65W Headlamp Bulb Headaches

Or, why you may not want the bright headlamp after all !

Someone recently told me, “Most British motorcycles with a standard 120 Watt charging system are capable of running a 60/55 watt headlamp bulb.” In my humble opinion, that is only HALF the story. And sometimes half-truths will get you into trouble faster than outright lies. So we need to be very careful here, my friends.

All this time you thought you were simply riding around to pick up chicks, drink beer, and have fun. That's not what's going on at all! What we are trying to do is keep the battery charged. In any automotive vehicle, the battery plays the same role as the mother does in a family. We have an old saying here, "If mama ain't happy, ain't no one gonna be happy" and it's the truth. The battery is the queen of the motorcycle. We **must** keep the battery happy or your riding experience is not going to be a pleasant one. Therefore the whole focus of the electrical system is the battery. The battery is in short is, "She who must be obeyed."

Rule No. 1

Charging systems are a lot like bank accounts. You have your paycheck deposited, and then you subtract from that what you spend, and what's left over is your “savings”. In an electrical system the alternator makes the “deposit”, the lights and ignition “spend”, and anything left over charges the battery. “Charging” then is simply energy being “saved”.

Rule No. 2

Now as everyone knows, you can maintain perfect battery charge levels by **A)** charging the battery at high current for a short time, OR **B)** charging the battery at low current for a long time. Both ways are acceptable as long as the battery is never allowed to get hot. Agreed?

When you fit a high wattage headlamp bulb, that leaves very little charging current for the battery. You have therefore entered the low current charging scenario, shown above as Rule 2 Option B. Therefore it follows that you are assuming...
1) That there are very low losses in your electrical system (your system is working exactly 100% perfect and has perfect connections), AND...
2) That you are riding a very long way to keep your battery "on charge" a very long time, AND...
3) That you are using very little brake lamp, turn signal, or horn, which would deplete your splendidly charged battery.

So YES, it is true, a 60/55W headlamp bulb will work in your Brit bike, but.... only on about 5% of the rider's machines reading this article. This is generally because most riders simply don't spend enough time in the saddle. TIME is the charging variable people most often forget about. TIME is the key to good battery charging... but most people simply don't ride British bikes that way anymore.

Here's another way to look at the same issue. We also could very loosely approximate the same thing mathematically by saying...

Battery Charge Condition = Charge Current x Time

Solely as an example, if we choose "6" as the perfect charge, then you can achieve that with 3A of charge current in 2 hours of charge time (3x2=6). Follow?

- As the charge decreases, say to 2A... the time has to climb to 3 hours in order to maintain the perfect charge.
- If a very large wattage headlamp bulb further decreases the charge to 1A, then it follows the charging time has to jump to a whopping 6 hours in order to get the same result.

And that's what's happening with the big 60/55W headlamp bulb and the stock 120W alternator. After powering the ignition and tail lamp there's only about 75W of power available. If you run the high wattage bulb, then that leaves you a measly 75W, minus the 60W headlamp, or 15W, to charge the battery. So 'yes' the big HL bulb will work, but only if you ride longer to make up for the greatly reduced charge rate.

The following table clarifies the situation for 12V motorcycles with perfect wiring conditions being continuously ridden above 3000 RPM. Less than perfect electrical wiring, lower RPM, and/or stop-start riding conditions significantly reduce these numbers.

Headlamp Bulb Wattage	Available Charge Current Highway	Available Charge Current In Town
35W (Stock)	2.85A	1.42A
45W	2.14A	1.07A
55W	1.42A	0.71A
65W	0.71A	0.35A

All numbers are approximate to demonstrate the effects on battery charging

In the end, it seems that the minimum charge current for average riders is approximately 1A which is easily achieved with the stock HL bulb, however in continuous non-stop highway riding situations or with AGM batteries, lower numbers may be permissible. So we see that the headlamp wattage is highly dependent on personal riding style and locale. The conclusion is then, what works for one rider may not work for another. Therefore, be very careful when following advice of others in headlamp bulb selection.

Hope this helps!

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