Monroe Australia is committed to excellence in customer service. It therefore continues to offer you a service that is unique to Monroe - Monroe’s Technical Helpline. With this facility, technical advice and assistance with any Monroe product is only a phone call away. The Helpline can provide advice and information on vehicle fitment, product range and applications.

If you’ve experienced a problem and have checked the Monroe catalogue to verify the unit corresponds to the correct part number, referred to any footnotes or instructions and still haven’t found a solution then you should ring the Helpline.

The Technical Helpline is just one of the ways Monroe continues to support you and all its customers Australia-wide

Important notes before you call.
To ensure you receive a speedy response please have the following information ready before you call;

- Make/model/year and build date
- Product name
- Product part number on carton
- Part number and date code stamped on product
- Parts package included
- Description of the problem...
How to use this manual

This booklet is designed to be used two ways; first as a training tool and second as a reference manual. We recommend that you first review this booklet from cover to cover.

Too often, customers are not even aware that they need shocks or struts. Or they may not be aware of the product choices and special application shocks that are available. It’s up to you to keep them informed. And it’s also up to you to use the information to assist customers to make informed decisions, as well as helping to increase your store’s shock and strut business.

The market for shocks and struts is growing, with great potential for increased profits on every sale. By using the information in this booklet in conjunction with the current Monroe catalogue, you can effectively contribute to your store’s growth and success, as well as your own.

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What is ride control?
Many things affect vehicles in motion. Weight, weight distribution, speed, road conditions and wind are some of the factors that affect how a car rolls down the highway. Under all these variables, however, the vehicle’s suspension system must continue to provide steering stability with good handling characteristics. And, at the same time, maximise passenger comfort. Steering stability and passenger comfort are what we mean by “good ride control”.

For good ride control, the suspension system – including the shocks, struts and springs – must all be in good condition. Worn suspension components may reduce vehicle stability and passenger comfort. They may also accelerate wear on other suspension system components, including tyres.

If a car’s tyres are wearing unevenly, or small areas of heavy wear at regular intervals around the tyre (called “cupping”) are evident, worn shock absorbers are probably the cause. Cupping is caused by the tyre bouncing on and off the road as it rolls. Worn shocks also increase body roll during cornering. This causes rapid wear on the outer edge of the tyre and affects the over-steer and understeer handling characteristics of the vehicle.

Another cause of tyre wear is incorrect wheel alignment resulting from loose or worn steering suspension components.
Shocks and struts are key components of the suspension system. Replacing worn or inadequate shocks and struts and thoroughly inspecting the entire suspension system will maintain good vehicle ride control, which provides our customer with:
- Improved steering stability and passenger comfort;
- Reduced wear on suspension components and tyres;
- Improved cornering, ride and predictable handling.

Why are shock absorbers important?
Shock absorbers play a vital and often under estimated role in vehicle safety.
They optimise vehicle handling, while providing positive steering response and safe braking.
As the wheels hit bumps in the road, energy is transferred into the springs of a car’s suspension. With worn shock absorbers, this energy causes the springs to oscillate. These oscillations cause the tyres to break their grip on the road, bouncing on and off the road for some time after hitting the initial bump.
Tests have shown that if just one shock absorber is worn, a car may need an extra 2 metres to stop. This could be the difference between stopping safely and crashing.

When braking in an emergency, worn shock absorbers cause the front of the car to nose-dive, transferring weight from the rear of the car to the front. This reduces the rear tyres’ grip on the road, causing them to skid, increasing the braking distance.
At the same time, the front tyres may momentarily break their grip on the road, causing the vehicle to yaw and swerve under brakes. Both situations greatly increase the possibility of a driver losing control, particularly in wet conditions.
The function of a shock absorber is to dampen spring oscillations, maintaining the tyres’ contact with the road, irrespective of the road’s surface. Shock absorbers literally convert the energy of suspension movement to heat, which is then dissipated into the air.

The importance of shock absorbers in overall vehicle dynamics has been underlined by the launch of the Monroe Safety Triangle which reinforces the interdependence between shocks, brakes and tyres - all three being equally vital in safe motoring.
THREE SIDES TO SAFER MOTORING

Shock absorbers, brakes and tyres are essential to your motoring safety. Shock absorbers keep your wheels in contact with the road – without them your brakes and tyres simply can’t do their job!

At 50km/h, just one worn shock absorber can increase your stopping distance by up to 2 metres!

STOPPING
At 50km/h, just one worn shock absorber can increase your stopping distance by up to 2 metres!

STEERING
Worn shock absorbers can cause your tyres to lose contact with the road dramatically effecting steering.

STABILITY
Worn shock absorbers cause excessive sway around corners making the car a lot less stable.

SAFETY TRIANGLE
The effects of worn shock absorbers

Nose-diving and swerving
Does the bonnet of the car dip down when you brake to stop or slow down? This is known as nose-diving and it means that the car is taking longer to slow down and stop. Worn shock absorbers can also cause the car to swerve on braking. Does the steering wheel vibrate uncomfortably? This could mean worn shock absorbers.

Bad vibes
Does the steering wheel vibrate uncomfortably? This could mean worn shock absorbers.

Side slide
Does the car veer in side winds? (You feel like you’re being blown off the road by winds that aren’t as strong as you thought.) This could be one of the signs of worn shock absorbers.

Shake, rattle and roll
Does the car rock and roll a lot over uneven surfaces, railway tracks and bumps? The car should ‘hug’ the road on bends. If it rolls, there’s a problem.

Tyre wear
If the tyres are wearing unevenly perhaps with bald patches, worn shock absorbers are probably the key cause?

Another 2 metres
If you’re travelling at 50 kilometres per hour on a straight, dry, uneven road, you could take an extra 2 metres to stop if JUST ONE of your shock absorbers is worn. That 2 metres can mean the difference between life and death.
Because there are many different types of suspension, not all shock absorbers look the same.

All shock absorbers fit into one of three groups. Conventional telescopic shock absorbers, struts, or spring seat shocks. The strut group consists of two types – sealed struts and strut cartridges. The trend is a definite swing away from conventional telescopic shocks toward struts and spring seat shocks.

**Conventional telescopic shock absorbers:**

Shown here are a front and a rear suspension design that use conventional telescopic shock absorbers.

This is the simplest type of shock absorber and typically cannot be repaired: it is simply unbolted and replaced with a new unit. This type of shock absorber can be found on both front and rear suspension systems and is relatively inexpensive.

**Strut type shock absorbers:**

While their primary function is identical to conventional telescopic shocks, struts are used as a suspension unit and are more ruggedly built to cope with higher suspension loads and lateral (sideways) forces. They eliminate the need for several suspension components like upper control arms, ball joints and more elaborate cross members. This saves weight and valuable engine compartment and luggage space.

While struts are used almost exclusively for the front and rear suspension of small and medium-size cars, the trend is for larger vehicles to also be built with struts.

**MacPherson strut cartridges and sealed struts:**

Struts are presently manufactured in two types, sealed and repairable units.

The shock absorber of a repairable MacPherson strut is replaced by fitting a factory sealed MacPherson strut cartridge to the original strut housing. The cartridge is held securely in position with a lock ring screwed into the top of the strut housing.

Sealed or non-repairable struts, as the name suggests, are sealed during manufacture and are sold as a complete unit. Otherwise the design is similar to the repairable struts.

The current trend in strut suspension is that vehicle manufacturers are swinging away from repairable struts to sealed struts. Initially restricted to small and medium-size vehicles, even large vehicles are now beginning to use struts. Spring seat shocks are also becoming very common.

Examples of the spring seat design can be found on the front suspension of BA Ford Falcons and the rear suspension fitted to Mitsubishi Magna sedans.
**Shock absorber construction**

What makes one shock absorber different from another?

All shocks, whether they are strut cartridges, sealed struts, spring seat shocks or just conventional telescopic shock absorbers, work in the same way. So don’t be fooled by the differences in external appearance.

During suspension movement the shock absorber is designed to resist compressing and extend in length. This is known as damping control during the shock absorber’s compression and rebound strokes.

The shock’s damping control is generated by the resistance of specially blended hydraulic oil forced to flow through restrictive internal valving. All shocks, whether they are hydraulic or nitrogen gas pressurised, use oil in the same way to operate.

The large majority of all shock absorbers manufactured today are constructed having an inner cylinder, sometimes called the pressure tube, inside a second tube – the outer body of the shock is known as the reservoir tube. This type of design is called Twin Tube construction.

What makes one series of shocks different to another can be found in the internal valve components, along with the piston and piston rod diameter. All of these differences greatly affect a shock absorber’s damping characteristics.

Monroe ride engineer specialists select different valve components and orifice sizes to control fluid flow within the shock. This determines the “feel” and handling a product series will give a vehicle and caters to the needs of various segments of the market.

As a result, Monroe produce a series of shocks that address different customers’ needs while covering a vast range of vehicle makes and models.
How shock absorbers work

Shock absorbers work on the principle of fluid displacement on both their compression and rebound strokes.

A typical shock absorber has more resistance during its rebound stroke than its compression stroke. This controls the suspension spring while accommodating various road surfaces and irregularities.

Suspension control is achieved by the shock absorber converting the energy absorbed by the spring, due to suspension movement, to heat energy and dissipating it into the air.

Valving stages

As the velocity of the shock’s stroking increases, the level of damping control changes due to the shock’s multi-stage valving.

Each Monroe Australia valving system has a minimum of three valving stages of both compression and rebound.

The first valving stage – the “bleed” stage influences handling and is also responsible for slow vehicle ride quality. When a shock absorber is extended and compressed by hand, the resistance you are feeling is due to the bleed stage valving.

The second valving stage is the “blow off” stage. This stage controls vehicle handling and highway ride quality and is effective in the mid-range stroking velocities.

The third valving stage – the “orifice” stage operates during high stroking velocities. It controls high-speed suspension movement, preventing the suspension from “bottoming out” and provides high speed vehicle stability.

The three chambers of a shock absorber
Compression stroke
During the compression stroke the piston is moving down.

There are two compression valves; one in the piston, while the other is located in the compression valve assembly. The multistage valving located in the compression valve assembly is responsible for the shock damping during the compression stroke.

As the piston rod moves down the inner cylinder, high pressure oil is generated beneath the piston in chamber three [3], creating compression damping control.

The volume of oil equal to the piston rod entering the inner cylinder is forced to flow from chamber three, through the compression valve to the reservoir, chamber two [2].

At the same time, unrestricted oil flows from chamber three through the piston and intake valve located in the piston assembly to chamber one [1]. This ensures the inner cylinder is always completely full of oil.

Rebound stroke
The piston moves up the inner cylinder during the rebound stroke. Both the piston and compression valve assemblies also have a rebound valve. This time the multistage valving responsible for the shock damping during the rebound stroke is located in the piston assembly.

As the piston rod moves upward, unrestricted oil flows from the reservoir, chamber two, through the compression valve assembly into chamber three. The volume of oil entering chamber three via the compression valve is equal to the volume of the piston rod exiting the shock absorber.

As the piston moves upward, rebound damping control is created by high pressure oil being generated in chamber one. This is due to the restriction of oil flowing through the piston valving to chamber three.

The benefits of gas pressurisation
Even during normal driving conditions, a vehicle’s suspension works a shock absorber hard. One moment the shock absorber is on the compression stroke, a fraction of a second later it has changed direction to the rebound stroke.

This happens thousands of times every kilometre. Imagine what the shock absorber has to cope with on rough roads or under high speed conditions. It is estimated that a shock absorber cycles at least six million times in 20,000 kilometres.

Hydraulic shocks are quite efficient. However, when oil is forced to flow from a high to a low pressure area as it does on both compression and rebound strokes, the sudden pressure drop causes bubbles to form in the oil. This is called the process of cavitation and aeration.

Air bubbles, unlike oil, are compressible. Therefore the initial piston rod travel of each stroke will simply compress the bubbles before the oil is forced through the valving.

This produces a damping control lag which compounds the problem and results in deterioration of shock absorber efficiency. Pressurising shock absorbers with nitrogen gas prevents bubbles forming in the oil, because the low pressures which support cavitation are eliminated. This significantly improves shock damping control and their fade characteristics.

Monroe Australia has spent considerable time in designing and refining the Monroe valving system to optimise the feature of gas pressurisation, providing a better ride, reduced noise, plus improved handling.
The benefits of Reflex Technology

The ride characteristics experienced with any suspension set up usually means an inescapable compromise between comfort and handling.

In general, good handling requires firm damping from the shock absorber, while maintaining a comfortable ride requires a shock absorber with softer damping characteristics.

The design of the Monroe GT Gas Reflex has a refined valving system which maintains excellent vehicle stability and handling whilst delivering a high level of comfort for all vehicle occupants. This has been achieved by the introduction of Twin Disc Technology - a valving refinement that is present in both compression and rebound.

In technical terms, the first disc set in the compression valve restricts oil flow at low piston rod speeds (e.g. highway lane change) resulting in a firm, stable manoeuvre at any vehicle speed.

This can be seen in the way the blue car - fitted with GT Gas Reflex - negotiates the slalom test with considerably less body roll than the white car, which is fitted with original equipment shock absorbers. Both cars are travelling at the same speed.

The Twin Disc Technology of Reflex enables the driver of the blue car to safely negotiate the obstacle avoidance test at 60 km/h while the white car on traditional shock absorbers is unable to stay on a safe course.

Photos taken under controlled conditions using an independent professional driver.
The GT Gas Reflex car offers vastly superior ride comfort when compared against traditional shock absorbers over the ripple test.

At increased piston rod speeds (e.g. bumps or potholes) the first disc set instantaneously lifts, where upon a second disc set then arrests vehicle motion maintaining vehicle stability.

A high degree of comfort is achieved by this decoupling effect. Similarly in rebound, the valving incorporates a newly designed disc stack with a tri-edged rebound disc. This disc restricts movement of the first valving stage, allowing a small degree of disc “blow-off” at three points on the disc. As piston rod velocities increase, the subsequent valving stages activate, cushioning harsh road inputs and controlling suspension movement. The combination of the valving refinements in both compression and rebound result in a shock absorber that is able to deliver ride comfort combined with excellent handling attributes.
When to replace shocks and struts

Because shock absorbers wear out gradually, most vehicle owners don’t realise how their car’s ride and general handling has deteriorated until it is pointed out by someone else.

Therefore, it’s not hard to understand why it hasn’t occurred to many customers that their shocks may need replacing! Monroe recommends regular shock inspection – at least every 20,000 kms. However, worn shock absorbers may be only one reason why they need to be replaced. A vehicle may also be equipped with shocks that were not designed to meet the particular needs and wants of the current driver.

Inspecting shocks and struts

1. Bounce test
Push down and quickly release the front and rear corners of the car to bounce test the shock absorbers. Feel how easy it is to bounce the car up and down. The car should stop after 1-1.5 bounces. If the car bounces excessively, the shocks are definitely worn and need replacing.

2. 20,000 kms
Check the number of kilometres recorded on the odometer. Shock absorbers should be checked every 20,000 kms, depending on individual driving habits and road conditions.

On older vehicles, determine the age of the shocks by checking the build date code stamped into the body of the shock.

3. Check for noise
Knocking shocks can be identified by placing a finger on the end of the shock’s shaft while bouncing the car. Knocking indicates faulty shock absorber internal components. However, always check for faulty installation before condemning the shock itself.

4. Tyre wear
Worn shocks are the most common cause of uneven and “cupped” tyre wear. Cupping is caused by worn shocks allowing the tyre to bounce and skip over the road and looks like a series of flat spots at regular points around the tyre. The easiest way to check for cupping is by running your hand over the tyre’s tread and feeling for any flat spots.

5. Check the ride height
Worn shock absorbers do not affect the ride height of a vehicle, but the general condition of the suspension does. So if the vehicle is sagged in the rear or in one corner, the shocks are probably worn too.

6. Check the bump stops
Check the bump stops for condition and evidence that the suspension may have been bottoming out. Oil-soaked or split bump rubbers and shiny metal bump stops all indicate a lack of damping control.

It may also indicate the vehicle is being operated under severe heavy-duty conditions and the shocks currently fitted are inappropriate for the application.
Evidence of leaking usually shows around the piston rod oil seal area. Shocks are filled with a precise amount of oil during manufacture, so when shocks begin to leak oil, a lag in damping control begins and usually a knock can also be heard. As a result, leaking shocks cannot work effectively.

When a leak has just begun, the oil looks fresh and wet. After it’s been leaking for a while, road dirt, dust and grit together with the oil, coat the body of the shock or strut with a moist oily paste.

However, if a leaking shock is not replaced, over time the “moist oily paste” dries out. This indicates the shock has been useless for a long time! The danger is that because the faulty shock appears dry and only coated with “mud”, it is often missed. Leaking shocks need to be replaced.

8. Broken mounts
Shock absorber mounts are designed to last as long as the shock itself. Worn mounting rubbers indicate the shock will probably need replacing. Always check the cause of broken shock mountings. Broken mountings are rarely due to a manufacturing fault. Check the part number for correct vehicle application and evidence of incorrect installation.

With modified vehicles such as lowered cars and raised 4WDs, always check that the shock has a small amount of travel left in reserve with the suspension at full compression and rebound. The extended and compressed lengths of the correct part-numbered shock may no longer be appropriate for the modified vehicle application.

9. Replace all four units
When you determine that your customer’s vehicle has worn or inadequate shocks and/or struts, recommend that they be replaced with new Monroe units. Also, for the best possible ride and balanced handling, we recommend that you replace all four shocks at the same time.

10. Special application units!
Some customers may want a better ride or need a special shock because of the way they use their vehicle. So even if a shock is operating properly, it may not meet your customer’s needs. For example, for the 4WD owner who is serious about off-road 4WD excursions, the original standard shock absorber will probably not be up to the task.

In his case, fitting Gas Magnum shock absorbers would be the perfect choice. Another example is the driving enthusiast who wants to optimise the handling of the car. Fitting GT Gas Reflex shocks will provide the improvement the owner desires.
Tips on selling shock absorbers

Identification
1. Road test the vehicle (listen for knocking shocks).
2. Bounce test the vehicle (the car should stop after 1 to 1.5 bounces).
3. Check shocks for leaks.
4. Check the bump stops for evidence of bottoming out.
5. Check for irregular tyre wear (cupping – a series of flat spots at regular intervals).

Selling
1. Always report the condition of the shock absorbers to all customers. This helps raise customer awareness and understanding.
2. Explain the role shock absorbers play in the performance of the vehicle, i.e. improved stability, braking, steering and cornering.
3. Use the “Product Sales Guide” and Monroe brochures as sales aids, as they provide great information for the customer to understand the importance of shock absorbers.
4. Explain to the customer the importance of the ‘safety triangle’ – where brakes, tyres and shocks are all equally vital for safe motoring.
5. Customers can sometimes be surprised by the cost of replacing all 4 shock absorbers and affordability may be a factor. To assist in spreading the cost to the customers you could suggest the front shocks be given priority and replaced first, due to the braking forces and load they are subjected to daily, and recommend replacing the rear shocks at their next service.

Some helpful facts
1. A car travelling at 50 km/h could take an extra 2 metres to stop if just one shock absorber is worn.
2. Worn shock absorbers can increase tyre wear by as much as 7% (test conducted between Monroe & Pirelli).
3. Worn shock absorbers mean your tyres grip less and make it harder to steer.
Monroe Gas-Magnum TDT Absorbers

Australians love their four wheel drives. But as 90% of Australians live in cities, most off-road vehicles spend a lot more time on city streets than outback tracks.

Now there’s a specialty shock absorber that gives you better performance from your 4x4 both on-road and off - Monroe’s Gas-Magnum TDT. Australian made for Australian conditions, our exclusive Twin Disc Technology (TDT) has been combined with the legendary durability of Monroe’s Gas-Magnum to yield a specialty 4x4 shock absorber that can keep you safe and comfortable on virtually any type of surface.

Like its predecessor, the Gas-Magnum TDT is engineered to take the knocks and produce maximum damping response under all four wheel drive applications, with minimal fading in harsh conditions. On crowded city roads, Monroe’s Gas-Magnum TDT smooths out the constant acceleration and braking and eliminates the sway associated with a high centre of gravity while providing fast response when needed.

Best of all, this performance can be yours for a remarkably affordable price, and comes with a three year, 60,000 kilometre warranty. So if you own a four wheel drive, there’s only one shock absorber for you: the new Monroe Gas-Magnum TDT.

Benefits

- Twin Disc Technology (TDT) delivers surefooted control on all road conditions, providing enhanced stability and safety.
- Large 35mm (1.3/8”) bore, welded mountings, dust shielded and hard chrome plated piston rod all provide for increased strength and durability.
- Nitrogen pressurised against cavitation and aeration.
- Patented design uses Teflon to reduce friction, heat and wear.
- Durable twin-tube construction.
Monroe GT GAS with exclusive Reflex™ Technology Shock Absorbers

Monroe GT Gas with exclusive Reflex™ Technology delivers excellent vehicle stability and handling without compromising driver and passenger comfort.

On Compression, the revolutionary disc valve set design partially opens at low piston speed to provide limited oil flow, yielding a firm and stable manoeuvre when taking corners at low speed, or changing highway lanes. When the piston speed increases due to bumps, potholes, sharp cornering, or emergency braking at high vehicle speed, an intermediate disc is activated, allowing an immediate increase in oil flow, resulting in increased vehicle stability and safer road handling with minimal impact on driver and passenger comfort.

On rebound, the twin disc rebound design features a unique scalloped intermediate backing plate, that allows the valve disc to flex as the piston speed increases, metering the oil flow as demanded by the driving conditions. The outcome is a cushioning of harsh road conditions.

The Reflex™ valving technology in both compression and rebound is a product that delivers enhanced control and handling with no compromise to ride comfort and is also backed by a 3 year/60,000 kilometre warranty.

Product Features
- Twin disc design
- Teflon banded piston
- Multi-lip piston rod seal
- Superior hardchrome piston rod finish
- Nitrogen gas pressurised
- 3 year/60,000 kilometre warranty

Benefits
- Firmer and safer handling with no compromise on comfort
- Low friction, long service life
- Improved retention of fluid and gas
- Increased seal durability
- Optimum fade-free performance under all conditions

Compression
At low piston speed (eg. a highway lane change) the valve disc set partially opens to provide limited oil flow. Result - a firm and stable manoeuvre at any vehicle speed.

At increased piston speed (eg. bumps, potholes and severe breaking) the valve disc set activates to increase oil flow. Result - increased stability with a high degree of comfort.

Rebound
As the piston rebounds, the unique twin disc technology valve activates. As piston speed increases, the subsequent valving stages activate. Result - greater driving control of suspension movement together with a cushioning of road harshness.
**GT-GAS with exclusive Reflex™ Technology**

Combines upgraded and refined damping rates, with all the fade-free damping control benefits of gas pressurisation. GT - Gas with Reflex™ Technology delivers enhanced handling and control without any compromise in ride comfort.

**Features**
- Exclusive twin disc system.
- Teflon banded piston - low friction, long service life.
- High displacement, multi stage valving - precise control.
- Superior rod finish - increased seal durability.
- Multi lip seal - state of the art durability.
- Non ride height dependant.
- Three year/60,000 km warranty.

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**Gas-Magnum TDT**

Super duty gas charged shock absorbers. Engineered for 4x4 and light commercial vehicles for on and off-road use.

**Features**
- Nitrogen gas charged.
- 1-3/8” (35mm) bore.
- Multi stage, high displacement valving.
- Superior chrome rod.
- Multi lip seal - state of the art durability.
- Non ride height dependant.
- Three year/60,000 km warranty.

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**GT Sport**

Designed with control and quality in mind, GT Sport achieves the desirable look of a lowered vehicle profile while providing optimum performance and control.

**Features**
- Sports performance tuned.
- Incorporates proven Monroe Reflex™ Technology.
- Increased compression travel.
- Specially designed compression bumper rubbers.
- Exclusive twin disc design.
- Nitrogen gas pressurised.
- 3 year/60,000km warranty.
GAS-Magnum

Super duty gas charged shock absorbers. Engineered for 4x4 and light commercial vehicles for on and off-road use.

Features
• Nitrogen gas charged.
• Large bore.
• Multi stage, high displacement valving.
• Superior chrome rod.
• Multi lip seal - state of the art durability.
• Non ride height dependant.
• Two year/40,000 km warranty.

Max-Lift

Max-Lift is a sealed, gas filled pressure cylinder that exerts an outward force. This force acts like a spring to lift and hold open hatches, bonnets and boots. An exact replacement fit for most applications.

Features
• Superior rod finish - increased seal durability.
• Teflon piston seal - superior sealing strength.
• High pressure gas filled - smooth action.
• One year warranty.

Gas Riser

A versatile gas pressurised heavy duty unit that enables ride height adjustment. Ideal for vehicles that operate under a variety of load and towing conditions.

Features
• 150 psi rating.
• Teflon banded piston.
• Gas pressurised.
• Multi lip seal.
• Two year/40,000 km warranty.
Monroe Original

Designed to meet or exceed the motor vehicle manufacturer’s specifications for original equipment.

Features
• Teflon banded piston - low friction, long service life.
• High displacement, multi stage valving - precise control.
• Superior rod finish - increased seal durability.
• Multi lip seal.
• Two year/40,000 km warranty.

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<td>MG</td>
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Steering Damper

Absorbs steering shock and vibration caused by road irregularities - cracks, corrugations, holes, rocks and wheel tracks. Ideal for use on 4x4 and commercial vehicles.

Features
• 50/50 damping control.
• Superior Nitrite Carborized plated piston rod.
• Multi stage valving.
• Boot assembly sold separately.
• One year/20,000 km warranty.

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<th>Steering Damper</th>
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Monroe Magnum Truck

Heavy duty commercial strength shock absorbers engineered for high kilometre long haul use with proven durability to withstand severe terrain operation.

Features
• Magnum 60, 1-3/8” (35mm) bore.#
• Magnum 70, 1-3/4” (45mm) bore.
• Multi lip seals - state of the art durability.
• Heavy duty construction and valving.
• One year/unlimited km warranty.
• Van Magnum - Two year / unlimited km warranty.
# On most applications

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**Strut Mate**

Too often a new strut or cartridge is fitted with the old original and damaged suspension travel limit bushing (compression bumper) and dust boot.

The Monroe Strut Mate kit includes a high quality, soft entry urethane compression bumper, a new dust boot, retaining strap and fitting instructions.

**Features**
- Premium quality microcellular urethane bumper.

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<tr>
<th>Strut Mate</th>
<th>Typical Part No Series</th>
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**Magic Camber**

Magic Camber from Monroe is a simple solution to the problem of camber correction. It enables camber to be corrected on most vehicles fitted with strut type suspension.

Incorrect camber can increase tyre wear by a staggering 20-50% and have a serious effect on a car’s performance and safety.

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<tr>
<th>max-lift</th>
<th>Typical Part No Series</th>
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<td>GAS SPRING</td>
<td>ML</td>
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**Tools**

**Branick Spring Compressor. Part no. 7400**

The new Branick 7400 handles a wide variety of strut configurations including the more challenging shocks such as the BA Falcon and Rav 4 as well as long, short, narrow or angled springs. The unique ‘floating head’ design self adjusts to provide uniform compression of the strut spring. Extra long top handles provide extra torque. The 7400 increases workshop safety and reduces the time needed to compress springs.

Designed to be mounted on a workshop wall or bench mounted with the optional benchmount bracket.

**Operator safety features include**
- 3 point upper and lower hook design.
- Double start Acme thread.
- 24” stroke.
- Compression down to 2”.
- 741 Bench mount option available & sold separately.

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**Monroe Cartridge Lock Ring Tool. Part no. TK2**

- This unique combination tool allows removal and tightening of most popular cartridge locking rings.
- Fits many original equipment sizes.
- For use on 1/2” square drive units.
Common causes of return

**Oil Leakage**

**CAUSE:** Chrome peeled off/leakage.

- ? Worn out bumper + dust shield.
- ! Check and replace with new bumper and dust shield.

**Noise**

**CAUSE:** Piston rod chrome surface damaged (by vice grips or pliers).

- ? Piston rod and oil seal damaged after using pliers or grips during installation.
- ! Use the correct mounting tool to avoid the piston rod turning during the tightening of the central top nut.

**Oil Leakage**

**CAUSE:** Stem end broken off.

- ? Tightened with power tool. Top bearing blocked (if present).
- ! Apply correct tightening torques (refer to vehicle manufacturer’s specifications). Use correct tool. Check and replace upper bearing if necessary.

**Noise**

**CAUSE:** Abnormal damage or rust of the cartridge tube (accident damage, product abused or the presence of water inside strut housing).

- ? No oil put in the strut housing during assembly of the strut cartridge.
- ! Handle product with care prior to fitment, always put 50cc oil in strut for correct heat conduction. Cartridge once locking ring is tightened to specifications.

Safety Note: Always fit new units in pairs to ensure safe handling and brake performance.
CAUSE: Knocking noise. Paint worn off at bottom and on top of cartridge housing. Broken sealing (see right picture).

* Cartridge not tightened correctly. Old locking ring reused. Not all provided parts used if needed (new locking ring/spacer/centering cap).

* Apply correct tightening torques (refer to vehicle manufacturer’s specifications). Use all provided parts according to the mounting instructions. Use correctly. Always check for movement of the cartridge once locking ring is tightened to specifications.

CAUSE: Knocking noise. Piston rod circlip damaged/out of groove.

* Piston rod nut over-tightened forcing circlip from groove, or insufficiently tightened allowing movement of the mounting components causing circlip to be pushed out of groove.

* Apply correct tightening torques (refer to vehicle manufacturer’s specifications).

CAUSE: Knocking noise. Irregular damage of the piston rod stem thread.

* Mounting parts mounted incompletely or not put in the correct order. Mounting parts too tight or too loose after mounting.

* Ensure all mounting parts assembled in the correct order and tightened to the correct specification (refer to vehicle manufacturer’s specifications).

Safety Note: Always fit new units in pairs to ensure safe handling and brake performance.
Installation and removal tips

Before installing shocks

1. Read the instructions that come with the new units you are going to install in conjunction with the relevant vehicle manufacturer’s workshop manual.
2. Check the mounting parts supplied with the new unit to make sure you have everything you need.
3. Hold the shock vertically with the dust tube or shaft to the top and pump it up and down several times to prime it.

Removing front shocks

1. Hold the upper stud of the shocks so it does not turn. Then, remove the upper stud’s retaining nut, retainer and rubber bush.
   Note: On units without dust tubes, the stud end is machined to allow you to hold the stud with a spanner when removing the nut.
2. With the vehicle raised, remove the bolt(s) which holds the lower shock mount to the suspension control arm. On some vehicles the shock is pulled out from the bottom. On other applications it may be removed from the top.

Installing front shocks

1. Place the lower metal retainer and rubber bush on the stud. Then, insert the shock up through the lower control arm into its upper frame mounting hole in the lower control arm. Place the upper rubber bush retainer and nut on the shock absorber upper stud. Position and install the lower mounting bolts in the control arm.
2. When installing a shock that’s larger than the shock being replaced, you may need to slightly enlarge the hole in the lower control arm with a round file to install the new unit.

Removing rear shocks

1. Raise the vehicle and support the rear axle.
2. Disconnect upper mountings first. Then, lower mountings.

Installing rear shocks

1. Connect upper mountings first. Check the clearance of brake lines, fuel lines and the exhaust system, both on and off the hoist.

Installation do’s & don’ts

1. Tighten nuts and bolts securely, but do not overtighten. If rubber bushes bulge outside the retainer washers then the mounting has been over tightened.
2. Always fit new replacement parts.
3. Do not grip the piston rod with any tool during any replacement procedures. Marks on the piston rod will damage the shock’s oil seal and are specifically excluded from warranty.

Check your installation

Check all clearances with the car on the ground. Also check that the tyre pressure is to manufacturer specifications.

Struts

1. If possible always road test the vehicle before and after you install struts or strut cartridges.
2. Select the right Monroe strut or cartridge for the car you are working on. Car manufacturers are continually refining strut specifications, so always check the application, including the vehicle’s build date.
3. Often cars will require a wheel alignment after the struts have been removed. Check the vehicle’s workshop manual for details if in doubt.
4. You may need to scribe marks on the strut’s upper bearing plate and the car body’s strut tower. If the strut is fitted with an adjustable camber bolt as part of its lower mounting, its position should be marked as well. These precautions will prevent wheel alignment problems during assembly.
5. Always refer to the installation instructions applied with your replacement parts before commencing a strut job.

Strut tools

1. A manual, portable air, bench or wall mounted spring compressor is needed to compress and remove the coil spring from the strut.
2. A spanner wrench is needed to remove and replace the strut’s locking ring on replaceable cartridge units.
3. A torque wrench is needed to tighten all mounting bolts to vehicle manufacturer’s specifications.

Strut cartridge do’s & don’ts

1. In most cases discard the old locking ring from the strut housing. Screw the new locking ring supplied with the new cartridge into the housing all the way by hand prior to fitting the cartridge to check for thread damage and that you have the right locking ring.
2. After discarding the old cartridge, always check inside the strut housing for any remaining components.
3. Check the length of the cartridge and ensure it is not loose in the housing, even though the lock ring is fully tightened.
4. If the brake line has been removed during the strut replacement, bleed the brake system when the job is completed.

Sealed units do’s & don’ts

1. During the strut installation take care not to damage front-wheel axle rubber boots as they are easily damaged and cause CV joint failure.
2. Never over-compress the coil spring when dismantling the strut assembly. Use the minimal force needed to do the job. Make sure all components, particularly the bearing plate thrust washers and the top and bottom spring seats are properly aligned when reassembling the strut.
Serving your customer...
the professional way
You are the shock absorber specialist, and your customer relies on you to guide them to the right buying decision. Serve your customer the professional way by knowing all your Monroe products, asking your customers questions to determine their individual ride control needs, and effectively communicating the benefits of the various Monroe products.

Why customers buy
The obvious reason consumers buy new shocks and struts is to restore ride control - that control lost due to normal wear. Other customers buy because of their special needs. Needs like a firmer ride, a softer ride, heavy-duty use, or a desire to improve the handling of their vehicles.
Vehicle safety is also a main reason customers are buying new shocks. Due to Monroe advertising, customers are becoming more aware of the important role shock absorbers play in a vehicle’s safety.

Customer types
Just as consumer ride control needs are different, people have different reasons for buying shocks. More consumers buy shocks because of brand name than any other reason, including price and quality. Monroe is the leading brand name in shock absorbers, making your selling job easier just by mentioning it.

Selling... is serving your customer
A successful sale results in satisfaction for both the customer ... and you. But to achieve that sale, the basic guidelines to professional selling must be followed.
First, thoroughly know the benefits of the Monroe product you are selling. Then determine the customer’s need by asking the right questions. Effectively explain the product and its benefits to the customer. Next, make a recommendation and reinforce it. Finally, ask for the sale.

Knowledge and skill
Know the entire Monroe product range. Ensure you have a current Monroe catalogue and are familiar with all Monroe products. From the conventional shock to the latest advances in sealed struts and replacement cartridges ... from nitrogen gas and Strut Mate to the range of Monroe Max-Lift products. The more product knowledge you possess, the easier the rest of your sales role becomes.
Knowledge gives you the confidence to think positive, and your confidence is transferred to the customer. It enables you to take the initiative in helping a customer make an informed buying decision.
After all, you are the ride control expert and the customer is looking to you for guidance. Customers quickly develop trust in people who know their products and who are interested in finding what they want.

Consumer need
Determine exactly what the customer’s ride control needs are by asking the right questions. Vehicle make, year, model and special options will tell you a lot about the basic application data. In addition, inquire about the number of kilometres travelled, road handling problems, if the customer carries or tows heavy objects, and the kind of ride the customer desires. Listen carefully. Your customer will tell you a lot.

Vehicle inspection
Often, consumers will not be aware their shocks or struts need replacing. But if a vehicle is on the hoist for other work, don’t overlook the opportunity to inspect for telltale signs and irregular tyre wear. So it is important everyone in the workshop knows how to diagnose worn and faulty shocks. Check the shocks or struts for fluid leakage. Check mounting parts and other suspension components for signs of wear or damage. It is important to be up-front and honest about the vehicle’s condition. You don’t want a come-back on a good brake job because you neglected to point out that the shocks or struts needed replacing.

Make and reinforce your recommendation You know the Monroe product line.
You know the consumer’s ride control needs. Now, make the right shock recommendation. Start with the choice you feel is most appropriate to the customer’s needs and give the customer all the available options. Maximise your own opportunities by recommending premium products. Reinforce your recommendations by explaining the benefits that result from fitting Monroe products: improved handling and passenger comfort, reduced wear on other vehicle components, quality and long life.

Ask for the business
You’ve provided the information the customer needs to make a decision. Now provide an easy opportunity for them to have the need fulfilled. Make it easy.
Make it immediate.

Selling ... now it's easier
From top-of-the-line to the most basic shock you sell, you can be confident of the quality with Monroe. Know the product line, determine the customer need, make a recommendation and ask for the business.
The result? A successful sale and a satisfied customer.
WARRANTY STATEMENT.

Monroe Australia warrants all Ride Control Products marketed under the Monroe brand name to the original retail purchaser against defects and premature loss of damping force for the periods stated below:

3 Year/60,000 kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) GT GAS with Reflex™ Technology products.
   b) Gas-Magnum TDT products
   c) Quick Strut products
   d) GT Sport

2 Year/Unlimited kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) Sensa-Trac products*
   b) Magic Camber products
   c) Van Magnum products
   *excluding commercial use vehicles.

2 Year/60,000 kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) Sensa-Trac products*
   *on commercial use vehicles.

2 Year/40,000 kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) Gas Riser products
   b) Monroe Original products
   c) Gas-Magnum products

12 Months/Unlimited kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) Magnum 70 Series products
   b) Magnum 60 Series products
   c) Max-Lift products

12 Months/20,000 kilometres from date of retail sale or date of fitment, whichever occurs first.
   a) Steering dampers

Note: Monroe Australia’s obligation under this Warranty is limited to the replacement of the defective unit only. Costs of removal of the defective unit and replacement of the unit are not included.

WARRANTY CLAIMS.

Monroe Australia is dedicated to the pursuit of product excellence and the achievement of maximum consumer loyalty. Monroe Distributors are qualified to validate all Warranty claims, but Monroe Australia reserves the right to inspect all units claimed as defective. As a matter of policy, all warranty claims submitted will be honoured, under the terms of our stated Warranty, provided:

- A fully completed Monroe Australia claim form is presented with each defective unit to an authorised Monroe Distributor.

Note: One claim form can be used for up to two defective units.

Please nominate the number of units being claimed.

- Information on the Warranty Claim Form includes all vehicle identification data, part number, fitting or sale dates and a description of the defect.
- In addition, both the customer’s and reseller/installer’s names, addresses and telephone numbers must be provided, to allow Monroe Australia Representatives to contact claimants.
- Copies of proof of purchase documents are attached to the claim form, which must be signed by the Monroe Distributor’s Claim Officer.
- This Warranty does not apply to units which have been modified or improperly installed, nor to units fitted to vehicles contrary to application information contained in the Monroe Product Catalogue or its subsequent amendments.

EXCLUDED FROM MONROE WARRANTY ARE:

1. Cartridges claimed for noise, which have not been properly tightened down with the locking ring.
2. Severe interference between unit and other suspension components, causing noise or failure of the shock absorber.
3. Units that were involved in an accident and show dents and nicks.
4. On air-adjustable units, air-sleeve damage such as burn holes and abrasion caused by another part of the vehicle is specifically excluded from Warranty.
5. Units showing evidence of improper tightening of the mounting bolts causing parts to wear or bend.
7. Vice jaw or “multigrip” type wrench marks on polished section of piston rod, causing damage to oil seal and oil leakage.
8. Struts and cartridges that have not been fitted with serviceable bumpstops (where originally fitted). To the extent permitted by law, and subject to any warranty or right implied by the Trade Practices Act, or any State act or regulation which warranty or right cannot by law be modified or excluded by agreement, all warranties, conditions, representations, assertions and statements (whether express, implied, statutory or otherwise) which are not expressly set out in this Warranty Statement and any liability arising on the part of Monroe Australia for any breach of such warranties, conditions, representations or statements (whether express, implied, statutory or otherwise) which are not expressly set out in this Warranty Statement and any liability arising on the part of Monroe Australia for any breach of such warranties, conditions, representations or statements are hereby expressly excluded; and where any warranty is implied by law and is not excluded by reason of (paragraph 1), subject to any contrary provisions (which cannot be modified or excluded) of the Trade Practices Act, or any State act or regulation, the liability of Monroe Australia shall be limited to a liability to pay to the purchaser an amount equal to the cost of replacing the goods excluding, to the extent permitted by law, costs of removal of the defective goods and installation of the replacement goods.
Study quiz

1. Conventional shocks support vehicle weight.
   - True
   - False

2. Gas-charged shocks are charged with...
   - freon
   - nitrogen
   - oxygen
   - argon

3. Gas charged shocks...
   - maximise aeration
   - increase the cavitation process
   - improve ride and vehicle handling
   - having no oil, are less likely to leak

4. When you replace a front strut you should...
   - replace one only
   - replace both front units
   - replace front and rear

5. Aeration
   - improves shock and strut dampening capabilities
   - reduces dampening capabilities
   - has no effect on the dampening ability of shocks and struts
   - educes shock fade characteristics

6. Does Some GT Sport product come with specially designed compression bumper rubbers?
   - True
   - False

7. What suspension system component damps the oscillations of coil springs or torsion bars?
   - Sway bar
   - Tie rod ends
   - Upper control arm
   - Shock absorbers

8. Which of the following is true of the conventional shock absorber?
   - it damps spring oscillations
   - it’s a velocity sensitive damping device
   - should be primed before installing
   - all of the above

9. Loose or worn suspension parts cause tyre wear problems?
   - True
   - False

10. To meet your customer’s needs, you must evaluate his or her vehicle’s...
    - performance characteristics
    - intended use
    - actual use
    - all of the above

11. A Shock Absorber Specialist is concerned about...
    - the condition of all suspension components
    - how the vehicle is used
    - the effects of load conditions on the vehicle
    - all of the above

12. Worn shocks and struts may affect...
    - wheel alignment
    - braking distance
    - steering response
    - ride comfort
    - all of the above

13. Monroe GT Sport has been specially designed to...
    - improve suspension reaction time
    - precise dampening control
    - dramatically reduce body roll
    - all of the above
14. To maximise shock absorber performance, it is recommended that shocks or struts be replaced for all four wheels.
   - True
   - False

15. In a twin-tube shock absorber, the valving at the base of the pressure tube controls...
   - rebound
   - compression

16. Which of the following can indicate that a shock absorber is faulty?
   - oil leaking from the shock
   - “cupped” tyre wear
   - worn shock mounting parts
   - all of the above

17. What Monroe product is specifically designed for lowered applications?
   - Gas Magnum TDT
   - GT Gas Reflex
   - GT Sport
   - Original Gas

18. Gripping the piston rod with vice grips during shock installation will damage the shock’s oil seal and void warranty.
   - True
   - False

19. Shock absorber life depends on many factors. However, Monroe recommends that shocks are inspected regularly, or at least every...
   - 20,000 kms
   - 80,000 kms
   - 60,000 kms
   - they last the life of the vehicle

20. Good shock absorbers may need replacing if their damping control design doesn’t meet the needs of the current driver.
   - True
   - False

21. An installer should always check that new shocks have a certain amount of travel left in reserve with the vehicle’s suspension at both full compression and rebound on vehicles...
   - that have modified suspension
   - with lowered ride height
   - that have raised ride height suspension
   - all of the above

22. Shiny suspension bump stops could indicate...
   - lack of shock damping control
   - the vehicle is constantly “bottoming out”
   - the suspension is constantly heavily loaded
   - all of the above

23. When bounce testing a car to check for worn shock absorbers, the car should stop bouncing after...
   - 2-3 bounces
   - 1.5-2.5 bounces
   - 1-1.5 bounces
   - 0-1 bounce

24. Monroe Australia warrants all GT Gas Reflex and Gas Magnum TDT products marketed under the Monroe Brand Name for...
   - 1 year or 20,000 kms
   - 2 years or 20,000 kms
   - 2 years or 40,000 kms
   - 3 years or 60,000 kms

25. What bore size is Gas Magnum TDT?
   - 25mm
   - 30mm
   - 32mm
   - 35mm

26. Worn shock absorbers can reduce a car’s cornering ability by increasing body roll.
   - True
   - False
27. How many part numbers of STRUT-MATE cover almost the entire vehicle range?
   - 10
   - 11
   - 12
   - 13

28. Which of the following is not a Monroe Gas-Charged product
   - Maxlift
   - GT Sport
   - GT Adjustables
   - GT Gas Reflex
   - Gas Magnum

29. Why should an installer screw the supplied locking ring of a new strut cartridge all the way into the strut housing before fitting the cartridge?
   - to check for thread damage
   - to ensure the supplied lock rings has the correct thread
   - to check the lock ring screws all the way into the strut
   - all of the above

30. During rebound stroke, oil flows back into the pressure tube through the compression valve from the reservoir tube.
   - True
   - False

31. Vehicle manufacturers are swinging away from “repairable” struts in favour of “sealed” struts...
   - True
   - False

32. Spring seat shocks are similar to...
   - telescopic shocks, but carry high side and suspension loads like struts
   - struts, but don’t carry any suspension loads
   - struts and are always fitted to the rear of the vehicle
   - both telescopic and strut designs, but are not subject to high side loads

33. Spring seat shocks can be replaced by fitting cartridges.
   - True
   - False

34. In the name Gas-Magnum TDT, what does “TDT” signify?
   - Twin Disk Technology
   - Thermo Dynamic Technology
   - Three disk Technology