LET THERE BE LIGHT!

PHOTOS: LAURENS PARSONS

Wipac technicians ensure pre-test settings are as they should be

Jerry Thurston spends an illuminating day with experts specialising in prestige vehicle lighting

We are inside a plain-looking works unit on a Buckinghamshire trading estate. It's pitch black apart from a thin luminescent blue line across the floor and the glow from a computer screen that illuminates the faces of the technicians who work here at exterior vehicle lighting specialist Wipac – which has given LRO an access-all-areas pass for the day.

At a given signal a switch is thrown and a brilliant beam of white light hits the far wall, projected from a test rig set at Defender light height. It certainly looks impressive – but just how great the difference is between this and what we're used to is revealed when the guys flick between the Wipac LED unit and the standard seven-inch halogen headlamp that many of us use. It's like comparing a 1934 black and white movie and the latest big-screen, high-resolution blockbuster – one fuzzy and muffled, the other sharp and zingy. That's not unexpected, of course – it's how high- and low-tech compare. Question is, when compared with the Wipac unit, how does another, cheaper LED lamp compare?

I spring a bit of a surprise on my hosts. From the back seat of the LRO Defender I produce a commonly available budget-priced LED headlamp. Okay, this is the least expensive option, but I'm interested to find out if you really do get what you pay for – so can we compare them, please?

Craig Byrom confidently wires my cheapie into the rig and switches it on. It looks okay to me – bright enough and similar in pattern. But after the guys have switched between the two beams a couple of times, I notice the differences. I don't need recourse to the high-tech monitoring equipment to see how the beam is less defined and more scattered. The experts' keen eyes are picking out more subtle weaknesses: 'See the shadow areas here and here? Now compare it with ours.' They flick it across… Ah, no shadows. 'Ours is sharper overall and doesn't zing off to the side either.

'It's brighter too,' they proclaim. 'You'll not see it on the background, because it's a finite distance away. It all just looks bright and white, but look at the image on the computer, it's easier to see from that.'

The lighter the colours, the brighter the light, they explain. The image shows the beam pattern and intensity, looking like elongated ovals on their sides, on top of one another; bright yellow in the centre, turning to purple as they spread out across the screen. It's easy to see that the Wipac light has lighter colours, so it's a lot brighter. But by how much? Some keyboard prodding follows: 'We are at about 45,000 candela [one candela being the power of one wax candle] as opposed to about 25,000 candela for the other.'

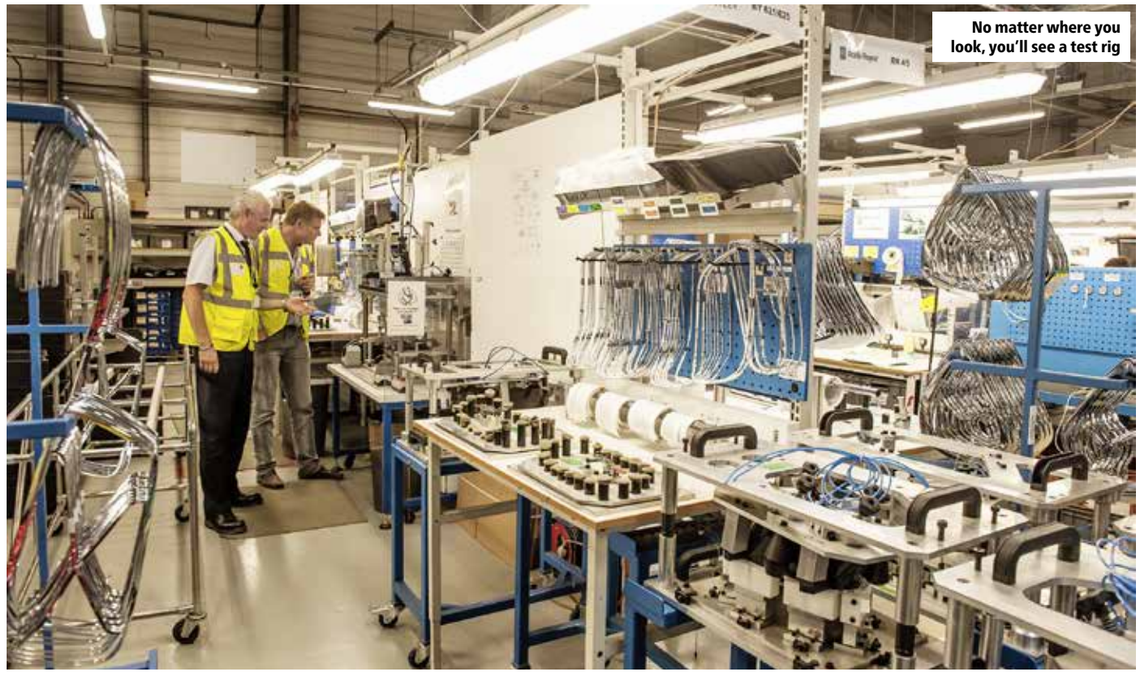
Defender headlamps

I ask about the e-mark that you see stamped on vehicle lamps. 'Essentially, it's a standard that allows us to produce a component – in this case your Defender headlamp unit,' I'm told. There are different regulations for North America and Canada but the e-mark means the unit is acceptable for use all over the European Union. E11 is the mark for the UK, but all member states have a different one: E4 denotes the Netherlands, for example.

David Bates (left) and Sven Dollmann (right) keep a close eye on LRO's Jerry. And quite right too

WIPAC...

If you think the name is a bit familiar, you're right because it's an offshoot of the company that made the Wico magneto fitted to so many tractors and stationary engines over the years – very much a tradition the company is proud of.



No matter where you look, you'll see a test rig

LEDs and inner lenses assembled in eat-your-dinner-off-it spotlessness

High electrical current is used to coat parts with a metal layer

The specification the units need to meet is tough and you can't self-certify – they have to be tested independently. The testers look for things like the way the power of the beam is distributed – you don't want a huge amount of light high up in the pattern because it will dazzle oncoming traffic. That's just one of many different things they will assess.

To pass and get the e-mark a light has to comply with all of these. It's a guarantee of quality and performance, if you like, although like exams you can just scrape through or get full marks and both will get the coveted E11.

The making of a headlamp

I'm keen to find out how you actually make a headlamp – and my guides are happy to oblige by showing me around the production plant, which makes original-equipment lights for such prestige marques as Lamborghini. Aftermarket lights are made in a different plant, but it's much the same process.

What happens is that massive, eight-ton moulding tools squeeze out molten plastics to form the bodies and lenses. Plating, if required, is zapped on with great precision and the sub-units are then assembled into the finished light units.

'If prototypes survive this torture chamber they'll be all right for years on a hypercar'

Cleanliness is the watchword here, with white-coated workers working in ultra-spotless rooms. No, sorry, we can't go in – we're far too dirty! But we do know what goes on in these rarefied surroundings: the company's production experts insert the LEDs and internal lenses, then assemble the wiring before the units are heat-bonded together. After a strict quality control inspection, the lights are shipped to the customer.

How can we be sure that LED lamps for which we have just forked out more than £400 can cope with the worst that a determined driver Land Rover driver can dish out?

Another works unit contains the answer to that one. It's part of Wipac's test facilities – and on the day of our visit, lighting units destined for the next generation of £200k-plus vehicles were being tested.

Vibration like nothing else

And I mean *tested*. A hundred per cent humidity at 40ºC; salt spray; baked at 80ºC for a few months; vibration like you've never experienced before… The motor that dishes out this punishment weighs more than a tonne and the rig is hugely over-engineered.

But my favourite bit of kit is a combined oven and freezer that takes a lamp on an eight-second journey from 101ºC to minus 41ºC and back again, over and over again. Baked, fried, drowned, knocked about – if the prototypes survive this torture chamber for a few months they'll be all right for many years on the front or back of a hypercar.

After seeing what Wipac expects its lamps for road cars to endure, we can be pretty certain that the far more robust-looking units destined for our Land Rovers will be all light on the night. LRO