



THE MAGNIFICENT 20

BY THE EDITORS OF MOTOR

Each year the call goes out to the world's automotive tool designers, manufacturers and suppliers. The message is simple: Send us your latest and greatest—tools that are truly new and innovative. Show us something that makes us say: “Wow! We’ve never seen anything like this before.” Besides standout originality, there’s only one other criterion that must be met for consideration: The product must have been introduced between May 1, 2012 and June 30, 2013.

MOTOR's annual Top 20 Tools competition is now in its 22nd year. As in years past, we were impressed by the quality and ingenuity of the entries we received. We offer our sincere thanks to all companies that submitted candidates for consideration, and special congratulations to each of this year's winners. Without further ado, we proudly present the best of the best for 2013.

Photoillustration: Harold A. Perry; images: Thinkstock

U.S. MAIL

TOP-20 TOOLS
MOTOR
2013





Auto EKG by Automotive Test Solutions

The solution for driveability problems caused by carbon deposits in the intake system and on the valves is a common one—clean the deposits. But before a shop sells the service, it has to know if the driveability issue it's trying to solve is going to be benefitted by the carbon cleaning process the company is marketing. In this case, the company is Wynn's USA, an automotive specialty chemicals marketer, and it wanted to be able to provide shop customers with an evaluation method. It's possible to use a borescope to get an indication, but a simple, quick method that could be validated for all gasoline engines was needed for field use.

This led to the Auto EKG, a PC software system for combustion analysis, based on an existing tailpipe sensor that had been developed for misfire diagnosis by ATS (Automotive Test Solutions). AutoEKG software looks at the combustion efficiency by reading the pressure changes within



the exhaust system, which indicates the cyclic variations within the cylinders, a measure of the carbon buildup. The exhaust pressure pulses are timed to the ignition coil discharges using an antenna that reads them and reports to the PC.

Power Pro by Hickok/Waekon

Current diagnostic routines dictate time-consuming circuit diagnostics, but never test the component, so replacement of the component often ends up as a last-step fix. The Power Pro (Part No. 78065) is designed to accurately drive DC and pulsewidth-modulated (PWM) motors, actuators and solenoids on today's vehicles. More and more vehicles are using PWM-driven components, and they can no longer be tested simply by directly applying 12 volts, without the potential for misdiagnosis. Power Pro can supply up to 40 amps to connected or disconnected components, displaying actual current draw in .1-



amp increments, and it has the ability to drive them from 0% to 100% in 1% increments. Kit contents include the main unit with 7-ft. cables, two 3-ft. 40-amp test leads, two battery clips, two alligator clips, two female spade probes and a male spade probe.



OTC Brake Pad Gauge by Bosch Automotive Service Solutions



This handy pencil-style gauge allows the user to quickly identify brake pad life on inboard or outboard pads on most vehicles without removing the wheel assembly or brake caliper. Brake pad wear can be checked while performing other service on a vehicle, as quickly as checking tire pressure.

A red-yellow-green indicator provides a visual in-

dication of remaining brake pad material, and can be used to explain service recommendations to a customer. Green means the brake pads are okay, with 8mm or more of pad material remaining; yellow indicates they'll need replacement soon (3 to 8mm remaining); red suggests immediate replacement (0 to 3mm remaining).

Video Scope by ANSED Diagnostic Solutions

The Video Scope Monitor features a compact monitor with a shock-resistant glass screen weighing only .66 lb. (without batteries). A 3.5-in. TFT LCD QVGA display offers 640×480 image and video resolution for improved viewing and recording. Monitor screen images can be viewed in Inspection, Snapshot and Video modes. Date and time information is displayed on-screen and transfers to picture and video recordings. The 3X & 5X Digital Zoom modes allow you to zoom in for a closer view. The tool features the company's Hyperion Technology 5.5mm×1m probe and a trio of unique features designed to enhance viewing capabilities.

Light Boost improves image clarity by increasing or decreasing LED light illumination of an object. Bright or dark objects, shiny or dull surfaces, smooth or rough surfaces are better viewed using more or less light in some cases. One switch located in the probe control



box changes the LED light brightness for improved viewing clarity.

Mirroring & Image Rotation allows a technician to digitally rotate the image viewed on the monitor screen. With the push of a button, letter, number and picture orientation can be changed. Letter or number sequences can be viewed in reading order, and upside-down pictures can be changed to the proper viewing configuration.

The Particle Free & Anti-Reflection feature digitally reduces image glare and reduces or removes camera lens particle and spot contamination. Images are "cleaned up" by selecting the Particle Free & Anti-Reflection mode button.

The scope includes a 110 Degree Screw-on Mirror with Locking Collar. Probes are dust- and fluid-resistant to water, coolant and brake, fuel and transmission fluids. A full range of unique accessories is available to complement the video scope kit.



Mongoose PRO by Drew Technologies

The Mongoose series of SAE J2534 pass-thru devices has gained popularity as low-cost reprogramming devices for shops that have their service volume concentrated in specific makes. Pro GM II, the



newest version of the tool for General Motors vehicles, adds an important new feature—software drivers that enable the shop to do Tech2Win, a PC version of Tech 2, the GM diagnostic scan tool since 1995. Tech2Win provides Tech 2 diagnostics for most GM domestic-build cars built in the OBD II era (individual models on which it wasn't implemented and the new Global Diagnostic System the notable exceptions). Most carmakers are working to provide J2534 versions of their diagnostic software, but Tech2Win was written in an ISO (International Standards Organization) programming protocol (22900), so an ordinary J2534 pass-thru wouldn't be compatible.

Short-term software access for both the J2534 reprogramming and the ISO 22900 Tech2Win diagnostics is available at the GM tech info website. All Mongoose devices have the electronics built into the OBD II connector.

Suspension Wear Indicator by Mueller-Kueps

An assortment of pry bars, cheater pipes, wedges and other bars have been used in an attempt to identify worn suspension parts. This simple but ingenious Suspension Wear Indicator (Part No. 432 910) provides a safe and effective replacement for all of those methods.

To use the tool, a tire is raised off the ground to allow clearance, then lowered until some of the vehicle's weight rests on the tool. This allows the suspension to remain in its normal "as driven" position. With the tool positioned parallel to the tire tread, slowly rocking the handle allows the user to check for side-to-side suspension wear. Placing the tool perpendicular to the tire tread, then applying the brakes, checks forward and reverse suspension wear. Two tools can be used at once to simultaneously check for wear on both sides of a front or rear suspension.

Strut bushings and bearings, link pin bushings,



wheel bearings, CV axles, ball joints, tie-rod ends, steering rack mounts, torsion bar bushings and control arm bushings all can be checked for wear, play or looseness with this tool. It allows the user to positively see, feel or hear a problem while performing suspension diagnostics.



CRP129 Scan Tool by Launch Tech USA

This tool blurs the lines between a code scanner and a professional scan tool with features such as bidirectional controls for electronic parking brake release, steering angle reset and oil service light resets. It also has the ability to display, record and replay enhanced data for automatic transmission, SRS and ABS, and has graphing capabilities for generic OBD II and support for all OBD II test modes, including Mode 6.

Manufacturer-specific code definitions are built into the tool, as is an enhanced help function. Other



features include a 3.5-in. TFT color display, a lithium-ion battery, printing via PC, internet updatability and a rugged outer molding that protects the tool if it's accidentally dropped.

S6810 Semi-Deep Flip Socket by Snap-on Tools

With carmakers adding underbody panels to lower coefficient of drag for improved fuel economy, the result is a tedious process of unthreading dozens of screws to be able to check and reach mechanical components or even do something as simple as get to the drain bolt for an oil change. It's a slow process even if there's a single-size screw, but often there are at least two sizes.

A technician could carry a pair of sockets or a pair of ratchets, each with a different size socket, but the new S6810 1/4-in. drive Semi-Deep Flip Socket is a lot more convenient. One end is 8mm, the other 10mm, so if you're working on a BMW with some 30 screws, you have both sizes you need. In addition, you



can take the flip socket to a number of other cars that use either screw head size on underbody pan fasteners—from Lexus, Infiniti and Mercedes-Benz, down to the Chevy Cruze/Buick Verano. The 12-point sockets engage every 30°, for better access.



Maximus Scan Tool by Matco Tools

The Maximus is a fully functioning diagnostic scan tool, capable of everything from pulling codes to diagnosing the most complex problems, while also functioning as a tablet computer with the Windows 7 operating system. This allows you to access repair databases quickly and run multiple applications while diagnosing vehicles. One-click Wi-Fi updates mean the most current software on a single vehicle line can be accessed in as little as 45 seconds.

The tool's design features include a 9.7-in. In-Panel Switching (IPS) touchscreen, a built-in camera, VGA and HDMI video out, audio out and multiple USB ports along with Wi-Fi B/G/N and ethernet. The tablet uses Wi-Fi for internet and Class 1 Bluetooth for no-hassle connectivity to the vehicle. Maximus is also compatible with optional enhancements, including a four-channel lab scope, a sensor simulator, a J2534 pass-thru device and a battery tester. A rugged out-



er-case molding and a solid-state hard drive offer maximum tool protection. A built-in battery and docking station, as well as a 30-day free trial of Direct-Hit from Identifix, are also included.

Digital Angle Gauge by Brown Line Metalworks

A torque wrench that can measure angular rotation of the wrench for commonly specified torque-to-yield measurements—or at least an adapter that attaches to it—should be in every technician's toolbox. The type that many shops have is designed to go on a ratchet-type torque wrench, but typically has limitations: It fits just one-drive-size wrench and must mount on the head of the wrench, where it could pose a clearance issue, and in operation can pose a problem maintaining accuracy in ratchet mode.



This new Digital Angle Gauge, which has a dual-axis gyrometer and V-channel magnetic retaining groove, overcomes both of these issues. It fits on the wrench handle, so it can be positioned out of the way of any clearance issue, plus mount to virtually any size ratchet (or breaker bar), from ¼ in. up to 1

in. And if the ratchet handle is moved back more than 7°, the gauge goes into ratchet mode. It has a backlit LCD that shows torque angle, plus colored LEDs and a buzzer to alert the technician when the preset torque angle is reached. The gauge is accurate to $\pm 2^\circ$.



VERUS PRO by Snap-on Diagnostics

VERUS PRO offers a scanner, a four-channel scope, a data manager, a waveform library, schematics, TSBs, an online technical forum, Fast-Track Troubleshooter, guided test procedures and verified repair tips integrated into a single tool. The Sure-Track Expert Information Community offers parts replacement data and real fixes, and the optional ShopKey Repair Information System provides quick access to repair guidance for virtually any light vehicle on the road.

The VERUS PRO is thinner and 3 lbs. lighter than the original VERUS display tablet. A high-resolution 10.2-in. touchscreen provides detailed graphing, precise results and easy-to-read information and schematics. A single keyless adapter for OBD II applications means there's no need to change adapters or keys to suit specific vehicles or systems. Wireless scanning for 1980 and newer vehicles, Wi-Fi and a built-in internet browser give you



the freedom to work from anywhere in the bay. An internal hard drive allows you to store vehicle records, diagnostic data, test results and screen images, plus add your own software applications. The "S" button instantly captures screen images and provides navigation shortcuts.

TwinForce Diagonal Cutters by KNIPEX

Every shop has diagonal cutting pliers, in fact, usually more than one—a large set to cut through thick materials and a small set for where access is limited. These TwinForce pliers have a dual-hinge camlike axle design that provides increased leverage within the framework of a 7-in. tool that fits into quarters that a comparable-performance 10-in. tool cannot. The pliers' design provides a high transmission of cutting force, which the company's tests show requires 50% less physical strain than conventional 7-in. cutting pliers.

The TwinForce can cut through metal tape or wire as thick as $\frac{3}{16}$ in. because the jaws open up, so the cutting effort can be applied two or three times, if necessary. There are two models—No. 73-71-180,



which has conventional plastic-dipped handles, and No. 73-72-180, which has a dual-material handle covering that's shaped for extra comfort.



Fuel & A/C Disconnect Pliers by Lisle

The unique design of these pliers (Part No. 37300) provides extra leverage when disconnecting quick-connect couplings on a vehicle's air conditioning and fuel lines. It can be used with $\frac{1}{16}$ -, $\frac{3}{16}$ - or $\frac{1}{2}$ -in. adapters

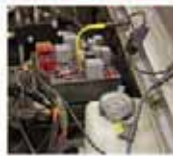
from the company's 37000 or 39400 Disconnect Tool Sets. The pliers' forks have different-size openings so the tool can be turned around to fit single-step or two-step collar lines. They can also be used to reconnect stubborn lines or connections that are tucked away in hard-to-reach areas.

110 YEARS **NEW TOOLS**



37300 FUEL AND AC DISCONNECT PLIERS

Provides extra leverage when disconnecting quick connect coupling air conditioning and fuel lines. Use with 5/16", 3/8" or 1/2" adapters from the Lisle 37000 or 39400. The forks have different sized openings so the tool can be turned around to fit single or two step collars. Can also be used to reconnect stubborn lines in hard-to-reach areas.



69300 MASTER RELAY AND FUSED CIRCUIT TEST KIT

Test live circuits from the relay or fuse box. Extend the capability of your digital multimeter. Includes eight jumpers to fit most popular relays. The jumpers have tabs for clamping and flat pads to place test leads on. Includes Test Lead Kit (69250 - see below for more information) with terminal leads with switch, fuse and power options provides easy access to check current or voltage. Pliers easily remove electrical relays without damage. Works without piercing wires. A great first line circuit testing kit.



53460 HARMONIC BALANCER INSTALLER

Installs harmonic balancers or drive pulleys that are pressed on the crankshaft. Includes ten threaded adapters to work on many domestic and some import harmonic balancers. Two long adapters for use on Dodge Hemi and Generation III GM motors. The 1.75" spacer allows the tool to work more effectively on deep harmonic balancers.



69250 TERMINAL LEADS WITH POWER/SWITCH/FUSE

Terminal leads with switch/fuse/power provide several ways to check circuits from the fuse or relay box. Different sized ends on the wires give flexibility to plug directly in the relay base or to fit other relay sizes not covered by the relay test jumpers (like VW & BMW). Five wire sets (pairs) fit many vehicle fuses including: Female-Pal, JK, LJK, Male-L-mini, Mini ATO and Maxi. Use the on/off switch to control a circuit. Test before or after the switch by using the stacking banana plugs. Power lead with alligator clip can apply external 12v power to only the circuit that is being worked on. Two 3.5 foot extension lead wires can be used if you are controlling a circuit while the vehicle is on a hoist. The in-line fuse holder (common ATO fuse style) protects the circuit and multimeter during testing.



34910



34900 WATER SENSOR WRENCH, LATE MODEL 34910 WATER SENSOR WRENCH, AFTERMARKET

For use when replacing the fuel filter or when servicing the water sensor. The plastic sensor is easily damaged by tools, like pliers, that do not specifically fit the sensor. 34900 fits the water sensor on 2012 and newer 6.6L Duramax diesel engines. 34910 fits the aftermarket water sensor on 2001 through 2011 6.6L Duramax diesel engines.



54500 LARGE INNER TIE ROD TOOL

Works on inner tie rods with inaccessible wrench flats on many trucks and SUVs. Includes five crows feet, sizes 1-7/16", 33.6mm, 38.4mm, 40mm and 42mm, to fit many Toyota, Nissan, Ford, Lincoln, Mercury and Chevrolet applications.



48300 PUSH ROD REMOVER

Redesigned for newer 3.5L and 3.9L GM engines. Also works on 2.8L, 3.1L and 3.4L GM V6 engines. Quickly removes push rods so you can replace the intake gasket. No need to loosen and retighten the rocker arm. The tool pivots the rocker arm to compress the valve spring.

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Smoke Pro Portable Leak Detector by Redline Detection

The Smoke Pro Portable Leak Detector (PLD) is equipped with an on-board micro compressor, eliminating the need for shop air and gas lines. This allows the tool to be taken where the work is. A fraction of the size and weight of conventional evap

testing machines, this leak detector allows clean, cost-efficient, quick, contaminant-free diagnostics. The PLD also gives technicians the ability to utilize an air-only, contaminant-free testing cycle, which is mandated and recommended by many OEMs.



OEM APPROVED CONTAMINANT FREE
SMOKE PRO®
PORTABLE LEAK DETECTOR

WINNER!
The Best New Technology in Smoke Detection

"The NEWEST & BEST technology out there!
Has its own built in micro air compressor."
"This is like going from an old-fashioned wall-mounted telephone
to a cell phone - what a difference! Wish I'd done it sooner."



REDLINE DETECTION.COM
SMOKE PRO PORTABLE LEAK DETECTOR



John Bean AC400 Touchless Alignment Wheel Clamp by Snap-on Equipment

The John Bean AC400 Touchless Alignment Wheel Clamp allows the user to securely clamp to a tire without touching the rim, while still providing accurate and highly repeatable results. Clamping is accomplished with a single fast-action adjustment knob that adjusts to the full range of tire sizes, without exchanging accessories, in just a few turns.

The wheel clamp features clutch limited-clamping force for consistent and secure attachment. Its self-centering design allows measurement of cross-diagonal and tire-rolling radius that helps reveal collision damage and mismatched tire sizes. Drop-tested, lightweight cast-magnesium construction eases the weight users have to carry and a comfortable handle accommodates gloved hands.



AC400 TOUCHLESS ALIGNMENT WHEEL CLAMP

Snap-on Equipment is pleased to announce it has won a prestigious MOTOR Magazine Top 20 Tool Award for its AC400 touchless alignment wheel clamping system.

FEATURES INCLUDE:

- Secure Clamping Without Touching the Rim
- Fast and Easy to Use
- Ergonomic Design
- Self Centering Design
- Lightweight and Durable
- Accurate and Repeatable



JohnBean.

Circle #19



R3130 3/8-in. Cordless Ratchet by Ingersoll Rand

Given a choice, you'd probably want a cordless electric ratchet for underhood work, if you can fit it in. Because if you can't, you may have to snake an air line in to use an air ratchet, or exert the extra effort with a manual tool.

The new R3130 (3/8-in. drive) is a new slim in-line design that uses a 1.5-amp/hour, 20-volt lithium-ion battery, with a motor that can deliver up to 54 ft.-lbs. of torque. The battery pack is installed behind where the technician's hand holds the tool, a new approach to layout that means if your arm fits in, so will the ratchet. The battery pack is controlled by an intelligent management system and the battery itself is an advanced design that has high charge capacity and low impedance so it can deliver maximum power and runtime. The ratchet head is

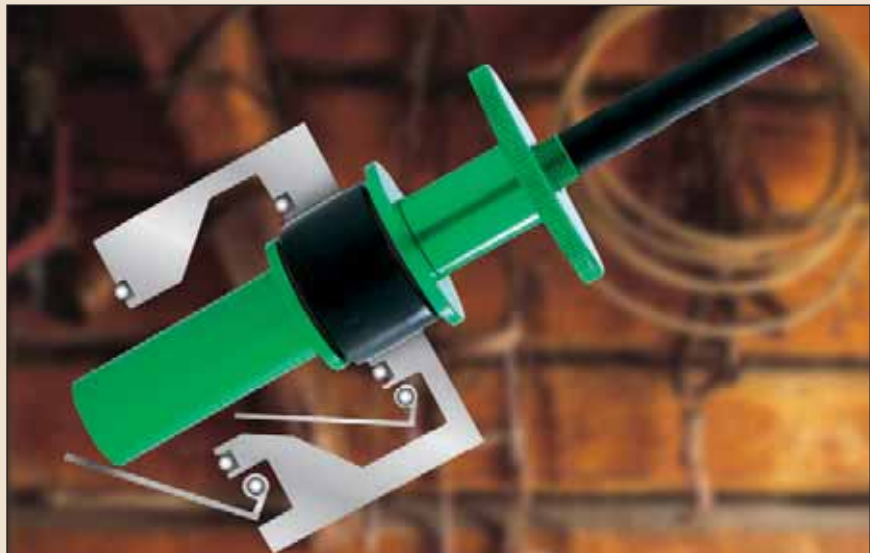


the same one used for the company's air tools. Because the new ratchet is on the company's IQ Series platform, its battery pack is interchangeable with others in the IQ Series.

Ford & GM Capless Fuel Neck Adapter by STAR Envirotech

Capless fuel fills started with Ford and now you'll also find them on General Motors cars, with more manufacturers expected to join. There's no issue with using these systems during refueling, but when you're trying to perform evaporative leak detection using the conventional adapters that go over the capped fill neck to seal, you need something different.

This new adapter for both Ford and GM has been introduced as that answer. It's simply inserted through the spring-loaded double doors of the capless neck and when it reaches a stop at the outer end of the fill neck, the technician then twists it to seal. Once the adapter is in place, any evap system diagnostic equip-



ment, such as pressure/vacuum decay or a smoke or smoke/dye machine, can be used. The adapter, made of fuel-resistant plastics, is warranted for five years.



DEF-Chek Tester by Thexton Manufacturing

DEF (diesel exhaust fluid) is a precise mixture of 32.5% automotive grade urea and 67.5% deionized water, required both for emissions control and fuel economy. That formulation has very little margin for contamination, which can occur in several ways. They include storage with the cap off (or missing), a defective tank vent, improper addition of water or even mixing in coolant from a failure of a coolant-type (nonelectric) heating system. A dashboard warning light may illuminate on some trucks, but for the most part, it comes down to checking the remaining fluid's specific gravity when it comes in for a tank refill. There are refractometers for the purpose, ranging from the eyepiece type (as used for testing antifreeze concentration) to one of the electronic types calibrated for DEF.

An inexpensive alternative is the new TH108 hydrometer. Just draw out a sample of the DEF and



the number of floating discs indicates the urea concentration percentage (two should float if concentration is correct). The discs are temperature-compensating, so the DEF can be tested hot or cold. If the DEF is contaminated, a service procedure, such as flushing the tank with deionized water, is specified.

Ford Power Stroke 6.7L Diesel Injector Sockets by SP Tools/Schley Products

The high-pressure fuel injectors on heavy-duty diesels are a high-volume service item for many shops, the Ford 6.7L Power Stroke V8 a common example. Replacing injectors is a job that requires cleanliness and care, and one of the issues is the need (cited by Ford in its service manuals) for a deep-well crowfoot to access and torque to specifications (20 N-m/177 in.-lbs.) the plastic fuel line fittings. It takes care, because you don't want to crack them.

An ordinary deep 17mm crowfoot socket can do the job, but you'll feel a lot better working with the new No. 11400 socket. It's a 12-point design specially shaped to fit, with the nose angled to prevent damage to the electrical connec-



tion. It can be spun by hand under the bend in the lines to complete loosening or begin retightening.



Extraction & Filling Pump by CTA Manufacturing

The No. 7077 looks like a suction gun (and it really is), but like many of MOTOR's Top 20 Tools selections over the years, it's a conventional shop tool that has a host of appealing features that make it special. The 1500cc (1.5-qt.) piston/cylinder body is clear polypropylene, so when it's used to draw out fluid, a technician can see the condition of the fluid.

Although all tools of this type can be used for extraction and filling, as a practical matter, you usually have to pick a single function. However, this tool is easily taken apart for cleaning, so you can not only change from extraction of dirty fluid to filling with clean, but change from one fluid to another without fear of cross-contamination. The plunger piston comes with double seals, and the kit includes an extra set if the shop uses the pump for corrosive fluids. The hose has an aluminum tip, which can accept add-on hoses to reach into recessed areas or to attach the special transmission fluid filling adapters required for some vehicles.





BRAKE PAD GAUGE

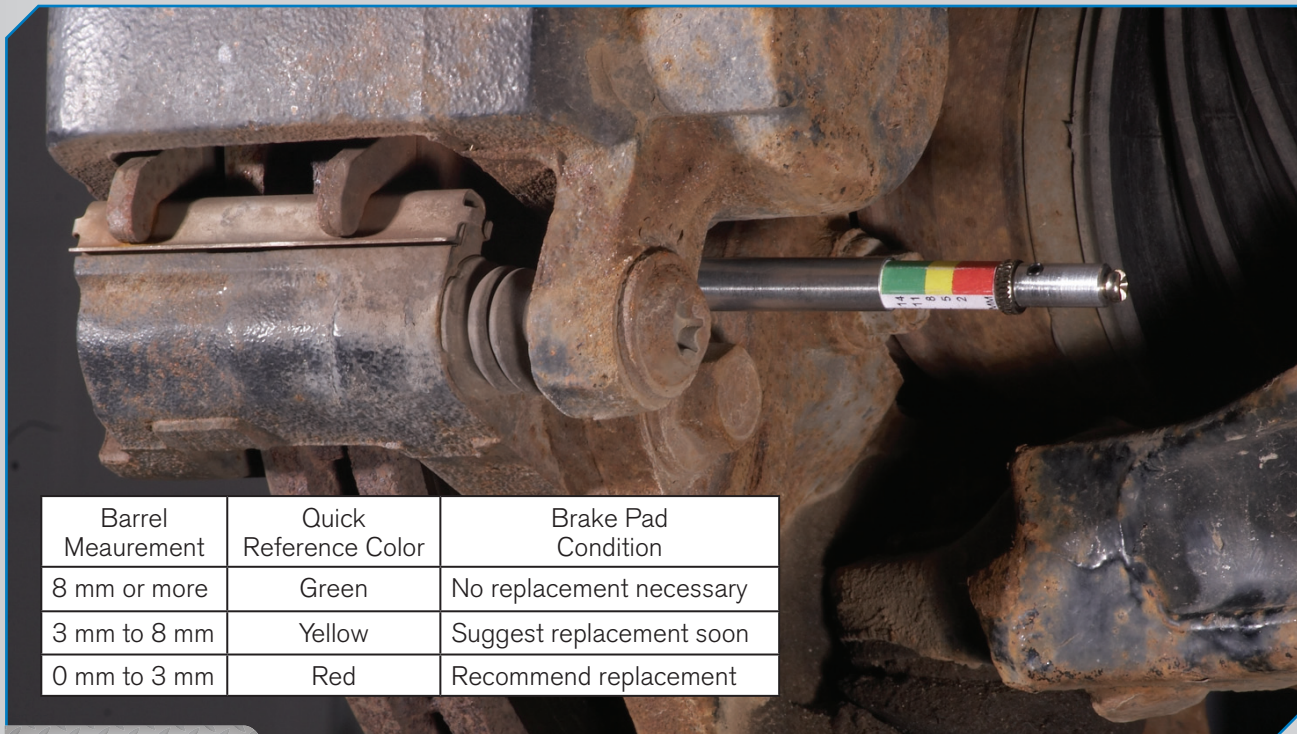
Quick reference of brake pad condition via color code scale

SPEED UP your inspection process.



The 6596 Brake Pad Gauge allows for a definitive measurement of brake pads to determine remaining life.

Unique design allows for measurement on the vehicle without the removal of any components in most cases (wheel assembly or brake caliper).



Barrel Measurement	Quick Reference Color	Brake Pad Condition
8 mm or more	Green	No replacement necessary
3 mm to 8 mm	Yellow	Suggest replacement soon
0 mm to 3 mm	Red	Recommend replacement

Attain measurement without removing any parts from the vehicle.

6596 Brake Pad Gauge



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