





THE MAGAZINE FOR THE AUTOMOTIVE AFTERMARKET...

ISSUE 13 SPRING 2024



SECURE DIAGNOSTIC ACCESS FROM BOSCH

SEE PAGE 4

HELLA, THE WHOLE WORLD OF ELECTRONICS

SEE PAGE 6



SEE PAGES 12 & 13





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SECURE DIAGNOSTIC ACCESS (SDA) SMOOTH ACCESS TO PROTECTED VEHICLE ELECTRONICS

Restricted access to diagnostic functions

Modern vehicle electronics are increasingly threatened by tampering and hacking attacks. More and more vehicle manufacturers, therefore, protect access to the diagnostic data of their new vehicle models. This usually makes it impossible to perform active diagnostic tasks such as the calibration of driver assistance systems or service functions. As a result, independent workshops face technical and administrative challenges because some vehicle manufacturers use proprietary security solutions with different access requirements and payment concepts.

Secure Diagnostic Access (SDA) as part of ESI [tronic] Evolution

Bosch offers a solution for this: Secure Diagnostic Access (SDA). As part of the ESI[tronic] Evolution diagnostic software, SDA enables unrestricted work on vehicles with protected vehicle electronics in the future. Access is available for various vehicle manufacturers and models and is continuously being expanded by Bosch. SDA is supported by the latest generation of Bosch diagnostic tools, including the

KTS 560, 590, 350 (and KTS 250 with limited functionality). Instead of separate diagnostic devices and licences for each manufacturer, just a one time registration for SingleKey ID and online user identification are required. This will allow access to all participating manufacturers.

Full speed ahead with Bosch SDA

Since 2021, SDA from Bosch has meant full speed ahead for extensive diagnostic work on access-protected vehicle electronics. With the integrated and standardised Secure Diagnostic Access solution, Bosch continues to provide centralised access to secure vehicle data through ESI[tronic] Evolution diagnostic software and the brand coverage continues to grow.

Our overview shows which brands have been integrated into the standardised solution so far.

Abarth, Alfa Romeo, Audi, Chrysler, Cupra, Dacia, Dodge/RAM, Fiat, Ford, Hyundai, Jeep, Kia, Lancia, Mercedes-Benz, Nissan, Polestar, Porsche, Renault, Seat, Skoda, Subaru, Volkswagen & Volvo



MAHLE HIGHLIGHTS QUALITY AND EXPERTISE IN ENGINE, GASKETS, AND THERMAL MANAGEMENT RANGES

MAHLE is a pivotal brand in the automotive industry, with every second car globally equipped with its components. The company prioritises building enduring partnerships and delivering market-leading products to meet evolving industry demands.

Engines and Gaskets

MAHLE's engine components include pistons, cylinder assemblies, engine bearings, valve train components and NRMM turbochargers. All are designed with German engineering expertise.

The gaskets range, spanning over a million applications, exemplifies innovation and quality. Designed for various sectors, including trucks, marine, and industrial, MAHLE gaskets meet stringent OE quality standards.

Thermal Management

Seasonal variations and maintenance practices significantly impact vehicle thermal management. Proper coolant levels and regular air conditioning system usage are essential to prevent overheating or freezing.

As a tier-one supplier to vehicle manufacturers, MAHLE adheres to ISO standards and undergoes regular audits, ensuring exceptional product quality. The company's extensive product range is continually updated to accommodate hybrid and electric vehicles, reflecting its commitment to innovation.



Training and Support

MAHLE stands out as the sole tier-one supplier offering a comprehensive thermal management program in the aftermarket. Customers benefit from technical assistance via helplines and online training courses.

The MAHLE training portal provides a range of learning options, including classroom sessions, online courses, and interactive modules. Garages can access direct technical support and fitment advice through MAHLE's dedicated email helpline at technical.uk@mahle.com.

MAHLE's unwavering commitment to quality, innovation, and customer support ensures that its products meet the highest standards, providing reassurance to technicians and workshops worldwide.

If the job requires a MAHLE quality component, then ring us today!

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MAHLE



MAHLE Aftermarket training portal

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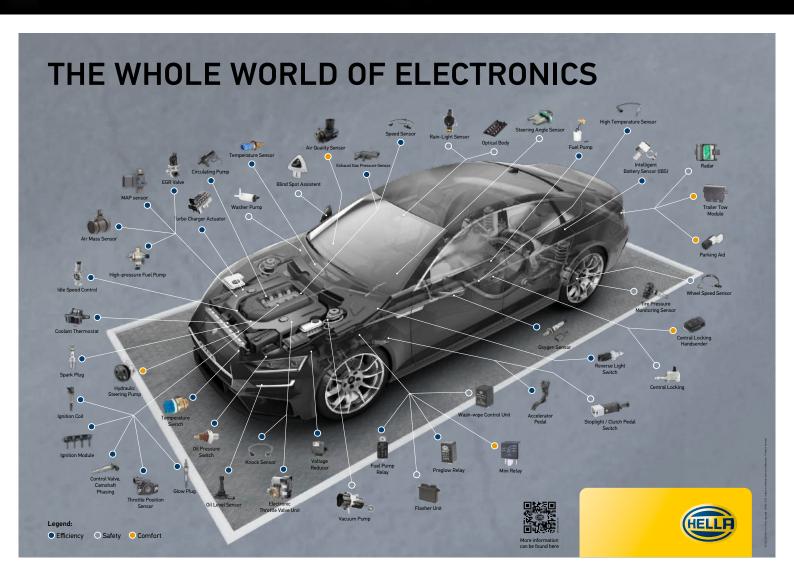
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REPXPERT



CONCENTRIC SLAVE CYLINDERS: THE DIRTY SECRET

For Schaeffler Technical Manager and Senior REPXPERT Alistair Mason, an everyday occurrence is to overhear technical phone calls or see inspections being carried out on returned LuK Concentric Slave Cylinders (CSC).

This has allowed him to identify one particular issue that is rarely discussed, but which affects *every* type of CSC for *every* vehicle application. The dirty secret is: **Contamination**. Schaeffler now has more CSCs returned with contamination related failure than are returned with signs of being over-pressurised during installation, the previous number one cause of premature failure.

So, what is causing this? It could be low cost or even missed servicing, ignoring recommended fluid changes, and of course, lower mileage or dormant vehicles due to the new working practices caused by COVID hasn't helped.

Contamination, put simply, means that the clutch fluid has become old, polluted, and discoloured. It attracts moisture, guide tube debris, and who knows what else could be in there!

When fitting a new CSC some installers will happily pump this contaminated fluid into the new cylinder, therefore contaminating and shocking the new seal. As a result the seal starts to swell (see picture lower left), leading to inevitable failure, usually 1000+ miles after the CSC was replaced, although failure can occur earlier in extreme cases.

The question to ask yourself is "Do you know the history of the clutch fluid you are draining?" It is also worth bearing in mind that the usual vehicle manufacturer's recommendation, and also that of component manufacturers, is to change the hydraulic fluid every two years.

The way to avoid a contamination related failure is clear: Drain, flush and refill the clutch fluid every time you install a new CSC. Doing this five-minute job correctly could prevent a disgruntled customer returning for yet another CSC.

Please don't get caught out!



Alistair Mason



Seal measurement





Examination of the assembly reveals the seal to have been contaminated causing it to swell to 46.9mm (left). The nominal size for this CSC is 43mm (right).





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UNLOCK POWERFUL PRECISE PERFORMANCE WITH NGK SPARK PLUGS

While spark plugs may seem like just a small component in the grand scheme of a complex modern engine, their impact on everything that makes your customer happy - power, MPG, and more, can't be overstated. That's why investing in premium spark plugs is not merely a choice; it's maximising performance and customer satisfaction.

Our precious metal spark plugs make the perfect choice for any workshop looking to unlock multiple long-term benefits. Our platinum and iridium technology offers a stable and powerful spark all while being less susceptible to typical wear and corrosion. This means that the customer can enjoy spark plugs that don't compromise on power, even during longer service intervals.

While precious metal spark plugs make the ideal service upgrade, our standard spark plug range still boasts market-leading ceramic technology for a great value and reliable option.

Choose Excellence; Choose Precision; Choose NGK Spark Plugs.

TECH TIPS

- Maximized Power Output: Precision sparks lead to optimal combustion, translating to performance at your command.
- Enhanced Fuel Efficiency: Say goodbye to lost miles per gallon. Our spark plugs ensure that every drop counts.
- Extended Engine Life: Reduced stress on engine components means a longer and healthier life for your customer's beloved machine.
- Our top tip don't forget the basics, even when undertaking a fault investigation. Thanks to the pivotal role spark plugs play in a correct combustion sequence, it's important to assess spark plug condition, application, and fitment if you're investigating engine or running faults. Issues like misfire could be the result of poor installation such as over or under torquing.





SHORT TERM SAVINGS, LONG TERM PROBLEMS

Kilen explains why fitting inferior quality springs, to save just a few pounds, can often lead to expensive remedial repairs in the future, costing both the customer and the workshop.

It's an old saying but 'buy cheap, buy twice' is often true, or in the case of vehicle repairs 'fit cheap, fit twice'. Having the same repair carried out twice, in relatively short succession, is not only inconvenient for the customer, but it also often leads to them questioning the quality and ability of the workshop that carried out the repair, not understanding that it is a component fault. Is it really worth potentially losing a customer for the sake of a £10 - £15 saving on the overall job, especially when the labour element is usually more than the cost of the spring itself?

Coil springs are deceptively simple; a length of steel formed into a helix and painted black. This apparent simplicity can give the impression that all springs are created equal. The reality is very different. Each Kilen coil spring is manufactured in-house, checked to ensure correct fitment, and designed to match or exceed OE quality.

While a coil spring may look insubstantial, it is a safetycritical component responsible for maintaining the correct vehicle ride height and absorbing impacts during travel.

Coil springs, constantly exposed to the elements, are subjected to high amounts of stress as they support the weight of the vehicle, isolating it from the road. It is therefore vital that the spring material is of sufficient quality and the spring surface suitably protected from corrosion, to ensure the spring can withstand years' of dynamic use.

The quality of the steel wire used to produce coil springs is of utmost importance. In lower quality steel, found in some 'budget' springs on the market, surface and inner defects are not uncommon (fig 1).

These defects reduce the spring fatigue strength, leading to premature sag and increasing the risk of early breakage. Fig 2 shows the results of life-cycle testing on 'budget' springs. OE standards require no breakage within at least 1 million test cycles, but the 'budget' springs tested all broke at between 240,000 and 320,000 cycles. Simply put, these budget springs are likely to fail in as little as a quarter of the time of a quality unit.

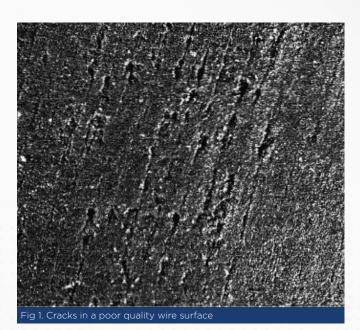




Fig 2. Result of life-cycle testing on budget springs

Only a few steel mills worldwide are capable of achieving the necessary surface and internal wire quality for modern suspension springs, and Kilen source only the highest grade specialist spring steel from selected mills, however, even the best quality spring wire requires additional treatment to ensure optimum performance and a long life.

After coiling, each Kilen spring goes through a multistage heat treatment process to improve fatigue strength and to ensure a tough and ductile spring. Additionally, each Kilen spring is bombarded with millions of tiny steel balls in a process called 'shot peening,' further improving the fatigue strength of the spring and providing an optimal surface for painting.

The most common cause of spring failure is corrosion, as chips in the exposed layer of paint cannot be avoided. Without additional protection the spring will immediately begin to rust, leading to creep corrosion under the paint which spreads rapidly, greatly reducing spring life expectancy.

Fig 3 shows surface defects on a spring after 1000 hours of salt spray testing. There are many small rust points, plus a large area where laser surface etching was used to apply the logo and part number. It is clear this solution compromises surface quality.



Fig 3. Surface defects on a spring after 1000 hours of salt spray testing

Kilen provide an additional layer of corrosion protection between the paint and the spring by using the protection method of zinc phosphating (see fig 4). This provides protection from corrosion even after defects occur in the paint layer, and is significantly more effective at preventing corrosion than other methods, e.g. iron phosphate, sometimes used on cheaper springs (see fig 5).

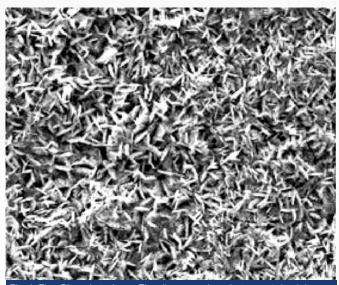


Fig 4. Zinc Phosphate layer. The discs are phosphate crystals giving protection under, and adhesion to, the paint layer

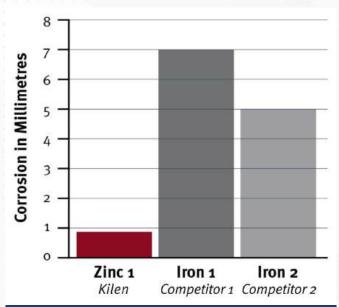


Fig 5. Creep corrosion test results showing the difference in corrosion resistance afforded by alternative phosphate methods

Aside from the cost and inconvenience of fitting inferior quality springs, there is also a serious safety element, should the spring fail. Fig 6 shows the sidewall of a tyre that was damaged by a broken spring. The tyre was sliced open by the jagged end of the spring and instantly deflated, leading to the vehicle and passengers having to be recovered. Fortunately, the breakage happened at low speed, had it happened on the motorway the outcome could have been much worse. Again, is the small cost difference between a budget and quality spring worth the risk?



Kilen Coil Springs - fully backed by manufacturer's warranty.

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SEASONAL ADDITIVE TIPS

Lucas Oil explains why engine components need an extra coat

The next generation of mechanics is already learning about the benefits of the additive approach to vehicle maintenance solutions. When the Lucas Oil Academy (LOA) visited Leicestershire College, and Furness College in Cumbria recently, the service menu included three key benefits for learners

Beginning with a focus on additives, our LOA technicians explored their role in problem-solving situations and as preventive maintenance solutions, leading to more technical discussions. Following that, attention was shifted to the wide range of career opportunities available in the automotive industry, specifically emphasising options for young and committed team players. Lastly, the conversation turned towards winter car care, highlighting the challenges posed during this season, including the avoidable maintenance problems faced by various vehicles, such as high-performance modern soft tops, cherished classics, or high-value vintage cars.

Fuel system protection



Ignition problems related to fuel degradation affect unused vehicles whether they are young or old. Octane Booster is a highly potent problem-solving additive from Lucas Oil that's designed to restore the ignition properties of 'stale' fuel, or fuel that's degraded. In practice, fuel begins to degrade within two weeks of manufacture.

Added to the fuel tank, this additive increases the Research Octane Number (RON) rating. For example, moving from RON 95 to RON 96 involves an increase of ten full points. Octane Booster's performance stands out from other brands because it can increase the

RON by three complete numbers (e.g. RON 95-98). It's an ideal additive for any vehicle that's been left standing with fuel in the tank.

Easier piston travel, greater valve seat protection and improved performances for cylinders are extra benefits. Pumps and carburettors/injectors are vital components that will consequentially run with reduced friction and experience less wear.

Heavy Duty Engine Oil Stabilizer

This additive is a first choice for petrol or diesel-driven models being garaged for the winter season, because the stabilizer helps prevent damage caused by dry starts. Dry starts can occur on first ignition after any lay-up, which means the product is best used to protect engines at any time.



For example, engine oil stabilizers help to protect the priceless collection of motor vehicles at the National Motor Museum, Beaulieu. As Lucas Oil has recently been named the Official Lubricant and Additives Partner for the workshop, additives will continue to form essential elements of the collection's preventive yearround maintenance programme.

When a vehicle is unused, oil drains down into the sump, leaving components unprotected. Consequently, metal-to-metal contact is likely at engine turnover. It's a major cause of engine damage. Thanks to a stabilizer coating over all internal engine parts (throughout the standing period) a safe and engine-friendly re-start is guaranteed.

Heavy Duty Engine Oil Stabilizer is recommended for cars running on:

- Mineral oils such as 20w-50
- high-mileage vehicles on 10w-40 oil
- 5w-30 semi-synthetics where engine wear is likely.

For cars using 5w-30 and 5w-40 synthetic oils in high-performance engines, there is a Pure Synthetic Stabilizer option. A Low Viscosity Stabilizer is available for vehicles using oils such as:

- Ow-16
- 0w-20
- Ow-30
- Ow-40

Our LOA technical specialists explained that the additive helps preserve engine oil viscosity, improve fuel efficiency and consequently reduce smoke and emissions. For Heavy Duty Stabilizer and Pure Synthetic, a recommended ratio of 80% oil to 20% additive is recommended. One can of Low Viscosity Stabilizer will treat between 4-7 Litres of oil.

Training session results

The LOA sessions help students appreciate that when used appropriately, additives help garages save time and cost, while making significant contributions to revenue and profitability. Additionally, they help satisfy customer expectations with respect to smooth running, increased MPG and more manageable long-term vehicle maintenance costs.



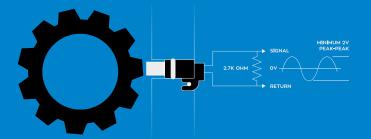
The camshaft sensor monitors the positions of the camshaft to allow for correct ignition timing. The crankshaft sensor detects the position of the crankshaft allowing the ECU to calculate its position in relation to the pistons in the engine. There are two types of sensor, an Inductive (magnetic) or Hall effect sensor. Both operate by outputting a voltage when close to metal – the frequency of this signal is detected by the ECU.

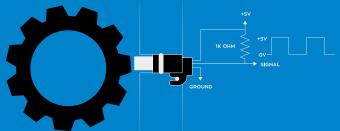
INDUCTIVE:

Uses a magnet to pick up a signal from the engine cranking. Either mounted in the block of the engine, near the fly wheel or close to the crankshaft itself. It picks up notches on a spinning disk, reluctor wheel or the crankshaft. When each notch passes, it causes a change in the magnetic field, sending an alternating current signal to the ECU.

HALL EFFECT:

This type is mounted in the same places as the inductive sensor and responds to the same notches. Though instead of an analogue AC signal, it creates a digital signal, either on or off, as the notches pass the sensor. They are also known as crank sensors, speed sensors, RPM sensors or fly-wheel sensors.





GENERAL FITTING ADVICE

- 1. Camshaft sensor failure is commonly caused by damage from oil contamination. Ensure any oil leaks are addressed before replacing the sensor.
- 2. Carefully remove the old sensor.
- 3. Oil the 'O' ring of the new sensor
- 4. Correct positioning of the new sensor is critical. Camshaft sensors often feature slotted mounting holes and/or locating pins. Ensure that any locating pins are correctly seated before fully slotting into place. Failure to do so can shear off the locating pin causing misalignment of the sensor and incorrect readings.
- 5. Reconnect wiring and reset the ECU if needed.





MOVE FORWARD. ALWAYS.™

DAYCO HIGHLIGHTS FORD TRANSIT 2.0-LITRE DIESEL ECOBLUE TIMING BELT REPLACEMENT

As the original equipment (OE) supplier of the timing and auxiliary drive systems used for the 2.0-litre EcoBlue engine used in the popular Ford Transit from 2016, not only is Dayco able to provide a genuine like-for-like replacement for the independent aftermarket, it's also the source of helpful technical advice and direction, which is available in print and online.



In its latest bulletin, Dayco is urging workshops to be aware that oil contamination from the diesel fuel is not uncommon with this engine and that can have a particularly adverse impact on the belt, which in this application, is a 'wet' or belt in

oil (BIO) system. In fact, in extreme cases, this can cause material to dislodge from the belt surface, further affecting the oil and potentially causing problems such as blocking the oil pump strainer.

It is therefore imperative that technicians check the condition of both the oil and the belt, every time one of these vehicles enters the workshop.

In the case of the oil, this is easier than it might first appear, as the presence of diesel in the oil is generally noticeable by its smell. So, rather than undoing the drainplug and walking away, whenever carrying out a scheduled oil and filter change, technicians should smell it for diesel fumes and check the strainer that the oil will have passed through, because it's possible that fragments of the belt or deposits of material that have been dislodged, will be left behind.

When it comes to the belt however, things are a little trickier, but although awkward, it is possible to assess the condition of the back of the belt by viewing it through the oil filler, a check that Ford also state should be regularly made.

Following these checks, if any evidence of diesel or debris is found in the oil, and if there is any visible damage whatsoever to the back of the belt, then belt replacement is necessary because the failure of the belt will have catastrophic consequences to the engine. No matter what the condition however, Ford's scheduled belt replacement

interval must be taken as an **absolute maximum**, and that the oil pump belt is always also changed along with the timing belt.

Although BIO systems are becoming the favoured primary drive solutions with several manufacturers, and so belt replacement increasingly common, there are some aspects of the EcoBlue application that are also worth pointing out to workshops undertaking the work.

The first, a best practice principle, is to smear oil on the back of the belt once it is fitted, which will lubricate the contact point between the belt and the tensioner when the engine is being turned over by hand to check the timing is correct, as well as on its initial start-up, once the replacement is complete.

The second point concerns the tensioner, which, in contrast to most belt tensioners, is a slipper, rather than a wheel, but it too must be replaced along with the belt. However, it must be positioned correctly, with its location tab in the corresponding recess, before the bolt is tightened and the pin retaining the spring, removed.

The final point is the timing belt cover, which is a relatively thin metal sheet, that is not reusable, so a replacement, along with the appropriate sealant, must be sourced from Ford before the work is started.

Reaching the cover is most easily accessed through where the front righthand headlight is mounted, so its removal, along with the air filter assembly, starter motor, auxiliary belt and water pump belt, which, in this instance, must be cut, and the disconnection of several of the cooling hoses, are all necessary steps in the process.

However, Dayco naturally recommends technicians refer to a reputable source of service and repair data, such as that supplied by Autodata or HaynesPro, for the full repair instructions, as well as for specified tightening sequences and torque values.

Naturally, Dayco carries the timing belt kit (KBIO17), oil pump belt (941121) and auxiliary belts (6PK1410S & 3PK715), in its comprehensive aftermarket range.

For more information regarding the OE quality power transmission products in the Dayco range, please email: info.uk@dayco.com or visit: www.daycoaftermarket.com



ELEVATING BRAKE PAD STANDARDS

All Einbach brake pads boast ECE R90 aftermarket type approval - E Mark ensuring they have undergone rigorous testing to meet stringent OE standards. Einbach brake pads are categorised as "Spare parts of matching quality," aligning with the EEC Commission Regulation (EU) No 461/2010 issued on May 27, 2010.

Einbach brake pads not only meet OE standards but also deliver performance within +/- 15% of the original equipment cold braking performance. Einbach pads are tested beyond R90 requirements to assess high-temperature performance, wear characteristics, and noise levels. With ongoing production conformity testing, Einbach guarantees consistently excellent performance.

KEY CONSIDERATIONS:

- The commitment to quality is evident in the meticulous manufacturing process. Einbach employs RMR (Rubber-Metal-Rubber) shims throughout the range to minimise noise and vibration. These shims are produced in a purpose-built rubber coating facility, ensuring quality control at every step.
- Einbach is produced using specific friction materials, including low-metallic and ceramic formulations, to ensure low noise, low dust, and low wear characteristics. Chamfers and slots are precisely machined to OE specifications or to enhance NVH performance.
- Incorporating OE Positive molding technology results in more even wear and consistent performance characteristics. Furthermore, steel backplates are treated to resist corrosion, enhancing longevity.

THE FACTS IN THE FACTORY:

• The Einbach factory production team understands that quality is paramount. With two Link and one Horiba Advanced IAG production line employs hot pressing,

grinding, powder coating, and assembly to ensure precision and consistency.

• Computer-controlled friction material mixing is centrally monitored by QC staff, guaranteeing optimal consistency. Final inspection includes an automatic weighing process to maintain strict adherence to specifications.

Einbach's commitment to quality and performance ensures that their brake pads not only meet but exceed industry standards, providing garages with peace of mind and confidence that they are fitting a quality part. First time, every time!





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THE MAGAZINE FOR THE AUTOMOTIVE AFTERMARKET



