

# Motor Age

Advancing the Automotive Service Professional Since 1899

Anniversary Edition/2016  
Advertorial Supplement

**1899** FIRST SHOCK ABSORBER  
The first shock absorber was developed by Lewis R. Royce, a British engineer. It was a simple mechanical device that used a spring and a damper to absorb road bumps.

**1902** FIRST SHOCK ABSORBER  
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**1904** INTERNATIONAL EXPANSION  
Monroe's products were first sold in Europe, marking the beginning of international expansion.

**1916** MONROE'S FIRST PATENT  
Monroe's first patent was granted for the shock absorber, marking a significant milestone in the company's history.

**1920** MONROE'S FIRST SHOCK ABSORBER  
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**2016** MONROE'S FIRST SHOCK ABSORBER  
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**America Rides Monroe**  
because Monroe covers America!

Monroe covers America with many power-trained menpower. But that's really nothing new. Monroe has been at it for a long time. Over the decades, many important innovations in ride control.

country with instructional films and slide programs, with hands-on training sessions, with illustrated manuals. And most important, they're doing it where the action is! Right in your own back yard. Or, more accurately...

# A CENTURY OF MONROE®

LOOKING BACK AND INTO THE FUTURE WITH A LEGENDARY BRAND

**THE FUTURE OF RIDE CONTROL**  
Technologies that could be coming soon to your shop.

**SERVICING TODAY'S ELECTRONIC DAMPERS**

**ANATOMY OF A QUALITY STRUT ASSEMBLY**  
The stakes are too high not to know the differences.



# IT'S IN OUR NAME

# MONROE

## SHOCKS & STRUTS



## A Spectrum of Technologies for Today's Vehicles

Featuring our latest global Original Equipment valving technologies, Monroe® OESpectrum® ride control products are designed with the right technology specific for each application to provide added control while reducing harshness experienced with rough, bumpy road conditions.



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# MotorAge

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## THE LEGEND OF MONROE®: MADE IN THE USA.

Although it's now a global force in ride control, the Monroe brand remains firmly rooted here in the U.S.A., with thousands of employees manufacturing shocks, struts and related products at the brand's state-of-the-art facility in Paragould, Ark. Above, Jeff Koviak, vice president and general manager, North America Aftermarket, Tenneco, addresses employees before they begin the afternoon shift at Paragould.

### COMMUNITY

**4** Our brand is you  
The 100th Anniversary of Monroe is more than a celebration of one of the industry's great brands. It's proof of the enduring value of talented automotive service professionals.

### OPERATIONS

#### MANAGEMENT

#### DRIVEN BY INNOVATION AND QUALITY SINCE 1916

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#### DOUBLE YOUR RIDE CONTROL BUSINESS

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#### VISIBILITY... AWARENESS...#SHOCKMOBILE!

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# OUR BRAND IS YOU

TOGETHER, YOUR SHOP AND MONROE® ARE MADE FOR THE ROAD AHEAD

BY JEFF KOVIAK | CONTRIBUTING EDITOR

**WELCOME** to this special edition of *Motor Age*, celebrating the 100th Anniversary of one of the auto care industry's most respected brands – Monroe®.

As the North American automotive service industry itself advances into its second century of growth, all of us at Tenneco are proud that Monroe remains one of the most trusted names in the business. In the world of advertising, this is known as “brand equity,” but at Tenneco we define it as having an exceptionally strong connection with the professionals who specify and install our products. Moreover, the continued vitality of the Monroe brand among consumers is a reflection not only of the products we develop and deliver each day, but also of the outstanding service experience you provide, day in and day out.

## Made for the road ahead

One of the hallmarks of great brands is their ability to anticipate and address new challenges and opportunities in a changing marketplace. As you might note in the historical overview that begins on Page 6 of this magazine, Monroe has been doing that since its founding in 1916. In fact, few might realize that the world's premier ride control brand actually began as a manufacturer of tire pumps for bicycles and early automobiles. Several years later, Monroe engineers identified the need

to improve on the harsh steering and handling characteristics of carriage spring suspensions. They answered this challenge with the introduction of the first automotive shock absorber, the Monroe Shock Eliminator. The rest, as they say, is history.

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**“The continued vitality of the Monroe brand among consumers is a reflection not only of the products we develop and deliver each day, but also of the outstanding service experience you provide.”**

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This commitment to innovation has continued throughout our first century. One of the most significant Monroe achievements of recent years was the introduction of the Monroe Quick-Strut® assembly, which helped revolutionize strut replacement in thousands of repair locations across North America. And, as with every product in our line, each Monroe Quick-Strut assembly is engineered and manufactured to stringent quality and performance specifications to help keep your customers safe, satisfied and loyal to your business.

Just as Monroe has helped drive the development of multiple generations of ride control technology, we are leveraging our global OE and after-market engineering resources to create world-class solutions for vehicles that will appear in your service bays five, 10 and even 20 years from now. One of Tenneco's most exciting new OE-focused suspension platforms is the Monroe Intelligent Suspension. You can read about the impressive capabilities of these next-generation systems beginning on Page 24.

I hope you will enjoy this special edition. We have worked hard to include valuable product, diagnostic and service insights – along with fun and interesting historical highlights – to benefit everyone on your team.

This magazine is much more than a celebration of our 100th Anniversary. It is another component of an ever-growing commitment to the partnership we have forged with talented automotive service providers worldwide. Together, our brand and yours are “Made for the Road Ahead.” 



## JEFF KOVIAK

is vice president and general manager, North America Aftermarket, Tenneco.



100  
1916 **MONROE** 2016  
YEARS



MADE FOR THE ROAD AHEAD.



THANKS FOR BEING OUR CUSTOMER

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# DRIVEN BY INNOVATION AND QUALITY SINCE 1916

## HOW ONE BRAND BECAME A DRIVING FORCE IN AUTOMOTIVE RIDE PERFORMANCE

**AUGUST MEYER** never met any of the pioneers of personal computing. Moreover, the world's first shock absorber wasn't anything like a PC, Mac or mobile device. But there are dozens – perhaps even hundreds – of similarities between the histories of Meyer's company and many of today's technology leaders.

Meyer's company quickly established itself as a driving force of automotive ride performance, and 100 years after its founding remains one of the best-known brands in the global automotive and commercial vehicle industries.

That brand is Monroe®.

"Perhaps the most impressive part of the Monroe story is that it is every bit as vibrant today as it was following its first product success," says Jeff Koviak,

vice president and general manager of Tenneco's North America Aftermarket business. "Very few brands have been able to maintain that competitive edge over a full century. I think that's largely due to our corporate culture. We never dwell on past accomplishments; our focus is always on delivering even greater value to the professionals who rely on our products."

This forward-thinking approach has played a role in every Monroe product, service and marketing innovation over the past 100 years.

In fact, few might realize that Meyer, the mechanic and entrepreneur who founded the company in 1916, initially marketed an air pump to help consumers repair tires damaged on North America's unpaved roads. As roads improved and, more importantly, a network of independent automotive service providers took root, Meyer and his partner, Charles McIntyre, looked for new ways to support their customers. Their next innovation – the Monroe Shock Eliminator – revolutionized their company and established an entirely new product category.

### A century of firsts

There have been hundreds of Monroe innovations through the intervening decades, from the first dual-action shock absorber (1929); to the Monro-Matic® shock (1951), which became an industry standard among automakers and within the aftermarket; to iconic technologies and names like Gas-Magnum™ (1982),

Monroe applies the technology of the single-barrel tire pump to smoothing the ride for America's drivers.



Sensa-Trac® (1991), Reflex® (1999), and OESpectrum® (2011).

The brand's portfolio expanded beyond conventional shocks in 1980 with Tenneco's introduction of its first original equipment and replacement struts, which addressed the increased use of MacPherson struts by leading global vehicle manufacturers. "While strut technology quickly became a major part of Tenneco's OE ride control business, we were also well aware that it posed new challenges for the service provider," Koviak says. "Struts are more complex to remove and replace, which ties up the



August Meyer founds the company in 1916.



The Monroe Quick-Strut unit was the first complete, ready-to-install replacement strut assembly available.

Tenneco over the past 13 years has invested in a more than 500-percent increase in strut assembly production in Paragould, Ark., and in 2016 alone expects to add 100 Quick-Strut part numbers, expanding the line's coverage to more than 132 million registered vehicles.

"Convenience is a huge advantage of the Quick-Strut assembly, but our commitment to quality and performance have played even greater roles in its continued success," says John Perrin, director of marketing and engineering, North America Aftermarket, Tenneco.

"It's not enough to develop a part that's faster and easier to install – it also has to help restore the OE-style ride and handling characteristics on each corresponding vehicle. Our engineers match every component to the unique demands of the specific application.

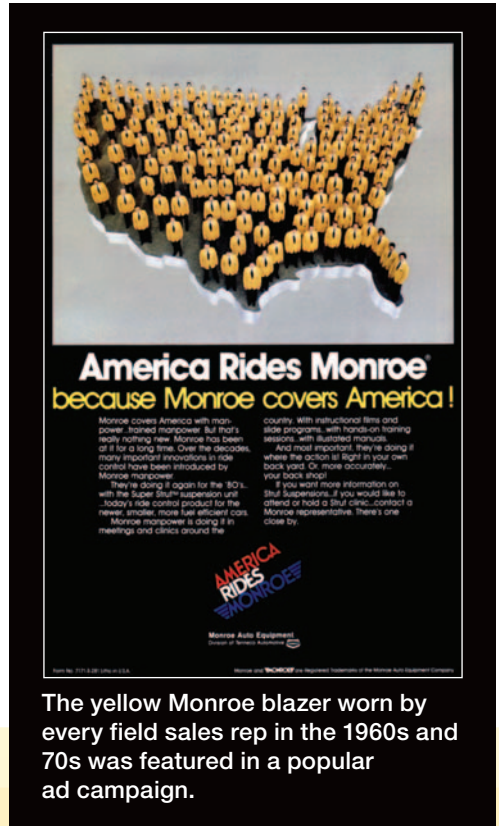
service bay. They're also more expensive than conventional shocks because of their increased content.

"As strut-equipped vehicles became a significant portion of the North American vehicle population, we invested the time and resources to help revolutionize the

service opportunity in the aftermarket. The industry was looking for a solution and we embraced the responsibility to deliver it."

The resulting innovation, introduced in 2003, was the Monroe Quick-Strut® assembly. Gone was the need for time-consuming disassembly and reassembly of the old and new strut tower. More important, the repair provider could now ensure a comprehensive, high-quality repair by replacing all worn components – including upper bearing, damper, coil spring, jounce bumper and more – by selecting and installing a single bolt-in unit.

The Quick-Strut assembly was an immediate success. And as more service providers recognized the benefits of this timesaving solution, they asked for additional part numbers. In response,



The yellow Monroe blazer worn by every field sales rep in the 1960s and 70s was featured in a popular ad campaign.

We use coil springs featuring premium, U.S.-manufactured steel. And we assemble Quick-Strut units in our U.S. facility to make sure they meet our stringent quality standards.

"A service provider typically only has one chance to perform a strut replacement over the life of a given vehicle. It makes sense to use the best parts from a trusted U.S.-based manufacturer to ensure the best outcome."

### Aftermarket's OE advantage

It might surprise some to learn that the Monroe brand isn't simply a leader in the aftermarket ride control category; Tenneco also supplies advanced ride control solutions – including many of the latest electronic systems – to major vehicle manufacturers.

The benefits of this expansive OE portfolio are not exclusive to auto-makers, however; they can also be seen in the growing Monroe OESpectrum® line of replacement shocks and struts. The OESpectrum

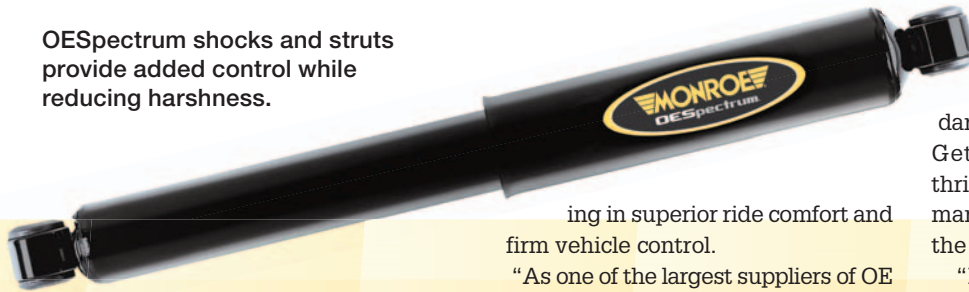


The Monro-Matic becomes the best-known shock absorber in the 1950s.



Today's North American Sales Force proudly wears the yellow Monroe blazer.

OESpectrum shocks and struts provide added control while reducing harshness.



offering includes an array, or "spectrum," of OE-inspired technologies for vehicles that have entered the after-market repair cycle.

In addition to conventional twin-tube and monotube shocks and struts featuring Tenneco's latest valving technologies, the OESpectrum line includes plug-and-play electronic dampers for a growing number of European vehicles originally equipped with the company's Continuously Controlled Electronic Suspension (CES). These replacement units respond to inputs from an ECU that processes driver inputs and data from sensors placed in key locations on the vehicle, result-

ing in superior ride comfort and firm vehicle control.

"As one of the largest suppliers of OE ride control systems, Tenneco is ideally positioned to support the long-term success of independent repair providers who rely on Monroe products," Perrin says. "When each new generation of our advanced OE solutions enters the service bay, technicians can be confident that we'll support them with the right replacement parts and great technical support to deliver a quality repair."

**Above all, great support**

"Only Monroe would think of that."

Whether the topic is the brand's classic shock absorber barrel displays of the 1950s, the bright-yellow blazers worn by every Monroe field sales representative in the 1960s and 70s,

the "Change Daily" underwear billboards of the early 2000s, or today's 28-foot-long, glow-in-the-dark "Shockmobiles" and "Everything Gets Old" campaign, Monroe has thrived on cutting-edge, head-turning marketing aimed at raising interest in the ride control service need.

"Ride control has always had to be sold – consumers simply don't automatically understand they should replace worn shocks and struts," explains Bill Johnston, director of sales, North America Aftermarket, Tenneco. "That fact has driven multiple generations of Monroe marketing and sales professionals to invent new ways to help our most important customers – service providers – grow their businesses."

Pride has been another important ingredient of the brand's success. That's why it was not uncommon to hear that sales professionals from competing suppliers envied the yellow Monroe blazer; they weren't necessarily fashionable (we're talking BRIGHT yellow), but they were touchstones sig-

CONTINUES ON PAGE 32

Monroe has always thrived on cutting-edge, head-turning marketing campaigns aimed at raising interest in the ride control service need.



EVERYTHING GETS OLD.  
EVEN YOUR SHOCKS.



INSPECT YOUR SHOCKS AT 50,000 MILES.



# IT'S IN OUR NAME



## Providing Industry Leading Coverage For Today's Vehicles

Your next ride control customer might walk out the door unless you have the OE-quality replacement parts he or she prefers. That's why thousands of shops worldwide choose Monroe. Our global OE leadership is more than a quality advantage – it's also a coverage advantage that can help you satisfy more customers every day.



[monroe.com](http://monroe.com)

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# DOUBLE YOUR RIDE CONTROL BUSINESS

LIKE THE SOUND OF THAT? HERE ARE SOME TIPS TO HELP MAKE IT HAPPEN.

BY **BRIAN ALBRIGHT** | CONTRIBUTING EDITOR

**MOST** customers – and many repair shops – don't consider ride control replacement. Even with the average age of vehicles edging toward 12 years, most cars go to the scrapyard with their original shocks and struts.

But ride control components do wear out, and service providers are likely leaving money on the table by not actively engaging consumers about the replacement of worn shocks and struts. Those consumers, meanwhile, are potentially experiencing degraded ride comfort, performance, stopping and stability in some driving situations, creating obvious safety concerns.

According to Bill Johnston, director of sales, North America Aftermarket at Tenneco, the primary reason ride control components are not replaced is because repair shops aren't inspecting and recommending replacement. "During the course of the customer taking their vehicle in for service, unfortunately no one mentions it," Johnston says. "They too often do not recommend ride control replacement."

Johnston says repair shops could significantly increase their ride control business by educating their service writers and technicians, providing better information to new customers and going the extra mile to complete more jobs with existing customers. What's more, that business can be gained with no new equipment or advertising expenses.



Photos: Thinkstock, Tenneco

As the manufacturer of Monroe® shocks and struts, Tenneco has developed a comprehensive education and training program called Safety, Service & Value to help shops improve their ride control business. “The goal is to get them to focus on products that wear out very gradually, since drivers don’t notice the change as much as they would with another component that might break or fail,” Johnston says. “That’s why these clinics are important. We educate the technicians and service writers to provide awareness to the owners so they are comfortable with inspecting and recommending ride control replacement.”

### **SYMPTOMS OF PHYSICAL DAMAGE THAT INDICATE NEW SHOCKS AND STRUTS MIGHT BE NEEDED**

Are there signs of physical damage that could compromise the ride control unit’s ability to function as intended?

- Is the rod bent, rusted, loose or scratched?
- Does an air shock have a torn or leaking air boot?
- Is fluid actively leaking down the side or off the bottom of the unit?
- Has corrosion compromised the integrity of any components that make up the shock or strut?
- Are non-replaceable bushings damaged or missing?
- Do the vehicle’s tires display cupping or other abnormal wear?
- Is an electronic damper producing a diagnostic code indicating failure? **NOTE:** *This might require additional electronic circuit diagnostics. See related feature on Page 13.*

### **Six-figure opportunity**

Training staff to educate customers about the value of ride control replacement could result in six-figure revenues, not including the alignment work and other services that often go along with ride control replacement.

Some industry estimates indicate that nearly 70 percent of vehicles keep their original shocks and struts through their end of life. “Much of that is because shops did not, in the course of regular maintenance, recommend ride control replacement,” Johnston says.

Depending on the shop volume and average customer mileage, there could be a significant opportunity to boost revenue by performing more inspections and recommendations. Even Tenneco’s conservative estimates put that revenue at roughly \$124,800 annually based on perform-

ing 13 jobs per month. With the average installation costing roughly \$800, shops could potentially see as much as \$280,000 per year in additional revenue if they are able to close one more job per day (assuming four units are installed per job).

For older vehicles, this can be a difficult pitch. A high-mileage vehicle might have a resale value that is not that much more than the cost of new ride control components. Customers don’t know much about their ride control systems, and owner’s manuals rarely mention the replacement cycle for these components.

For vehicles in the right mileage window, however, shops can potentially double this business by following four basic steps. Below we’ve outlined a straightforward approach to selling ride control replacement that can help provide a boost in revenue with a minimal investment in time and training:

### **Step 1: Customer interview and assessment**



Interview the customer to determine if they are a good candidate for new ride control components. According to Johnston, the sweet spot for ride control is a seven- to 10-year-old vehicle with 80,000 to 100,000 miles. “That ties into when most of these vehicles get another new set of tires,” he says.

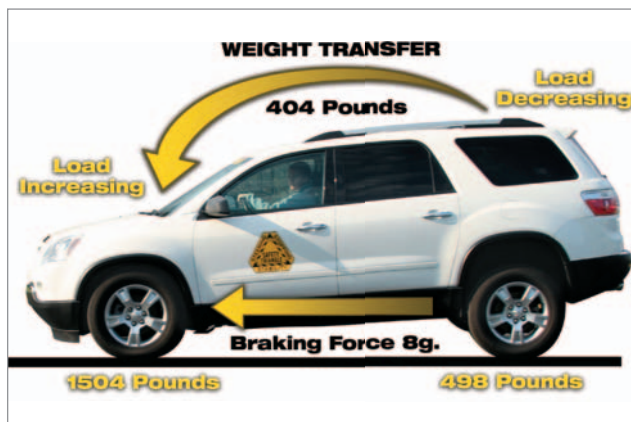
When you encounter the owner of such a vehicle, take the time to explain the importance of the ride control system. Focus on how ride control products help to provide safe steering, stopping and stability. “The shock absorber or strut is designed to control suspension movement,” Johnston says. “It helps keep the tire flat on the surface so you get the best braking, control and steering. This really goes hand in hand with tires, which is why tire dealers sell a lot more ride control units.”

Ask the customer if they’ve noticed a change in how the ride feels. Find out how they use the vehicle, and determine if the original shocks have ever been replaced.

Shocks and struts don’t just help improve passenger comfort and the smoothness of the ride. They help improve vehicle control, prevent premature tire wear, reduce stopping distance under certain driving conditions, protect

the front brakes and some suspension components from excessive wear, and help maintain proper wheel alignment. Many drivers wrongly believe these components will always last the lifetime of the vehicle. In truth, extreme temperatures and the high number of stabilizing actions a typical vehicle requires can wear down internal metal, rubber and plastic components as well as the shock fluid.

Once customers are aware of how the shocks and struts affect vehicle stability and performance, they are often more open to the possibility of replacing the units if they are indeed degraded.



## Step 2: Road test

Next, road test the vehicle on a route that will provide a variety of pavement and surface conditions, wide and tight turns, and multiple stops. "We generally encourage a test drive to make sure the vehicle is handling properly," Johnston says.

Before the test, check the tire pressure and ride height against manufacturer specifications. Pay attention to unusually harsh bumps, noises, and vehicle bounce and float, along with brake dive or acceleration squat. The technician should then report their findings to the customer.

## Step 3: Visual inspection

Following the road test, perform a full visual inspection of the ride control system and associated components. This



can be done in the course of other maintenance and repair steps, particularly if the customer is already having their tires replaced or rotated.

Look for any signs of wear or leakage while taking note of the vehicle mileage. Bushings, seals, tires, suspension parts, and brakes should be part of these inspections. Uneven tire wear, excessive brake wear or suspension component wear could indicate one or more degraded ride control units.

Explain to the customer the level of wear that has been observed, and the potential impact on the safety and handling of the vehicle. "It's really important to explain why you are recommending replacement to the customer," Johnston says.

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**"Asking to perform the service is critical. In fact, it can be unsettling for the customer to recommend a specific service and then not ask to do the work."**

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## Step 4: Win the business

Finally, you need to quote the job and ask for the business. That seems obvious, but many service writers are hesitant to ask for the sale because they aren't comfortable and/or don't want to give the customer the impression they are trying to upsell them.

"You'd be surprised at how often that final step doesn't happen," Johnston says. "But asking to perform the service is critical. In fact, it can be unsettling to the customer to recommend a specific service and then not ask to do the work. You want to make everybody comfortable and keep their confidence. Best-in-class shops do that every day."

Lead with the relevant benefits of replacement, not the features of the replacement product.

The sales process may stretch out over multiple service visits. An inspection should occur at 50,000 miles, according to recommendations from the Motorist Assurance Program (MAP), with technicians keeping an eye on the components from that point until the car reaches the service-life sweet spot and the tires are replaced.

Shocks and struts can measurably degrade at about 50,000 miles of service in some circumstances and driving conditions. Some might wear out faster because the vehicle is operated under more difficult driving conditions. Others might last longer.

The biggest obstacles to winning the business are the age of the vehicle and the cost to the consumer. Customers might not plan to keep older, high-mileage vehicles, so they'll likely decline the repair. "If they are going to keep the vehicle, we recommend telling them that by replacing worn ride control parts they could help reduce wear on other parts, including their brakes, suspension and tires.

But even if they say no after that first recommendation, many customers will buy the service from the first shop that

CONTINUES ON PAGE 32



# EMERGING RIDE CONTROL SERVICE OPPORTUNITIES

ADVANCED SUSPENSION TECHNOLOGY  
REPRESENTS ADDITIONAL REVENUE  
OPPORTUNITIES FOR THE SMART SHOP.

BY PETE MEIER | CONTRIBUTING EDITOR

**P**ick up the current issue of any of the major trade magazines (including the one you're reading now) and I'll guarantee there is at least one article that is again reminding you of the lightning changes in technology that are constantly occurring in our industry.

But new technology quickly becomes old technology. Not in the sense that it is outdated or outclassed. I mean that what was once covered by the OEM warranty is now out of warranty and the components are aging over time

Photos: Tenneco

and mileage. This brings service opportunities to your bay if you know what to look for and have learned how to properly diagnose and repair the systems.

In the ride control sector, that emerging service opportunity lies in electronic ride control.

### A Monroe® example

Tenneco, parent company of the Monroe brand, currently offers car manufacturers a range of electronic damper technologies under its Monroe Intelligent Suspension name. One

of these technologies – Continuously Variable Semi-Active Suspension (CVSA) system — is already well established within the North American vehicle population as an option on some German-branded vehicles and might begin to appear in your shop.

Developed by Tenneco in conjunction with Öhlins Racing, the CVSA system is a semi-active suspension that continuously adjusts damping levels according to road conditions and vehicle dynamics, such as speed, turning and cornering, delivering comfort without sacrificing the safety of sure handling.

A powerful Electronic Control Unit (ECU) triggers the CVSA system. Found at the heart of the CVSA unit, the ECU is designed to exploit the full potential of the electro-hydraulic valving system by processing input data sent by a group of sensors placed at key locations on the vehicle. Additional input signals are provided from other modules sharing the CAN (Controller Area Network) bus. The CVSA utilizes control software that processes the sensor information regarding steering wheel angle, vehicle speed, brake pressure and other chassis control information and sends signals that independently adjust the damping level of each shock absorber valve. CVSA dampers allow a large separation between maximum and minimum damping levels and adjust instantaneously to ensure the optimum in ride comfort and firm, safe vehicle control.

The first generation of CVSA went into production in 2003 as standard equipment on the Volvo R-line and as an option on the S80, V70, and S60. CVSA shocks also have been offered on several models manufactured by Audi, BMW, Mercedes-Benz, Volvo, and Volkswagen. Ford has also used CVSA technology on its S-Max, Galaxy and Mondeo.

## Service and diagnosis

According to Joe Bacarella, manager, product training and Technical Resource Centers for Tenneco, the company's electronic dampers are robust and suffer few premature failures. "In the unlikely event that they should fail, this would most likely be due to age and mileage," he says.

Some of the service and inspection procedures you know so well from dealing with conventional dampers apply to these electronically controlled units. The traditional "bounce" test can be used to check for noise concerns, binding damper assemblies and even to monitor for a change in switch states on some makes. Active fluid leakage might also be a cause for replacing the damper assembly.

The troubleshooting mistakes that many are making, though, center on the testing of the electronics. And it starts with a check for related Diagnostic Trouble Codes. The DTCs related to the ride control system are not recorded in the Engine Control Module. These codes

are logged in a dedicated control module or the Body Control Module, requiring a scan tool capable of accessing these ECUs. Relying on the data provided by a generic tool is causing many techs to miss needed information.

"Techs need to be aware that replacing these units will 'turn out the light' when the code specifically indicates an issue with a damper, or a solenoid that is integrated into the damper," Bacarella cautions. "Many techs are not as aware of diagnosing BCM issues as they are with ECMs. They've been taught how to read and resolve engine-related DTCs but unfortunately some of these classes don't explain that there are other codes to be found."

And making the same mistake is easy to avoid. Most professional grade scan tools offer enhanced scan modes for families of manufacturers – domestic, Asian and European. Tools made in the last decade or so with enhanced capabilities also allow the user to perform an "all system scan," a poll of all accessible modules on the network, and provide a list of any diagnostic codes stored and the module that logged them. This is a good practice to follow any time you connect to the vehicle's Diagnostic Link Connector.

## Apply a solid process

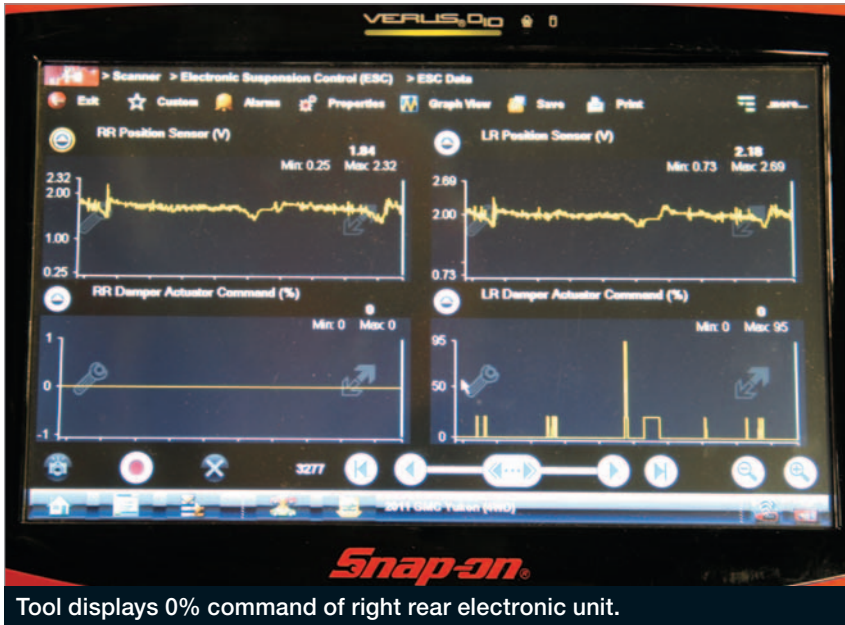
Once you have the code(s) retrieved, avoid another common troubleshooting mistake – assuming the cause of the



The traditional "bounce" or "jounce" test can be used to check for noise, binding of components and, in some cases, a change in switch states.



Scan tool shows proper operation of front dampers.



Tool displays 0% command of right rear electronic unit.

code simply by its description. “(Some) often confuse a diagnostic code for a leveling issue with a damping issue,” observes Bacarella. “As an example, Volvo Suspension Module codes SUM-

E000 through SUM-0337 are all related to the electronic suspension. However, the majority of these codes are related to issues with the sensors.” And replacing an expensive electronic damper isn’t

going to turn the light off for those codes!

When dealing with any electronic system, it is a best practice to first retrieve all related DTCs. The next step is to take the time to read up on the individual code’s enabling criteria and the conditions required for the code to be recorded by the governing ECU. This may also require some reading up on the system’s theory of operation if you’re new to working on these intelligent suspensions. Once you have a basic understanding of how the integrated sensors and components function together, you can begin laying out your test procedures to isolate the cause of the code(s).

Be sure to check for any related Technical Service Bulletins. These are, after all, electronic systems controlled by a computer, and sometimes all that is needed to correct the DTCs and restore proper operation is a reprogramming of the controlling ECU or a recalibration of an input sensor.

Of course, if you are really new to electronic suspension work, seek out training. Tenneco’s Bacarella leads the effort related to Monroe products. Options range from live classroom sessions to technical forums. To begin your quest for knowledge, start with the “Resource Center” link at [www.monroe.com](http://www.monroe.com) or visit the “TennecoInc” YouTube channel.

### Install and options

Removal and installation of electronic suspension dampers is relatively straightforward and similar to replacing a conventional unit. Check the model-specific procedure in your service information system, as some components (input sensors, for example) may require an initialization or relearn procedure.



Checking electrical resistance on old unit and new.



Note connectors for rear unit. There is a different pigtail configuration for the front units.

What about those customers who have older cars but can't afford to replace these often expensive units when needed? Tenneco offers Monroe kits designed to replace these units with conventional assemblies.

Bacarella offers some advice to consider before recommending this option: "Most of these kits are designed to replace the dampers when they are hydraulically or electronically bad. However, they are not designed to correct an issue with a bad sensor or air compressor. Some technicians tend to install these kits whenever there are any codes related to the electronic suspension system. Since

many of the electronic suspension sensors are integrated into other systems, they require that the electronic control system remain functional. Consequently, installation of the kit does not always take care of any suspension-related DTC."

Bacarella adds, "Since the cost of replacing electronic dampers on an older vehicle is sometimes cost prohibitive, we offer non-electronic options in conversion kit form for many applications. These kits often include the necessary components or instructions required to keep the electronic damper warning lights off; in rare cases, bypassing the ECU monitors is not an option."



Removing rear unit. Ensure axle is properly supported before removing upper and lower mounting bolts.




Installation completed. Before driving, ensure air compressor has inflated the shock's air boot.



Tenneco offers a variety of Monroe kits for conversion of OE electronic units to conventional assemblies.

The electronic ride control service market is yet another potential revenue source for your shop, but as is the case with any relatively new technology, success is dependent on education and proper tooling. Perform a proper diagnosis, install a quality product, and add to your bottom line!

## TENNECO Technical Resource Center

Call the Tenneco Technical Resource Center for the product support you need to get the job done. Available Monday through Friday from 8:30 a.m. to 5:30 p.m. EST, the company's ASE-certified representatives are available to answer your product questions and provide technical assistance. 



Pete Meier is the Director of Training for the UBM-Connect Automotive Group, which publishes *Motor Age*. He is an ASE certified Master Technician and sponsoring member of iATN. He has over 35 years of practical experience as a technician and educator.

 Email Pete at [pmeier@advanstar.com](mailto:pmeier@advanstar.com)



# IT'S IN OUR NAME

# MONROE

SHOCKS & STRUTS



## Specifically Engineered for Your Vehicle Nameplate

Created for European, Asian and North American vehicles, every Quick-Strut® component is designed, manufactured and assembled by Monroe® to deliver OE-quality, application-engineered assemblies – not some one-size-fits-all, retrofit replacement.



[monroe.com](http://monroe.com)

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# ANATOMY OF A QUALITY STRUT ASSEMBLY

Introduced in 2003, Monroe® Quick-Strut® assemblies had an immediate impact on the strut replacement category, helping to revolutionize the economics of what had traditionally been a time- and labor-intensive service process.

The proven benefits of the first complete, ready-to-install strut assembly made this Monroe innovation exceptionally popular among repair professionals. Perhaps not surprising is the fact that this popularity attracted the attention of other suppliers, some of whose own strut assemblies look similar to genuine Monroe Quick-Strut units but might not offer the same quality and performance you need and expect.

## One customer. One chance.

Because service providers often have just one chance to perform a strut replacement on a given vehicle, it's important to do the

job right the first time. This means understanding the risks you could be taking by selecting a product that might not have been engineered and manufactured with the precision, professionalism and high-quality materials

you have come to expect from an industry leading product.

Examine the details over the next few pages to learn more about the critical advantages built into the industry's premier strut assemblies.



**MONROE**  
**QUICK-STRUT**  
REPLACEMENT ASSEMBLY

## PRECISION ENGINEERED, ASSEMBLED, FIT CHECKED & TESTED

Vital to customer satisfaction? Yes.

A repair resulting in improper ride height and/or a ride that is either too harsh or too soft could trigger an expensive comeback and possibly lead to a lost customer. Monroe Quick-Strut assemblies have been tested on the corresponding vehicle model to verify that they help restore proper ride height and OE-style ride and handling.

## PREMIUM OE-STYLE UPPER STRUT MOUNT & BEARING PLATE

Vital to customer satisfaction? Yes.

Material strength is critical in any suspension component. The robust materials and design of the Monroe upper mount, as well as the SAE-grade hardware, help ensure exceptional strength, security and safety.

The upper mount and bearing plate are also key to restoring “like-new” steering precision and preventing NVH concerns, “memory steer” and other issues that could lead to an unhappy customer. Tenneco’s precise quality standards result in parts you can count on.



## PREMIUM UPPER SPRING SEAT

Vital to customer satisfaction? Yes.

A lower quality spring seat could increase the chances of steering complaints, unwanted NVH and other issues. It would be easy to substitute a lower quality, less expensive spring seat, but that’s not in the best interests of your customers or your business.



## APPLICATION-ENGINEERED COIL SPRING FEATURING U.S. GRADE STEEL

Vital to customer satisfaction? Yes.

Using a substandard coil spring or a spring featuring the wrong design can lead to a variety of ride and handling issues, including increased noise and a change in vehicle ride height in certain situations. Low quality spring steel might be more likely to corrode and/or break under certain conditions.

The springs used in every Monroe Quick-Strut assembly are precisely designed and calibrated for each vehicle model. In many cases, for example, Monroe Quick-Strut assemblies are equipped with side-load, or “banana,” springs to match the OE technology and help ensure original vehicle ride performance.



## USA QUALITY

Vital to customer satisfaction? Yes.

Your customers deserve to know where the products you install on their vehicles were designed and assembled. Monroe Quick-Strut assemblies are assembled in Tenneco’s North America Aftermarket ride control plant

in Paragould, Ark. In addition, a vast majority of Monroe shocks and struts sold in North America – including those struts featured in Quick-Strut assemblies – are manufactured in the Paragould facility. In fact, in 2015 alone the Paragould facility produced approximately 18 million replacement ride control units.

## PREMIUM BOOT & BUMPER KIT

Vital to customer satisfaction? Yes.

No part within a strut assembly should be an afterthought – each component should be specified, manufactured and assembled to strict quality standards. This includes the dust boot and bumper, which play important roles in preventing premature wear and damage to the strut.

Many of these parts might look alike, but there can be significant differences in performance and wear characteristics based on material formulation and manufacturing methods. As a service provider, you don't have time to check these parts in order to protect your customers and your business. By choosing a Monroe Quick-Strut assembly, you can be certain Tenneco has done that for you.

## PREMIUM STRUT TECHNOLOGY

Vital to customer satisfaction? Yes.

What do you really know about the quality and performance characteristics of the strut featured in any strut assembly? If you choose Monroe Quick-Strut assemblies, you can be certain the strut was engineered and built specifically for the vehicle you are repairing, with highly advanced, application-specific valving tuned and tested to provide OE-style ride and handling.

For European, Asian and North American



## A WARRANTY YOU CAN COUNT ON\*

Vital to customer satisfaction? Yes.

Your reputation is invaluable – it is your business' most precious asset. And so, when a customer reports a problem with any component you have installed, your

reputation is on the line. By choosing a Monroe Quick-Strut assembly, you are protected by a limited lifetime warranty from a leading global ride control manufacturer. Will another supplier step up in the same way to protect your good name?

passenger cars, the premium strut within a Monroe Quick-Strut assembly will feature Tenneco's OE-style, application-specific Velocity Proportional Valving Technology. This velocity-tuned valving automatically adjusts the strut control as wheel speed changes to absorb irregular road impact.

For light trucks and SUVs, which have higher centers of gravity, the premium Monroe strut will feature ASD (Acceleration Sensitive Damping) Technology that senses road impacts within 12 milliseconds to absorb harshness when needed for improved control.



### UPPER & LOWER SPRING ISOLATORS

**Vital to customer satisfaction? Yes.**

These components prevent metal-to-metal contact and related wear and noise complaints. Does your strut assembly supplier use only premium materials and designs that help ensure proper performance and durability? If you choose Monroe Quick-Strut assemblies, the answer is "yes."

# Safe & Sound<sup>®</sup>

## GUARANTEE

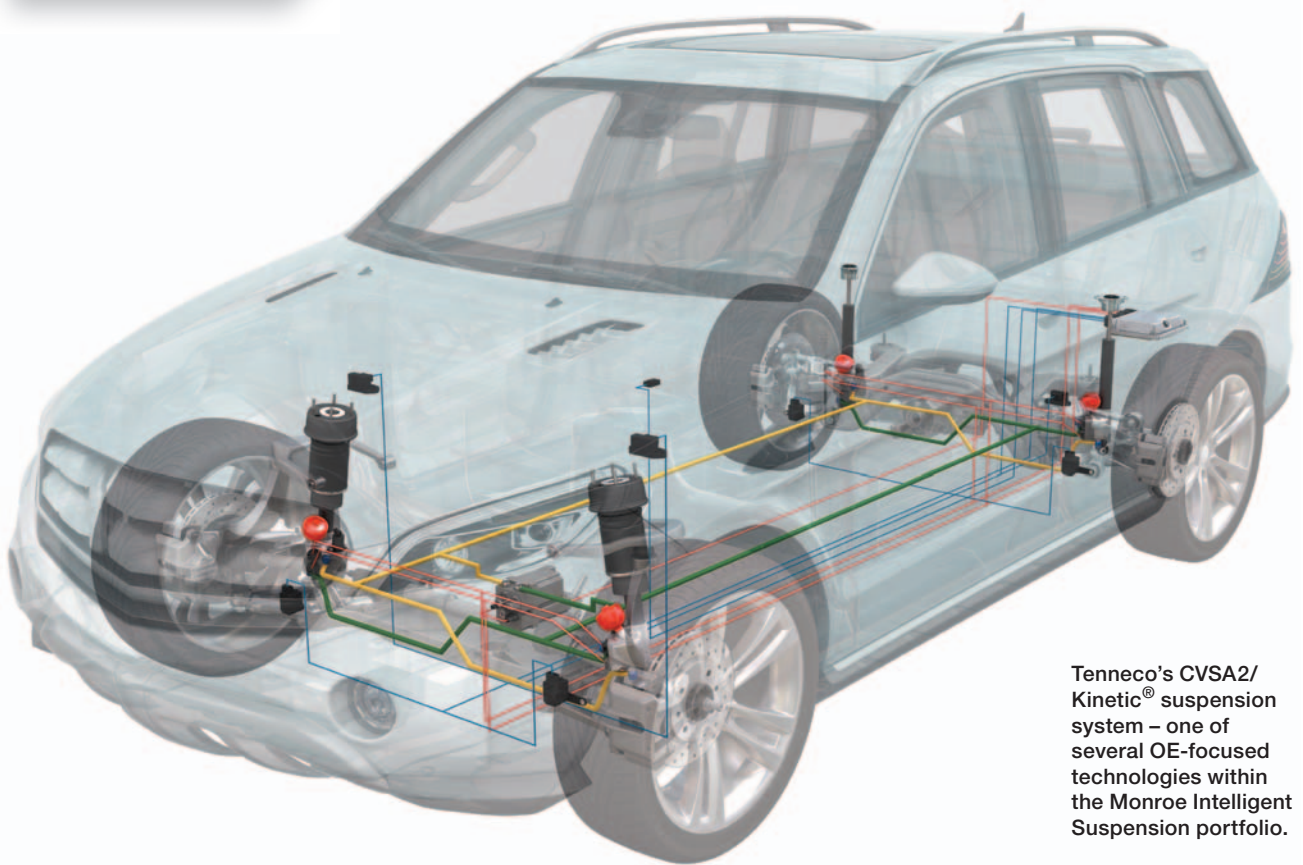
### 90 DAYS CASH-BACK OFFER\*

**Vital to customer satisfaction? Yes.**

Because of the comparatively high cost of strut replacement, some consumers are hesitant to say "yes." Will they really notice a positive difference in ride and handling performance? One way to build customer confidence is to offer a cash-back satisfaction guarantee.

By choosing a Monroe Quick-Strut assembly, your customers can enjoy the benefits of the Tenneco Safe & Sound<sup>®</sup> Guarantee. If for any reason a Monroe Quick-Strut assembly doesn't live up to the customer's expectations within the first 90 days, replace the product and Tenneco will refund the original product's purchase price (less any discounts and/or rebates), plus labor (up to \$50 per axle).

\*Restrictions Apply. Visit [monroe.com](http://monroe.com) for additional details and information on Monroe's Limited Lifetime Warranty and the Tenneco Safe & Sound<sup>®</sup> Guarantee.



Tenneco's CVSA2/  
Kinetic<sup>®</sup> suspension  
system – one of  
several OE-focused  
technologies within  
the Monroe Intelligent  
Suspension portfolio.

# THE FUTURE OF RIDE CONTROL

TECHNICIAN'S GUIDE TO TODAY'S AND TOMORROW'S MOST ADVANCED OE SYSTEMS

BY TRACY MARTIN | CONTRIBUTING EDITOR

**T**enneco's Monroe<sup>®</sup> Shocks and Struts brand is celebrating its 100th Anniversary. Monroe was established in 1916 in Monroe, Mich., and initially focused on the development and production of tire pumps – a much-needed tool in an era of unpaved roads and comparatively few repair shops.

But the brand's future – and in many respects the future of automotive suspension technology – was transformed in 1926 with the invention of the Monroe Shock Eliminator. From

there, Tenneco and the Monroe brand have achieved recognition as one of the world's largest manufacturers of suspension components. Today, Tenneco operates 15 world-class engineering centers across five continents and serves more than 25 original equipment manufacturers, including Ford, General Motors, Fiat Chrysler, Honda, Toyota, Volkswagen, BMW and Volvo.

Not surprisingly, the company also is on the leading edge of highly advanced electronic ride control and suspension technologies used in

many current vehicle applications and poised for widespread adoption in future platforms.

Early suspension dampers consisted of tubes with various sized holes drilled in them to direct the flow of oil to control suspension movement. A major disadvantage of these designs, however, was their passive nature – they could not react to variables within their operating environment. With the prolific use of high-speed microprocessor electronics, these passive systems have undergone radical transformations. A perfect

# IT'S IN OUR NAME

# MONROE

SHOCKS & STRUTS



## Bringing Innovative Technology to the Aftermarket

Each new generation of OE ride control technology will eventually become an aftermarket service opportunity. When it does, Monroe will be there to provide the world-class products and support you need. Because as a premier global OE manufacturer, we've helped establish a standard of ride and handling excellence at every stage of a vehicle's life.



[monroe.com](http://monroe.com)

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## INTELLIGENT SUSPENSION

example is Tenneco's original equipment (OE) focused Monroe Intelligent Suspension portfolio.

### Passive vs. active suspension

The concept of passive suspension is simple: A suspension engineer selects a design for a vehicle based on the vehicle's sprung weight, the unsprung weight of the wheel and suspension assembly, anticipated driving behavior, and average predictable road conditions the vehicle will encounter. All of these factors determine spring rate and shock absorber damping characteristics. But there are several variables that can't be anticipated, including actual driving style and driver habits, condi-

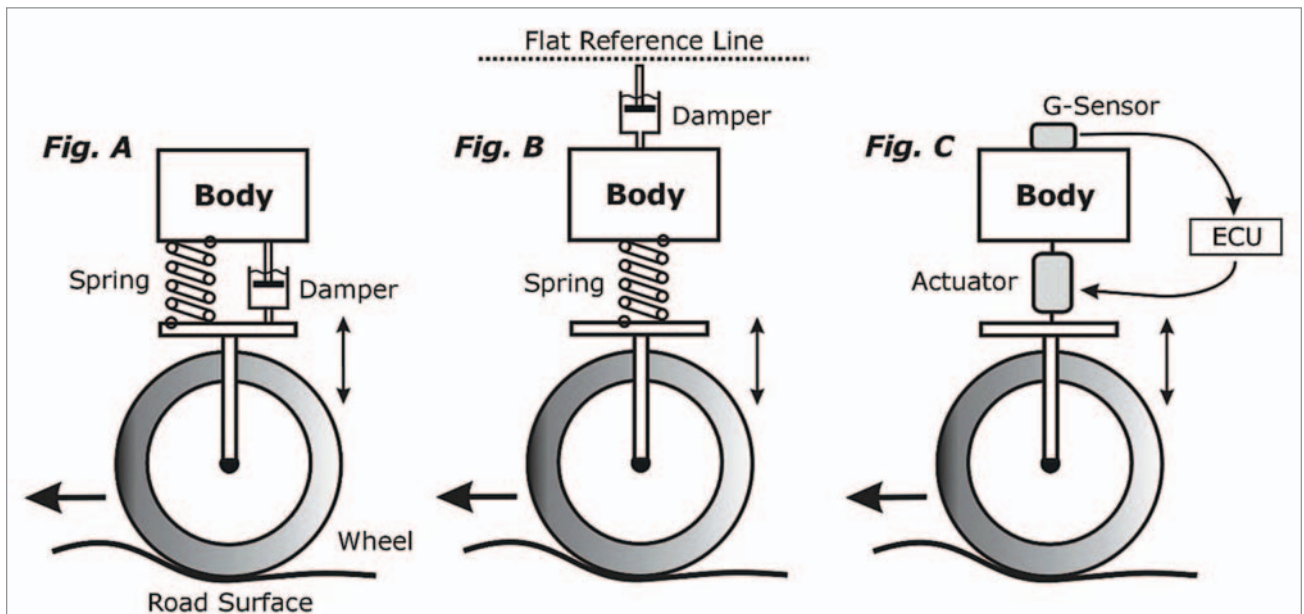
tion and types of roads on which the vehicle will operate, and the amount of weight it will carry. The term "passive" simply means that once the design of suspension components has been selected and installed on a vehicle, it is static and doesn't change.

### Turning to the future

Monroe Intelligent Suspension technologies offer active and adaptive OE suspension designs that control vertical movement of the wheel assembly relative to the vehicle's body. These advanced OE suspension systems utilize sensors, an onboard computer and actuators that control suspension damping and body roll or movement. They can continuously adjust to changing road surfaces and driving condi-

tions, giving the driver a more dynamic, controlled, comfortable and, above all, more enjoyable driving experience.

One drawback of earlier passive suspension designs is that they use only vertical acceleration of tires and wheel assemblies to determine how the suspension reacts. Monroe Intelligent Suspension technologies, by contrast, prioritize vehicle handling as it adapts to changes in road surfaces, thereby assisting drivers by intuitively adjusting to changing conditions — almost like a sixth sense. By changing the character of a vehicle's suspension performance in response to varying road conditions, Monroe Intelligent Suspension technologies offer superior handling and road feel, which can provide the



**Figure A** represents a conventional passive suspension system where road surface transmits bump energy to the spring and damping unit and these components react to minimize body movement. **Figure B** illustrates the principles of active suspension systems. The vertical movement of a vehicle's wheels relative to its body is referenced by an imaginary flat line. The suspension system reacts to this reference point instead of the surface of the road. **Figure C** shows an additional operational component of an active suspension system. The imaginary reference line from Figure B is calculated based on values provided by an acceleration g-sensor located on a vehicle's body. The ECU controls the actuator to keep the g-sensor in a flat plain, and since an ECU can sense and react to changes in the road's surface at 100 times per second, the driver feels virtually no body movement, even though the road surface might be uneven.



# MONROE INTELLIGENT SUSPENSION SYSTEMS

## Dual-mode selective damping

Dual Mode Damper technology provides an enhanced experience in sporty compact cars. A button on the dashboard allows drivers to choose how their suspension will interact with the driving environment. Four electronically controlled rebound dampers connect to a simple control unit, which switches the dampers to toggle between soft and firm rebound settings. The system also provides drivers with the option to switch from a default comfortable ride setting for daily traffic, and a more aggressive, track-like performance setting.

## DRiV™

This system for compact and medium car segments uses an ECU located in each shock to control rebound damping based on forward and lateral acceleration. The DRiV system offers 75 percent of the performance, at 50 percent of the cost, of semi-active suspension systems.

## CVSA

The Continuously Variable Semi-Active Suspension (CVSA) system continuously adjusts damping levels according to road conditions and vehicle dynamics without the need to compromise comfort, performance or safety. Tenneco's first CVSA technology used an external valve to control damping. However, subsequent development of newer CVSA technology relocated the valve inside the damper. In addition, for even higher levels of performance and comfort, two-valve CVSA technology is available, with independent electro-hydraulic valves controlling both rebound and compression damping, providing increased suspension tuning range and a higher level of comfort, performance and safety in changing and demanding road conditions.

## CVSAe

CVSAe has proven itself a commanding product for 10 years with steady performance on 39 different vehicle models. With an evolved damper and hydraulic valve design, CVSAe is leading the automotive marketplace in suspension technology. This continuously variable,

semi-active suspension system senses road and driving conditions to adjust



dampers in each shock absorber in real time for a more comfortable and controlled driving experience. Each shock is connected to a central ECU that reads sensor inputs monitoring wheel assembly acceleration, body displacement and steering angle. The ECU can change rebound damping settings every 10 milliseconds to deliver optimal ride comfort and vehicle control. The dampers are based on a triple-tube design and use one externally mounted active hydraulic valve to control damping.

## CVSA2

The innovative and cutting-edge CVSA2 is the most recent semi-active damper technology from Tenneco. This lightweight system features two independent, externally mounted electro-hydraulic valves that control rebound and compression damping independently and provide increased tuning range to achieve more advanced levels of comfort and control.

This semi-active suspension system uses four electronically controlled shocks connected to a central ECU. Each shock has two electronic servo valves to control damping. The two-valve CVSA2 actuator is designed around a lightweight aluminum mono-tube damper that reduces weight and, unlike twin-tube designs, allows the unit to be mounted upside down when necessary.



## CVSA2/Kinetic®

The refined CVSA2/Kinetic® suspension system delivers the highest levels of vehicle occupant comfort in combination with



superb vehicle handling performance. This technology provides excellent body roll control, traction and wheel grip, making it ideal for sports cars, premium passenger cars and off-road SUVs alike. This sensitive suspension system effectively replaces the functionality of both front and rear mechanical anti-roll bars. The sophisticated roll-control system connects all of the CVSA2 dampers via hydraulic lines. Thus, body roll stiffness

is continuously progressive and can be fine-tuned and with an APMU installed, adjusted by drivers as desired for optimal performance and vehicle handling.

## ACOCAR®

ACOCAR is Tenneco's premier fully active Intelligent Suspension system. It represents an expansion of the responsive CVSA2 Kinetic concept, with the additional engineered component of active power packs installed on each corner of a vehicle to provide the ultimate driving experience.

ACOCAR is a fully active suspension that features active control of wheel assemblies and body motion to deliver superlative ride comfort, control and safety. With an almost magic "flying carpet"-style control of wheel and body motions, a vehicle's body can be fully maintained in a flat plain orientation that improves tire-to-road contact, even on bumpy roads and traveling through corners while still providing superior handling, safety and comfort.



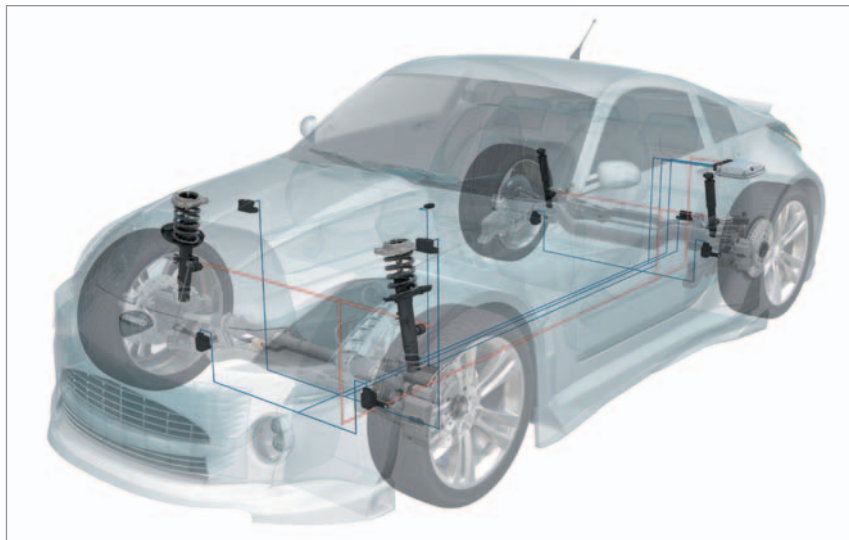
driver with extra confidence in challenging conditions.

In general, there are three types of electronically controlled suspension systems: selective, semi-active and fully active. Selective suspension allows a driver to select damping parameters for a vehicle's shock absorbers. With the press of a button, drivers can choose "comfort" or "sport" settings, depending on their anticipated driving environment and driving style. Semi-active suspension systems use electronically adjusted dampers controlled by an ECU. The ECU receives inputs regarding vertical wheel acceleration, body displacement, vehicle speed and steering angle to adjust damper settings in real-time. Semi-active suspension systems continuously adjust damping levels based on road conditions and vehicle dynamics to deliver comfort and control without sacrificing safety. Fully active suspension offers all of the features of semi-active systems with additional technology that replaces conventional springs with hydraulic actuators controlled by the system's ECU. In operation, the system controls body roll, pitch and heave while maintaining the chassis in a flat plain during acceleration, braking and cornering. Monroe Intelligent Suspension technologies use variations of these approaches.

### Leading the drive for intelligent suspension

A vehicle's suspension system has perhaps the greatest influence on a driver's ride experience, as well as providing an important opportunity for vehicle manufacturers to fulfill customer needs for a more comfortable, enjoyable and safe driving experience. Monroe Intelligent Suspension systems allow drivers to control suspension modes to make driving more comfortable or sporty according to their individual tastes. These state-of-the-art suspension technologies offer drivers the potential to enhance their individual driving experience when compared with conventional damper suspension systems, which only have one setting and therefore must strike a compromise between comfort and control.

A recent independent consumer



**Tenneco's CVSAe technology, also part of the Monroe Intelligent Suspension portfolio, is a continuously variable, semi-active suspension system that senses road and driving conditions to adjust the corresponding triple-tube, electronic dampers in real time. The system's ECU can change rebound damping every 10 milliseconds.**

clinic surveyed a group of 155 drivers from different vehicle segments that included compact class, upper mid-range vehicles and SUVs to assess the overall driving experience with passive and semi-active suspension systems. More than 94 percent of SUV drivers rated the overall driving experience of those vehicles equipped with semi-active suspension systems as "very good" or "excellent." Similarly, in the compact car segment, 86 percent of all drivers rated their overall driving experience as "very good" or "excellent," as did 88 percent of drivers of upper-middle class vehicles. It is clear from these studies that customers want comfort, control, flexibility and safety designed into the automobiles they intend to purchase in the near future.

In on-road testing, also performed by an independent testing institute, drivers rated intelligent suspension systems highly in reaction to improved stability during lane changes, strongly reduced body-roll oscillations during obstacle avoidance maneuvers and improved wheel-to-road contact on wet and broken road surfaces. In fact, during double lane-change tests utilizing a compact car, steering angle correction was reduced 15 percent and side-slip angle was reduced 37 percent. The reduction in body movement

was found to bring greater stability, which helps increase comfort and the feeling of safety.

Tenneco's Monroe Intelligent Suspension platform provides technologies customers can experience, feel and recognize. As these OE-based technologies eventually make their way into your service bay, you will have the opportunity to restore the "like-new" driving experience preferred by so many consumers.

"We will provide the comprehensive technical training and support – combined with quality Monroe replacement components – needed to address these service opportunities," says Jeff Koviak, vice president and general manager, North America Aftermarket, Tenneco. "That's the advantage of working with a manufacturer that is a leader both in the OE and replacement markets." *TM*



Tracy Martin has covered the power sports industries since 1998. He is also the author of six Motorbooks Workshop Series books published by the Quarto Publishing Group and is a regular contributor for *Motor Age*.

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# RIDE CONTROL TECH TALK

JOE BACARELLA, MANAGER, PRODUCT TRAINING AND TECHNICAL RESOURCE CENTERS, NORTH AMERICA AFTERMARKET, TENNECO, ANSWERS YOUR RIDE CONTROL QUESTIONS

**L**ike many technicians, I was trained to inspect the suspension system, particularly the shock absorbers, by performing a “bounce” test. Is this a relevant test and if so, how should it be properly performed and what should the technician be observing?

**Bacarella:** Due to the relatively low velocity generated during a “bounce,” or “jounce,” test, it is not an effective way to determine the amount of control a shock or strut is capable of producing. Jouncing the four corners of a vehicle is, however, a good way to try to pinpoint noises originating from suspension components. It also can help a tech locate binding suspension parts and can be used on some electronic suspensions to identify changes in damping characteristics/control under different system settings.

*When servicing a MacPherson strut assembly, it is still common practice to disassemble the unit and replace the damper alone. Which other components should be serviced at the same time and why?*

**Bacarella:** Due to the labor and special tools involved in disassembling a strut assembly, it makes sense to inspect and replace any related, worn components. Starting at the top of the assembly is the upper mounting plate, which is designed to isolate road noise and vibration. If it is worn, it might enable noise to be transmitted into the passenger compartment. Closely inspect the rubber section of the mount for wear, cracks and/or signs of excessive movement. Also inspect the metal part of the mount for excessive rust or damaged mounting studs.

A bearing is typically located directly below the mount. The bearing is designed to facilitate smooth steering motion and prevent “memory steer.” If it is damaged, binding or feels

“gritty,” it should be replaced. Next, inspect the upper spring seat and isolators. Corrosion and deterioration of the rubber are the major concerns with these items. The coil spring should be checked for significant nicks, kinks and corrosion.

It also is a good idea to check vehicle ride height prior to removing the assembly. Keep in mind that on some lighter vehicles, dynamic ride height issues are more prominent than static ride height issues. A worn compression bumper or boot assembly is a good indicator of a dynamic spring concern. This raises one final issue: If the jounce bumper and boot assembly is excessively worn, cracked or missing, it should be replaced. These items protect the new strut, mount and spring from damage that can result when the suspension bottoms out.

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**“On some lighter vehicles, dynamic ride height issues are more prominent than static ride height issues.”**

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*From time to time I have noticed oil stains on the bodies of shock absorbers. Some sources tell us that a little staining is normal, while others say any sign of oil loss is reason for replacement. Which is correct?*

**Bacarella:** If the shocks or struts are functioning correctly, a light oil film covering the top half of the shock body does not usually warrant replacement. This film results when oil used to lubricate the rod gets wiped from the rod as it travels into the shock or strut. Tenneco adds an extra amount of oil to shocks and struts during manufacturing to compensate for this slight loss.



On the other hand, fluid actively leaking down the side of a ride control unit indicates a worn or damaged seal, and the unit should be replaced.

*It is not uncommon to encounter a worn or broken damper mounting bushing. What is the proper service procedure for this instance if the damper appears otherwise serviceable?*

**Bacarella:** In many cases, new cushions for stem mounts or new bushings for loop mounts are available to replace worn items. To improve durability, many modern dampers feature non-serviceable, high-compression, pressed-in sleeves or bonded assemblies. In these cases a worn bushing would require damper replacement. It is good practice to identify the root cause of bushing failure prior to replacement. Often, a missing suspension stop (jounce bumper) or weak springs can cause premature bushing failure. Other potential causes include shock absorbers that are the incorrect length for the application and contamination of the bushing by engine oil or other chemical. **ZZ**

# VISIBILITY... AWARENESS... #SHOCKMOBILE!

AN INSIDE LOOK AT ONE OF RIDE CONTROL'S MOST EYE-CATCHING GROWTH TOOLS

BY **CHELSEA FREY** | CONTRIBUTING EDITOR



Day or night, the Shockmobiles are impossible to miss.

**YOU** might not know it, but two 25-foot-long, 12-foot-high, glow-in-the-dark, rolling “shock absorbers” are supporting the growth of your ride control business.

Fully embracing all meanings of the word “visibility,” Tenneco’s Monroe® brand is communicating the importance of replacing worn shock absorbers and struts by way of two of the industry’s most eye-catching marketing tools – the Monroe Shockmobiles.

Each Shockmobile is fashioned after a premium Monroe OESpectrum® shock absorber. Massive fiberglass



A Shockmobile stopped at Barry’s Auto Center in Union, N.J. Technician Joe Jones (center) commented, “The problem is that people don’t know that they need to inspect shocks at 50,000 miles.” The Monroe mobile tour is working to change that.



Employees at Hovis Auto Truck & Supply in Hermitage, Pa., check out the Shockmobile.

tubes are fitted to custom-built chassis and towed by specially equipped late-model crossover vehicles. Day or night, the Shockmobiles are impossible to miss – their translucent tubes are illuminated by internal LED lighting that highlights the Monroe brand’s reminder to “Inspect Your Shocks at 50,000 Miles.”

**Consumer awareness**

With visibility comes awareness, and Monroe’s striking, unconventional Shockmobiles are certainly turning heads and churning curiosity of passersby on their tours across the U.S. and Canada.

At Barry’s Auto Center in Union, N.J., owner Barry Hunt and technician Joe Jones spoke to the importance of checking shocks, especially in their pot hole-ridden state. “The problem is that people don’t know that they need



Employees at Buy Wise Auto Parts in Vauxhall, N.J., gather around the Shockmobile.

to replace worn shocks. In fact, New Jersey vehicle owners should probably check theirs at 30,000 miles,” Jones stated.

“Another problem is that shocks go out gradually, and consumers can’t see them,” Hunt added. Since shocks and struts are out of plain sight, some

consumers might not even know what one looks like. For those who are unfamiliar, the presence alone of the Shockmobile encourages questions. Whether consumers ask the Monroe brand’s “brand ambassadors” and drivers about the Shockmobile and what it represents and/or check out



At Hovis Auto & Truck Supply in Grove City, Pa., attendees at Hovis's Technical Training Center took a break to pose in front of the Shockmobile.



The Shockmobiles are stocked with Monroe T-shirts, flying discs and totes to give to customers and consumers.

Monroe on social media, the Shockmobile prompts them to seek more information – which is always a good thing.

### Maximizing visibility

Since the launch of the mobile tour, the two Shockmobiles have collectively visited 100 cities, more than 200 customer locations and 100 consumer events, gaining millions of impressions on the streets and online. Along with visiting national landmarks such as the Grand Canyon and the St. Louis Gateway Arch, the Shockmobiles make appearances in July Fourth parades, Major League Baseball games, county fairs, customer trade shows and other events to

reach as many people as possible.

The highly visual—and photogenic—aspect of the Shockmobiles allows for greater visibility of the brand through social media. Who wouldn't want to take a picture next to a giant shock—and better yet, post it to social media to share with friends? To encourage passersby to engage online, the summer tour vehicles advertise Monroe's social media sweepstakes and corresponding hashtags. Monroe posts pictures of the Shockmobiles to social media to share the journey with its followers, often tagging the locations. By sharing each stop along the way online, Monroe reaches countless more consumers.



"Monroe is the McDonald's of the auto industry — they have fantastic marketing," said Jim Calabro of Buy Wise Auto Parts.

### Shop stops

The mobile tour also has been advantageous to Monroe customers; the Shockmobiles keep the brand top-of-mind for consumers, which benefits every business that carries and installs Monroe products. Due to the success of the first summer tour and the overwhelming demand for more customer visits, Monroe christened the second Shockmobile in 2015. As I witnessed on our two-day tour, auto parts suppliers are excited to welcome the Shockmobile to their front doors and are eager to have it stop by again.

Doubling the fleet of the mobile tour also helped Tenneco to prepare for the celebration of the Monroe brand's 100th Anniversary. The anniversary mobile tour actually kicked off with a three-week round trip to AAPEX in Las Vegas last November. The Shockmobiles donned the trade-specific campaign — "Made for the road ahead" — and the Monroe 100th Anniversary logo.



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# 2016 Monroe Promotion Schedule



**February 22 – May 31, 2016**



Consumers can earn up to a \$100 Visa® Prepaid Card\* for the purchase of Monroe and Rancho ride control products this spring.

CONSUMER

**September 1 – October 31, 2016**



It's a ghostly good time for motorists to take advantage of this consumer offer: Buy 4 for the price of 3!

CONSUMER

**June 1 – August 31, 2016**



Counterpeople can earn \$10 per pair of every qualifying Monroe Quick-Strut® replacement assemblies sold — collecting rewards on a Visa® Prepaid Card\* that's delivered at the end of the scorecard program.

COUNTERPERSON

**September 1 – October 31, 2016**



Service technicians can quickly earn a \$30 VISA® Prepaid Card\* for each pair of qualifying Monroe Quick-Strut® replacement assemblies installed during this scorecard program.

SERVICE TECHNICIAN



**January 1 – August 31, 2016**



Have a customer on the fence about a purchase? Use one of these valuable preferred customer coupons to help close the sale.

**February 22 – May 31, 2016**



Members can earn a chance to win \$100 daily by logging in to [www.Expert-Plus.com](http://www.Expert-Plus.com) and answering a brief multiple-choice question.

MEMBER TECHNICIANS

**April 1 – May 30, 2016**



Rev up your business by installing combinations of Monroe and Rancho ride control products and Walker and DynoMax emissions control products during this fun scorecard promotion.

MEMBER TECHNICIANS

**September 1 – October 31, 2016**



Earn exciting merchandise by installing qualifying combinations of Monroe, Rancho, Walker and DynoMax products during this popular fall scorecard promotion.

MEMBER TECHNICIANS

**WALKER** EMISSIONS CONTROL **MONROE** SHOCKS & STRUTS

**Expert Plus 2016**

**ENROLL \$100 TODAY!**

**100 YEARS**

**MADE FOR THE ROAD AHEAD.**

**Often imitated, never duplicated!**

- **Drive Consumer Traffic to Your Door** with attention-catching offers and advertising
- **Get Rewarded for Sales** with useful premiums and exclusive incentives
- **Expert Plus Learning Center Online Training** Take the online tests to earn Training Certificates

Contact your Monroe or Walker representative for details

[www.expert-plus.com](http://www.expert-plus.com)

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**[Driven by innovation and quality]**

CONTINUED FROM PAGE 8

nifying the pinnacle of professionalism and customer support.

(As part of the 100th Anniversary celebration, Tenneco in January presented each member of its North American Sales Force with a Monroe blazer. They were worn with pride throughout the company's 2016 Sales Conference.)

This same sense of pride can be seen in every current Monroe campaign, promotion, training initiative and other program designed to engender customer success. Tenneco's Expert Plus loyalty program each year enrolls thousands of service businesses that proudly specify and install Monroe and Walker products. The hands-on Monroe Ride & Drive training experience attracts thousands of technicians, service writers and others who sense the opportunity to increase sales and better serve their customers. Even Monroe's iconic



This OESpectrum shock absorber is hard to miss as the Shockmobile drives through cities across North America, spreading the word on the importance of inspecting ride control units.

counter stools are symbols of service, value and pride.

"We had a special guest during our 2016 Sales Conference – Rick Meyer, the grandson of Monroe founder August Meyer," says Koviak. "He told us that as far back as he can remember, members of the Monroe team understood the responsibility to be their customers' best

business partner.

"A lot has changed in our industry, but our commitment to customer success has never been stronger. No one will do more to partner with the front-line professionals who drive this industry. When people ask me what makes Monroe, Monroe – that's the answer I give them." *TL*

**[Double your ride control business]**

CONTINUED FROM PAGE 12



recommends it to them. At some point down the road, when they decide to purchase shocks and/or struts, they'll likely come back to the shop that first

gave them the information.

"By educating the customer about the safety and performance value of replacing their shocks and struts, you can potentially boost your financial performance," Johnston says. "If you follow this four-step process you should see your business grow over time."

For more information on the Safety, Service & Value (SSV) program and benefits of implementing a proactive ride control inspection and recommendation program, contact your local Monroe representative or visit [www.monroe.com](http://www.monroe.com). *TL*



Brian Albright is a freelance journalist based in Columbus, Ohio, who has been writing about manufacturing, technology and automotive issues since 1997. He is a regular contributor to *ABRN*, *Aftermarket Business World* and *Motor Age*.

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# TOOLBOX

TOOLS, PARTS AND  
RESOURCES FOR EVERY  
SHOP EVERY DAY

## RIDE CONTROL SOLUTIONS

FINDING THE RIGHT PRODUCT  
FOR ANY CUSTOMER NEED

### MONROE OESPECTRUM®

**Tuned for Exceptional Control**

*For: North American, Asian & European passenger vehicles*

Featuring Tenneco's latest global OE valving technologies specific to each application for added control while reducing harshness experienced on uneven road surfaces.

- Passenger car shocks and struts
- Light-truck shocks
- Monotube shocks (for vehicles originally equipped with monotube units)
- Replacement cartridges
- Electronic dampers (select applications)
- Limited Lifetime Warranty\*
- Safe & Sound® Guarantee 90-Day Cash-Back Offer\*



### MONROE REFLEX®

**Help Reduce Vehicle Roll and Drive**

*For: Larger light trucks, SUVs & other vehicles with high center of gravity*

Deliver enhanced stability by reducing body roll rate in evasive maneuvers or tight turns.

- Monotube shocks (for vehicles originally equipped with monotube units)
- Truck shocks (Acceleration Sensitive Damping Technology)
- Struts (Acceleration Sensitive Damping Technology)
- Limited Lifetime Warranty\*
- Safe & Sound® Guarantee 90-Day Cash-Back Offer\*



### MONROE GAS-MAGNUM®

**Firm Control Without a Harsh Ride**

*For: Mid- to full-size, light-duty work trucks & vans*

Engineered to provide firm control without a harsh ride. Featuring up to two times the fluid capacity of standard 1-inch-bore shocks.

- Light-truck shock absorbers
- Limited Lifetime Warranty\*
- Safe & Sound® Guarantee 90-Day Cash-Back Offer\*



### MONROE QUICK-STRUT® ASSEMBLY

**The First Complete, Ready-to-Install Strut Assembly**

*For: Millions of passenger cars, light trucks & SUVs*

Precision engineered, assembled, fit checked and tested to help restore factory ride height and OE-style vehicle performance.

- Assembled in the U.S.A.
- Application-specific premium strut and spring technology to optimize each vehicle's unique ride and handling characteristics
- Quicker – No need to disassemble existing strut assembly
- Safer – No need to compress coil spring
- Easier – No specialized tools needed
- Limited Lifetime Warranty\*
- Safe & Sound® Guarantee 90-Day Cash-Back Offer\*



\*Restrictions apply. Visit [monroe.com](http://monroe.com) for additional details and information on Monroe's Safe & Sound® Guarantee 90-Day Cash-Back Offer and Limited Lifetime Warranty.

# TOOLBOX

TOOLS, PARTS AND  
RESOURCES FOR EVERY  
SHOP EVERY DAY

## RIDE CONTROL SOLUTIONS

FINDING THE RIGHT PRODUCT  
FOR ANY CUSTOMER NEED

### MONROE MAX-AIR®

#### Air Adjustable Shock Absorbers

*For: Vehicles that occasionally haul heavy loads or tow trailers*

Designed to help vehicle owners maintain proper ride height to match variable load conditions.

- Assist in maintaining ride height with up to 1,000 lbs. of additional weight\*
- Adaptable to most vehicles equipped with automatic leveling systems
- Large-volume air chamber inflates to up to 150 psi
- Packed in pairs along with air line, fittings and air fill kit



### MONROE MAX-LIFT®

#### Gas Charged Lift Supports

*For: Passenger vehicles equipped with and/or needing lift-supported trunks, hoods, hatches, windows, doors, etc.*

Custom-engineered and manufactured to provide smooth operation and increased durability.

- Exact-fit replacement for worn original units
- Universal units for pick-up caps, tool boxes and more
- Premium, nitro-carburized rod helps provide exceptional corrosion resistance and durability



### MONROE LOAD-ADJUSTING SHOCKS

#### Assist in Maintaining Ride Height Under Heavy Loads

*For: Passenger vehicles that periodically carry heavy loads and/or tow trailers*

Adjust rapidly to changing road and weight conditions for enhanced control and uncompromised ride comfort.

- Engineered to handle up to 1,000 lbs. of additional load while assisting in maintaining ride height\*
- Fitted with heavy-gauge, calibrated spring for extra control and comfort
- Ideally suited to light trucks and vans



### MONROE SUSPENSION CONVERSION KITS

#### Electronic & Air-Spring System Replacement

*For: Vehicles originally equipped with air or electronic suspensions*

Money-saving alternative to installation of a replacement factory-style air-ride or electronic suspension system. Converts system to a conventional suspension setup.

- Restores factory ride height and provides stable, comfortable ride
- Kit includes detailed instructions, necessary parts and hardware for a superior fit and trouble-free installation



\*Capacity limited by vehicle suspension, tires and transmission. See vehicle owner's manual for details.

# RANCHO

PERFORMANCE SUSPENSION & SHOCKS

FOLLOW  
THE  
LEADER



**Lifestyle defined since 1955**

PERFORMANCE SUSPENSION SYSTEMS | SHOCKS | rockGEAR™ PRODUCTS



...SINCE 1955

FOLLOW US ON



#RANCHODESTINATIONS

# IT'S IN OUR NAME



## Global Supplier of Ride Control Products

Leading global vehicle manufacturers partner with suppliers that deliver world-class products developed and tested to the highest standards. Our global network of advanced R&D and manufacturing facilities continuously meets the highest standards for product performance, endurance and reliability. OE leadership is part of our DNA...and it's in our name.



[monroe.com](http://monroe.com)

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