

ANY QUESTION ANSWERED

If we don't know the answer, we'll find the person who does

Q Where can I get my ESA shock rebuilt?

My BMW R1200GS has always made a slight metallic noise when travelling over bumps in the road. I assumed it was just something the Telelever system did, but just after the last MoT at 20k miles, the front ESA shock failed completely, leaking oil. The price for a new one made me wince; can I get it rebuilt?
Michael Hughes, email

A Answered by Chris Dabbs, MCN

A lot of firms are wary of the shock's internal servo motors that adjust damping. Although they weren't designed to be rebuildable you have two choices in the UK.

Andy Robinson at Firefox Racing in Keighley has designed robust, replacement internals. He can

turn a shock around in one to two weeks for about £200, tailoring it to your riding needs, with a two-year guarantee. Or, you can send in your old shock and he'll install the necessary parts in a new YSS unit for £395.

The other option is a German-built Wilbers unit. They also offer a tailor-built rebuild to match your riding; on

or off-road, solo or mainly two-up. There's a two-week turnaround, the shocks have a five-year warranty and the cost is £595, but you need to send your old shock to them so they can transfer some of the electrics from your old shock to fit on the Wilbers unit. You can also buy the shock, complete with new electrics from them, but it's around £1500.

Not many folk touch the shocks, but you do have options...



KIT CHOOSER



Q How best can I travel light?

I have a 1996 Yamaha Thundercat and I am planning a four-day trip. Can you advise on the best luggage options to travel light and have a back pack?
Ian Graham, Cutlercoats, Tyne and Wear

A Answered by Keith Roissetter, Infinity Motorcycles

The Thundercat is a relatively easy bike to put some temporary luggage on. Ideally, I'd suggest putting a rack on the back and mounting a tail pack to it. You can mount bags on the pillion seat but if you're taking a rucksack it may cause a bit of 'crunching up' against the tank. A tank

bag is a great idea, and between that and a tail pack you may well have enough space to leave the rucksack at home.

The 35-litre Oxford F1 Tail Pack has a few side pockets and has been well developed over the years. The heavier-duty T40R is a bigger and they both convert quickly into rucksacks to make lugging them

about easy. The Bagster Spider is quite stylish but only has a 23-litre capacity when expanded. The best stuff is probably the Kriega range and a US30 Drypack may work for you. Having said that, a dedicated roll bag such as the Oxford Aqua T-50 range or the Spada 40-litre Dry Roll Bag with some decent bungees will work for the trip as well.



R125 has no diagnostic port

Q Gear indicator woes

My wife has a 2015 Yamaha YZF-R125 ABS, which I have been trying to fit a Gipro gear indicator to, without much success. Try as I might, I can't get the speed function to work over 6mph. Any help is much appreciated.
Gary Adams, email

A Answered by Giles Harwood, HPS

The Gipro is normally a simple bike-specific plug-and-play installation into the diagnostic port under the saddle on most current bikes. However, on bikes which do not have a diagnostic port (and on some ABS-equipped Yamahas and Triumphs, where the makers say electronic/electrical accessories could affect the ABS) the Gipro supplied is one of two universal kits. The universal option is more involved to wire up, as you need to find/connect to a tachometer pulse feed from the bike's loom, and an electrical speedometer pulse feed wire. Alternatively, on a small number of bikes, it's necessary to fit a wheel speed sensor which is supplied with the 'WSS' universal kit. Unless you are competent around electrics, I'd use a professional to get it installed.



Run it in hard to use less oil

Q My bike has a thirst for oil

My Kawasaki Ninja 650 is using a litre of oil every 1000 miles, surely that can't be right?
William Farley, Exeter

A Answered by Chris Dabbs, MCN

It is not unusual for bikes to use a litre of oil per 1000 miles if they are being used hard, or if they have been run in too gently – in this case, the bores and pistons don't bed in well and high oil consumption is the result. The engine doesn't smoke because the oil only gets past the pistons when the engine is working fairly hard, and because the gas temperatures are very high under these conditions, the oil is burnt and leaves very few deposits.

MCN LAW

Your legal questions

Q How do I prove cause of my injuries?

I had a no-fault accident six months ago and the driver's insurer admitted liability. They instructed a rehabilitation company, but the insurance company is refusing to pay for physio to help my back and neck pain as they are disputing the cause of my injury. What is going on? They have admitted fault!
Colin Watts, email

A In your claim, you must prove the accident caused the injuries for which you are claiming compensation. This is evidenced by obtaining expert medical evidence in the form of a medical report. Things that can be relevant are any pre-existing conditions (for example, previous back or neck ache), either constitutional, or as a result of a previous accident.

It is important your medical expert has access to all of your medical records, and the report should deal with any relevant history and cause of your injuries. In other words, were they more likely than not

'There is no reason the defendant shouldn't pay your physio costs'

caused by the mechanism of the accident? Assuming you have supportive medical evidence, there is no reason the defendant should not pay your physio costs. If, for example, you had tripped over a wall a few weeks before the bike accident and thus had pain before, then your opponent's insurer does not have to compensate you as the injury pre-dated the accident. But accidents can exacerbate pre-existing symptoms and it is important the medical experts deals with this where applicable, apportioning injury between the two accidents.

Andrew Campbell
Solicitor and author of the MCN Law column for the last five years

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Motorcycle Accident Solicitors

EXPERT'S GUIDE TO... V4 ENGINES

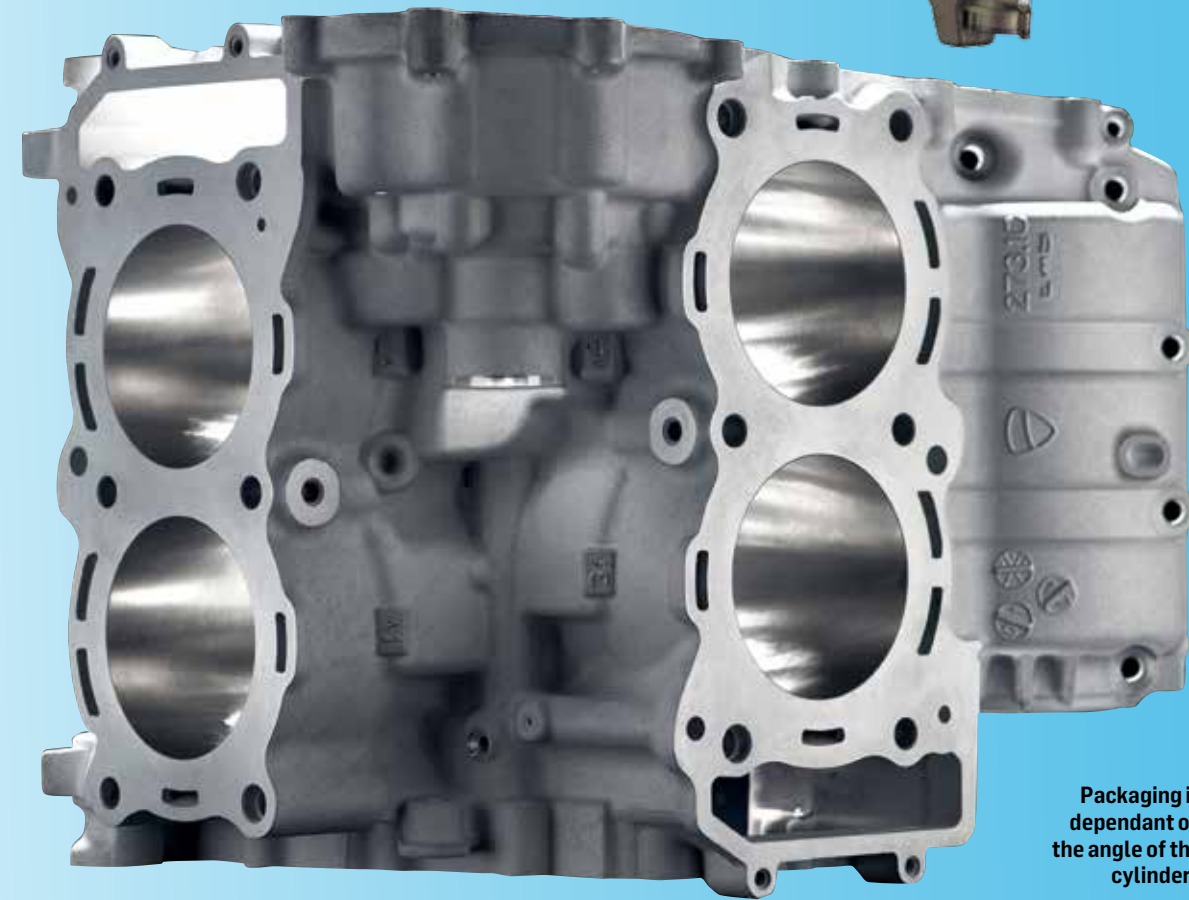
Pros, cons, firing orders and packaging explained



THE EXPERT

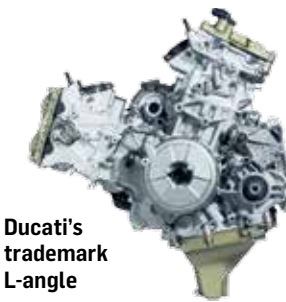
Nell Spalding is the author of **MotoGP Technology** and is often called in when **Eurosport** need something complicated explained on the TV.

The V4 made its track debut with conventional pistons (it was first seen in the oval-piston NSR500) in 1982 with the Honda RS1000RW. It made so much power (148bhp+) that it required a new generation of tyres to be designed. This concept morphed into the RVF750 and finally the RC30, which dominated production bike racing. Ducati, Honda, Aprilia and KTM now all run V4s in MotoGP, while Yamaha and Suzuki run inline fours with unconventional firing orders designed to replicate the power characteristics of a V4 but without the packaging issues.



Packaging is dependant on the angle of the cylinders

4 THINGS YOU NEED TO KNOW



Ducati's trademark L-angle

1 The benefits

For the same capacity, a V4 has a shorter stroke than a V-twin, allowing it to rev higher and produce big power, while mimicking the V-twin's smooth torque characteristics. On track, the V4 has predictable throttle response and a good drive out of corners with a smooth torque curve.

It's also a narrower layout than an inline four, allowing chassis designers to optimise weight distribution and also increase ground clearance, while in 90-degree format its primary balance means that there is little need for heavy balancer shafts to be added to the motor.



Honda's RCV road bike houses a 90-degree V4

2 The disadvantages
V4 production bike engines are very expensive to build – and then there's packaging! The V4 format has hot exhausts exiting from both the front and rear of the motor, and the positioning of the inlet ports between the V makes adding a fuel system tricky as there is so little space.

The V-angle can also create issues, with a narrow V pushing the inlet system up and creating a tall engine. A 90-degree V can be long, which adversely affects the bike's wheelbase.

3 Angles
There is no set V-angle for a V4 and different manufacturers have used different angles. Ducati has historically run a 90-degree angle in an 'L' configuration, which has good primary engine balance but results in a long motor.

Honda's first MotoGP V4 was around 75 degrees initially, which is more compact, but they now use a 90-degree V, and so do KTM. Aprilia have around 75 degrees for their V4, which is compact but not as tall as the 65-degree unit in the RSV4 road bike.



4 Firing orders

Modern four-stroke V4s can run a 'screamer' configuration, where the crankshaft is designed to phase the cylinders' combustions as evenly as possible over each 720-degree cycle.

Another option is a 'big-bang' configuration where cylinders fire in closely linked groups with various configurations of firing order dependent on the design of the cams and crankshaft.

The recently-favoured variation in MotoGP is the cylinders firing rapidly at 90-degree intervals followed by a 360-degree gap. Each variation has its own benefits and disadvantages in terms of grip, power delivery and mechanical stress.

4 Firing orders

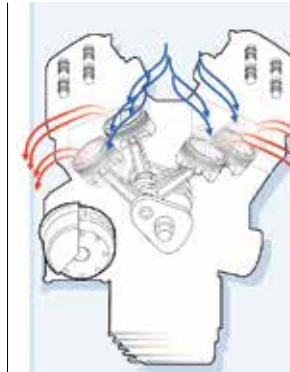
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Ducati's Panigale V4 runs a 'twin-pulse' firing order, which has a 70-degree offset between the two crank pins, so the combustion occurs in two groups set 70 degrees of crankshaft rotation apart, followed by a gap of almost one revolution.

The reason is that each cylinder's individual power pulse lasts about 70 degrees



Firing order determines a V4 engine's character

so coupling two 'bangs' that far apart mimics a big V-twin's feel. Ducati used this set-up in the 990 and 800 eras, but it doesn't appear to be what they are currently using in MotoGP.

Next week

Frame design

