



AUTOMOTIVE USER MANUAL

Introduction

Nitron Racing Systems was formed in 1998 by founder and CEO Guy Evans with the aim of supplying the best possible race shocks made to the highest specifications. Nitron continually develops its products with top level drivers achieving podiums across the world. Nitron strive to supply the highest quality and value, always focusing on delivering serious performance without compromising on design and build quality.

Thank You!

Thank you for purchasing a Nitron shock absorber kit. Nitron have invested heavily in developing the technology, materials and performance of our racing shocks and we are pleased to be able to pass on this experience to our customers. All our shock designs are based on many hours of track testing and racing. This race DNA is then hand built into your shock kit by our skilled suspension technicians.

Nitron have made the NTR range of shocks simple to install, setup and use but please take a moment to accustom yourself with your new shocks and the adjustment system outlined in this manual.

Before Installation

Carefully study this manual and reference any notes against the vehicle manufacturer's guidelines before installing your new shocks. Nitron's online technical help database can be found at www.nitron.co.uk for additional information regarding installation and setup. Any uncertainty regarding your shocks or installation should be clarified with your Nitron dealer.

Safety Notice



Warnings are given by this symbol. This will indicate that your safety is involved and careful attention should be made to observe these instructions. Severe injury or fatality may occur if these instructions are not observed.

CAUTION: Indicates that special precautions must be taken to avoid damage to the suspension or vehicle.

NOTE: Highlights important information regarding procedures or recommendations on the products installation or use.

Recycling

Nitron take the environment seriously and as a company we do our best to reduce waste wherever possible. Nitron are happy to recycle any of its products from our customers and will offer recommendation as to the appropriate disposal methods upon request.

Continual Improvement

ISSUE: 01.20

Nitron products are subject to continual improvement and development. Every effort is made to reduce any differences between this manual and your shock absorber. Please consult your Nitron dealer if you have any questions with regard to the contents of this manual. Printed in the UK.

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Nitron shock absorbers should be installed by a qualified technician. Installing any shock absorber that is not approved by the manufacturer may affect the handling of your vehicle. Nitron will not be held responsible for any damage or injury caused through incorrect fitment, modification or incorrect application of any Nitron shock absorbers or related products.

Your New Shock Kit

Your shocks have been designed and hand built in the UK using components and materials derived from top level racing so you can be sure of the quality and performance.

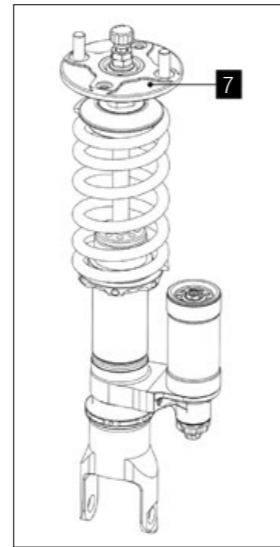
Please take a moment to familiarise yourself with the components and controls of your new shocks.

The worlds best performing race shocks are high pressure nitrogen gas mono-tube designs. Every single Nitron shock is engineered to this design. The basic principle involves moving a valved piston through a quality suspension fluid under very high pressure with nitrogen gas, separated by a floating piston. The pressure exerted on the system prevents the suspension fluid from 'cavitating' which offers consistent and fade free damping of the vehicle. For this reason, Nitron NTR shocks do not have any internal user serviceable parts and should only be opened by authorised Nitron service technicians.

Exceptional Features as Standard

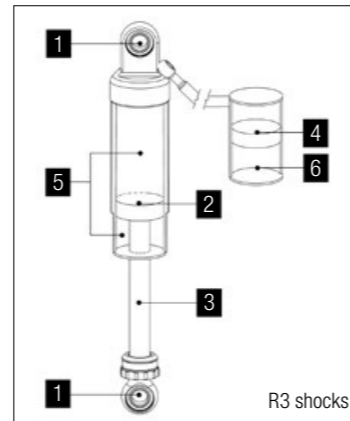
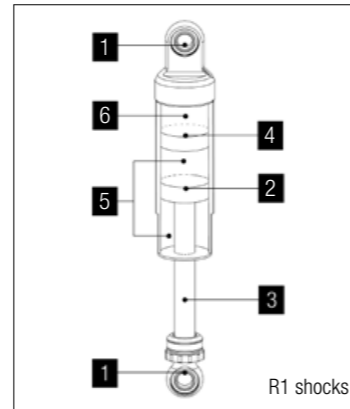
All Nitron NTR shocks owe their exceptional performance to the quality of materials and design, featuring:

- Lightweight, fully titanium and hard anodised aluminium construction
- Fully CNC billet machined and precision assembled
- Fully re-buildable and re-valvable
- Infinite range of bump/rebound ratios controlled by fully sealed adjuster mechanisms
- Ultra low friction design
- Induction hardened super-polished chromium plated piston rod
- Low friction rod seal, double acting rod scraper and cellular progressive bumpstop
- Superior 40mm or 46mm Teflon piston and floating piston
- PTFE lined bearings



Basic Shock Design

1. End Eye / Clevis
2. Damper Piston & Shim Stack
3. Shaft / Rod
4. Floating / Separator Piston
5. Suspension Oil
6. Compressed Nitrogen Gas
7. Top Plate



NTR-R1 (2-way, Single Damping Adjuster)

Campaigned over some of the most demanding endurance races around the world, NTR R1 kits provide the answer to uncompromising quality, reliability and performance without the need for a remote canister. A double-acting, single dial offers effortless control over a wide range of damping adjustment in both bump and rebound; helping to rapidly react and adapt to changing circuit conditions. All shocks feature adjustable spring platforms for ride height adjustment, plus length adjustable ride height (where possible) and come complete with Nitron NTR springs.

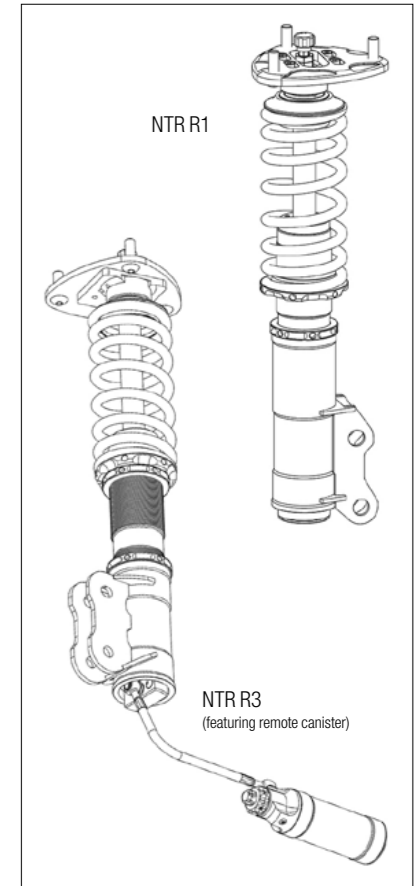
This kit includes Nitron's camber and castor adjustable pillow-ball top mounts (where applicable), eliminating any rubber in the system to ensure all track inputs are transmitted directly into the damper; maximising control and providing optimum feedback to the driver's finger tips. The adjustable top plates also give control over camber and castor angles for a more race orientated setup and the option to explore track and slick tyre capabilities.

NTR-R3 (3-way, Triple Damping Adjuster)

NTR Race R3 kits set the standard for ultimate performance. The VLN Nurburgring lap-record holding design offers racers and race engineer's precise damping control. Available over a wide range of sports, formula and GT platforms; R3 kits provide reliability with virtually zero fade and include Nitron's camber/castor adjustable pillow-ball top mounts (where applicable).

The R3's remote reservoir (or piggyback in some specifications) provides yet another level of performance over the R1 kits. Designed for serious race use and incorporating independent bump and rebound valving mechanisms and an independent low speed bleed adjuster for reducing harshness and increasing mechanical grip. High speed damping can be kept soft so the car is stable when running kerbs / rumble strips, whilst not compromising body control in the transient cornering phase

NOTE: Some vehicles must be fitted with wheel spacers. Please contact your Nitron Dealer for further details.



Installation

In most cases your shock kit will be a direct replacement for the originals and will not require any specific installation instructions. The correct procedure for shock replacement using the correct torque settings can be found in the vehicle manufacturers workshop manual. Nitron recommend that a qualified technician carry out the installation of all safety critical components.



Improper installation of a shock absorber could result in serious injury or death.

If you have any questions regarding the installation of your NTR shocks, please contact your Nitron dealer.

NOTE: After installing a shock absorber, the fitment of all other vehicle parts should be checked for conformity against the manufacturer's manual.

Before Adjusting Your Shocks...

Before you start adjusting your shocks, please note the base settings set by the factory on your build card. Nitron recommend that you keep a note of the changes you make and list down your chosen settings for future reference.

NOTE: Ensure that your vehicle is in a serviceable condition. Correct tyre pressures, suspension component condition and wheel alignment should all be to the manufacturer's specification before you install or adjust your shocks.

Suspension Setup

Dialling-in your settings

The main purpose of your suspension is to keep the tyres in even contact with the ground to maximise grip in all circumstances. By 'tuning' or adjusting your shocks, you will be able to achieve the best possible results from your driving. It should be noted that there are many factors affecting the handling of any chassis and as such the shocks should not be adjusted in isolation when exploring a new vehicle setup.

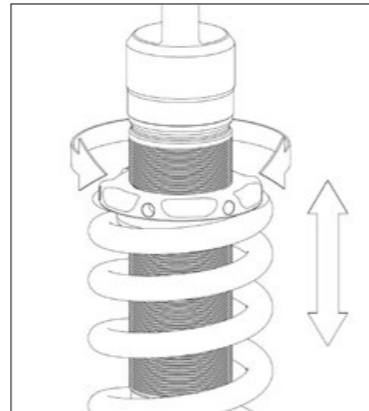
Setting the Spring Pre-load

Spring preload refers to the amount the spring is compressed under the weight of the vehicle. The primary reason for changing the pre-load on the spring is to adjust the chassis' ride height, corner weight and geometry. By changing the spring preload the spring does not become 'stiffer' or 'softer' (a spring's rate remains constant regardless of how much the spring is 'pre-loaded').

Your Nitron shocks are supplied with a pin-spanner which locates in the holes of the spring platform, allowing you to either increase or decrease the preload on the spring.

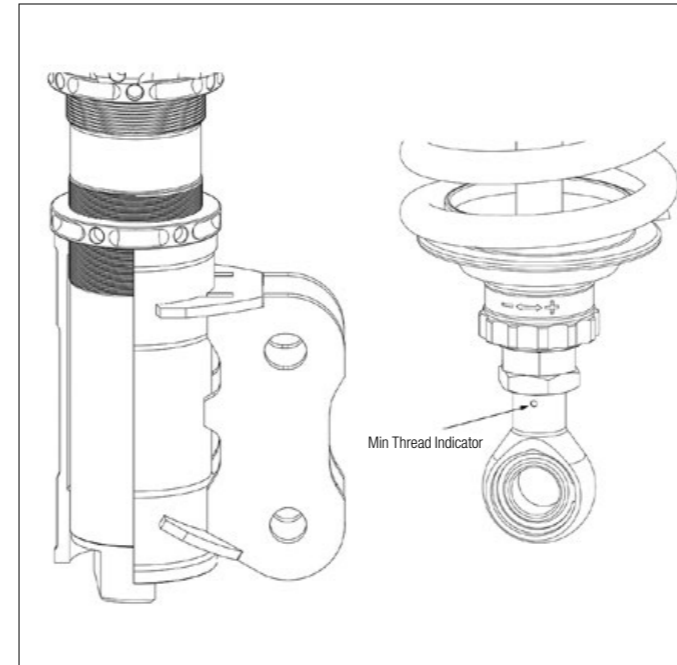
To increase the preload turn the spring platform in a clockwise direction (compressing the spring).

To decrease the preload turn the spring platform in an anti-clockwise direction (unloading the spring).

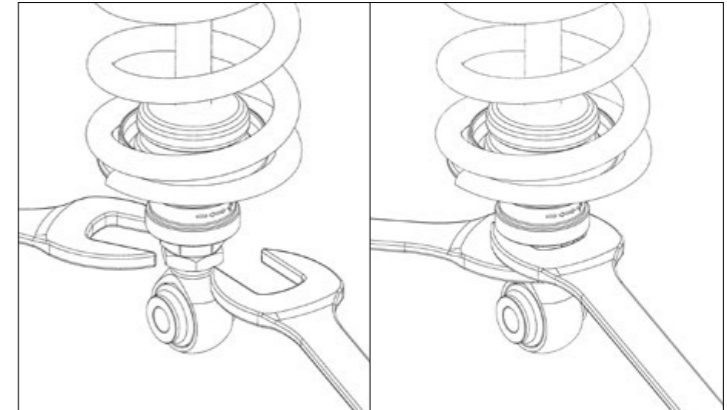


Independent Ride Height Adjustment

If your shocks have the independent ride height adjustment feature, the chassis' geometry can be altered without altering the pre-load to the spring.



Strut dampers with lower brackets should only be altered from their factory position by trained persons using the correct factory tools.



CAUTION: It is very important that you do not unscrew the adjustable end eye beyond the indicator mark. It is vital to use two thin section spanners to lock the adjuster – one to hold the rebound adjuster housing and the other to tighten the nut. Tightening torque is 40N/m.

The Importance of Chassis Geometry

Although a primary contributor, shock absorbers in isolation are unable to provide the formula for a winning vehicle. Chassis dynamics and handling is a broad discipline and requires many hours of design, modification and testing.

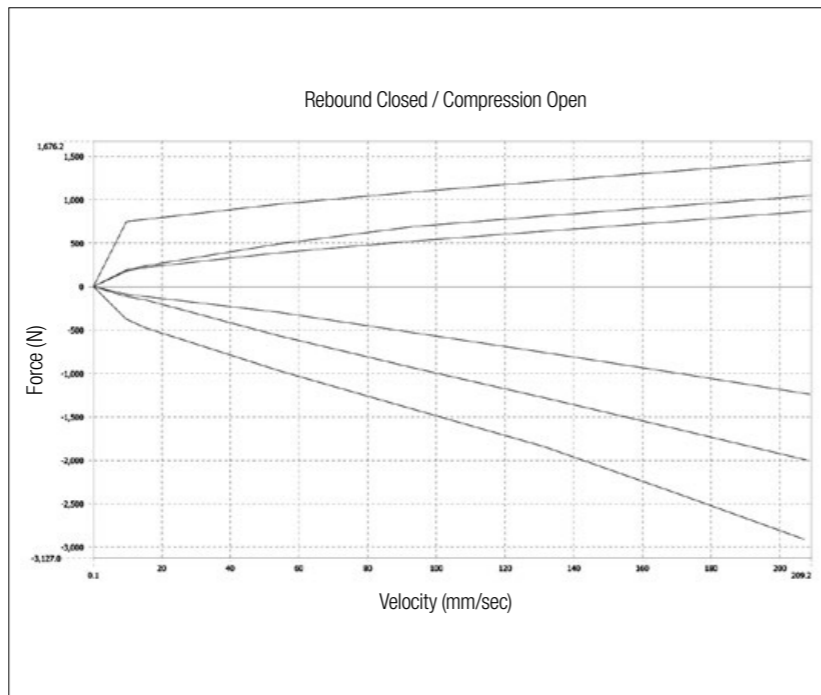
Nitron highly recommend that your vehicle is correctly setup and aligned after new shocks have been installed. A full geometry setup, including the minimum of wheel alignment and corner weighting is a necessary requirement to explore the full potential of your new suspension. Details and advice on setup can be found at www.nitron.co.uk or by contacting your Nitron dealer.


What is Damping?

Your shocks have been built to specific weight and performance specifications with pre-set factory damper settings (adjuster 'clicks'). Nitron recommend that you experience your vehicle with these damping settings before making any further adjustments. Dampers produce a force proportional to the speed at which the shock shaft moves into or out of the shock. To the right is a force / velocity graph produced by testing an NTR shock on a dynamometer. By adjusting the damper settings via the adjuster knob(s) you are able to change the rate of rebound and compression damping that the shock produces.

Damping Adjustment

Nitron NTR shock absorbers have a class leading level of adjustment giving you excellent tuning potential. If you are inexperienced with suspension setup, the most effective way to understand how the controls affect the vehicle is through calculated trial and testing; changing one adjustment at a time to avoid confusion. Damper settings are always adjusted from the 'full hard' or full '+' setting and noted as a negative figure from this position. Therefore, a '-10R' reference would denote that the rebound damping has been set 10 clicks from full hard. This is achieved by turning the rebound adjuster clockwise until no further clicks are felt, followed by 10 anti-clockwise clicks. Never force the adjuster knobs as this may result in damage.



 NOTE: Suspension setup is a complex subject and should not be considered in isolation to other components and functions of the vehicle and driver.

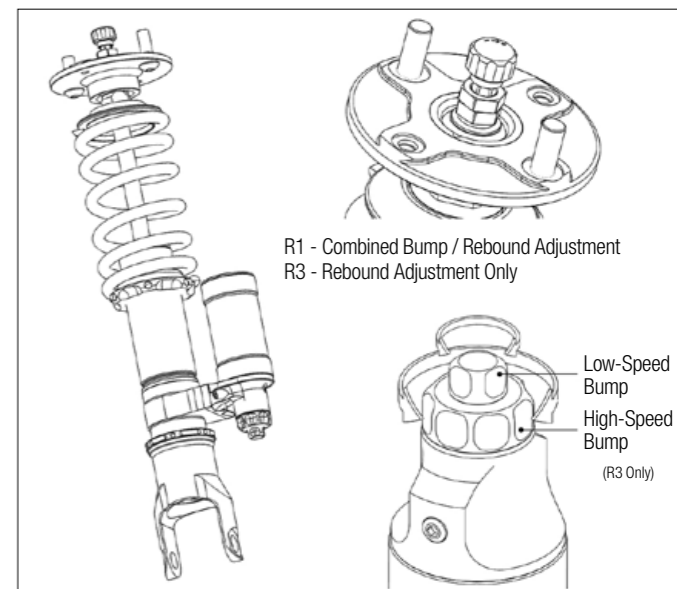
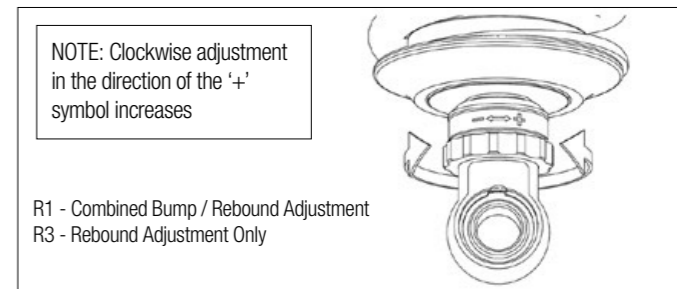
NTR-R1 (2-way, Single Damping Adjuster)

R1 shocks feature a single combined damping adjuster which controls both rebound and bump damping at the same time. This allows very quick and easy changes to the setup of your vehicle. The adjuster is located at the bottom or top of the shock and offers a minimum of 22 'clicks' of linear damping adjustment. To increase the level of damping the adjuster should be turned clockwise. Beyond 20 'clicks' from full hard the adjuster will have negligible effects.

NTR-R3 (3-way, Triple Damping Adjuster)

R3 shocks have independent rebound and bump damping adjustment by employing a separate gas reservoir either mounted remotely through a hose or 'piggybacked' to the main shock body. The rebound adjustment is the same as that found on the NTR Race R1 and is located at the top or bottom of the piston rod with a minimum 22 'clicks' of adjustment vial the large black dial.

The bump damping adjustments can be found on the top of the remote reservoir or piggyback canister. This large black knob has 16 'clicks' of adjustment and controls the 'high speed' compression. A small silver low-speed bump adjuster knob mounted above the larger black compression adjuster independently controls the 'low' speed bump damping with a minimum of 26 'clicks'.



Inspection & Care

As with any other part on your vehicle and to ensure your Nitron shock gives you many years of service, it is necessary to carry out periodic maintenance.

The shock absorbers should be regularly cleaned with a soft cloth and household detergent at least bi-monthly and monthly in arduous or wintery conditions. A light spray of a water repelling oil or lubricant should be applied to the shock and in particular the chrome shaft if the vehicle is to be left standing for considerable time. The bump stop should be pushed towards the shock body with a soft instrument to allow cleaning and application of lubricant to the shaft beneath.

CAUTION: Never use strong detergents, thinners or brake cleaner as they can damage the surface finish of the shock and seals. The use of compressed air or pressure washers is not recommended.

Inspection Points:

1. Check that the shock is securely fitted to the vehicle
2. Check the bearings for excessive play
3. Check the shock absorber for damage or surface wear from external components
4. Check the shaft for corrosion or markings / striations
5. Check the condition of the shaft underneath the bump stop
6. Check the free motion of the adjusters
7. Check the routing and quality of any braided hoses fitted
8. Check for wear on composite materials including the end-eye bearing seals



Do not use the vehicle if you are in any doubt regarding the road-going safety of the vehicle.

Warranty & Servicing

Nitron warrant all its products and accessories against design and material defect for a period of 1 year from date of purchase. The warranty does not cover any such failure due to incorrect fitment or use and does not extend to any other part of the vehicle.

All NTR shocks require specific maintenance detailed herein.

Failure to comply with the installation and maintenance procedures may result in avoidable damage caused to the shock or vehicle.

Your Nitron shocks have been designed and built to provide you with many years of exceptional performance, however it is recommended that they are serviced by a Nitron approved service centre.

Recommended Service Intervals:

Race use: Annually, Every season (Off-peak - December/January/February is advised)

Street/ Road use: Every 20,000 - 30,000 Kilometres/ 12,000 -18,000 Miles

Nitron offer a 12 month warranty on all shocks that are out of warranty and are serviced by an approved centre. It is recommended that all Nitron shocks comply with the service schedule outlined on the unique service schedule card included with the original documentation. Please see website for further details and promotions.

NOTE: Any given warranty will be void if the shock is serviced outside of an authorised service centre. A list of authorisd service centre's can be found at www.nitron.co.uk.

Tel: +44 (0)1993 849449 | sales@nitron.co.uk | www.nitron.co.uk

Notes



www.nitron.co.uk

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