



April 2018 Newsletter

Greetings Fellow Mercedes-Benz Owners!

I hope you and your car are both doing well. Although your Mercedes-Benz likely tells you when it's time for a service, now is a great time to check the maintenance schedule to plan for what it will be needing. In addition to oil changes, it might be time to service other critical fluids. And don't overlook the cabin air filters. While those won't affect the performance of your car, they can affect your enjoyment of it!

TRIVIA

Last month's trivia question was, "What is a rear fog light and how do I use it?" Most everyone knows what front fog lights are for. They shine a lower beam pattern that keeps the light from reflecting on the foggy air, and have a wider pattern to illuminate the road, shoulders and markings immediately in front of your car. Rear fog lights shine from the rear of your vehicle. However, their purpose is not to illuminate anything for you, but instead to make your car more visible to other drivers.

The fog lights in Mercedes-Benz vehicles are activated by pulling out on the light control knob when the park or headlights are on. The first position will activate only the front fog lights, and the second position adds the rear fog lights. Actually, the rear fog lights are not multiple "lights" but only a single red one, and only on the driver's side of the vehicle. It is a brighter bulb than the park/running lights, equal in brightness to the brake lights. Its purpose is not only to make your car more visible to following drivers, but to highlight the driver's side so they will know where to pass.

SPEAKING OF LIGHTS...

The external lighting of your Mercedes-Benz is a fairly complex system. It has to not only look good on the car and provide enough light for you to safely see and be seen at night, it also has to meet many worldwide government regulations. This is all quite challenging for automotive engineers and designers. Some lighting designs might look great and give the driver a bright view of the road, but not meet government regulations. Meeting government regulations might indicate lighting that is contrary to the car's design. Not only that, with Mercedes-Benz building cars for worldwide use, it becomes even more of a challenge to make sure that the lights meet all of those countries' regulations.

One thing that you might notice in many newer cars is that their headlights are brighter and more white than older model cars. In fact, some may appear to use a series of smaller bulbs instead of a simple pair of bulbs. For almost 100 years, automobiles have used traditional incandescent filament-style bulbs. This is a sealed glass bulb, filled with inert gas, with a wire filament inside. When an electrical current is applied to the filament wire, it heats up and glows. Along the way, argon gas in the sealed bulbs was replaced with halogen or xenon, but little else changed. And by the way, the drastic temperature changes and vibrations of a vehicle are a pretty harsh environment for a hot filament inside a bulb, so it's likely that replacements will be required often.

TECHNOLOGY FOR BRIGHTER LIGHTS

Eventually, the technology changed and gas-discharge bulbs were introduced. Instead of placing an electrical current on the filament inside a sealed bulb, a higher voltage is used which ignites the bulb's internal xenon gasses, so there is no need for a filament. Depending on the mixture of gasses in the bulb, the color can be adjusted so that it appears more white as compared to the yellowish color of traditional incandescent bulbs. Of course headlight color is dictated by government regulations, so while there are aftermarket kits that can offer some odd colors, original equipment is generally tuned toward the white or yellow end of the color temperature spectrum.

Advantages of HID bulbs is that they give off much more light. Without a filament to break, they also last longer - many, many years longer than incandescent bulbs. There are a few disadvantages. Since these bulbs require a much higher voltage to ignite their gasses, they require an "ignitor" to give them an initial jolt of about 25,000 volts to get the gas glowing, then a transformer to convert the car's 12-volt electricity to 85 volts to keep it powered. When these electronic transformers and ignitors fail or suffer damaged, they are much more expensive and difficult to replace than a simple bulb.

The latest technology uses LEDs and even a few manufacturers are introducing laser-based lighting systems. The advantages of LEDs is that they operate at a lower voltage than HIDs so no transformer or ignitor is needed. There is no sealed glass bulb to break, and they use less power than incandescent and HID lighting. They do have weaknesses, though. LED bulbs are very susceptible to heat, so often large heat sinks and fans are used to keep them cool. Another disadvantage of LEDs is that their light is very directional or "narrow", so special lenses and even arrays of LEDs are used to project the light into a more usable pattern.

Laser lighting uses mirrors that direct the light through special gas-filled lenses, creating the desired beam pattern. In some countries, LED and laser lights are used in elaborate computer-controlled arrays in such a way that beam patterns can be

adjusted dynamically based on the driving situation. Infrared cameras can recognize road hazards ahead and instruct the headlight system's computer to customize the beam pattern. Hazards like an animal on the road far ahead or a pedestrian on the shoulder can be highlighted with brighter light to get the driver's attention. These fully adaptive systems are just now becoming available and may take some time before governmental agencies approve them. And of course they will always appear first in the most expensive cars with the latest, cutting-edge technology.

LIGHTING UPGRADES

Keep in mind that the factory lighting that came in your Mercedes-Benz was designed for optimal functionality and performance, based on the components used. Although there are many aftermarket kits that will allow you to upgrade your factory incandescent lighting to HID or LED, these may not be the best fit for your car. There are many factors affecting this, including the lens type and the car's computer control systems.

There are three types of lenses used for headlights: diffuser, reflector and projector. Diffuser lenses use patterns molded into the outer headlight lens to create an appropriate beam pattern. Because these give the headlights a clouded appearance (even when clean and new), they are not often used anymore as they aren't very stylish. Reflector housing headlights use a clear outer lens, and a large chrome reflector behind the bulb that not only reflects the light, it is shaped to give it the desired beam pattern. Projector lenses are much like what a film projector uses. It's a smaller, round lens that sits in front of the bulb and both projects the light and creates the pattern. These often use shutters to create that sharp upper cut-off pattern. Some even use electrically operated shutters to switch between low and high beam lighting (often called "Bi-Xenon" systems)

Typically, HID and LED lights will not give off a good lighting pattern when installed in diffuser or reflector housings. There were some factory HID systems that were designed with diffuser or reflector housings, but they were specifically tuned for the brighter light. Most projector-based housings can use any type of bulb system, although some are designed specifically for LED or HID lighting. Retrofitting HID or LED bulbs into a projector designed for incandescent bulbs will probably work, though it might not be completely legal based on local regulations.

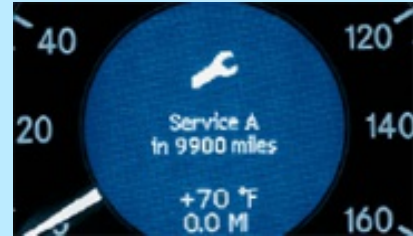
Finally, bulbs other than headlights (side markers, turn signals, brake and park lights) can also be upgraded to LEDs. Since these lights do not need to create a particular beam pattern, they are not as critical. However, LED light does not project as wide a pattern, so while they may "look good", they might not be as visible to other drivers. Finally, most modern Mercedes-Benz vehicles are designed with special circuitry to detect and warn about defective bulbs. Since HID and LED bulbs draw less current than their incandescent counterparts, they may trigger errors. There are kits available

with built-in electronics to "fool" the car into seeing them as drawing a full power load, so if you are considering an upgrade, you need to investigate that feature.

THIS MONTH'S TRIVIA QUESTION

What is the "Drive-by-Wire" technology used in most modern Mercedes-Benz vehicles?

Send us your answers at info@benzbits.com. We'll announce the correct answer and "winners" in the next newsletter. There are no prizes, just recognition for the right answer!



Thanks for reading! We hope you have enjoyed this month's topics.

Sincerely,

Benzbits

Got questions? Ideas for newsletter topic? Drop us a note - info@benzbits.com

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