Caterham Buyers Guide

I will try to answer and highlight the more general information which can be applied to your car before making recommendations at the end. You may find me rambling a little and referring to specific cars halfway through.

As I hope you are aware, I sell a range of brands of dampers. I also sell a range of specifications - non-adjustable all the way to 4 way adjustable and Semi Active.

We will always find the best product for your use and budget. This is our core principle. We would like to see you return to us for service and upgrade. Telling your friends and widening our customer base. Offering a service that is bespoke for each customer is at the heart of our service.

Here we go then – fixed rate, 1 way, 2 way,3 way, Active or more:?

Justifying a set of the 4 way Ohlins TX40, 3 way Penske or Tractive Active Suspension for road use will be difficult, however if you want the best specification at a very reasonable cost and you really want the ultimate adjustment, quality of product and brand then they are worth every penny. Indeed we have provided a significant number of sets to road going owners who wanted just that “Ultimate Performance”. You will never ever need another set of dampers!
In many respects I think you feel the better quality of a damper on the road than you do on a track where surfaces are far smoother and consistent. On track though there is a stopwatch! Good suspension setup will provide confidence in the car which will always lead to performance gain.

All costs are for full kits of 4 dampers – springs, spacers and adjustment tool.

Fixed Rate Dampers

As it says really these are suspension dampers which have no adjustment for the valving of the damper. They do have ride height adjustment but nothing else. For this specification we only offer the Quantum Zero. It is available in regular linear piston and valve configuration, digressive/linear piston formats. Our specification will make sure the suspension will be set up exactly for your needs not to hard and certainly a great improvement on standard dampers. (For digressive valving and pistons please see the information below).

The Quantum Zero is fully upgradeable to either one or two way in the future if required as it would be to add digressive pistons at a later date.

Quantum Zero £1202.06 incl springs + vat

1 **Way Adjustment** – One adjuster that alters both Compression and Rebound settings

In the one way range we have Quantum One.Zero, Nitron NTR1, Nitron NTR1 Pro 46mm and Penske 7500.

Nitron NTR1 @ £1397.50 + vat
Nitron NTR1 Pro 46mm @ £1682.75 + vat
QRS One.Zero @ £1563.45 + vat
Penske 7500 1 Way @ £2023.52 + vat
TracTive 1 Way £1579.08 + vat

Nitron offer two great value, well specified products within this range, both recognizable by the smart hard anodised grey exterior coating.

The NTR1 40mm is probably the more familiar of the Nitron 1 way dampers which you will see on many Caterham's. This is altogether a more focused product that benefits from being ‘made to order’ so allows input from us to ensure our massive experience with Caterham suspension is fully utilised. The NTR1 has 24 clicks of adjustment. NEW for 2020 is our Digressive Piston Option for the 1 way NTR1 40. At just £100.00 + vat for the 2 front dampers it makes for a real positive turn in and great ride over larger bumps.

The Nitron NTR1 Pro 46mm until recently has not been something I would have recommended for use with a lightweight car. It has not been able to flow enough oil at low speed damper movement (giving to firm a ride). Now though following work with our Autograss customers I am able to use a high flow 46mm piston in the build specification. This now means that the 46mm Pro damper performs exactly as required. With the benefits arising from greater oil capacity and strength it’s a great damper that should be considered. Nitron is a UK manufacturer.

The Quantum is entirely manufactured and assembled in the UK save for perhaps the O rings or seals used. The quality of engineering design and indeed finish is second to none. Hard anodized just like the Nitron and available in an all black finish if required for a small additional cost.

The One.Zero has 27 “clicks” of adjustment. Very progressive and you really do feel the "clicks". The Quantum has finer adjustment but the Nitron can be adjusted over a wider range.

Quantum also offers a digressive piston option which again I would recommend for the front dampers only. The cost is £150.00 for the pair. Additionally the Quantum can be built into a 2 way damper with very little work perhaps at the time of service.

The Penske 7500 is as you would expect a fantastic product but I feel the fitment of the Nitron and Quantum offer better value at their respective prices.

New on our list of suspension is TracTive Suspension. TracTive are a Dutch company established in 2010. They have vast experience working for one of the longest established performance brands prior to creating their own business. The quality of the engineering is second to none. I like the products very much.

The TracTive 1 way damper is very competitively priced at just £1639.08 + vat

I would have no difficulty recommending any of the above – it is dependent on the options and upgrades you may wish to make in the future.

Nitron NTR1 40mm, Penske 7500, Quantum and Tractive all have Digressive Piston options.

2 Way Adjustment

QRS Two.Zero @ £2353.79 + vat
Penske 7500 @ £2354.48 + vat
Penske 8300 @ £4347.08 - *remote reservoir and upgradeable to 3 way 8700 specification.* Includes Digressive piston
Ohlins 2 way with remote reservoir @ £4539.33 + vat Includes Digressive Piston
Ohlins ILX 2 Way - no reservoir required @ £4872.67 + vat (Fantastic dampers with great performance and packaging. Very easily tuned or modified to adjust in more "ways" Includes Digressive Piston).

Quantum Digressive for the front dampers make the kit price £2503.79 + vat Penske 7500 also has them at an option taking the total to £2623.00 + vat.
What would I do at this price point. I would need to consider if I wanted to upgrade in the future. No doubt the Penske and Ohlins with the remote reservoirs are better performing in my opinion.
Penske 7500 and Quantum offer great performance for the cost and with simple installation it's really up to you.
Of the higher spec pair the Penske 8300 however is a fantastic damper with the possibility to upgrade easily to 3 way. This would be my choice if funds were available.

3 & 4 Way Adjustment

At this level we have the Nitron NTR3 and NTR Pro 46mm, Ohlins ILX, Ohlins 46mm, Tractive and Penske. I have owned and used the Nitron NTR3 Pro for a competitive season and they were faultless. The regular NTR3 isabsolutely great value for money. New for this level of damper is the Tractive 3 way. Superb quality and engineering at very good value for a wide body damper.

Although a significant price differential my current damper of choice is the Penske 8700. There currently is a significant difference in the way the dampers perform and the way the car responds. If you are choosing a multi way damper it is likely you require the fine adjustment and performance of the Penske. It comes with a Digressive/Linear piston and is infinitely adjustable. Simply superb. I use this myself as it offers huge performance. (This damper has won the Indy 500 many times in recent years. It is the spec damper for all BTCC cars – even if they have other stickers on the cars). We have specifications for Ohlins ILX and regular 46mm dampers. The ILX are an all in one damper with no remote canister and are of a very high specification. I would certainly recommend them if you have the budget. This is though reflected in the cost!

Nitron NTR 3 - £3043.75 + vat
Nitron NTR 3 Pro - £3246.25 + vat
Tractive 46mm 3 Way - £3090.00 + vat
Penske 8700 – 3 Way - £5463.12 + vat
Ohlins ILX – 3 Way - £5939.33 + vat
Ohlins 46mm – 3 Way - £5272.67.00 + vat

Tractive Active Ride

The Tractive Suspension – ACE system can run in super compliant supple ride and the moment a sharp or positive action is input whether steering, acceleration or deceleration the damper reacts. Going from full hard to full soft or vice versa in less than 10 milli sec. (Less than 1/100th sec). Its simply unbelievable and for a road and track or just fast road user transforms the car. This reaction of the damper is continuous. Not just switching from hard to soft but changing from every acceleration force induced in the car.

The ACE system allows on the fly adjustment. Should the track surface change mid-race or track session, if your tyres go off mid-race or the balance change you can adjust the balance and settings via the remote control.

Again I have used this system and thoroughly tested it before offering it for sale. Its difficult to explain here how amazing the active ride really is. For those on the road and track it should be something you consider.

Active Ride ACE– Remote Electronic Adjustment £3950.00 + vat

Active Ride ACE+– Remote Electronic Adjustment £4675.00 + vat **(Recommended)**

Active Ride R-ACE– 2 speed compression and Remote Electronic Adjustment £5686.97 + vat

All the Tractive Active dampers give a Digressive valving force curve. Much wider than the traditional dampers.

Pagani, Dallara Road car, RUF Porsche and others now fit these as standard to their cars. This is the level of performance offered.

Springs

All of the above dampers are supplied with linear springs or with our own twin spring progressive set up. (£175 option for the rear only). The benefits of the progressive set up make for a far less harsh ride. I particularly like them on the rear of a 7 for road use. Do not underestimate the significant benefit that the new dampers and valving will bring to ride quality but the twin spring is a fantastic extra.

Pistons and Digressive Valving

This affects the shape of the damper force curve/plot. It brings a further enhancement to ride and performance. Unfortunately as always there is a cost implication as the machining process for the digressive piston has to be completed on 2 different machines and has to be handled by a “man” a number of times. The linear piston is one machine - one time handling.

General Information

Lets look at the standard dampers.

Bilstein. I have tested many and most of the various M1/M0 types etc (there are far more than the 2 specs). They perform well - the curve/plot is good except it’s all a little soft on the front and a little hard on low speed weight transfer at the rear. Digressive in shape = good but just under damped. Works well on a road car with less power and momentum. Spring rates OK - front could be stiffened a little - rear is progressive and good.

My testing of these has found that although they seem not to fail to often they do not match each other very accurately. Indeed after testing one batch of 9 front dampers the range across all was in excess of 60% of the adjustment in a Quantum. Additionally it was the newest set that were the furthest apart. - hardest and softest. This not a criticism – they are simply different spec dampers intended for different work.

Any of the new dampers will make an improvement to ride and control, precision etc. So long as we get the spring rates correct they will not be harsh either.

So what to do? Well I do not yet know your budget. I will therefore make some assumptions.

You would like to see a good step up in performance - you probably drive it faster than when you first had the car so it's not so much as the car falling away as you improving and feeling more comfortable. It's a very very fast and stable car so you need to ensure it has the poise to make use of its power.

Option 1 - Ultimate spec.

Penske 8700 Series - 3 way adjustable - £5686.97+vat or Tractive ACE+ Active Ride @ £4675.00 + vat (We have sold many more of these kits recently than anything else).

Option 2 - High Spec/Performance 2 way - 3 way

Nitron NTR3 @ £3043.75 + vat – awesome!

QRS 2 Way - Digressive front piston £2503.79 + vat

Penske 7500 - £2354.48 + vat

Option 3 - 1 way adjustable

Nitron NTR1 – Digressive Front £1497.50 + vat (progressive rear springs (£175.00) if on the road mostly.

There are so many options without a budget it is difficult for me to make a selection. Let me have some figures and I will guide you more accurately.

The only thing I would add in the first instance is that I do offer a stiffer set up for the track guys – that's the whole idea of speaking to me rather than a manufacturer who knows the dampers but not the car.

Lead Times

The approximate lead time for the manufacturers is stated below.
Nitron 4 Weeks
Penske 3 Weeks
Ohlins 10 - 12 Weeks
Quantum 5 Weeks
Tractive 3 Weeks

Further Reading

Before explaining a little more about the 1 way/2 way lets look at your existing dampers.
I can not say if anything is wrong until they are dyno tested.
It is unlikely the Billstein dampers have failed - just that they are under damped - not enough force to control the car momentum (bump) and the spring strength - rebound.

You could look for leaking seals etc but its not the full picture. Billstein's should be good for 100k miles. But they are more closely related to an OEM damper for a road car than a performance damper. Far more friction.

3 Way Dampers

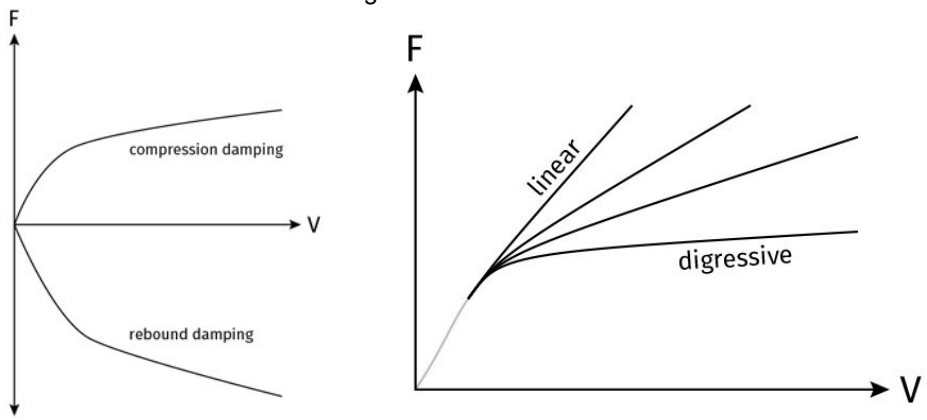
Similar to the 2 way by separating the bump and rebound but it also splits the compression adjustment into 2 sectors. Low speed damping (which is the area a driver will feel the most) and high speed which you will only feel if hitting a hole in the road or a kerb at the race track.

Digressive Piston

In a linear piston the forces increase hmmmm in a "linear" way. From slow speed (damper travel speed) through to high speed (pot holes or kerbs on a circuit).

The digressive piston allows the force to blend way at the high speed end - so it’s not too firm when you find those sharper bumps and holes. Likewise I opt for a double digressive - meaning the rebound is also digressive and the spring can push out quite quickly under high loads to keep tracking the surface.

But when the speed (damper) are lower the control forces are still relatively strong. This give great feedback and confidence when driving.



Progressive springs.

Good on all the dampers but if I had to choose between digressive piston and progressive springs I would opt for the digressive piston on the front and progressive springs on the rear - particularly for road spec. On the 2 way damper I would want both on the road and just the pistons on track. The linear spring being more predictable on the smoothest of surfaces.

So the progressive springs on a 2 way damper can be left to do their own thing - you can soften off the rebound and let the spring take care of things. They will sit at a fairly soft rate at ride height but stiffen under compression when needed. The rear will roll less as one side stops pushing out so hard and the other side increases the force at which it pushes back against roll.

It's all very subtle but quite effective and you would certainly feel all the changes if tested back to back.

I don't think there is much more I can say other than they will be very confidence inspiring - they will change the car dramatically for the better - like you will get a new grin on your face again when you drive.

All of the above dampers come with valving and set up that we have developed along with the manufacturer's to meet our specific criteria. You may find what is supposedly the same damper for sale elsewhere – But it's what is inside that counts !

By the way the Tractive Active Dampers do all of the above – all of the time – without you knowing it 😊 and you can adjust from your seat whilst driving!