The misunderstood HID Bulb

High Intensity Discharge (HID) headlamp bulbs, for some mechanics, are a misunderstood product, often referred to as “scary and expensive bulbs”. Ring Automotive explains the basics of theses bulbs, removing all mystery and misconception.

High Intensity Discharge (HID) headlamp bulbs, also known as Gas Discharge or Xenon bulbs, have steadily increased in usage across the automotive market. The obvious difference is that HID bulbs have no filament. Instead of a filament that glows, there is a glass capsule in the centre of the bulb containing Xenon gas. Two metal electrodes going into the glass capsule create a high voltage arc across the Xenon gas, igniting the gas which produces a bright white light. This is very similar to how fluorescent tubes work.

The bit that puts mechanics off is the start-up voltage, typically up to 24,000 volts. The high voltage is required to bridge the gap between electrodes. A ballast is required for each headlamp, converting battery voltage into 24,000 volts to ignite the bulb. After the bulb is lit, the operating voltage drops to 85v, for D1 and D2 HID bulbs, and 42v, for D3 and D4 HID bulbs.

Clearly this high start-up voltage can be potentially hazardous. By following safety instructions, HID bulbs can be fitted perfectly safely.

Types of HID Bulbs

There are 4 cap type references of HID bulbs; D1, D2, D3 and D4. These all come with a suffix of either R or S (eg D1R or D1S). Bulbs with the suffix R are designed to work in Complex Surface headlamp units. Bulbs with the suffix S are designed to work in Projector headlamps.

All HID bulbs must be fitted with a direct replacement. So if you remove a D2R HID bulb, it must be replaced with a D2R HID bulb.

D1 and D3 bulbs have the ignition/starter pack fitted to the bulb. On D2 and D4 bulbs, the ignition/starter is combined with the ballast.

D3 and D4 bulbs are recent additions to the range; they are designed to work with new compact ballasts and are already being fitted to Audi, BMW and Lexus. They contain less mercury, so have better eco friendly credentials. They also run at a lower voltage of 42v once operating.

HID bulbs and HID headlamp systems are only street legal if the bulbs being fitted are E marked, and are fitted to cars that have auto levelling to prevent dazzle and a wash/wipe to prevent the light scattering from dirt on the lens.

Benefits of HID Bulbs

HID Bulbs are 3 times brighter than a halogen bulb, they also have an incredible long life, averaging around 2,500 hours of use. They produce a crisp white light, close to that of natural daylight.

Fitting

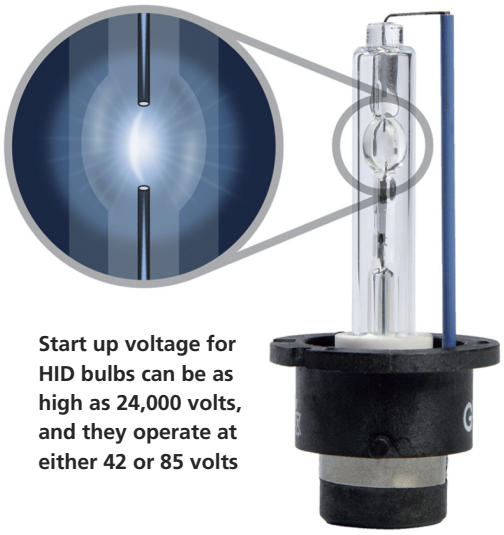
The high start-up voltage is hazardous and is understandably the main concern for mechanics. But rather than refer the owner back to a main dealer, by following these simple steps you can change HID bulbs safely.

The first thing to do is isolate the light circuit completely. Turn off the ignition and headlight switch. Isolate the headlamp circuit by removing the relevant lighting fuse. As an additional precaution, wait 5 minutes for the bulb to cool down. HID bulbs run at very high temperatures, so it is worth giving them time to cool down.

You can then proceed to change the bulb as you would do a normal headlamp bulb. Remove the bulb cover. Unplug the bulb connector and then remove the HID bulb, replacing it with the same reference type. Once the bulb has been replaced reverse the fitting process remembering to re-install the fuse.

It has always been important to replace bulbs in pairs. With HID bulbs it is key; HID bulbs should be replaced in pairs to ensure a colour match.

Xenon Capsule
Point of Ignition arc



Start up voltage for HID bulbs can be as high as 24,000 volts, and they operate at either 42 or 85 volts

Benefits to You

The benefit to mechanics for fitting HID bulbs is twofold. Firstly, you are not losing a customer to a main dealer, or another garage that can replace HID bulbs. Secondly, fitting HID bulbs increases your sales margin. The cost of replacing ordinary bulbs at retail prices is at least €25. The cost of replacing 2 HID bulbs at retail is - €160 to €560, depending on the type of HID lamp.
By just replacing two HID bulbs, the additional revenue is between €135 and €535.

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