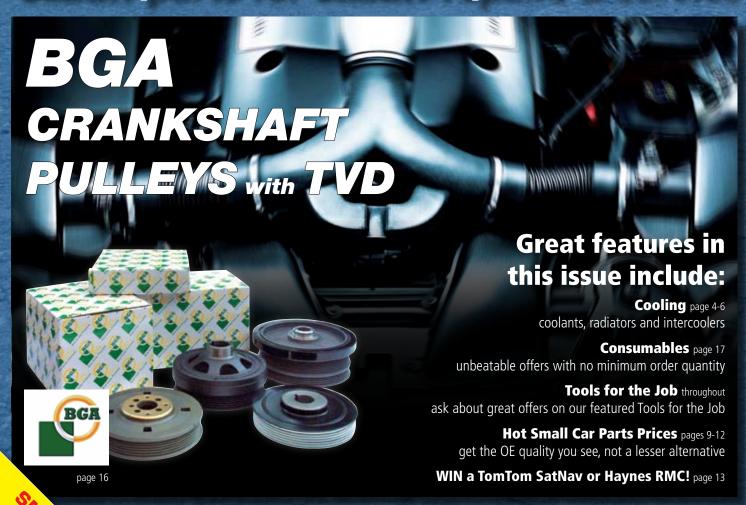
S | Bennet

SMART parts for **SMART** repairs & service



www.bennetts.com

To receive the special offer prices in this leaflet please quote "Smart Parts Issue 12" when ordering

If you would like to be kept up to date with promotional offers via e-mail, please send your e-mail address to sales@bennetts.com

OE quality throughout: all parts meet or exceed specifications of EC Block Exemption standards

Issue 12 Offers end 31 December '08



Number Plate Legislation: Bestplate Alternatives

From 1st November 2008 number plate personalisations must show the supplier's name and address and no other information will be allowed. Web addresses, franchise logos, etc will not be allowed.

From the same date it will be an offence to supply non-compliant number plates - including wrongly spaced characters, holograms, illegal flags, etc. The maximum penalty will be £2,500 and/or suspension from the Register of Number Plate Suppliers for up to 5 years. Selling for show/display only is no longer legally acceptable. Bestplate products are available to enable continued advertising in the form of Frame Plates, Badging Strips and Lip* Plates. These offer larger advertising space than existing personalised plates and details stand out really well, especially on the vehicle rear.

*Lip plates are under review by the DVLA who may rule they are illegal, but, say Bestplate, any ruling will not be retrospective and supply will continue until a decision is made.



Last Two Months to Collect & Claim Ferodo Rewards

Enjoy the experience of a lifetime or a little extra for the home as you choose. Collect and redeem Ferodo box ends* against some fantastic rewards. This offer ends on 31st December 2008.

Contact your local IFA Member for your Ferodo Rewards brochure. *Terms & conditions apply.



Valeo Starters/Alternators: 'Back in the Box' Innovation

Valeo offers a wide range of competitive Standard Exchange product for cars and LCV. 1,779 part numbers give 96% coverage including 1,111 alternators and 668 starters.

Best of all, their innovative 'Back in the Box' scheme for core return helps you to reclaim your surcharges faster and allows them to claim 'Best in Class Core Management!





Gates Launch New Product EuroGrip® Flexible Coupling

Gates have launched the EuroGrip® flexible coupling. Gates' years of under-bonnet materials experience has been used to develop this new automotive product type.

The EuroGrip® flexible coupling is a rubber sleeve which transmits torque to drive engine accessories (e.g. alternator, power steering pump, air conditioning compressor) and damps vibrations between two connected shafts. They are particularly suitable for

applications where two shafts are subject to misalignment and axial movement as they relieve the stress that would result from a rigid coupling.

The EuroGrip® flexible coupling consists of an inner lubricated jacket surrounded by glass fibre cord, sheathed in fibre loaded HNBR compound. Volkswagen applications are available now and more will follow shortly.

For more details contact your local IFA Member.



Block Exemption May End: Sign R2RC Petition Now!

The R2RC (Right to Repair Campaign) have warned it is possible Block Exemption may end. The Brussels Commission issued an evaluation report this year, "aspects of which do not seem to favour renewal of Block Exemption" according to Peter Coombes, the R2RC spokesman. He reassures that the R2RC is providing a structured response and is working hard to gain support both politically and from within the industry.

A petition will be presented to the EU very soon (November/ December) so no time can be lost - if you have not already done so, sign up and demonstrate to the EU the strength of support from industry. Visit the R2RC web site www.r2rc.co.uk and register your support using the on-line petition. The petition needs as many names as possible, and has already had considerable success in attracting industry and consumer support, but no-one in the industry can afford to be complacent. Everyone involved in any

aspect of the industry (from technicians to parts company staff to suppliers) who has not yet signed the petition should do so urgently.

Consumer awareness and support is being raised in a R2RC initiative launched at The London Motor Show this year.



SMART PARTS Issue 10 Competition Winner!

SMART PARTS Issue 10 gave readers a chance to win an iPod® Classic 160GB by answering three straightforward questions (answers below).

Congratulations to **Robert**Mitchell of Darnley Auto

Works in Strood, Kent. Darnley
are a customer of IFA Member
Ajay Autoparts (part of the Jayar



Group). Robert is shown receiving his prize from Ajay's Regional Manager, Paul Isted, who was accompanied by the local Ajay Branch Manager, Mandy Mansfield.

Don't forget to enter the Issue 12 competition on page 13 for your chance to win a fab First Prize of a TomTom One XL v2 Great Britain or one of two second prizes of a Haynes 1:24 RC Car.

Answers to Issue 10 SMART PARTS Competition: 1. Ferodo, 2. Five, 3. Felipe Massa



Number 1 for Engine Management — The Leading Brand

From an ECU down to a temperature sensor you're bound to find the part you require in the Intermotor range:

- Air Mass Meters
- Direct Ignition Coils
- ABS Sensors

- Oxygen Sensors
- ECUs
- EGR Valves

- Throttle Position Sensors
- Engine Position Sensors
- and many more...



Latest range updates:

Ignition Coils

- Comprehensive range totalling 222 parts
- 36 new parts added
- New catalogue IC-2



- Range now 30 references
- Just 10 sensor elements cover approximately 1000 applications
- New catalogue AMM-3



Oxygen Sensors

- All makes range comprising 449 OE fit parts
- Approx 93% UK car parc coverage



Intermotor – Advanced Technology



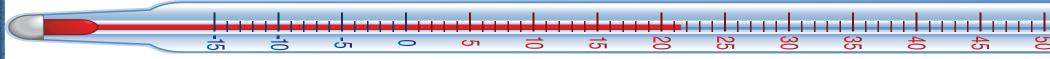
VAG Scan & Reset Tool

Contact your local IFA Member for an amazing deal on this tool

• TOOLS FOR THE JOB •

• TOOLS FOR THE JOB •

DOES YOUR CUSTOMER'S CAR REQUIRE A SPECIFIC COOLANT?



Which coolant does it take?



MAKE	MODEL*
Audi	A2, A3, A4, A6, A8, Cabriolet, RS4, S3/4/6/8, TT
Cadillac	All Models
Chevrolet	Captiva, Kalos, Lacetti, Matiz, Tacuma
Citroën	Xsara, ZX, Visa (except Visa 652cc - Air Cooled),
	Saxo, LNA, Synergie/Evasion, Xantia, XM, C2, C3, C4,
	C5, C6, C8, CX, C-Crosser, BX, Berlingo, AX
Daewoo	All Models
Fiat	All Model from 2005 onwards
Ford	Cougar, Explorer, Focus, Fusion, Galaxy, Ka, Puma,
	Ranger, S-Max, Sportka, Streetka, Tourneo
Honda	All Models (excluding Legend 3.5i)
Isuzu	D-Max, Trooper 3.0/3.1/3.2i/3.5
Kia	Cee'd
Lexus	All Models, except: RX 400h 3.3i V6 VVTi (Hybrid)
Mazda	Mazda 2, MPV, Premacy, Tribute
MG & MG Rover incl. Rover	All Models
Mini	Mini One Diesel
Mitsubishi	All Models
Nissan	Murano, Qashqai, X-Trail, 350Z 3.5 V6
Peugeot	All Models
Proton	All Models
Renault	All Models
	Maestro, Metro, Mini 1000, Montego, Taxi
Saab	9-5, 9-3
Ssangyong	All Models
Seat	Alhambra, Altea, Arosa, Cordoba, Leon
Skoda	Fabia, Felicia, Octavia, Roomster, Superb
Subaru	All Models
Suzuki	All Models
Toyota	Auris, Aygo
Vauxhall	Agila, Albany, Antara, Signum, Meriva, Monaro,
	Combo, Calibra, VX 220, VXR, Zafira: except
	Zafira 2.2i 16V Direct Auto, -Sport
Volkswagen	Beetle, Bora, Eos, Fox, Lupo, Phaeton, Sharan,
	Touared Touran Vento

MODEL' 100, 200, 80, 90 Blazer, Can All Model Carens, Cerato, Clarus, Magentis, Mentor, Pican All Model 121 626 929 Demio Mazda 5 Xedo All Models Bluebird, Cherry, Laurel, Maxima, Prairie, Serena, Silvia Stanza, Sunny, 100NX, 200SX, 300C, 300ZX, 350Z Rolls Royce incl. Bentley All Model 900, 9000 Malaga, Marbella 105S, 120L, 120LS, 130L, 135, Favorit 4 Runner, Camry, Carina, Celica, MR2, Paseo, Picnic All Models All Models, from 2006 onwards refer to owner Carlton/Omega, Cavalier/Vectra, Astra/Belmont, Astra/ Kadett, Nova/Corsa, Senator, Sintra, Manta, Lotus Carlton, Monza Volkswager Carat, Corrado, Polo G40, Rallye Golf, Santana, Scirocco, Modern cooling systems now require very specialised coolants, depending upon the make & model of the car. There are 2 main types of coolant that are used:-

- Organic Acid Technology (OAT) based
- Silicate based

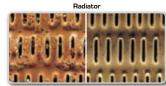
They have both been developed to protect the different metals found in the engine from corrosion and erosion, which include:-

- Aluminium
- Cast iron
- Rrass
- Copper

As well as protecting these metals, a high quality coolant needs to safeguard the system from overheating in the summer and freezing in the winter.



Failing to use a good quality coolant WILL cause damage to a car's cooling system



Corrosion and deposits after 2 years using a standard coolant





Damage caused by corrosion using a standard coolant





"Just part of the service"

4

tech

Coolants: formulation & VM specification are far more important than colour!

It's easy to be confused by the many different colours of coolant available, but the colours are meaningless! What matters is the coolant formulation and the vehicle manufacturer's (VMs) recommendation.

Modern engines are smaller/lighter and operate in much higher temperature ranges than their 20th Century predecessors. They use a wide range of metals and alloys – particularly aluminium – which demand special protection from corrosion and erosion. So vehicle manufacturers (VMs) set very rigid guidelines for the type of long life coolant/antifreeze that should be used to service their engines in the aftermarket: just as they do with engine oils.

Long life OE coolant technology has two dominant types. Both contain chemical inhibitors to provide long term engine component protection, while protecting against overheating/freezing at extreme temperatures.

Type 1 - OAT (Organic Acid Technology) based coolant (5 year service life) (e.g. Comma's manufacturer-approved Xstream® Red with BASF Glysantin® which is silicate free)

Type 2 - Silicate based coolant (3 year service life) (e.g. Comma's manufacturer-approved Xstream® Green with BASF Glysantin® which is nitrate, amine and phosphate free)

OAT and Silicate coolants account for over 3,800 car/LCV applications in the aftermarket. It is vital to know exactly which type goes in on the manufacturing line and why the VMs recommend like-for-like replacement.

Start by considering how much of the market is affected by these coolants:

- 70% of new cars are fitted with an OAT fluid
- 50% are factory-filled with BASF Glysantin®
- 68% of the aftermarket (by value) is now in long life 5 & 3 year coolants

Workshop usage over the last 18 months confirms the trend towards long life coolants:

- Standard MEG: down 6.7% in volume
- OAT: up 13.9% in volume
- Other colour long life: up 14.2% in volume

Modern coolants must balance competing demands (cooling effect, frost prevention, corrosion/erosion protection) against acceptable service life. OAT coolants are overwhelmingly preferred by VMs for the sustained protection and performance they deliver throughout their 5 year service life. They contain a blend of inhibitors to suit a wide range of engine designs and the 'at risk' construction materials.

OAT coolants must be used where specified, and should not be mixed with silicate-based coolants, or anti-corrosion properties are lost and service life reduced to that of a normal coolant, i.e. from 5 years to 2 or 3.

Remember, the colour in a coolant is just a dye. It gives no indication of quality or the type of inhibitor technology used. A coolant's ability to inhibit corrosion and erosion will be depleted after three to five years, leaving the cooling system unprotected. If there is any uncertainty about how old coolant is, drain, flush and refill with the appropriate coolant indicated in the Planet Workshop Application Guide.



If you think all glow plugs are the same, think again



With over 100 glow plugs, including both metal sheathed and ceramic types, NGK are capable of matching the requirements of virtually all standard engines and control systems.

Standard Type

Sheathed single coil glow plug, which heats at a fairly uniform rate to its maximum temperature with a constant current consumption.

Rapid Glow Type

The single heating coil installed in this design allows a higher current flow initially to promote a faster heating time. As the temperature rises, the resistance of the coil rises to restrict the current flow.

QGS Type

The 'Quick Glow System' glow plugs have specially designed heating coils, which can allow a very high current flow as soon as it is energised. Due to the extremely quick heating of these glow plugs, they require strict regulation and are only used in conjunction with specifically designed QGS control systems.

SRM Type

Self-Regulating Metal glow plugs contain two coils. The heating coil at the tip of the probe provides the heat source; the second (regulating) coil allows an extremely fast warm-up time to temperatures in excess of 900°C and once this temperature is reached can autonomously maintain a high final temperature allowing longer post-heating times.

Ceramic Type

Due to their unique design these glow plugs are afforded the greatest protection against the prolonged high temperatures involved with extended post-heating periods. They also possess the ability to withstand the high degree of thermal shock resulting from lightning-quick heating times.

Technical Perfection from the people who know. NGK

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Valeo & Nissens Cooling: great value, OE quality & range

OEM Intercoolers From Valeo

Benefit from the support of the World's No 1 for OEM intercoolers

Peugeot 308 1.6 07> HDI 16v (818837) THP (818841)

Intercoolers only available currently from the OEM - Valeo

A MARKET IN CONSTANT DEVELOPMENT

Engine emission regulations are becoming more stringent (Euro 4 back in 2005 and now Euro 5 in 2009). VMs reduce petrol and diesel engine size to limit energy consumption and exhaust emissions (downsizing). Adding a turbocharger and intercooler maintains the driving experience in spite of the downsizing.

In 2000 1 in 4 new vehicles were fitted with an intercooler. In 2008 the figure has doubled to 1 in 2!

WHEN DO YOU NEED TO REPLACE AN INTERCOOLER?

Due to its location, the intercooler needs to be replaced at the same time as a radiator. after a front crash or when an air leak is detected. Another reason could be corrosion. or damage of the intercooler fins, due to stone impacts. A faulty intercooler can lead to performance reduction and can result in a failed exhaust emission test.



Explore the widest cooling range



Since 1921 Nissens has been designing and manufacturing engine cooling and climate products for the automotive aftermarket.

Today with more than 10,000 references for cars, vans, trucks and buses, we are one of the largest manufacturers of automotive cooling and climate systems for the aftermarket.



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Master Cooling System Tester

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TRUPART

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- OE Replacement Headlamps
- Front Indicators
- Rear Lamps
- Fog Lamps
- Performance Rear Lamps
- Performance Indicators
- Performance 'Angel Eye' Headlamps
- Side Repeaters
- OE Replacement Door Mirrors
- OE Replacement Door Mirror Glasses
- Full OEM lighting programme
- Over 850 new part nos added this year

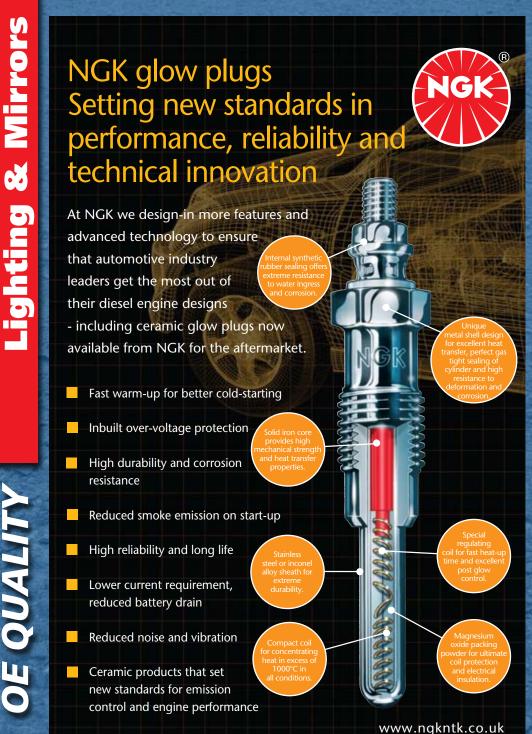
Trupart is the UK's leading distributor of Automotive Lighting, Door Mirrors and OE type Mirror Glasses

Trupart offer a 'Total Solution' for both OE replacement & original equipment lighting, together with a comprehensive range of complete Door Mirrors and an exciting range of 'Performance' style lighting products

The Trupart range has broadened still further with the recent launch of OE replacement Door Mirror Glasses

Trupart's 2008/9 Lighting Catalogue now includes OEM as well as OE replacement parts and is available at:

WWW.TEUPART.CO.UK



Trupart & Valeo Wipers: comprehensive range, great value

OE quality flat wiper blades

Fit the wipers the car manufacturers fit!



SILENCIO X•TRM: **PERFORMANCE** AND COMFORT

Valeo now offers a new generation of more efficient, highly reliable front and rear wiper blades.

The new Silencio X•TRM Flat Blade offers:

Constant pressure along the blade producing a high quality wipe

Anti-lift spoiler system integrated into the rubber profile

Innovative design style

Minimal obstruction of driver's field of vision

Improved winter resistance

Reduced number of

Simple, fast assembly



COMPACT: HIGH PERFORMANCE. **VALUE FOR MONEY**

SILENCIO

COMPACT Evolution: a specific technology to replace FlatBlades fitted to a vehicle at OE. 16 specific kits for RH drive applications

COMPACT Revolution: a flat blade for everyone! 9 references cover c.1000 applications and 74% of the UK car parc, equipped with

COMPACT Standard: conventional wiper blades, 23 part numbers covering 85% of the accessible UK car parc





Voted one of the Top Three Flat Blade Wipers in Auto Express product test Sept 2008

> **Trupart Wiper Blades Voted** Best Buy Winner in Auto Express 2004!

Consistent quality, performance & pricing

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Wiper Arm Puller Set

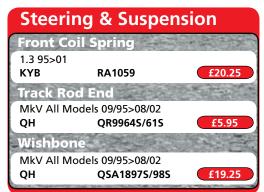
Contact your local IFA Member for a great price



TOOLS FOR THE JOB •



valeo added IIIIIII











Braking Front Pads 1.25 16v 02/00>02/02 ATE non ABS Ferodo Premier FDB1393 £17.95 Ferodo FSL FSL1393 £12.95 Front Discs (pair) 1.25 02/00>02/02 non ABS (Vented) 955024 £15.98 **Brake Eng**









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FIESTA





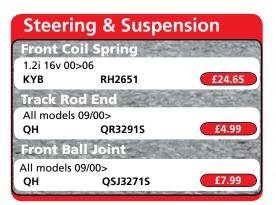
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Refer to Planet Application Guide for exact model & engine application

Oils			
Application	Fuel	Comma	Planet
1.3i Duratec 8v 02>	Petrol	XTech	5W30
1.6D,1.8D 84>95	Diesel	Eurolite	10W40

Transmission Clutch Kit 1.2i 16v 02/99>03/02 821117 2 pce kit £52.99 Valeo CSC* £35.99 804501 *concentric slave cylinder

Exhaust Systems Catalytic Converter 1.25 08/95>10/99 EEC FR8053 £67.99 Rear Box 1.25 95>02 21303 £21.50 Walker













Manual Book No: 4617



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KYB









Refer to Planet Application Guide for exact model & engine application

Oils			
Application	Fuel	Comma	Planet
1.2 12v 00>06	Petrol	Syner-G	5W40
1.7D 96>00	Diesel	Syner-D	5W40



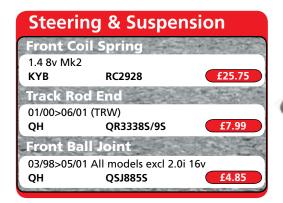
Transmission Clutch Kit 1.0 Z10XE (F13/5 Gearbox) 09/00-08/03 826662 2 pce kit £107.95 CSC* £54.99 804542 *concentric slave cylinder





EXHAUST SYSTEMS

Exhau	st System	S
Catalyti	c Converter	は実施が変化
1.6i 16v 08/	94>12/00	
EEC	VX8030	£39.99
Rear Box		
1.0 12v 09/	00>06	
Walker	22475	£32.95
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Planet

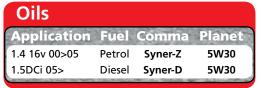








Refer to Planet Application Guide for exact model & engine application



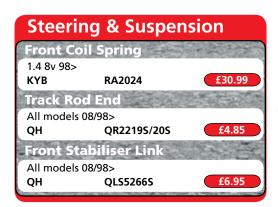


Transn	nission	
Clutch K	it 3 piece	が国主権の対象
07/94>02/9	5	
Valeo	003433	£37.95



EXHAUST SYSTEMS

Exnau	st Systems	
Catalytic	Converter	可是被告诉
1.6i 8v 03/9	8>01/00	
EEC	RE8024	£64.99
Rear Box		
1.6i 8v 03/9	8>	
Walker	22565	£45.85
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Front Pads
1.6 08/98>11/00 (Bosch)
Ferodo Premier FDB1378
Ferodo FSL FSL1378

Front Discs (pair)
1.6 10/98> ABS (Vented 247mm)
Brake Eng 952230

£17.50









Manual Book No: 3757

TECHNOLOGY AND POWER COMBINED









Refer to Planet Application Guide for exact model & engine application

Oils			
Application	Fuel	Comma	Planet
1.6i 01>06	Petrol	Syner-G	5W-40
2.0HDi 99>06	Diesel	Syner-D	5W-40



Transr	nission	
Clutch k	(it 3 piece	作 图
1.6i 09/98>	•	
Valeo	821341	£74.50
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VALKER

EXHAUST SYSTEMS

Exhau	st Systems	`
Catalyti	c Converter	
1.6i 07/98> EEC	PT8040	£51.85
Rear Bo	X	
1.4i 09/98 (Walker	(without chrome t/p) 21882	£27.15



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When it comes to less common replacement parts for Asian and American vehicles, you may think that your only option is to go to the main dealer.

In response to customer requests their range is constantly expanding with new 'specialist' products being added all the time.

This means it is always worth checking first before calling the dealer.

Thanks to Blue Print this is often not the case.



FIRST IN THE AFTERMARKET

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Correctly answer the 3 questions below for your chance to win*

- 1. What are the two types of torsional vibration damper?
- 2. What does 'QGS' stand for, in relation to Glow Plugs?

WIN* with SMART PARTS

TOMTOM One XL v2 Great Britain

TWO Second Prizes of a:

featuring iconic Haynes cutaway imagery!

(Courtesy of Haynes Publishing)

*Terms & Conditions apply (see below)

Haynes 1:24 Scale RC Car

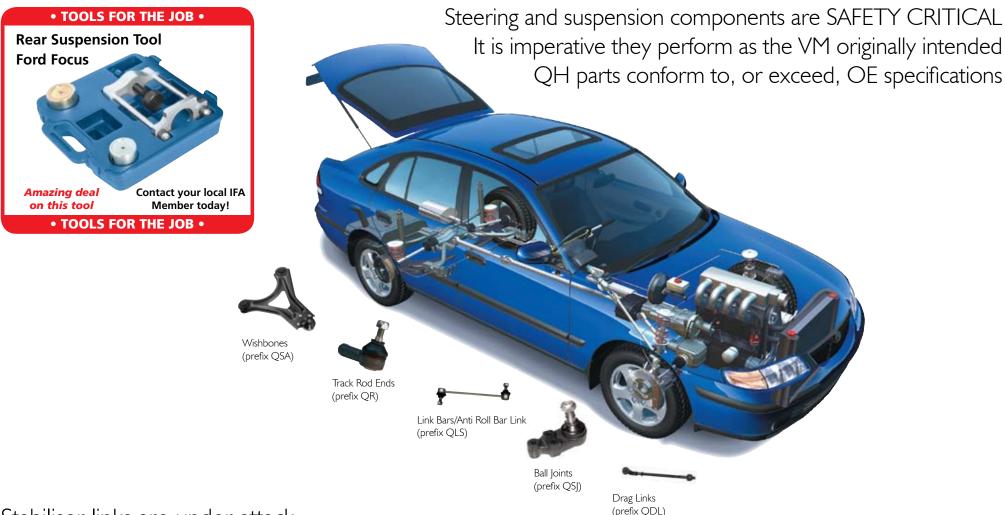
First Prize:

3. How many ignition coils are now in Intermotor's range?

SMART PARTS Competition Terms & Conditions: Closing date for entries 31.12.08. The draw will take place on 05.01.09. The first two correct entries drawn from all the correct entries drawn from all the correct entries drawn from all the correct entries of such gravity. The correct entries of such gravity of the delivered by post within fourteen days of the draw. The prizes are not transferable. The prizes will be delivered by post within 28 days of the draw. No cash alternative will be offered. Entries will only be accepted on the original entry form published in Smart Parts. Only one entry per person. Photocopied entries will not be accepted. Only legible entries with all questions answered correctly, showing a name, the name of the garage you work at and its address, and the name of your local IFA member will be entered into the draw. Proof of posting is not proof of delivery. No correspondence can be entered into. Entries should be posted to Smart Parts Competition, c/o Unbounded, PO Box 1041, Leamington Spa, CV32 STQ. By entering the competition you agree to participate in publicity should you win. The correct answers and winners' ammes will be published in SMART PARTS March/April 2009 issue. The promoter of the competition is the IFA, 9 Church Street, \$5 Austell, Cornwall, PLZS 4AT. The competition is not open to employees or their families or any agents of the IFA or their families or associates.

SMART PARTS Competition November/December 2008 Fill in the answers, complete your details then post this form to IFA Smart Parts Competition, c/o Unbounded, PO Box 1041, Leamington Spa, CV32 5TQ, to arrive no later than 31.12.08
1
¹ 2
5.
Name:
Garage Name:
Garage Address:
]
Which IFA Member supplies your garage? Branch

Don't compromise on safety critical components!



Stabiliser links are under attack

Due to the poor condition of some of the UK's roads and the increased use of invasive traffic calming measures, sales of Stabiliser (Anti-Roll Bar) Links have grown considerably over the last few years.

As they are such an integral part of a vehicle suspension design (controlling body roll during cornering), it is imperative that they always perform as the vehicle manufacturer originally intended. A large proportion of these components fail when they are exposed to excess sudden stress such as the vehicle being driven too quickly over speed bumps or up and down kerbs, or the bushes wear as a result of ingress of road debris, water, salt or just old age. With the propensity for Vehicle Manufacturers to fit Anti-Roll Bars to the front and rear of modern vehicles they are more often becoming the reason for a vehicle to fail its MOT. It is therefore very important that their condition is checked during every service.

Quinton Hazell only manufacture high quality replacement Stabiliser Links (prefix QLS) that conform to (or exceed) Original Equipment specifications. With a constantly evolving range, Quinton Hazell is able to supply Stabiliser Links for the vast majority of the vehicle parc including the plastic units now commonplace on the latest models.

Stabiliser Links form an important part of over 5,000 Steering and Suspension components available from Quinton Hazell.



www.qh.com

Difficulty in Bleeding Cooling System (BMW 3 Series E36) (732198)



The Problem

Valeo Service Warranty Department are receiving a high level of returns related to 732198, claiming the bleed screw (image 1) does not work, or the radiator seems blocked causing the vehicle to over heat.

Valeo Service understands the issue is eradicating all the trapped air in the cooling system. They are aware this vehicle application can be problematic when bleeding the cooling system. Further examination and testing of returned units has revealed no manufacturing defects, and the bleed function worked correctly. The problem is an air lock in the cooling system.

The Cure

To eradicate air in the cooling system, raise the front end of the vehicle independently of the rear (rendering the vehicle at an angle). Run the vehicle with the bleed screw removed fully (image 2), allowing trapped air to escape easily. If the engine temperature rises above nomal after the bleed screw is refitted, switch off the engine for a short time before restarting the bleeding procedure. Failure to remove the bleed screw fully (image 3) will prevent all the air in the system being eradicated.

Valeo Service strongly recommend the use of Valeo Fast Fill, a tool designed for high speed refill of the engine cooling loop. Air locks in the cooling system are eliminated as Fast Fill vacuums the system prior to refilling.

Bleed screw located Image 1 next to the Filler cap

Bleed screw fully removed to aid air bleed



Bleed screw partially removed



Detecting & Resolving Air Mass Meter Failure

Intermotor **2**



Air mass meter failure is hard to detect as symptoms are very similar to those demonstrated by a number of different failed engine sensors. The symptoms are poor throttle response, poor driveability, a slight increase in fuel consumption and a fluctuating idle speed.

The Solution

The Issue

Air mass meters generally fail because of contamination of the sensing element, either through moisture, dirt or some other debris. The only way to tell if the air mass meter has failed is to plug it into a diagnostic tool capable of identifying the correct code. If a failed air mass meter is identified then it should be removed from its housing (image 1) and a replacement installed in its place. Repair time is reduced as the air intake does not need to be dismantled to fit the new part and all that is required is removal of two torx screws to take the old element out of the tube.

Once the air mass meter is replaced the car should drive smoothly, with no hesitation or flat spots in acceleration and steady idle speed.

Due to the high cost of the platinum sensor technology (image 2) in an air mass meter, high quality alternatives are rare. Many use inferior technology and materials (image 3), prone to corrosion. They imperfectly match the performance characteristics of the OE part across the full range of temperature and loading. Result is poor fuel consumption, poor throttle response and more cost to rectify the failure!



Image 1 Sensor location in incomina air flow to engine



Image 2 Intermotor platinum sensor technology element



Image 3 Chinese element showing corrosion

Tensioner (Ford/Mazda) K025433XS



The Issue

Over the last few years the tensioner for the synchronous drive on Fiesta, Focus, Fusion, Puma and Mazda 121 with engines 1.2, 1.4 and 1.6 has changed a number of times:

- different pulley diameter: 60 and 62 mm
- different appearance: with and without oblong hole

Ford OEM and OES have recently replaced these tensioners with a new version (ø 62 mm, OE nr 1361840/4M5G6K254DB, Fig. 2).

The Solution

As Gates follows the OE market, this new tensioner has in recent months been included in our K025433XS, instead of the former type (Fig. 1).

> Fig 2 Retaining pin



Fig 1 Oblong hole adjustment



The new tensioner can replace all former types without problem. It is easier to install and avoids incorrect tensioning. as the back plate cannot be adjusted.

Install the new tensioner using the removed bolts (20 Nm). install the new belt 5433XS, pull the retaining pin out.

No other manipulating is needed, as the spring-loaded pulley will tension the belt correctly.



Crankshaft pulleys with torsional vibration dampers (TVD) have only been fitted in volume in the last 6-10 years. The rubber component deteriorates as it ages, and becomes brittle. Contaminants such as oil and grease affect the performance. The engine would shake to destruction without it. If not changed severe damage can be caused to expensive components - crankshaft, block, engine bearings, etc in addition to damage to auxiliary parts.

The crankshaft pulley is a service item (some vehicle manufacturers recommend replacement every 60,000 miles). It should be checked regularly for damage, cracks and corrosion.

Thankfully it's easier to replace than many technicians imagine!

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Rubber dampers vs viscous dampers

Two main types of torsional vibration damper are fitted to modern engines. The traditional style (Rubber Dampers) mainly for petrol engines, and the decoupled type (Viscous dampers) developed for modern diesel engines. Increased popularity of small diesel engines means many are now entering the 3-year plus aftermarket with rubber dampers fitted in need of inspection and possible replacement.

Rubber Dampers

In its simplest form, a rubber damper is just a mass (the inertia ring) and a spring (the rubber strip), tuned to a single frequency. This is added to the crank system at the end with the most torsional motion (the end opposite the flywheel). The damper motion lags behind the crank motion, imparting a lagging torque and absorbing some energy as the rubber strip flexes back and forth.

The damper is tuned to resonate at a frequency between the two main crank frequencies. The crank twist is reduced by the lagging damper torque and energy absorption, and the damper ring's twist motion on the rubber increases. The damper becomes the highly stressed part, instead of the crank.

The tuned rubber strip type damper is the most popular with OEM and the aftermarket:

- Most weight-efficient design
- Best Design for weight/inertia distribution (all the supporting hub on the inside & all the working inertia ring on the outside)
- Most economical to build
- Only three major parts with few critical dimension surfaces. The rubber strips are economically molded as straight parts
- Properly designed they are effective, reliable. & long-lived
- Rubber width, thickness and placement relative to the size of the inertia ring (as well as it's chemical compounding and hardness) are all-important to the total design
- Enclosed inertia ring hybrids easily contain the ring for SFI purposes, but the large hub

enclosing structure gives a high weight vs. effective inertia penalty

Viscous Dampers

Viscous dampers are a popular alternative to the rubber element type but operate differently.

The inertia ring is completely enclosed in the housing, surrounded with a very thin layer of high viscosity fluid (usually silicone based)

The inertia ring, free to rotate back and forth, lags the crank torsional motion applying a lagging torque to the crank nose. The ring motion running back and forth in the housing shears the fluid absorbing energy, as a rubber strip does as it flexes.

The biggest difference is that the inertia ring does not resonate at any frequency - it is not 'tuned' like a rubber damper. It does have a best dynamic stiffness where the damper works most effectively. This is controlled by the fluid viscosity and the housing/inertia ring clearance.

Viscous dampers are less frequency sensitive and, properly designed, have a long life. Their ability to absorb large amounts of energy makes them ideal for large engines and the best choice for trucks/marine diesels. They have limits/disadvantages for smaller engines:

- Heavier than rubber type for same capability
- Housing inertia is all parasitic "hub" and the ring's effective inertia is only half of its measured inertia. Half the inertia is experienced on the active side controlling vibration and half on the hub side acting as even more parasitic inertia
- The life of the viscous fluid is finite under prolonged heat and shear loading it breaks down chemically and leaves the ring too "free". It can get contaminated with bearing wear particles. The average user cannot detect this without sawing the damper apart. Big dampers in ship engines can be dismantled and fluid samples are analysed periodically to check condition
- Bearing materials between the ring and housing can fail locking the ring solid to the housing. This produces a really heavy dead weight pulley. Again, average users have no easy way to detect this
- The clearance inside the housing is in the 0.010" range - dents can trap the inertia ring, locking the damper

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