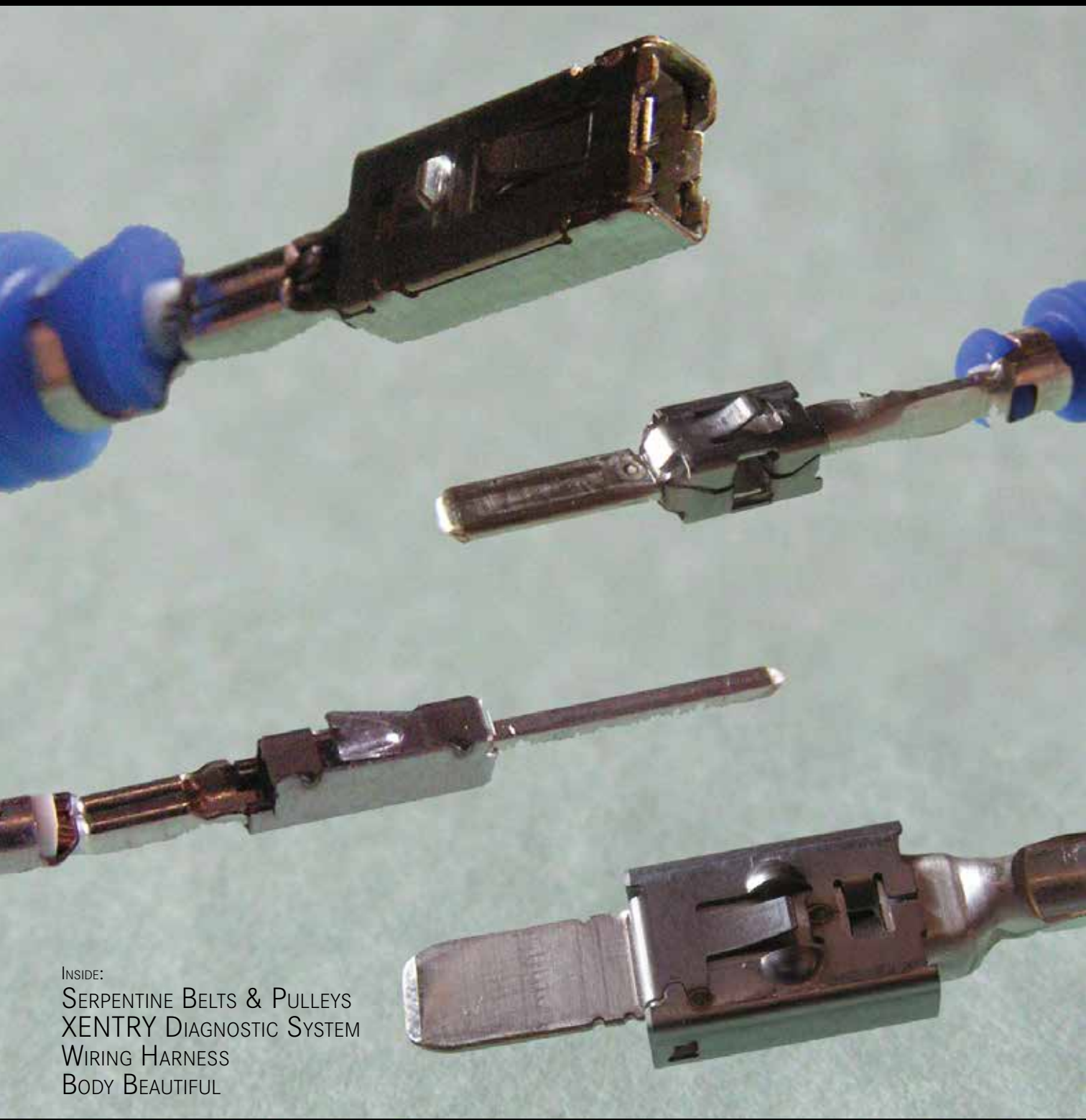
STARTUNED®

Information for the Independent Mercedes-Benz Service Professional

March 2016
U.S. $6.00 | €5.36
Volume 16 | Number 1



Inside:

Mercedes-Benz

Who's Your *Part*ner in Success? Mercedes-Benz's PartsPro

You've chosen your career as an ISP (Independent Service Provider) because you enjoy maintaining, diagnosing, and repairing motor vehicles. One of the most challenging pieces of your business is parts procurement.

Finding the right parts at the right price and being certain they will arrive when promised can be a challenge.

Wouldn't it be nice if there were a way to get the parts you need without the hassle and uncertainty, so you can get back to the important business of actually fixing cars and taking care of your customers?

With the Mercedes-Benz PartsPro wholesale certification program, now there is!

PartsPro is a rigorous program intended to train Mercedes-Benz dealership parts department personnel on how to better take care of you and ultimately your customers. PartsPro certified dealers have elevated their commitment to supporting the independent repair channel, and will provide you with the highest level of customer service. They focus on the things that matter most to you!

Convenience...Accuracy... Profitability...Delivery

A PartsPro dealer has the tools in place to better meet the needs of their esteemed wholesale customers.

For a dealership to achieve PartsPro Certification, parts department personnel must first undergo intensive "customer-centric" training which teaches personnel how to better help YOU.

There's far more to PartsPro than just customer-service training. The dealership must make specific commitments to provide "Best in Class" service in areas such as logistics, which includes ISP-focused parts availability, regular delivery service, outside sales people to provide you personalized service, as well as a dedicated phone line and "will call" pick up area.

Then there's technical help

On occasion we all need a helping hand. Your PartsPro dealer is there to assist. Whether it means providing diagnostic assistance, information on supplies or special tools, or anything else you may need, your PartsPro dealer is there to assist you in repairing your customers' Mercedes-Benz vehicles and getting them back on the road as fast as possible.

Only those dealerships that meet the stringent certification requirements earn the right to display the "PartsPro" logo. Additionally, they receive ongoing consultation and training to ensure that they are consistently providing the very best support to you, the ISP customer.

We hope you are already receiving industry leading service from your Mercedes-Benz dealer; however, once your dealer is PartsPro Certified, we believe you'll be thrilled with the new "Best in Class" parts-procurement experience!

Of course, you'll continue to have the peace of mind that installing only Genuine Mercedes-Benz parts can provide. |

StarTuned®

March 2016

Welcome to *StarTuned®*, the magazine for independent service technicians working on Mercedes-Benz vehicles. Your Mercedes-Benz dealer sponsors *StarTuned®* and provides the information coming your way in each issue.

Mercedes-Benz wants to present the information you need to know to diagnose and repair Mercedes-Benz vehicles accurately, quickly and the first time; text, graphics, on-line and other technical sources combine to make this possible.

Feature articles, derived from approved company sources, focus on being useful and interesting.

Our digest of technical information can help you solve unanticipated problems quickly and expertly.

We want *StarTuned®* to be both helpful and informative, so please let us know just what kinds of features and other diagnostic services you'd like to see in it. We'll continue to bring you selected service bulletins from Mercedes-Benz and articles covering the different systems on these vehicles.

Send your suggestions, questions or comments to us at:

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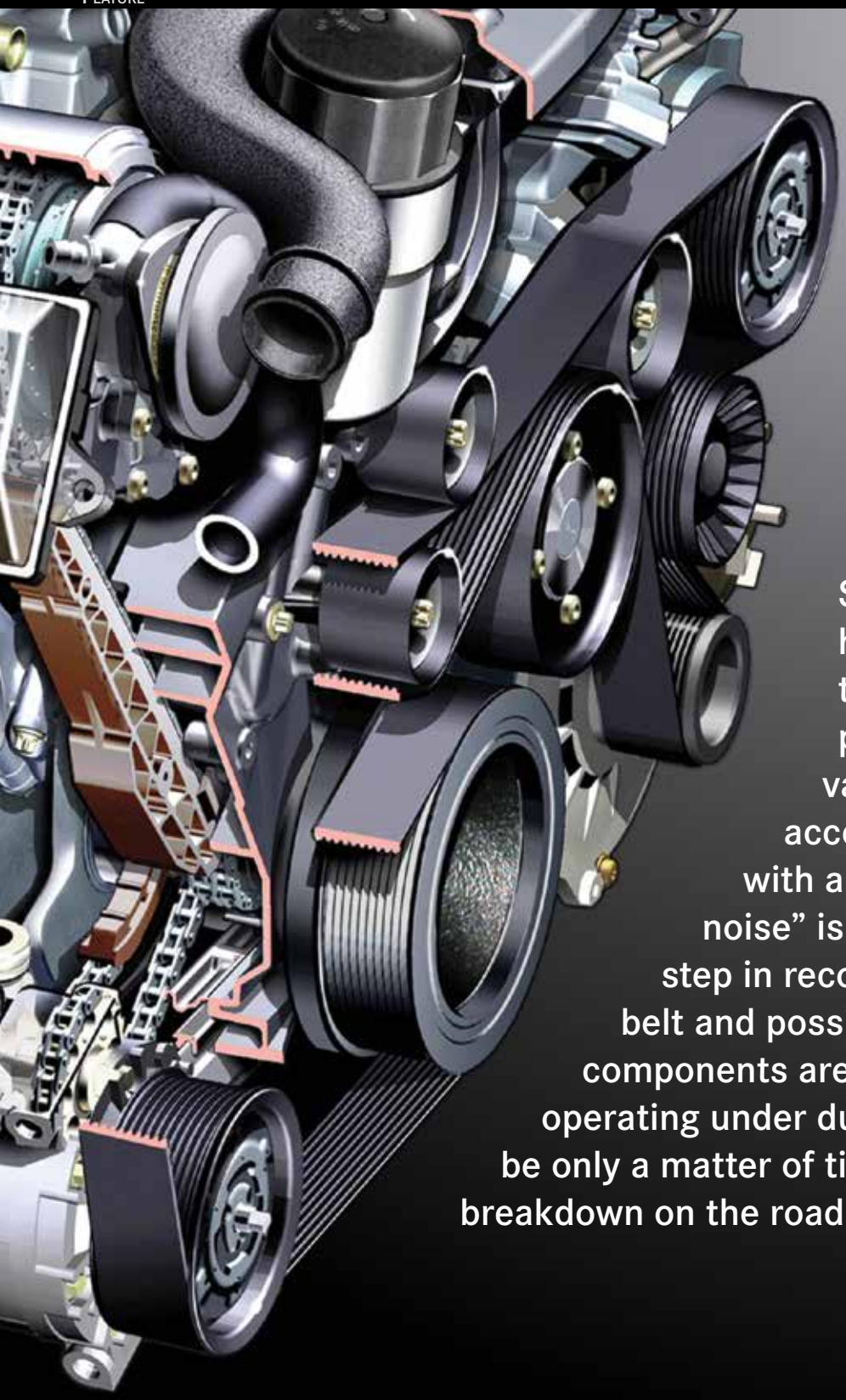
Visit us at our web site MBWholesaleParts.com to view this issue and past issues of StarTuned, along with a wealth of information on Genuine Mercedes-Benz Parts.

Visit mbusa.com to locate a Mercedes-Benz dealer near you.

In This Issue

Mercedes-Benz
The best or nothing.



Serpentine Belts & Pulleys

Serpentine belts have changed the dynamics of powering a wide variety of engine accessories. Dealing with apparent "belt noise" is often the first step in recognizing that a belt and possibly other system components are worn out, or operating under duress – it might be only a matter of time before a breakdown on the road.

Mercedes-Benz

Jumping into his pristine Mercedes-Benz, the driver fires it up, backs out of his driveway, and quickly heads out for an appointment. Proudly wearing its three-pointed star, the vehicle continues to run perfectly and is a constant pleasure to drive and own.

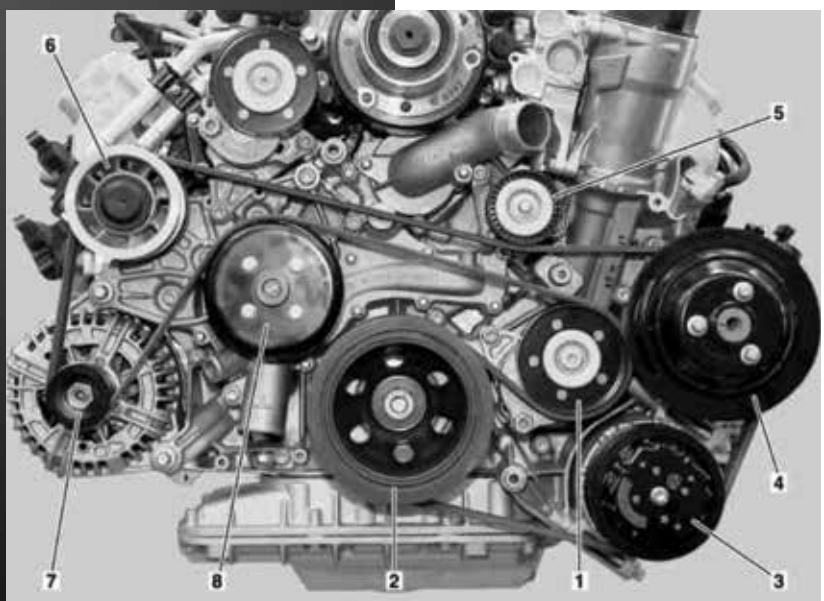
But there's that noise. As he accelerates, an annoying squeal sounds off again from under the hood.

"Would probably have been one of the fan belts slipping in an old car, but I've heard that now there's a single belt that powers everything, and there is no traditional fan belt," he thinks. "This isn't getting any better and could be most anything. Better have it looked at." Good idea.

Depending on the age of the vehicle, myriad noises that make you suspect a belt could be from the:

- Radiator fan
- Air conditioning compressor
- Water pump
- Power steering
- Alternator
- Serpentine belt, which replaces all of those accessory belts in modern cars

You need to evaluate the entire accessory drive system when tracking down noises that sound like a misbehaving belt, including belt, tensioner, and pulley condition, vehicle mileage, the state of the belt-driven components including the power steering pump, air conditioning compressor, water pump, and alternator. Unsteady or sporadic alternator performance, for instance, can not only interfere with the smooth running of the belt, but might even turn on the MIL (Malfunction Indicator Lamp).



Legend: Engine 113.992

1. Tensioning pulley
2. Crankshaft belt pulley
3. Belt pulley on refriderant compressor
4. Poly-V-belt Active Body Control pump or power steering pump
5. Pulley
6. Pulley
7. Alternator belt pulley
8. Coolant pump betl pulley

The serp on this Mercedes-Benz W211 E55 AMG engine engages eight pulleys. Ten is the most we've seen.

Serpentine saves power and space

The flat multi-"V" belt (also known as poly "V," multi groove, or multi ribbed) with all its advantages was first adopted in the late 1970s, and

its applications have evolved from fixed centers and manual tension adjustments to the hugely-successful full-serpentine with its automatic tensioner we have today.

Ever since Mercedes-Benz began using the full-serpentine two decades ago, it's been the Lord of the Belts. It's more energy-efficient and saves space in the engine compartment when compared to traditional "V" belts. When all is right with a "serp," it works like a charm, and R&R no longer involves bloody knuckles. If some condition should cause it to slip, or, worse yet, snap, virtually every system vital to the car's mobility will be adversely affected. Belt failure is dangerous, so much so that the A/C compressor clutch circuit interrupter was created to keep the belt from burning up if the compressor should seize.

The serpentine concept of a single, all-encompassing power take-off handling multiple accessories, rather than an individual belt for every application, was originally intended primarily as a packaging efficiency. By eliminating a stack of "V" belts, the engine package could be made considerably shorter, and accessories could be powered off both the front and back faces of the belt. Other compelling serpentine strengths are its heat-dissipating qualities, its ability to spin fast without lifting off and losing its grip (a function of its light weight), and the flexibility to bend around the small diameter pulleys needed for high drive ratios.

Keeping the belt engaged and on track requires relatively low tension due to even loading across its full width, and this tension is provided automatically by a spring loaded idler, which eliminates the need for periodic manual adjustments.

A squeal, or a chirp?

But let's get back to the driver with the noise.

There are two quite different common belt noises – "chirp" and "squeal" – with unique causes and solutions to whatever problem is causing the noise. A "squeal" is a high-pitched sound that continues for a matter of seconds, or remains constant. It will usually get louder with increased engine speed and is normally caused by chronic slippage between the belt and pulleys. A "chirp" is a sharp, short-duration noise, also high-pitched, that is commonly present at low engine speeds or idle. As belt speed increases, the chirp may diminish and disappear. Most chirps happen as a short belt span goes into a grooved pulley after leaving a pulley on the back side.

Chirping is normally from a misaligned pulley where the belt ridges initially contact the sides of the pulley's grooves, then slide downward along the groove's sides as the ridges seat. This could mean:

- Pulley misaligned or improperly installed
- Belt ribs extremely worn
- Worn pulley bearings causing the pulley to wobble and rock
- Contamination from oil, power steering fluid, antifreeze, belt dressing, or other substances

A squeal that occurs only when the vehicle is accelerating, or only when the engine is started cold, is probably due to a slipping belt. Causes of slip and squeal include:

- Low belt tension
- Substantial belt wear, stretched

This old chloroprene/neoprene belt shows the cracking that outmoded material commonly developed. It was still driving those accessories at 120,000 miles, which is testament to the serpentine concept's basic durability, but failure was imminent.

belt, degraded tensioner spring, or an excessively long belt

- Accessory or idler pulley drag, seized bearings, or accessory lock-up
- Contamination, especially from automotive fluids, but perhaps from the unconscionable use of belt dressing – that outmoded sticky stuff has always been verboten on multi-"V" belts.
- Water splashing onto the belt causing hydroplaning and loss of "traction," as you might say of a tire.

Serpentine belt issues are commonly the result of a weak belt tensioner spring, damaged or dry tensioner or idler pulley bearings, misalignment of a pulley, or bad bearings causing wobble or drag in one of the accessories the belt drives.

Standard industry belt diagnostics and maintenance once centered on replacing a serpentine belt if it had three cracks in a three-inch section. This was a good rule for older chloroprene/neoprene belts, but inappropriate for today's EPDM belts. EPDM (ethylene propylene diene monomer), which began to appear in the late 1990s, is much more resistant to cracking and "chunking," so cracks are no longer a good indicator of a belt's condition. Wear is the main problem since they are expected to survive for over 100,000 miles. So, you should be looking for material loss on the sides of the "V"s, and inexpensive plastic gauges are available to help you detect it.

More on EPDM

In the late 1990s, Mercedes-Benz replaced chloroprene/neoprene serpentine belts with those made of ethylene propylene diene monomer (EPDM). You can't tell these materials apart visually, but there's a huge difference in durability. Belts made with the older stuff have a life expectancy of 60,000 miles or so, and typically display deterioration as cracks and chunk-outs.

EPDM belts usually don't give you these visible signs even at more than 100,000 miles, but they are still suffering from a gradual loss of rubber – think tire wear. An EPDM belt with 100,000 miles on it may have lost more than 10% of its rib material, and it only takes 5% to lessen performance. Wear obviously widens the space between the ribs so that it bottoms out in the valleys of the pulleys – the crucial wedging force is reduced.

This EPDM belt also has over 100K miles on it, but shows no cracks. There's lots of wear, however.

All belt drives, serpentines or otherwise, are exposed to dirt, dust, road salt and sand, water, and engine fluids, and these contaminants along with any misalignment will cause accelerated wear of the rubber rib surface. When serpentine belts lose rib material, the profile of the ribs changes, thus how the belt fits around the pulleys, and this reduces tension and allows the slippage that can cause overheating and failure. Also, belts are designed to have clearance between the ribs and the pulley grooves (valleys), and material loss reduces that clearance impeding the flow of water and debris through the pulley. Belt slip from hydroplaning is often the result.

One means of identifying the noise and determining its cause is spraying the rib side of the belt with water at idle. If the noise gets louder, it's a squeal. If it goes away, it's a chirp. Another method is to remove the belt, and reverse it so that it travels backwards. If the noise disappears or gets quieter, the problem is almost certainly a misaligned pulley. If reversing the belt does not temporarily eliminate or soften the noise, the problem is something else.

Finding and curing misalignment and belt noise

The tensioner pulley should turn freely without binding, and the tensioner arm should move smoothly through its entire range. Obviously, adequate tension to keep the belt engaged is essential. Make sure you

take a close look at the gauge marks on the tensioner. If the pointer is far to the loose side, you've found excessive wear.

We should mention that on older models without automatic tensioners, proper installation includes re-tightening after five minutes of run-in. If this is not done, the belt may sound off right away, suffer damage, and need replacement again prematurely.

With misalignment one of the primary causes of belt noise, identifying and correcting it is crucial:

- Check the alignment of all pulleys, either with a straight edge or laser alignment device
- Make sure accessory pulleys and brackets are snugly tightened to mounting surfaces
- Replace tensioner or idler pulleys and any accessories that feel rough and are difficult to rotate by hand, or that wobble
- Closely check power steering pulleys, a major cause of misalignment

As we say often in StarTuned, taking the time to ask the customer some questions can save you from going down diagnostic dead-ends. Did the sound develop gradually, or start suddenly? When, exactly, does he or she hear it? Did anybody else do any repairs lately that involved the front of the engine (perhaps leaving out spacers or washers)?

Unusual signs

Studying the belt for unusual signs can help identify problems. Glazing at the edges, on its ridges, or in the grooves indicates that the belt is slipping and friction has caused

Automatic Tensioners and Pulleys Found Guilty of Belt Abuse

Automatic tensioners and their pulleys are absolutely crucial to the operation of serpentine belts, but may not last the lifetime of the vehicle despite a common assumption that they do. They contain internal components that eventually weaken and wear out. The automatic belt tensioner has two primary roles:

- Apply appropriate tension to the serpentine belt to keep it on track and give it the traction needed to transfer torque from the crankshaft to the accessories
- Smooth out crankshaft rpm variations

In addition to providing the necessary tightness to make the belt function, the tensioner protects accessories and other components, such as the water pump, alternator, and air conditioning compressor – from stress and premature failure. It also helps avoid accessory bearing failures due to excessive heat, vibration, or excessive manual belt tension. Over time, many miles, and high rpm, the tensioner spring loses its strength and its pulley bearings may eventually lose their lubrication and wear out, creating uneven tension, belt edge wear, and pulley misalignment.

Even slight misalignment and belt slippage can reduce accessory output, which is another reason you should always carefully examine the tensioner as an integral part of belt replacement, or any other repair that involves the serpentine system.

Extensive WOT can shred belts

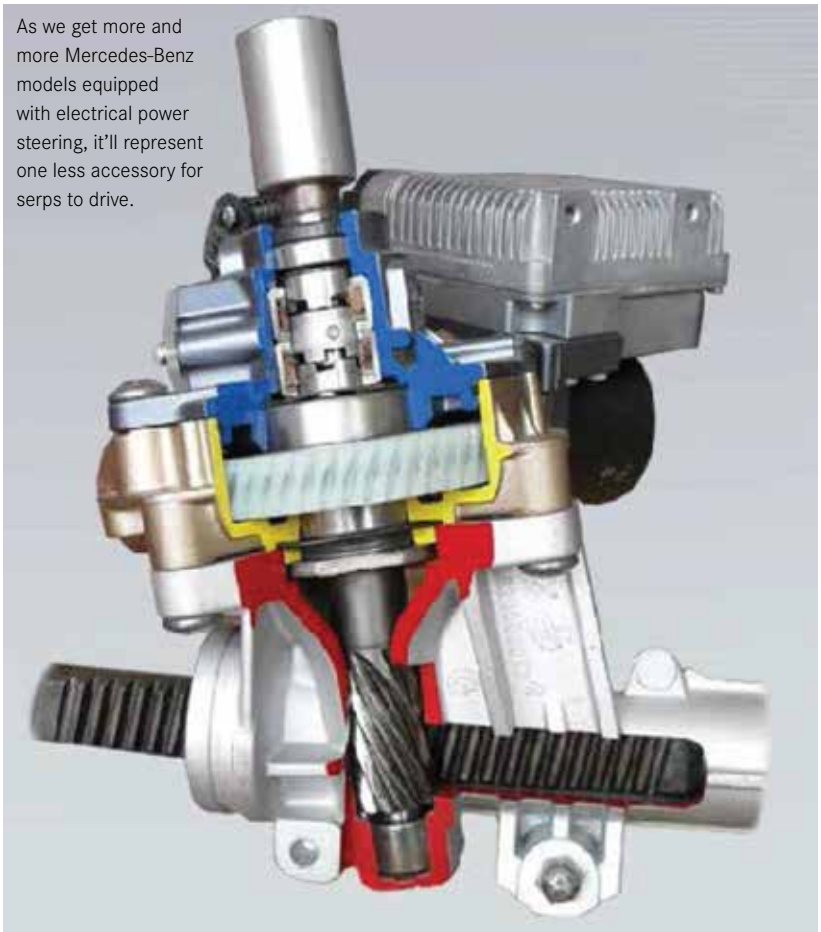
Misaligned tensioner pulleys can go virtually unnoticed in "regular" driving, until the driver decides to fully utilize power of that robust Mercedes-Benz engine and goes WOT repeatedly. Frequent hard acceleration and driving with the right foot firmly pressed to the floor can suddenly shred or throw belts for no apparent reason unless careful analysis of the tensioner pulley reveals misalignment. The cure, obviously, is careful mounting alignment or replacement of the pulley or the tensioner assembly.

Some accessories are more prone than others to cause belt problems, notably the power steering pump, alternator, and air conditioning compressor. Bad A/C clutch bearings, for example, can cause startling noises. If this isn't corrected ASAP, that expensive compressor may be damaged. The bearing noise may be only really apparent with the air conditioning on, not by spinning the pulley by hand. The dangerous possibility of a seized compressor, by the way, is why there's such a thing as an A/C clutch circuit interrupter – if crankshaft rpm doesn't coincide with that of the compressor shaft, electronic logic opens the circuit to keep that all-important belt from burning up.

overheating. Fraying at the belt edge is a good indicator of a misaligned pulley. If something appears to have attacked the surface of the belt, it's probably fluid contamination from oil, power steering fluid, or coolant, and this will transfer to the pulley groove surfaces, making them slippery and attracting dirt that grinds away at everything.

Typical problem causes and symptoms include:

- Belt slipping – squealing sound, polished belt edges, glazed belt grooves
- Misalignment of an accessory drive pulley – chirping sound, frayed belt edge
- Fluid contamination – oil, power steering, or coolant leak
- Defective tensioner, other than severe old age – excessive cracking
- Defective bearing in tensioner pulley or idler pulley – whirring sound
- Delaminating belt backing, chunking of belt ridges, or foreign object embedded in belt groove– rhythmic noises occurring at engine speed
- Damaged bearings in driven accessory – grinding sound (use your stethoscope)
- Belt coming off – pulley or belt misalignment (faulty assembly during service?), defective tensioner, or bearing wear in the tensioner, idler, or accessories



As we get more and more Mercedes-Benz models equipped with electrical power steering, it'll represent one less accessory for serps to drive.

Because of their internal reinforcement, serpentine belts don't actually stretch with use, but they wear, which has the same effect of increasing their operating diameter. While the tensioner is spring-loaded to continuously take up the slack, is it working properly? If a belt starts slipping, take it off, inspect the tensioner for cracks or signs of metal-to-metal contact between its arm and the spring case, make sure the arm exerts firm pressure throughout its travel, and spin the pulley by hand. You should feel no binding, resistance, or roughness, and hear no clicking or grinding.

Push the pulley side-to-side and in and out on its shaft to make sure there is no wobble or end play, and do the same on idler pulleys. Push the tensioner arm against the spring as far as it will move. You should feel firm and even spring pressure with no binding.

By the way, be aware that tensioner and idler pulley bolts often have left-hand threads.

Straightedge and laser

An accessory drive pulley can be misaligned either as "parallel misalignment," also referred to as "offset misalignment," or "angular misalignment." Parallel misalignment is when the pulley is not in line with the other pulleys because it is too far or not far enough onto its shaft, often due to faulty service procedures. Angular misalignment is where the pulley is at an angle to the other pulleys, normally caused by worn accessory bearings – you'll feel wobble.

Lay a straightedge across two pulley faces. If it doesn't lie flat, one of the

pulleys is misaligned. Check each against others until you isolate the one that's out of line. Special laser tools are available to accomplish the same thing, and they may work where a straightedge won't fit.

Accessory drive pulleys are often pressed onto their shafts, so when the accessory is replaced, the pulley is replaced with it. Even pulleys that must be transferred from an old component to a new one are often press-fitted. If the pulley is not installed to the exact original depth so that it is in line with the others, it must be moved in or out as necessary.

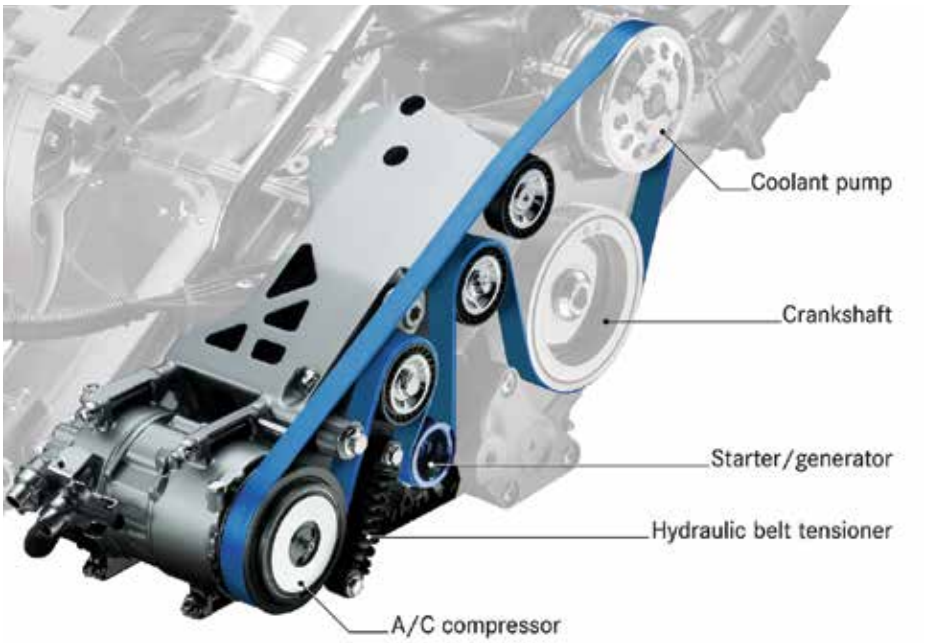
Changing duties

Conventional power steering is one of the major causes of belt distress. Add to that fluid leaks, the large amount of room the pump and its hoses take up, and its parasitic drag, and hydraulic p.s. isn't really such a great system. What's the alternative besides developing stronger biceps? Electrical power! Mercedes-Benz has been systematically adopting electric power steering (EPS) in late models – an electric motor assembly provides steering assistance, utilizing a ball-screw mechanism to provide the boost needed to steer the vehicle effortlessly. This results in one less accessory the belt has to drive, and one less point of potential trouble.

But that may be a wash because there's another new system that adds stress to the belt's life: ECO Start. A stop/start system saves fuel, but who wants to hear the regular starter engage every time a traffic light turns green? The answer is to use a starter/generator combination, which can give the crankshaft just enough of a spin by means of the accessory belt to start internal combustion. Time will tell how long serps will last in this kind of service.

We'll conclude with an interesting statistic: It's estimated that 20% of the vehicles on the road are in need of a new serpentine belt. That represents a big opportunity for you to both help your customers avoid the inconvenience and even danger of a sudden breakdown and make a nice profit. If they complain about the high cost of modern belts when compared to the "V" type, explain that not only do serpentines take the place of several of the old-fashioned variety, but they typically last at least three times as long without giving any trouble. They're a good deal for everybody involved.

If you see "ECO" displayed on the dash, that means this efficiency-enhancing feature is present.



The starter/generator of ECO Start gives the crankshaft a twist to get the engine started smoothly and silently. More work for the serpentine.

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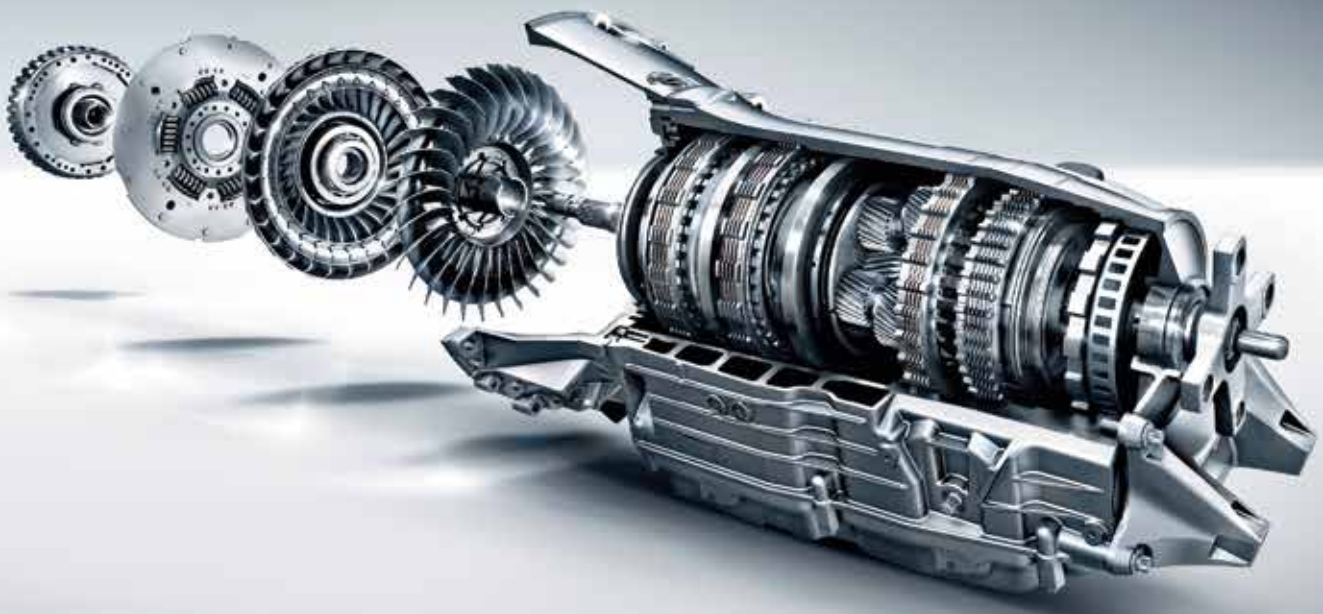
. . . getting you in gear since 2002.



Your Workshop Resource to Get the Job Done.

- WIS-net (Workshop Information System
- Wiring Diagrams
- Technical Bulletins
- Mercedes-Benz Special Tools
- Maintenance Sheets
- Star Diagnosis System (SDS)
- Mercedes0Benz Workshop Equipment

Mercedes-Benz

The best or nothing.

Newest Features of the Versatile XENTRY Diagnostic System

STARTUNED explores the latest developments in this exceptional technical resource

Late model powertrains, such as this Mercedes-Benz M178, are complex in the extreme. The latest-generation XENTRY kit will take the mystery out of them, plus it'll allow you to diagnose just about everything else in the vehicle.

It's no secret that Mercedes-Benz has always been at the forefront of developing useful and user-friendly diagnostic tools and equipment. XENTRY is the latest iteration of the Mercedes SDS (Star Diagnostic System), and continues to see refinements and additions to its hardware, software, and protocols that make it an especially powerful and useful tool for independent repair shops to use when servicing Mercedes-Benz vehicles.

XENTRY is especially appropriate for diagnosing Mercedes-Benz vehicles beginning with the introduction of the new 204-series in 2008, but it does so much more. It also includes DAS capability, which appears automatically for vehicles produced prior to the 204 series. Technically, XENTRY is compatible with Star Diagnosis basic2, Star Diagnosis compact3, Star Diagnosis compact3w, and Star Diagnosis4, but none of those are available or supported anymore. Since Mercedes-Benz leases XENTRY to automotive service businesses, you will be using it exclusively. It literally covers every system in every Mercedes-Benz since connected diagnosis started.

The XENTRY/SDS system is structured in such a way as to enable three key functions:

1. **Comprehensive vehicle identification.** Far beyond the vehicle's VIN, XENTRY will help you identify the build model ("Baumeister") number for the vehicle which, in turn, will allow you to view and record all of the attributes of the vehicle, including comprehensive chassis details and options as equipped. This will prove helpful for determining specifications and parameters for a particular vehicle, and will also facilitate the ordering of parts from your local Mercedes-Benz dealer's parts department.
2. **Diagnosis.** XENTRY will provide you with comprehensive diagnostic procedures, suggestions, and cautions. It will help reveal both known and not-yet-discovered faults. It will also facilitate post-repair quality control checks to confirm the effectiveness and accuracy of repairs that have been performed.
3. **Programming and software updates.** Using XENTRY, you can program or re-program existing control units as necessary after servicing or battery power disconnect. Note that the memory stored in a control unit that is being updated will likely be lost, so it is a good practice to record codes and other data during a Quick Test before re-flashing. You can also program new replacement components as necessary, and you can install software updates in order to keep vehicles up to date with the latest enhancements.

Be aware that while the ignition key must be turned to the "Run" position while updating a control unit, the engine must be off since other control units will be awake, functioning, and communicating, and this can interfere with the reprogramming operation. Ideally, you want all of the other control units on that CAN to be "asleep" and not transmitting data while updating the software on a particular control unit. Also, it is best to have a battery voltage maintainer connected to the battery cable lugs while programming a control unit.

System Resources

The latest version of XENTRY incorporates a host of resources to enhance the speed and accuracy of service in independent repair shops. Included are the following features, often referred to by their acronyms:

- Diagnosis Assistance System (DAS)
- Workshop Information System (WIS)
- Electronic Parts Catalog (EPC)
- STAR Finder – Component locator
- STAR Utilities – Utilities for self-test, word processing, file management, etc.
- Benz Disassembly System – a package of video lessons showing how to remove individual parts from Mercedes-Benz vehicles

The contents of XENTRY are multi-lingual in order to meet the needs of service technicians who may be more comfortable with a language other than English.

Broad Coverage

The XENTRY system provides technical information and procedures on a wide variety of vehicle systems and components including:

- Gasoline and diesel engines
- Transmissions and electronic selector modules
- Traction control systems, including ESP, ASR, ETS, ABS, BAS, and SBC braking systems
- Active body control suspension systems
- Supplemental restraint systems (SRS)
- Body control modules, including ACP, UCP, LCP, SCM, SKF, KFB, RCM, and DCM
- Drive authorization system
- Signal acquisition modules (SAM)
- Electronic ignition system (EIS)
- Instrument cluster
- Tire pressure control
- Parktronic
- Keyless Go
- Climate control systems
- Comfort/convenience systems

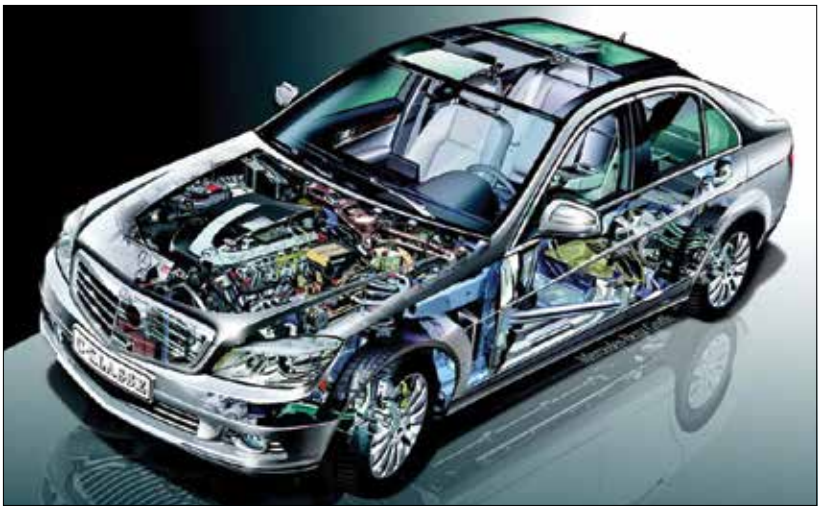
What You Get

The latest XENTRY package includes hardware and software, plus a subscription for software updates every 60 days. The XENTRY kit comes in a sturdy carrying/storage case, and includes:

- XENTRY Connect main control unit
- XENTRY Tab, the multi-function unit that also serves as a monitor/display
- Blu-ray drive
- Software/DVD discs
- All necessary cabling and power supplies

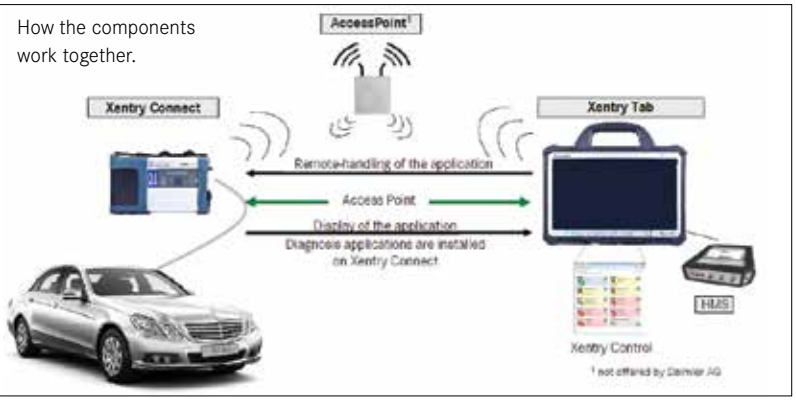
Right: XENTRY kit components are neatly packaged, and interface easily with each other and with the vehicle.

When the upgraded XENTRY kit was introduced a few years ago, most ISPs had no idea how much it can help them improve their service capabilities. Of course, software updates are ongoing.



Especially since the introduction of the new 204 series in 2008, the latest XENTRY kit makes practically anything possible.

How the components work together.



Ten Times?

The 1926 to 1928 8/38 Typ 200 was the first real Mercedes-Benz, newly developed after the Daimler-Benz merger. Its 2L M 02 inline six generated 38 hp, could propel the 2,535-lb. car to 47 mph, and achieved an estimated fuel efficiency of 15.7 mpg.

Why are we attaching this to an article on XENTRY? Because the technical complications that make sophisticated diagnostic equipment necessary have definitely been worth it. Consider the 2L four-cylinder in a 2016 AMG CLA45, for example. At 385 hp, it puts out 10 times the power of the 8/38 Typ 200 from the same displacement. It also gets about twice the fuel mileage. Whew! It's obvious that the engineers have been hard at work over the last 90 years, and what they've accomplished adds to our value as technicians.

The XENTRY Connect is, essentially, a task-specific PC, based on a Windows 7 operating system, on which the software runs. It has two cooling fans, two USB ports, plus an input for the power supply, a network/LAN port to use during initial setup, and an illuminated display that shows the operating and function status and includes function buttons.

The XENTRY display unit features a touch screen with operating pen, and is equipped with function buttons and a speaker. It has input ports for a host of connection needs, including a serial port, a LAN port for network cabling, a power supply input port, three USB ports, headphone and microphone jacks, a multi-card reader, and a WiFi on/off switch.

The main innovation is that all applications are installed and run directly on the multiplexer – XENTRY Connect. At the same time, it communicates with the car, interprets the vehicle's data, and offers the wide range of DAS/XENTRY diagnosis.

Setup is Straightforward

Once the various cables are connected, setting up the XENTRY unit is not difficult. It starts with opening Windows 7 and working through the self-guided Windows setup. Then the Blu-ray unit is connected via two USB cables, and the XENTRY installation DVD goes into the Blu-ray unit, where you're asked to proceed through a self-guided configuration setup. LAN and WiFi configuration is next, as per your shop's setup. Then configuration settings are transferred to the XENTRY Connect unit via a network cable.

The system includes expert configuration options to meet the network and internet needs of various shop setups. Once the system is set up and configured, you can use the Blu-ray update disc (every 60 days, as already mentioned). Once you insert the disc, the download process is automatic.

Controlling it

When using XENTRY, it is helpful to understand the role of the various buttons and controls on the screen. Here are some of the functions of XENTRY and the procedures for launching them. This is by no means a comprehensive explanation of all of the features of this innovative system, just an overview of the primary functions.

The main navigation bar is down the left side of the screen, and the icons are listed in a logical order from top to bottom. This is done so it is intuitive to work from top to bottom when using the system. Tapping the icons activates the following:

- Vehicle identification, preferably by VIN, but can also be provided by model year, chassis type, body style, etc.
- Diagnosis via XENTRY or DAS, depending on which model series is being serviced.
- TIPS – this page, soon to be available in the U.S., requires a network connection and also a valid PAI User ID.
- WIS/ASRA net – requires the user to log into EPC net or the WIS/ASRA net server.
- EPC net – requires an online connection to EPC net or WIS/ASRA net server with password.
- System settings for language, date/time, etc.
- Exit – closes XENTRY.

In addition, icons are provided for Print and Help functions.

Attaching XENTRY to the vehicle is straightforward, starting with the OBD connector. The Control software will show that the XENTRY Connect drive is ready. You can then open the software, tap on the Diagnostics icon, and select the model being serviced.

From there you can open the diagnostics field to adjust various settings using the Diagnostics Desktop. Finally, choose the appropriate profile – Workshop Network, or Direct Connection (Service 24 hour mode).

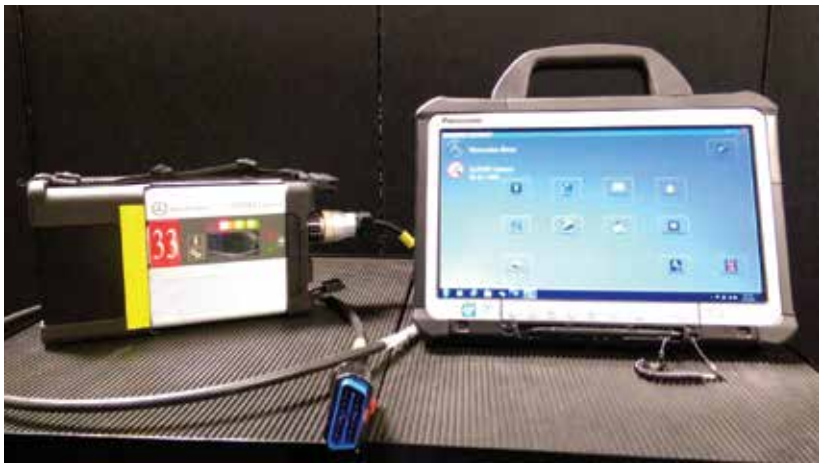
In order to launch and actually use XENTRY, you begin by identifying the vehicle you're working on. This is done, preferably, by entering the vehicle's VIN. However, you can also click on the appropriate vehicle model designation and select the Diagnostics icon, and XENTRY will automatically pull the VIN directly from the vehicle via the OBD connection.

If for some reason the VIN is not available, you can select the Passenger Car tab, then choose a model and sub-model, along with appropriate engine and transmission selection.

As you begin to enter data and task selection, you'll note that there's a status bar across the bottom of the screen that shows the specifics of the detail you've selected. XENTRY retains this information even as you continue to open multiple applications, and you can always refer to this status bar to confirm the particulars of the vehicle you're servicing.

In fact, that's one of the helpful features of XENTRY: It has combined a variety of applications into a single interface, so it is only necessary for the user to log on once, and to enter vehicle identification information once. This facilitates switching among multiple open XENTRY applications when servicing the same vehicle, and the system will "remember" any settings that have been changed or any changes made to the vehicle, so the same up-to-date data will appear in all open applications.

Opening the diagnostics tab will open either XENTRY Diagnostics or DAS depending on the vehicle being serviced. Newer models will open in XENTRY Diagnostics, while older



"Pass-thru" is accomplished with XENTRY Connect. It interprets the vehicle's software language and communicates that information to the SDS.

vehicles will open DAS. XENTRY Diagnostics has two main views – Functions view and Control Units view, with the Functions view being the default setting. As a general rule, the default Functions view is the best choice for nearly-new vehicles, while the Control Units view is typically the most appropriate for older vehicles where targeted control unit programming is called for. There is also an icon for Special Functions that provides a pathway to information on retrofitting and conversions.

Users will be happy to know that they can perform quick tests in either Functions view or Control Units view. When using the Quick Test function, a status line will show key parameters, such as battery voltage, the status of the connection with the vehicle, and even the status of the vehicle's ignition switch (on or off).

The Quick Test function is a viable alternative to the Guided Fault Finding (GFF) feature in XENTRY – Mercedes-Benz recommends starting each diagnostic procedure with Quick Test. This is because this function typically leads you to the various related functions that a customer might describe as malfunctioning. From there you can look at "Actual Values" to examine live data and view adaptation information that a control unit has acquired. This precludes the need to use a DMM (Digital Multi-Meter) to test and record the voltage at each component's signal line. If the live data shows a questionable voltage, you can confirm this reading by checking voltage at the actual component.

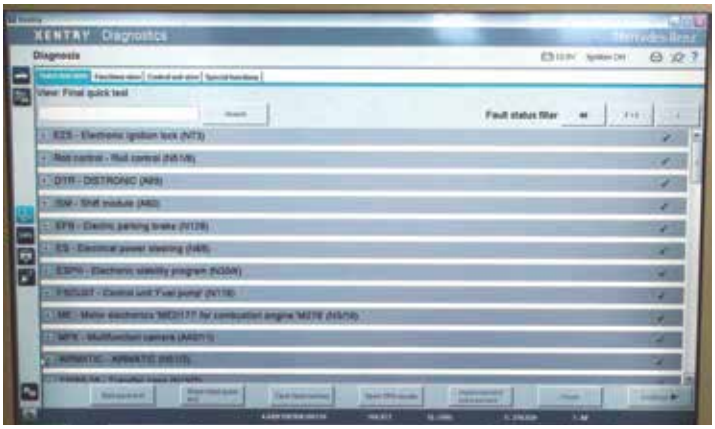
To determine whether a control unit is actually able to regulate an output, you can opt for the "Actuations" feature in XENTRY. This provides a simple on/off function that allows you to manipulate a control unit to operate the driver that controls the system outputs. You'll measure the voltage on the control side of the component and determine whether or not the control unit is able to supply power or a ground pathway to the control circuit. These functions normally must be carried out with the ignition key in the Run position and the engine off, as noted above, which reinforces the need for the use of a battery maintainer during testing.

When exiting XENTRY, active programs continue to run, such as when flashing a control unit. This feature is helpful when you are connecting to another vehicle immediately after your current procedure is done. This makes it easy when working on multiple vehicles concurrently, such as when you're waiting for one vehicle to warm up or run through certain cycles. XENTRY allows multiple programs to continue to run in the background, so you can switch between vehicles as necessary.

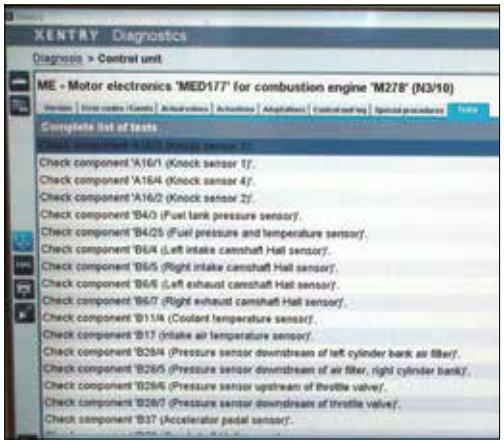
While the XENTRY Connect is taking care of its business, perhaps flashing a control unit, you can use the Tab for other purposes

When service is complete and you're ready to sign off, the exit menu offers you three choices.

- You can exit XENTRY diagnostics.
- Or, you can log off from the service, in which case all on-line applications are exited, the user is logged out, but XENTRY and XENTRY Diagnostics remain open.



Today, since so many features are dependent on control units working together, it makes sense to run XENTRY's "Quick Test" of all the vehicle systems at the outset of any diagnosis, as Mercedes-Benz recommends. This will allow you to see the "big picture" and avoid chasing dead-ends. You can select "Functions View," and the SDS will pull up the units that have control over the feature you select.



The latest XENTRY system has a "Tests" tab that expands on the previous SDS software actuations tab. You can perform static and dynamic tests for each system in a particular control unit. They will simulate the self-diagnostic functions that run automatically.

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Wiring Harness Repair

Twist and Tape is History

When an electrical fault occurs, the old twist and tape repair is no longer an option for today's tiny electrical terminals and connectors. Rather than scrambling to find the parts and tools needed when faced with an electrical problem you haven't seen before, you should be using the Mercedes-Benz Wiring Harness Repair Kit. It contains every type of terminal, connector, and tool needed for wiring harness repairs.

Note: diagrams within this article are colored for reference purposes only.

Fifty years ago, the average vehicle contained under 200 feet of electrical wiring. Thanks to an ever-increasing number of electronically-controlled automotive devices, luxury vehicles today may contain up to a mile of wiring. Connecting those wires requires over 1,000 terminals, plus related connectors, seals, and protective housings.

To maintain high Mercedes-Benz performance standards, every wire, terminal, and connector is designed to meet specific application requirements. As a result, you'll see different wire thicknesses matched to the amount of current a circuit is designed to carry, and contrasting insulation types based on the need for heat shielding and resistance to moisture, abrasion, oil, and chemicals. You'll face a variety of terminal and connector combinations to meet vibration, shock, and other abuses common to certain automotive locations and environments.

Mercedes-Benz engineers have designed superior wiring connections that provide electrical conductivity in spite of vibration, high heat, moisture and automotive chemicals, and that perform reliably for many years.

But the automotive environment challenges even the best over time. Loose connections, frayed wires, and corroded terminals reduce the flow of electrical current. Improper repairs, inadvertent severing of a line, crushing or cracking a connector, or an animal chewing through insulation all can reduce electrical conductivity. Accidents and severe road shocks can re-position and expose a wire or fitting to moisture, excess heat, or rubbing and chafing damage that is unlikely to have occurred under the original factory wiring layout. Any of these conditions can cause a quiescent current draw, commonly called a parasitic drain.

The wire, or the owner?

Assuming that the charging system is functioning properly and the battery is not dying, before blaming any wiring harness you must rule out improper vehicle shutdown as a cause of battery draw failures. Ignition or lights left on, a door or deck lid not completely closed, or other vehicle system or component consuming power when it should normally remain inactive after engine shutdown can cause a quiescent current draw.

The current path

Once you've ruled out operator error as a cause, you'll need to identify the likely source of the quiescent power draw. Trouble codes and other stored data can help narrow your focus to one or more fuse boxes. A millivolt (mV) drop test across the fuses, or an amp clamp test of various circuits can help pinpoint the circuit where the fault originated. It is no longer accepted practice to use the traditional method of pulling fuses one at a time to find the one with the unwanted draw. That will just confuse the diagnosis by waking up modules when the fuses are plugged back in.

Now you can locate the specific wires and connectors on the wiring diagram, and begin visual inspection and testing to identify the fault-causing damage. The damage will determine what type of repair can best ensure that the problem does not reoccur.

Contact faults

Anything that prevents terminals and connectors from maintaining contact over their mating surface area effectively reduces the conductivity of the connection. Poor conductivity may cause a controller to not see sufficient voltage at a given pin, and shut down operation of that circuit.

Cable that is not pushed far enough into the contact portion of a crimped or soldered terminal must be cut off and inserted into a new terminal. Insulation that has been pushed under the wings of a crimp may form stress cracks and eventually allow current to find a new path away from its intended destination. Incorrect, missing, or deformed terminals or pins must be replaced.

Housing/Coupler faults

Loose screw connections must be tightened to the proper torque specification, or replaced if damaged beyond repair.

A cracked or warped housing or coupler casing, in addition to not holding terminals and connectors in close contact, may have the opposite problem. The damaged housing may squeeze terminals too close together, creating potential unintended pathways for current to jump from one circuit to another. Damaged housing components must be replaced.

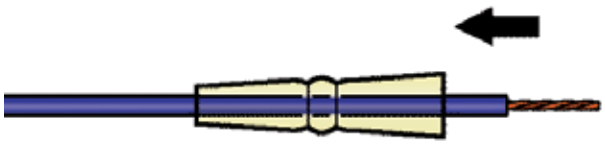
Wiring faults

Minor abrasion of the wire exterior (insulating tubing) can be covered with new PVC tape. Insulation that has separated from the wire or is cracked, cut, or damaged in a way that would allow current to escape or moisture or other contaminants to directly impact the wire must be cut and repaired.

A missing or damaged grommet increases the risk of a wire rubbing against a sharp edge as it passes through a panel. Fit a new grommet as needed.

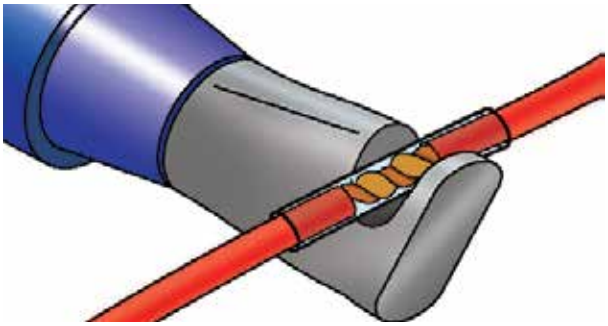
Mercedes-Benz wiring harness repair kit

Mercedes-Benz approved wiring harness repair methods include use of Raychem solder connectors (radial, axial,

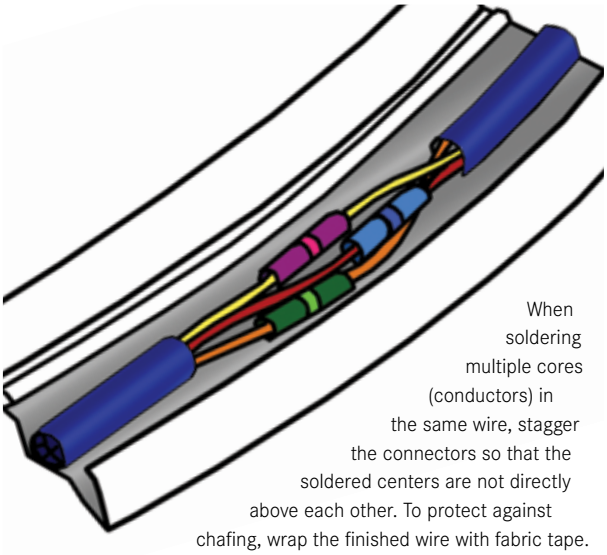


Select the appropriate Raychem axial solder connector based on the cable cross-section (diameter of wire, including insulation). Insert the axial connector onto the cut end of the wire, narrow end first.

Twist the wires neatly and cleanly, then slide the connector over the spliced area.



Pre-heat a hot air blower/heat gun (with automatic temperature control) to 752° F (400° C). Push the axial connector sleeve back to where the solder pre-form is centered over the twisted together wire. Heat the sleeve from center to ends until the solder melts completely and the sleeve has shrunk properly around both ends of the wires. Pre-heating the gun cuts down the amount of time it takes to melt the solder, thus reducing the risk of overheating the wires.



When soldering multiple cores (conductors) in the same wire, stagger the connectors so that the soldered centers are not directly above each other. To protect against chafing, wrap the finished wire with fabric tape. In the engine compartment, fabric tape should only be used in combination with other (watertight) safety measures.

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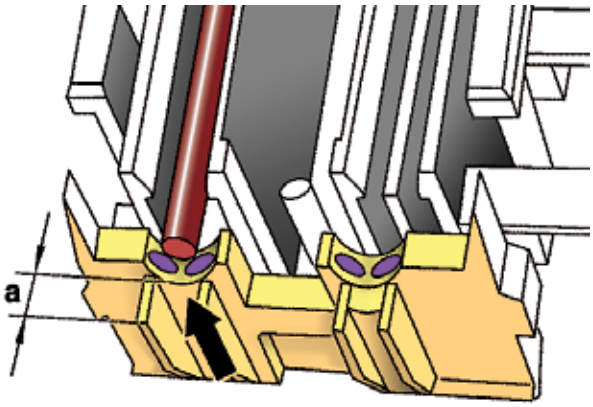
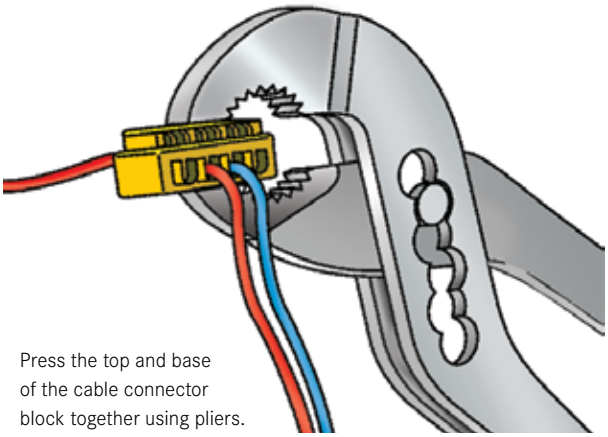
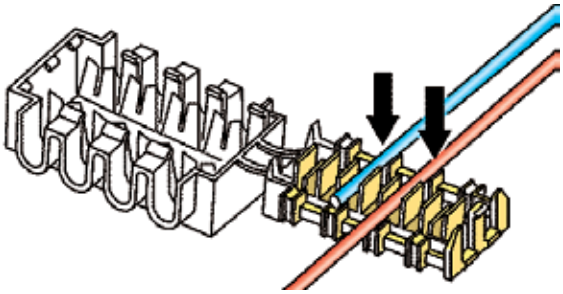
and either type in combination with a cable tail), crimping (round or flat wires), soldering (for solder-type contacts only), and snap-lock rapid connection technology. All of the approved connectors, tools, and die sets are available in basic and extended wiring harness repair kits from Mercedes-Benz. It is explicitly prohibited to use the old fashioned twist and tape method, wire nuts, direct soldering of wires or pins (except to specific solder-type pins), or unapproved crimp connectors.



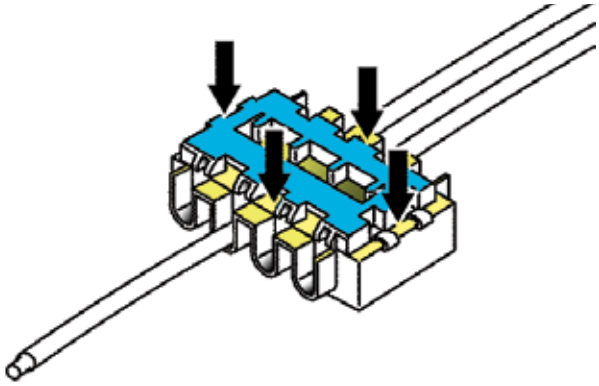
Left: Position the end of the wire or cable approximately 2 mm from the edge of the connector housing. This ensures that both sides of the notch grip the wire, and that the gap (a) between the wire end and the housing is large enough to prevent a short circuit.



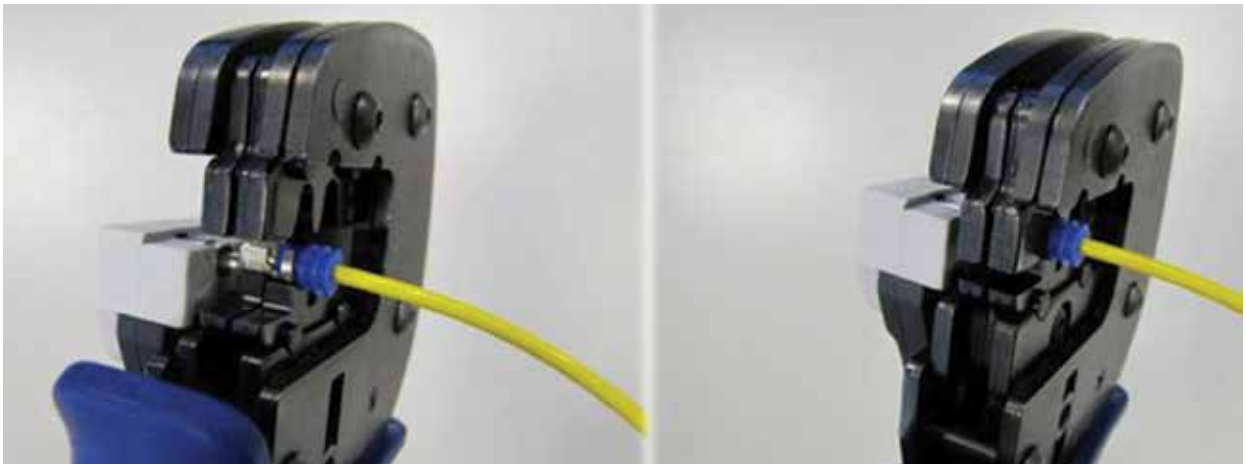
Press the top and base of the cable connector block together using pliers.



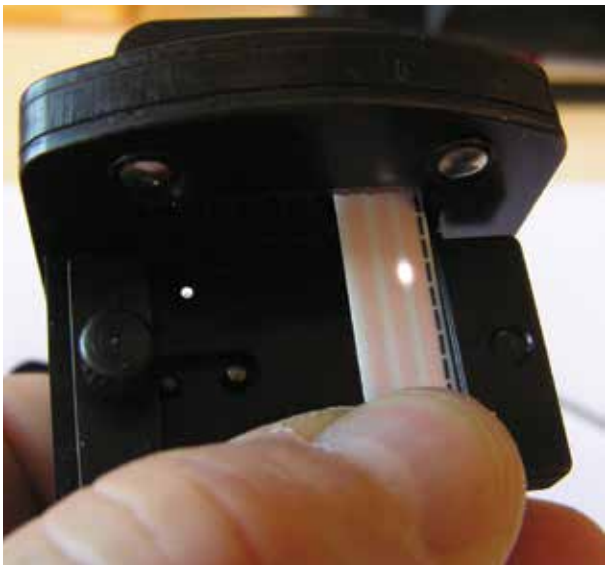
Select a Rapid Connection Technology cable connector with enough cross-sections to hold each wire in a separate notch. Insert wires or cables into notches in the top half of the cable connector.



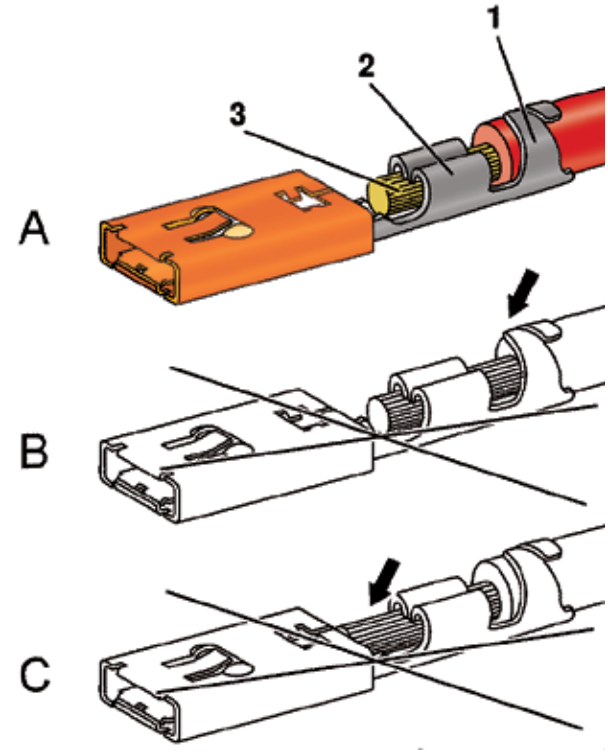
Check that the connector has snapped tight on all four sides. If possible, secure the connector in vehicle to prevent rattles.



On the left is a manual crimping tool with the jaws open and contact and wire in position, ready to be crimped. Note that only the small end of the blue seal is inside the crimper jaws. On the right, the crimper has fully closed around the contact and wire. The wide end of the seal remains uncompressed, so it will fit snugly when the contact or terminal is inserted in its connector or housing.



The Mercedes-Benz-approved hand-held crimper for flat cable allows lateral adjustment of the ribbon so that the copper conductors align properly where the cable ends meet. The cable is correctly aligned when light from tiny openings in the tool is fully visible between two conductor tracks.



"A" shows a correctly-crimped connection of multi-strand wire with the exposed portion of the wire (A3) enclosed, but not crushed, gouged, or misshapen by the crimped tab (A2), and tabs clamped properly around the outside insulator (A1). "B" shows the wire stripped too much so that the ears are not gripping the insulation. In "C," the wire is inserted too far into the connector and sticks out to the tip. If the tabs are piercing or deforming the conductors (B), or insulation (C), a new connector must be installed and the crimp re-done.

Raychem solder connector

Soldered connections require tight control of key factors such as soldering temperature, flow and wetting, and the amount of solder deposited on the conductor and terminal. Simple things such as improper tinning of the soldering tip, or excess solder blocking the port for a pin or wiring terminal, can reduce conductivity and weaken repair durability.

Mercedes-Benz approves soldering as a repair for small and medium diameter electrical wires, but only using Raychem pre-fabricated solder connectors. These approved connectors help technicians achieve the required control of key soldering performance factors. They reduce repair failures by restricting where the contact parts can be placed, making it easy to see whether the correct length of wire has been stripped and properly positioned for joining, and helping to hold it in position during the solder application.

Several different connectors accommodate various wire outside diameters. Each different solder connector is designed to match a specific combination of wire color code, core (conductor) diameter, and insulation thickness.

Cables 6 mm or larger cannot be repaired and must be replaced. For smaller wires, regular soldering is permitted, but using only the basic radial or axial soldering connectors in the Mercedes-Benz wiring harness repair kit. See the kit instructions and the Mercedes-Benz Workshop Information System (WIS) or other approved repair information source for details on a specific Mercedes-Benz model or component.

If you are removing damage and splicing back together only one wire, the Raychem Axial Solder Connector is the Mercedes-Benz approved repair method. The pre-fabricated sleeve contains a flux-filled pre-formed solder, adhesive-lined end seals, and a polyvinyl heat shrink casing. The translucent sleeve makes it easy to see when melting is complete. It also helps avoid excessive heating, which compromises the dielectric properties of the wire insulation and may result in poor adherence of the solder.

Rapid connection technology

When repairs require you to cut and combine two or more wires simultaneously into a single connector, the Mercedes-Benz procedure requires use of either a Raychem Radial Solder Connector, or for interior

(excluding Supplemental Restraint System and other safety-related systems) and trunk wiring only, authorizes use of wiring connectors featuring rapid connection technology.

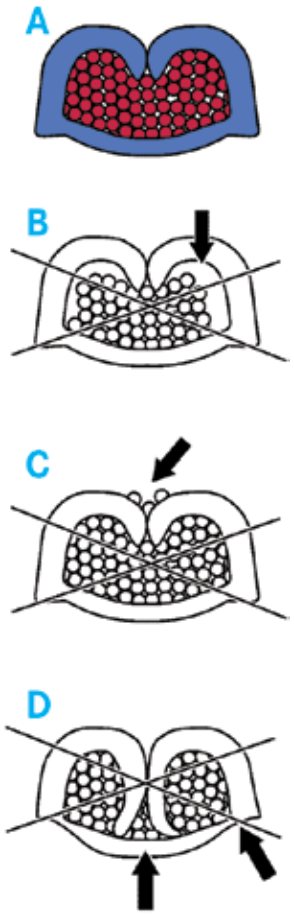
Rapid connection technology is a snap-lock wire connector block containing tin-plated contacts which touch the wires or cables. There is no soldering, and the lines do not have to be stripped.

Crimping

The first step in crimping is to select the correct crimp contact, or connector. It must match the gauge size and amp rating of the wire, the shape (round or flat), and whether or not it's required to seal against moisture. Any Mercedes-Benz Wiring Harness repair kit includes a lookup table showing crimp connector options based upon these and other relevant factors.

Strip the wire using an approved Mercedes-Benz wire stripper. The approved tool allows you to strip the wire without fraying or pulling it apart, and cut through the insulation without extra pulling or multiple cuts. That means no nicks or gouges in the wire surface to cause contact gaps or fitting problems that reduce current flow or create an unreliable connection. Avoid unapproved stripping tools.

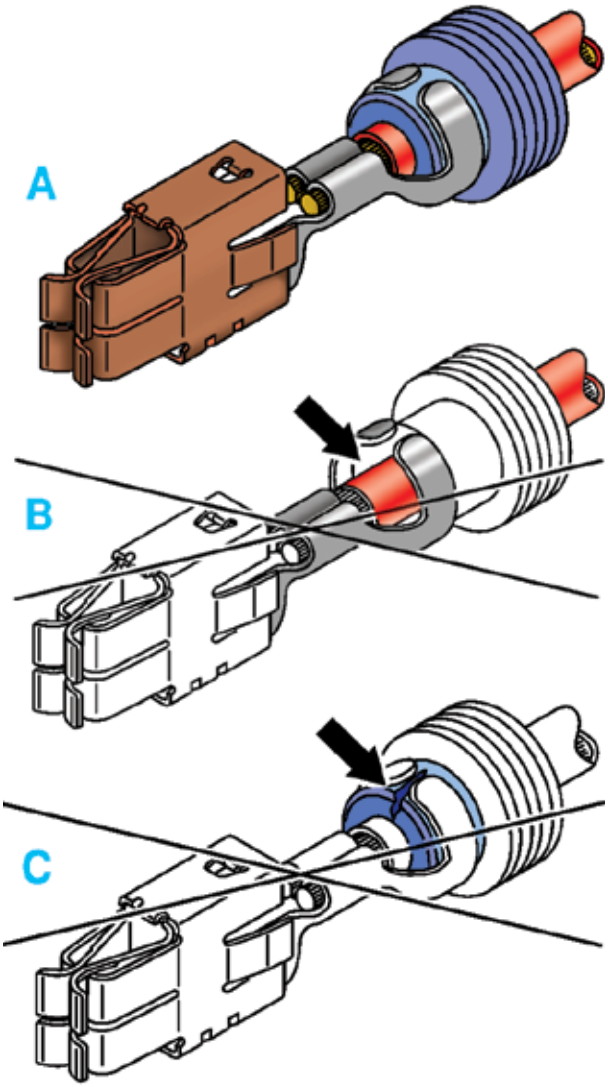
Select the correct crimping (die) set and mount it to the Mercedes-Benz crimping tool. Insert the crimp contact (connector) into the positioner in the crimping tool. Slide the stripped wire into the connector and ratchet the crimping tool until it is fully closed.



A cross section view of a properly crimped wire shows all wire strands fully enclosed by the crimp (A), with no gaps (B) inside the crimp and no strands outside (C) of the crimp. If tabs are compressed all the way to the bottom of the connector (D), the crimp is weakened and should be re-done with a new connector.

Frustration fighter

The days of finding out the hard way that your screwdriver cannot pull the pin without damaging the contacts, or hoping that there is a comparable connector in good condition in your salvaged parts pile, are finally over. Mercedes-Benz engineers have done a masterful job of collecting everything you need to make wiring harness repairs the safe way, and combining them in one of several different Mercedes-Benz wiring harness repair kits.



"A" shows a watertight connection with the wire insulation properly crimped to help prevent moisture ingress and corrosion. In "B," the seal is not fully engaged by the holding ears, and "C" shows the seal pinched by the ears, allowing a moisture channel.

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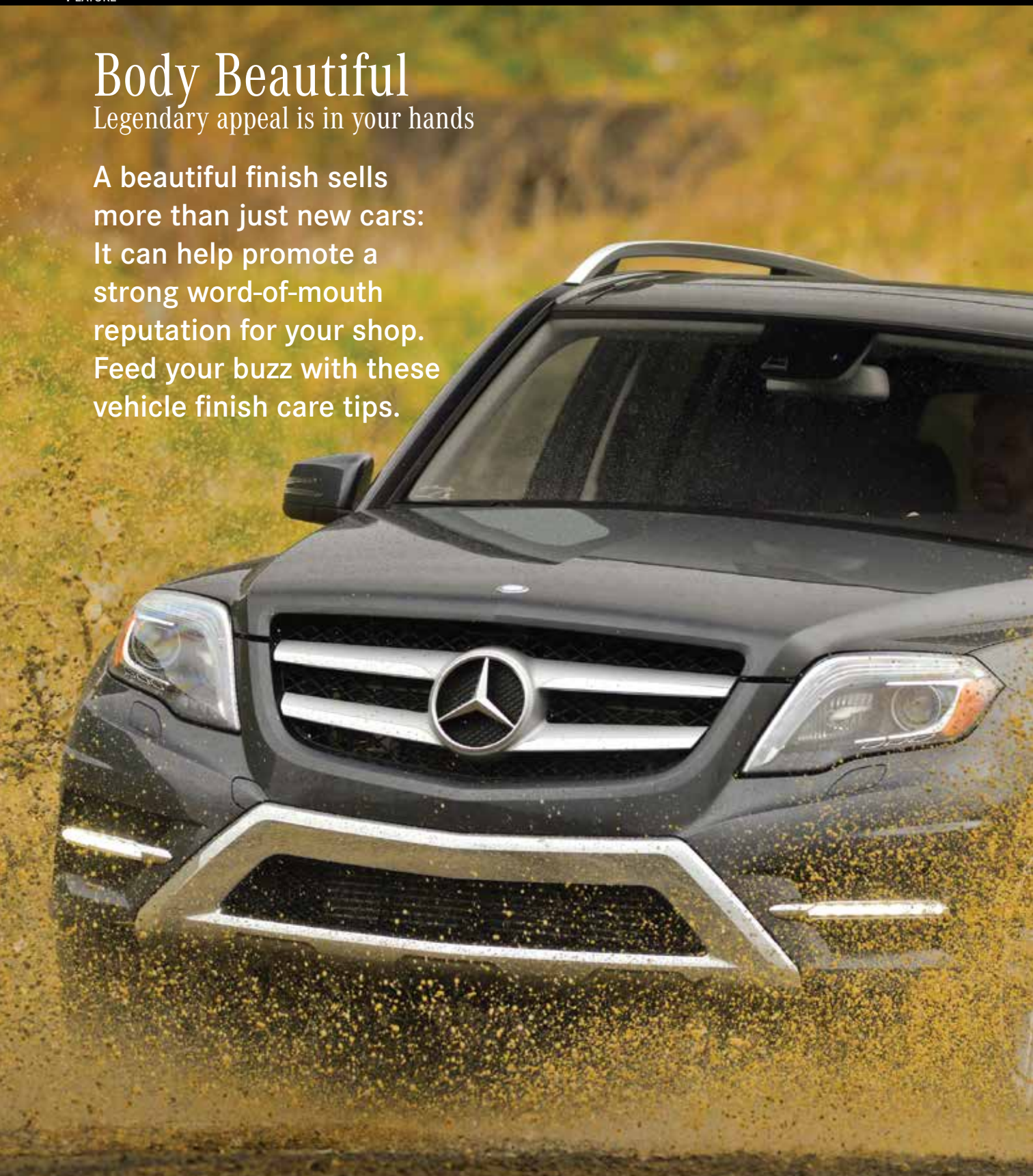
A beautiful finish sells more than just new cars: It can help promote a strong word-of-mouth reputation for your shop. Feed your buzz with these vehicle finish care tips.



That perfect finish is subjected to continual environmental assaults. You can't keep it in a protective bubble, but you can certainly mitigate the damage and help preserve the vehicle's appearance, much to the delight of your customers.

Automotive finish damage is a problem that, if not addressed early, will worsen. Corrosion eats through metal. Chip damage and scratches allow moisture and wind to get under the paint film, causing flaking. Bird lime, insect secretions, and tree resin over time cause cratering of the paint surface. Road tar, de-icing chemicals, brake dust, rail dust, acid rain, and other industrial fallout bond chemically with the paint, leaving it feeling dirty and rough-textured even after washing.

If the original surface has begun to lose its gloss, it is time to come to the rescue with the Mercedes-Benz family of powerful cleaners, polishes, and preservatives. Inspect the surfaces and use tar, tree resin, and bird and insect remover products to remove any road grime or stubborn biological deposits.

Next, wash the vehicle with Mercedes-Benz paint cleaner. It is specially formulated with mild abrasives to remove the weather-induced fogging that has dulled the luster of the finish. Buff the finish to an even sheen, and then apply a gloss preserver. The cleaner forms only a very thin protective coating which does not last long, so a gloss preservative is good preventive maintenance for the finish.

The wheel on this 1904 90 hp Mercedes race car could certainly use a coat of old-fashioned enamel or lacquer paint. Note that this is an early use of steel for rims in place of wood (varnish, anyone?).

Mercedes-Benz recommends cleaning and preservative application twice a year. For severe duty vehicles such as limousines or vehicles often parked at construction sites or industrial areas, more frequent or more intensive paint finish care is advisable.

Headlamp lens cleaning

Headlamp lenses are made of a polycarbonate (plastic) and covered with a clearcoat. Do not use scouring products or dry cloths on headlamps, as they will scratch the surface. Do not use solvents, as the plastic is not fully resistant to them. Instead, wipe the lens with a damp sponge. If these precautions are not followed, surface damage to the headlight may occur, including the appearance of a dull, milky coating that dilutes and weakens light projection, matte (glossless) spots, and scratches that may lead to strain cracks due to thermal expansion and contraction cycles.

Spot Repair

Mercedes-Benz recommends spot repair for minor paint refinish in small areas such as door edges, fenders,

and lower side panels that have suffered chip damage. The diameter of the defect should not exceed 3 cm.

Sand out the damage and matt down the surrounding area. Prime and paint the prepared area with a basecoat and feather it out. When the basecoat has flashed off, cover the matted surface with clearcoat and blend it out at the edge using a fade-out thinner. Once the area is dry, seal it with a polish. The total spot repair area should not exceed a diameter of 20 cm.

Scratch-resistant clearcoat

In recent years, new automotive paint systems have been introduced that offer a higher level of scratch resistance than traditional finishes. Some of these paint systems use microscopically small silica-based particles (nanoparticles), while others benefit from optimized and increased cross-linking of the clearcoat film. Finish appearance and durability is comparable, regardless of which of the two types of clearcoat technologies are used.

The factory finish of almost all Mercedes-Benz vehicles since the 2005 model year now includes these more scratch resistant clearcoats. They are identified by a "C" in front of the color number on the code label. More scratch resistant clearcoats are also available for collision repair use. Application methods do not differ significantly from those of traditional clearcoats. Of course, follow the paint manufacturer's instructions on drying temperature and time.

Sanding re-work on the new clearcoats is more complicated, thanks in part to the increased hardness of the film. Dust and other defects require more effort to remove from the paint, and sanding must be finer and done more carefully. Mercedes-Benz instructions recommend use of an abrasive paper of at least 2500 grain size, and preferably between 3000 and 5000 grain size.

The finish requires special polishes, and attention to details of polishing machine speed, pressure, and coverage area.

No ghosts

Do not attempt to polish more than one-quarter square meter of scratch-resistant clearcoat surface area at a time. Follow the polish manufacturer's instructions on polishing time, and use the same amount of time, pressure, and polishing speed on each one-quarter meter of area. Otherwise, visible differences will appear in the different areas.

Spot repair is approved for minor paint damage around door, headlamp, and sunroof edges, and lower side panels that have suffered chip damage.

Use an eccentric polishing machine and a multi-stage polishing method. Polish the surface for at least 10 seconds at a very low rotational speed (approximately 800 rpm). Follow that with three additional polishing stages totaling a maximum of 30 seconds each. Bump up the rotational speed for each stage until by the fourth you are using 1600 rpm.

Use light pressure and uniform crisscrossing movement at each speed, in order to prevent ghosting. Because the finish is ground while being polished, a more abrasive effect is observed at the start, and an intense gloss becomes evident in the final stage.

Spray on deionized water and immediately buff with a tack rag to remove polish residues. Seal the polished area with a gloss preservation agent.

For Designo (lacquer) paint finishes, wash the vehicle with a regular cleaner, then spray on deionized water and wipe surfaces clean using a micron-grained microfiber cloth. Seal surfaces with a gloss preserver.

Gloss preserver

New and well-maintained paint is water-repellent, i.e. water droplets form beads on the surface. If water fails to form beads, this is an indication that the paint has weathered and needs re-preserving.

Gloss preserver protects against weathering and preserves the existing luster of the finish. Wash the vehicle. Apply gloss preserver onto a clean polishing cloth and rub evenly onto the vehicle surface to produce a thin unbroken film. The gloss preserver forms a white film as it dries. Buff the surface with a clean polishing wad or cloth until the surface is clear. Repeat treatment every three to six months as needed.

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Nano Paint Sealer

Mercedes-Benz has a nano paint sealer that outshines and outlasts acrylic or wax coatings. The application process is a bit more demanding, but the results are noticeably worth it.

First, wash the surface to remove any grease, dirt, or other contaminants. Next, polish with Mercedes-Benz Nano Polish. Make sure there are no scratches, streaks, or ghost swirls on the surface when dry. Spray the surface with Mercedes-Benz Paint-Prepare and wipe it off with a clean microfiber cloth. If any ghostings or streaks appear, re-polish the area.

Pull the retaining ring off of the top of the can and turn the Nano Paint Sealer upside down, pressing its applicator firmly down onto the surface you are sealing. Apply the Nano Paint Sealer with a uniform pressure and crisscrossing stroke, covering only one-quarter of a square meter of surface area at a time. Allow each small area to flash off for 15 to 30 seconds, and then polish with a microfiber cloth to remove excess sealer. Any streaks or ghost images can be removed for up to one hour by applying a thin coat of nano sealer and cleaning with a microfiber cloth.

Allow sealed surfaces to cure for at least one hour, with the vehicle parked in a dry place and not touched. Write the date the sealer was applied on a sticker (supplied in the nano kit) and attach the sticker to the B-Pillar. The vehicle should not be washed for at least three days after treatment. Inform the customer not to use highly concentrated alkaline cleaning agents (bleach, ammonia, lye), as they will remove the nano paint sealer.

Light alloy wheel repair best practices

Mercedes-Benz light alloy wheels and plastic hubcaps feature a two-layer metallic paint surface. Clean them only with Mercedes-Benz care products which preserve the paint.

Do not use scouring agents, acid-containing or strong alkaline agents or a scouring sponge, as these can scratch or etch the surface. Normal dirt, including brake dust, can be removed with hand-hot water, a mild dirt solvent (similar to that used for the vehicle body) and a sponge. Use plenty of water.

Stubborn dirt

When the mild cleaner is not enough, there is a Mercedes-Benz approved alloy wheel cleaner (part number A 001 986 3471) that gets rid of stubborn dirt. After cleaning, treat the surfaces with polish and gloss preserver.

Mercedes-Benz light alloy wheels are divided into three zones for the purpose of repair decision-making. The outer rim to a depth of 25 mm (Zone A) may be spackled to eliminate scratches and gouges of no more than 1mm deep. The rest of the public-facing rim (Zone B) may only be painted. The wheel center (C) may never be repaired or painted.

If the vehicle has a clearcoat paint system with higher scratch resistance properties, see the Mercedes-Benz service information for that model for cleaning instructions.

Flash rust

There is also a Mercedes-Benz cleaner specifically for flash rust removal (part number A 001 986 1371). Flash rust appears as small holes that form where metal particles have adhered to the surface and over time, corroded the finish. Airborne metal particles from construction sites, industrial areas, and railroad tracks are the likely sources of flash dust.

If your inspection reveals that metallic particles merely lie on the paint and have not yet eaten into the topcoat, the wheel can be cleaned with metal dust remover. If in doubt, use a magnet to check whether the particles have begun to embed themselves into the metal. Do not attempt to clean metallic dust that has not yet formed rust spots by polishing, because this can scratch the surface finish.

The same recommendations for metallic dust removal apply to the finish on the vehicle body. It may be necessary to remove any wax coating from the body beforehand with the aid of a wetting solution.

Cosmetic surgery

You may repair damaged light alloy wheels, but only in the outer rim area, only when damage does not exceed

a depth of 1 mm, and only on cast light alloy wheels. Forged light alloy wheels may be painted, but not spackled or processed in any other manner.

Never attempt to repair light alloy wheels that have been cracked, or that have damage deeper than 1 mm. If there is any material damage to any area other than the outer 25 mm of the rim (Zone B in the image above), including light alloy wheels whose outer or inner rim flange is deformed, replace the wheel. Do not repair or paint that wheel.

Protect yourself

Do not repair wheels that have been previously treated. This includes thermally stripped, blasted, machined or reshaped light alloy wheels. Also avoid repairs to chrome-coated wheels and those that have pure clearcoat varnish in bright-finished areas.

Only cast light alloy wheels with the designations “AlSi 7 Mg” and “AlSi 7 Wa” may be spackled. See your Mercedes-Benz repair information source for further details and restrictions.

Do not focus heat excessively at specific points using an infrared emitter, heat gun or similar device. Heat only up to a maximum of 194 degrees F, for no more than 40 minutes. Heat application should be reasonably balanced, avoiding higher temperature loading on one side than the other.

This premium Maybach wheel is beautiful, but just as susceptible to curb and other damage as lesser specimens.

Mercedes-Benz Mobil 1

Product Name	Part Number	Quantity	Product Description	Recommended Consumer App.
Mercedes-Benz SPEC.				
Mobil 1 Formula M 5W-40	BQ 1 09 0144	Bulk - No Equipment	Fully synthetic formulas designed specifically for gasoline passenger cars	Low SPAsh. Available at most MB dealers
	BQ 1 09 0162	6/1 Quart Cases		
	BQ 1 09 0151	55 Gallon Drum		
Genuine Mercedes-Benz Oil MB 229.5 Specification SAE 5W-40	A0009898301USB6	12x1 Quart Cases	Fully Synthetic formula specifically designed for Mercedes-Benz engines that require the 229.5 Specification	Mercedes-Benz Engines that require 229.5 Specification Oil
	A0009898301USB8	55 Gallon Drum		
	A0009898301USB9	Bulk - No Equipment		
Mobil 1 0W-40	BQ 1 09 0010	Bulk - No Equipment	Fully synthetic formulation designed to meet the requirements of many European vehicles	Porsche A40. Many European vehicles. HT/TS applications.
	BQ 1 09 0015	6/1 Quart Cases		
	BQ 1 09 0016	55 Gallon Drum		
Mobil 1 ESP X1 0W-30	BQ1090184	Bulk - No Equipment	Advanced full synthetic formulas designed specifically for diesel passenger cars that have particulate filters	Low SPAsh. Available at most MB dealers
	BQ1090182	6/1 Quart Cases		
	BQ1090183	55 Gallon Drum		
Genuine Mercedes-Benz Oil MB 229.52Specification SAE 5W-30	A0019893701USA9	Bulk - No Equipment	Fully Synthetic formula specifically designed for Mercedes-Benz engines that require the 229.51 Specification	Mercedes-Benz Engines that require 229.51 Specification Oil
	A0019893701USA6	6x1 Quart Cases		
	A0019893701USA8	55 Gallon Drum		
Mobil 1 5W-50	BQ 1 09 0133	16 Gallon Keg	Higher viscosity, advanced full synthetic formula designed for performance vehicles	Porsche A40. HT/HS applications.
	BQ 1 09 0134	6/1 Quart Cases		
Mobil ATF 134	BQ 1 09 0166	55 Gallon Drum	Extra high performance automatic transmission fluid formulated with selected HVI base oils	Recommended for use in Mercedes-Benz automatic gearboxes
Mobil 1 ESP Formula MB 5W-30	BQ 1 09 0165	12x1 Liter Cases	Advanced full synthetic formulas designed specifically for passenger car diesels that have particulate filters	Low SPAsh. Available at most MB dealers.
AdBlue® ½ Gal.	A 000 583 0107	1/2 Gallon Bottle	Non-toxic solution that transforms harmful Nitrogen Oxide (NOx) emissions from diesel-powered vehicles into harmless water vapor and nitrogen	Recommended for use in Mercedes-Benz, Volkswagen + BMW AdBlue® (DEF) applications
Diesel Exhaust Fluid 55 Gal	BQ 1 47 0002	55 Gallon Drum		
Mobil 1 5W-30	BQ 1 09 0017	6/1 Quart Cases	Advanced full synthetic formulation designed to meet the requirements of many domestic, including GM, and imported vehicles	Vehicles that require 5W-30. Corvette approved.
	BQ 1 09 0018	55 Gallon Drum		
Mobil 1 10W-30	BQ 1 09 0019	6/1 Quart Cases	Advanced full synthetic formula designed for domestics and imports	Vehicles that require 5W-30 or 10W-30
	BQ 1 09 0020	16 Gallon Keg		
	BQ 1 09 0021	55 Gallon Drum		
Mobil 1 5W-20	BQ 1 09 0083	6/1 Quart Cases	Advanced full synthetic formulation designed to meet the requirements of many newer vehicles including Hondas, Fords, Chryslers, and newer Toyotas	Vehicles that require 5W-20
	BQ 1 09 0084	55 Gallon Drum		
Mobil 1 0W-20 AFE	BQ 1 09 0169	6/1 Quart Cases	Advanced full synthetic formulation designed for enhanced fuel economy and cold weather performance	Most vehicles that specify 0W-20 (newer Toyotas and Hondas), 5W-20 and certain hybrids
	BQ 1 09 0168	55 Gallon Drum		
Mobil 1 0W-30 AFE	BQ 1 09 0174	6/1 Quart Cases	Advanced full synthetic formulation designed for enhanced fuel economy and cold weather performance	Most vehicles that specify 5W-30 or 10W-30
Mobil 1 Synthetic ATF	BQ 1 09 0164	6/1 Quart Cases	Multi-vehicle, fully synthetic fluid designed to meet the demanding requirements of modern passenger vehicles	Vehicles that require Dexron III, Ford Mercon and Mercon V performance levels
	BQ 1 09 0163	55 Gallon Drum		
Mobil 1 15W-50	BQ 1 09 0023	55 Gallon Drum	Boosted, higher viscosity, advanced full synthetic formula designed for performance vehicles	HT/HS applications. Racing and Flat tappet applications
Mobil 1 Gear Oil (Mobil 1 Gear Lube 75W-90)	BQ 1 09 0085	12/1 Quart Cases	Exceeds the most severe service requirements in both conventional and limited slip applications	SUITABLE for use in modern high performance automobiles like SUV's, Vans and Light duty trucks requiring API GL-5 level performance

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Please have a look at our oil portfolio which is available through your local Mercedes-Benz dealer. Our dealers are able to offer you a wide variety of oil grades at competitive prices.

Product Name	Part Number	Quantity	Product Description	Recommended Consumer App.
Mercedes-Benz SPEC.				
Mobil 1 Gear Oil (Mobil 1 Gear Lube 75W-90)	BQ 1 09 0085	12/1 Quart Cases	Exceeds the most severe service requirements in both conventional and limited slip applications	SUITABLE for use in modern high performance automobiles like SUV's, Vans and Light duty trucks requiring API GL-5 level performance
Mobil Special 5W-30	BQ 1 09 002464	Bulk - No Equipment	Formulated from quality base stocks combined with modern performance additives to give the engine the expected protection and performance under a wide variety of operating conditions	Recommended for gasoline fueled automobiles and light duty trucks requiring an API SN/SM/SL/SJ
	BQ 1 09 0171	12/1 Quart Cases		
	BQ 1 09 003064	55 Gallon Drum		
Mobil Special 10W-30	BQ 1 09 003164	Bulk - No Equipment	Formulated from quality base stocks combined with modern performance additives to give the engine the expected protection and performance under a wide variety of operating conditions	Recommended for gasoline fueled automobiles and light duty trucks requiring an API SN/SM/SL/SJ
	BQ 1 09 0172	12/1 Quart Cases		
	BQ 1 09 003764	55 Gallon Drum		
Mobil Special 10W-40	BQ 1 09 003864	Bulk - No Equipment	Formulated from quality base stocks combined with modern performance additives to give the engine the expected protection and performance under a wide variety of operating conditions	Recommended for gasoline fueled automobiles and light duty trucks where a higher viscosity API SN/SMSL/SJ oil is preferred or recommended
	BQ 1 09 0173	12/1 Quart Cases		
	BQ 1 09 004464	55 Gallon Drum		
Mobil Special 5W-20	BQ 1 09 012464	Bulk - No Equipment	Formulated from quality base stocks combined with modern performance additives to give the engine the expected protection and performance under a wide variety of operating conditions	Recommended for gasoline fueled automobiles and light duty trucks requiring an API SN/SM/SL/SJ
	BQ 1 09 0170	12/1 Quart Cases		
	BQ 1 09 013264	55 Gallon Drum		
Mobil Special 20W-50	BQ 1 09 004664	55 Gallon Drum	Formulated from quality base stocks combined with modern performance additives to give the engine the expected protection and performance under a wide variety of operating conditions	Recommended for gasoline fueled automobiles and light duty trucks where a higher viscosity API SN/SMSL/SJ oil is preferred or recommended
Mobil Delvac 1300 Super 15W40	BQ 1 09 0053	Bulk - No Equipment	Extra high performance diesel engine oils that help extend engine life in the most severe on and off-highway applications while delivering outstanding performance in modern, high-output, low-emission engines including those with Exhaust Gas Recirculation (EGR) and After-treatment Systems with Diesel Particulate Filters (DPFs) and Diesel Oxidation Catalysts (DOCs)	Specifically recommended for the latest low-emissions, high performance diesel applications equipped with aftertreatment systems using Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC) technologies
	BQ 1 09 0058	12/1 Quart Cases		
	BQ 1 09 0059	4/1 Gallon Cases		
	BQ 1 09 0060	55 Gallon Drum		
Mobil Delvac 1300 Super 10W30	BQ 1 09 0086	Bulk - No Equipment		
Mobil Delvac 1 5W40	BQ 1 09 0051	4/1 Gallon Cases	Fully synthetic supreme performance heavy duty diesel engine oil that helps extend engine life while providing long drain capability and fuel economy for modern diesel engines operating in severe applications	Recommended for use in all super high performance diesel applications, including modern low emission engine designs with Exhaust Gas Recirculation (EGR)
	BQ 1 09 0052	55 Gallon Drum		
Mobil Grease XHP 222	BQ 1 09 0078	60/14 oz Cartridge	Formulated to provide excellent high temperature performance with superb adhesion, structural stability and resistance to water contamination	Recommended for industrial and marine applications, chassis components and farm equipment
	BQ 1 09 0079	120 lb Keg		
	BQ 1 09 0080	400 lb Drum		
	BQ 1 09 0098	40/14 oz Cartridge		
Mobil Lube HD Plus 80W90	BQ 1 09 0096	120 lb Keg	Extra high performance, automotive lubricant formulated from select base oils and an advanced additive system specifically for limited-slip differentials	Recommended for use in limited-slip differentials, axles, and final drives requiring API GL-5 level performance
	BQ 1 09 0097	400 lb Drum		

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