBT-200 shows available power in CCAs at the end of each test.

It also provides bad cell detection and high/low voltage capture for improved starter/charging system testing.

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## Meet CA and OR energy requirements

Clore Automotive Booster PAC, Nos. ES2500C and ES5000C, meet new energy requirements in California and Oregon. All Booster PAC models are designed to deliver high peak amps, extended cranking power and durability for vehicle jump starting. Both models offer automatic charging and industrial-grade Hot Jaw clamps to ensure efficient power transfer. The impact-resistant cases and heavy-gauge flexible cables offer protection from everyday shop environments, and battery status LEDs provide a quick snapshot of onboard battery condition.

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## Graphic display of voltage readings

CanDo BAT Plus Battery Tester offers users a comfortable, ergonomic design and easy operation for accurate battery testing. It has an easy-to-read screen with graphic display of voltage readings and actual battery condition. This tester can perform battery tests on or off the vehicle to many types of 12V batteries, including SLI and AGM batteries. It also has the ability to perform grounding tests, cranking tests and alternator tests. The integrated thermal printer will print complete battery and system test reports and a customizable company header and footer can be added. Multiple language support is also available.

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### Comprehensive test kit

E-Z-Hook Flexible DMM Test Accessory Kit, No. 3604, includes a variety of connectors such as alligator clips, probes and insulation piercing test hooks. The kit includes five different test leads of various lengths. The connectors and test leads are designed to work with most industry standard digital multimeters. The kit variety provides a choice of test connectors that can easily be interchanged depending on the requirement. The insulation-piercing XEL test hook has recently been redesigned with shrouded banana sockets on both sides of the handle, allowing for greater flexibility in the field.

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### Test HV batteries

AR&D Generation III Battery Discharge Unit (BDU) comes as a microprocessor-controlled test unit that will test the energy and power capabilities of hybrid and electric vehicle battery pack systems. The unit can be used to test, analyze, and condition (cycle) a battery pack or for determining an accurate state-of-health analysis. By directly connecting to the battery pack modules, the BDU microprocessor system acquires data that provides accurate battery pack SOH information that supports a predictive maintenance program by testing, rebuilding or conditioning battery pack systems.

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### Wheel charger and power supply

Associated Equipment ESS6007B Intellamatic Smart Charger comes as a 12V 40 amp/130 amp boost wheel charger and power supply for standard automotive, deep-cycle, AGM and gel cell batteries. The ESS technology turns the ESS6007B into a stable power supply for extended service procedures or reflashes. The charger has a nominal 13.7V DC output.

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## KNIPEX Tools 8" Angled Long Nose Pliers with Cutter and 7-1/2" Combination Pliers

Fort has used previous versions of these tools and he appreciates the new 25-degree offset feature.

By Mattie Gorman, Assistant Editor

**L**ou Fort, Lead technician at K.A.R.S. Inc. in Huntingburg, IN, tested out some of the tools from the Knipex Angled Pliers Series. He says the Knipex 8" Angled Long Nose Pliers with Cutter is a nice addition to his toolbox as they grip "quite well," and the Angled High Leverage Combination Pliers has become his new favorite pliers for removing small spring-type hose clamps. "At one point I caught myself thinking back a number of years and wishing I had them back then," he says.

Fort has found multiple uses for both pliers. "Over time, I have been using the Angled Long Nose Pliers with Cutter, more and more," he says.

Fort finds the long nose pliers are useful when holding onto small screws or bolts that are difficult to get into position and also when repositioning spring clamps used on various hoses for easier removal with a real pair of hose clamp pliers. "A perfect example would be the clamp used on Ford 6L and 6.4L radiator de-gas hose located in the upper left-hand corner."

He has also used the long nose pliers to straighten out cotter pins in hard-to-access applications, such as the lower ball joints on several different GM models.

He says, "The Angled High

Leverage Combination Pliers are seeing a fair bit of action over at the wire wheel on our grinder."

Fort appreciates that both sets of combination pliers provide a strong grip, yet they allow him a good visual while still keeping his fingers at a cool and safe distance.

"The combination pliers are holding up extremely well," even after holding short pieces of brazing rod. He says he would have otherwise tossed the pieces of rod if not for the 25-degree offset, giving him a clear line of sight. And "they are also still my go-to pliers when dealing with most small- to medium-sized spring clamps."

Fort has used previous versions of these tools and he appreciates the new 25-degree offset feature. The offset allows technicians to better view their work without

### PRODUCT DESCRIPTION:

Tools in the Knipex Tools Angled Pliers Series, made by Orbis, offer a 25-degree comfort angle to help wrists work the way they were naturally designed to work. The angled product line includes the following products: 8" long nose pliers (No. 90 21-150 SBA), 7" diagonal cutter (No. 90 21-180 SBA), 7-1/2" combination pliers (No. 90 21-410 SBA) and an 8-3/4" cable cutter (No. 90 47-220 SBA).

The angled long nose pliers feature three pulling grooves which will grab tightly when holding and pulling any round objects. It also features a round-pipe gripping area and induction-hardened cutting edges for cutting any hard wire. The angled, high-leverage diagonal cutters will cut any copper, aluminum, hard wire and ACSR. The combination pliers have greater gripping surfaces for pipes and connections. When cutting cable, the angled cable cutter will cut soft copper up to 2/0 AWG and aluminum cables. The cable cutter is not suitable for cutting steel wire or ACSR.

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affecting the holding power of the tool. He adds, "The 25-degree offset handles on the pliers may have saved a small amount of time in a few situations."

Although there isn't anything that Fort doesn't like about these tools, he does have a suggestion for improvement: "If I could, I would love to make them several inches longer and have a wider head on the combination pliers." **PTEN**



◀ The Knipex Tools 7-1/2" combination pliers



◀ The Knipex Tools 8" long nose pliers



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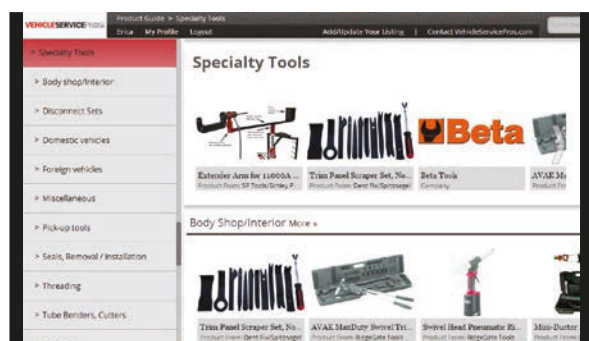
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# Big-Time Boxes

READERS OFFER A PROUD LOOK AT THEIR AWESOME TOOL STORAGE SYSTEMS.



## Mahogany cabinet personalizes the box

▲ Don Sutton designed a wood cabinet to provide additional storage space for his Mountain toolbox.

When it comes to toolboxes, Don Sutton is particular. A lifelong technician, he long ago learned that a toolbox has to be strong to carry the large number of tools that he needs. Today, he is the lead tech at a municipal garage for the city of Austin, TX, and the proud owner of a 72" by 30" by 48" Mountain toolbox on wheels with a custom-designed, mahogany cabinet. He estimates he has \$65,000 worth of tools in the big blue box.

When he went to work for the city, Sutton was using what he describes as a "medium-size" box. He placed some smaller boxes on the sides and on the top of the box to accommodate his growing tool arsenal. But after about seven years, that box was no longer large enough for all of his tools.

One day, Sutton noticed the Mountain toolbox on a tool truck. "I liked it because it was real wide," Sutton says of the Mountain toolbox. After installing the toolbox in his work station, Sutton designed a cabinet to go on top of the toolbox to give additional storage space. He hired a friend who is a carpenter to build the cabinet from mahogany. His friend advised him that mahogany is one of the more expensive woods to use, but it is stronger than other types of wood.

The drawers in the toolbox house 3/4" drive sets up to 3" wrenches. One drawer is for 3/8" sockets. He places taps, dies, calipers, dial indicators, diamond head drill bits and diamond heads in the wood cabinet drawers.

He built a pair of stereo speakers into the wood cabinet, which houses a radio.

On top of the main toolbox, below the

wood cabinet, is an open area with a peg-board display. Sutton placed a mini Homak toolbox in the open space to add even more storage space. The Homak mini toolbox has the same shade of blue as the main Mountain box.

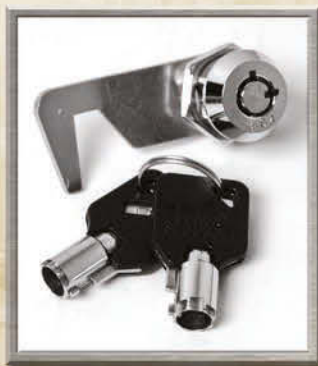
Decorating the front of the cabinet is a black and white photo of Sutton's 1965 Volkswagen, along with some iron-on character illustrations that he removed from T-shirts, mounted on paper and enlarged with a printer. **PTEN**

*(Editor's Note: Mountain has upgraded the toolbox model shown in this article. The part number for the new series is MTNTBR8120BA.)*



Want to show off YOUR Big-Time Box? Email [mattie@pten.com](mailto:mattie@pten.com) for more information.



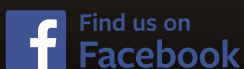


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