Capillary action

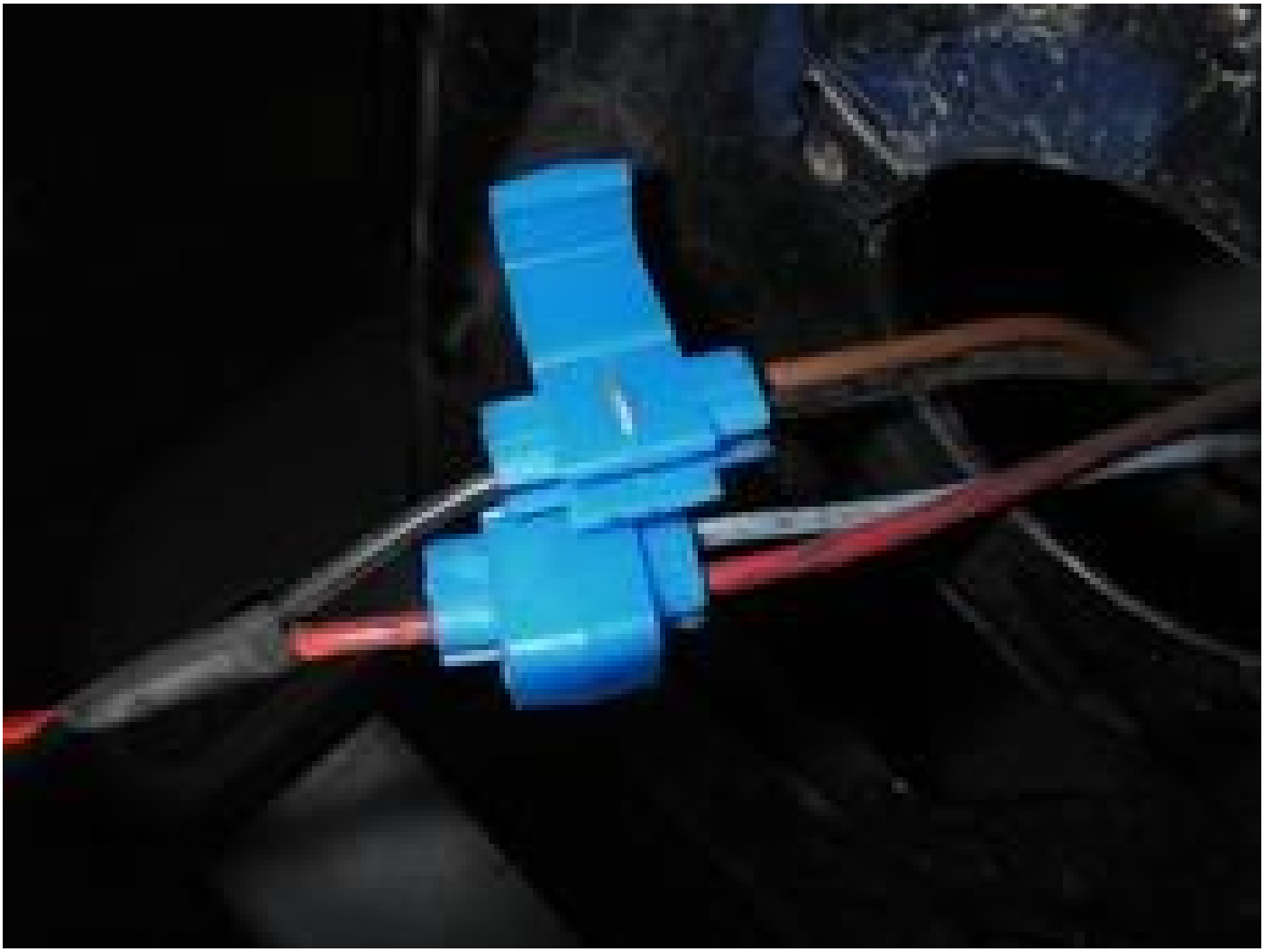
A rather unknown subject is the capillary action in lights. But more often than one might think this phenomenon is responsible for water penetrating into a light, accumulating inside. Capillary action describes the property of liquids to spread in narrow tubes or cracks in different degrees. In an electrical cable, capillary action can be understood as water molecules and molecules of the cable jacket attracting each other. And the narrower a capillary (capillary = narrow cavity), the stronger the attraction.

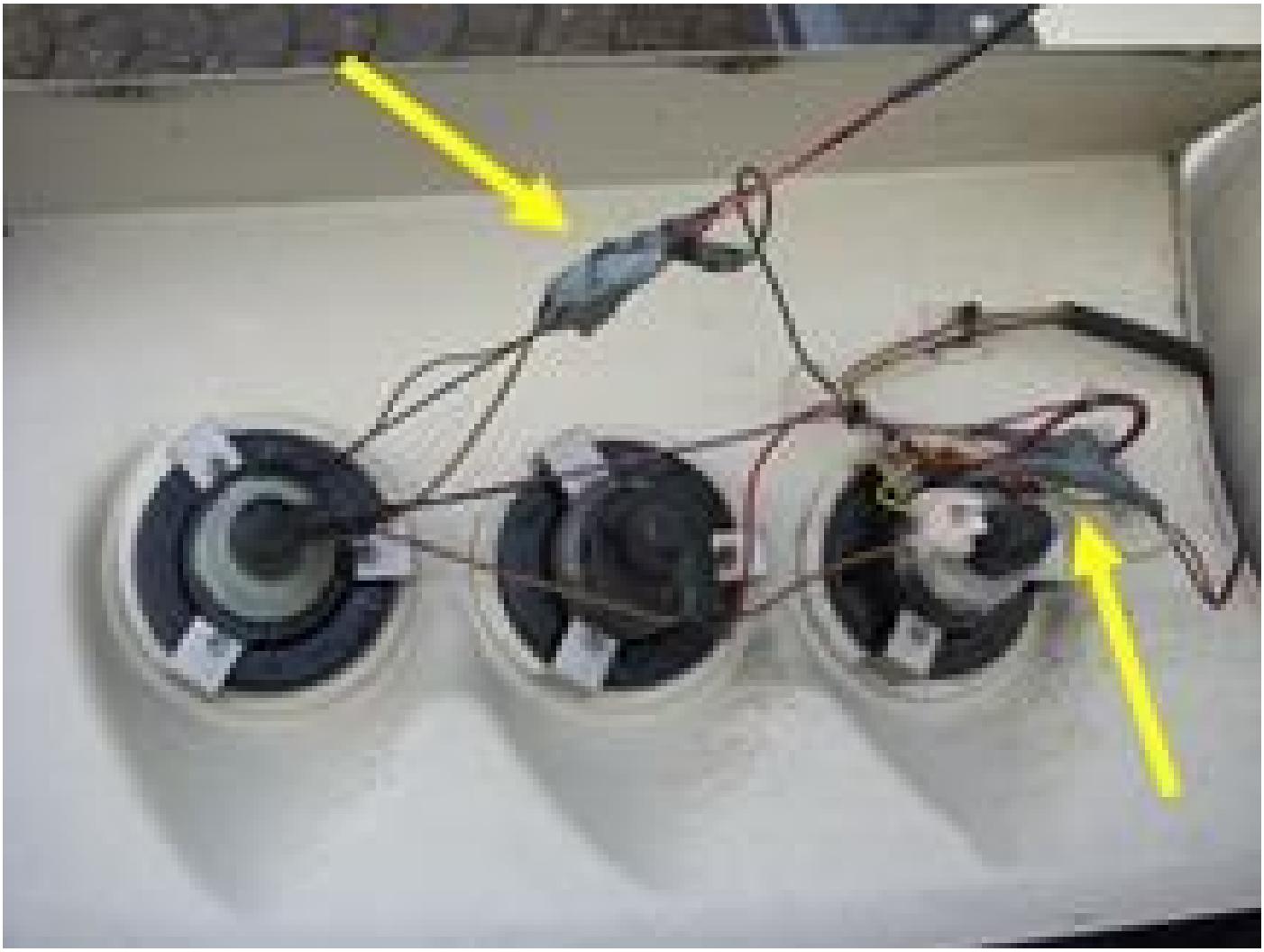
But for capillary action to kick in, water must first get into the cable. The cause is often due to a non-watertight plug connection. Simple flat connectors, cut-in connectors (electricity thieves), etc. do not provide adequate protection from moisture (Fig. 1).

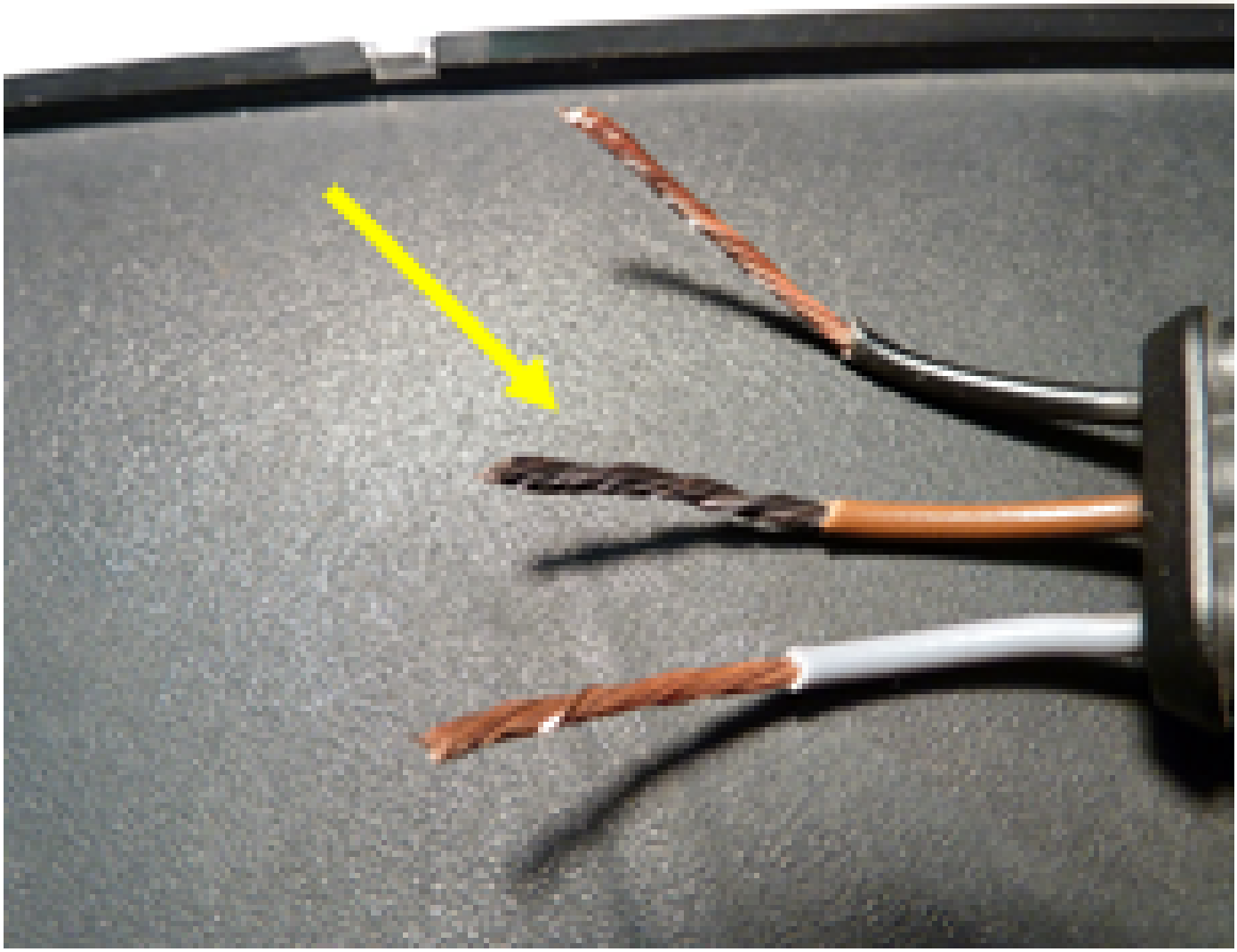
This allows water to penetrate through the uninsulated or poorly insulated cable section under the cable jacket (insulation) into the cable (Fig. 2).

It is hard to believe, but by the capillary action in the cable, the moisture gets between the copper strands and the cable jacket up into the lamp (Fig. 3). The copper strands are distinctively coloured by corrosion and therefore easy to recognise.

Therefore, watertight connectors and cable connections should always be used, such as the Superseal connector (Fig. 4) .







Due to the capillary action, not only the correct plug connector, but also the correct routing of the connection cables is important. The plug connections should be fixed to the body or attachments preferably in a horizontal direction. This way, the splash water can easily run off the plug connector ().

If the plug connectors are installed vertically, there is a risk that water accumulates in the respective cable openings and advances with time to the contact plugs ()

Particularly important is also a stress-free cable routing. If this is not the case, depending on the lamp design, the casting or sealing compound may detach from the cables, allowing moisture to penetrate through the resulting openings into the lamp ().

Based on the experience gathered over years of lamp development including its cabling, Hella has developed the special mounting spray MPS 100 (, part no.: 9XH 184 965-802). The spray keeps the seals and O-rings supple. Embrittlement or hardening is effectively suppressed. The lubricant has a high adhesion capability and wets the sprayed parts for a long time!

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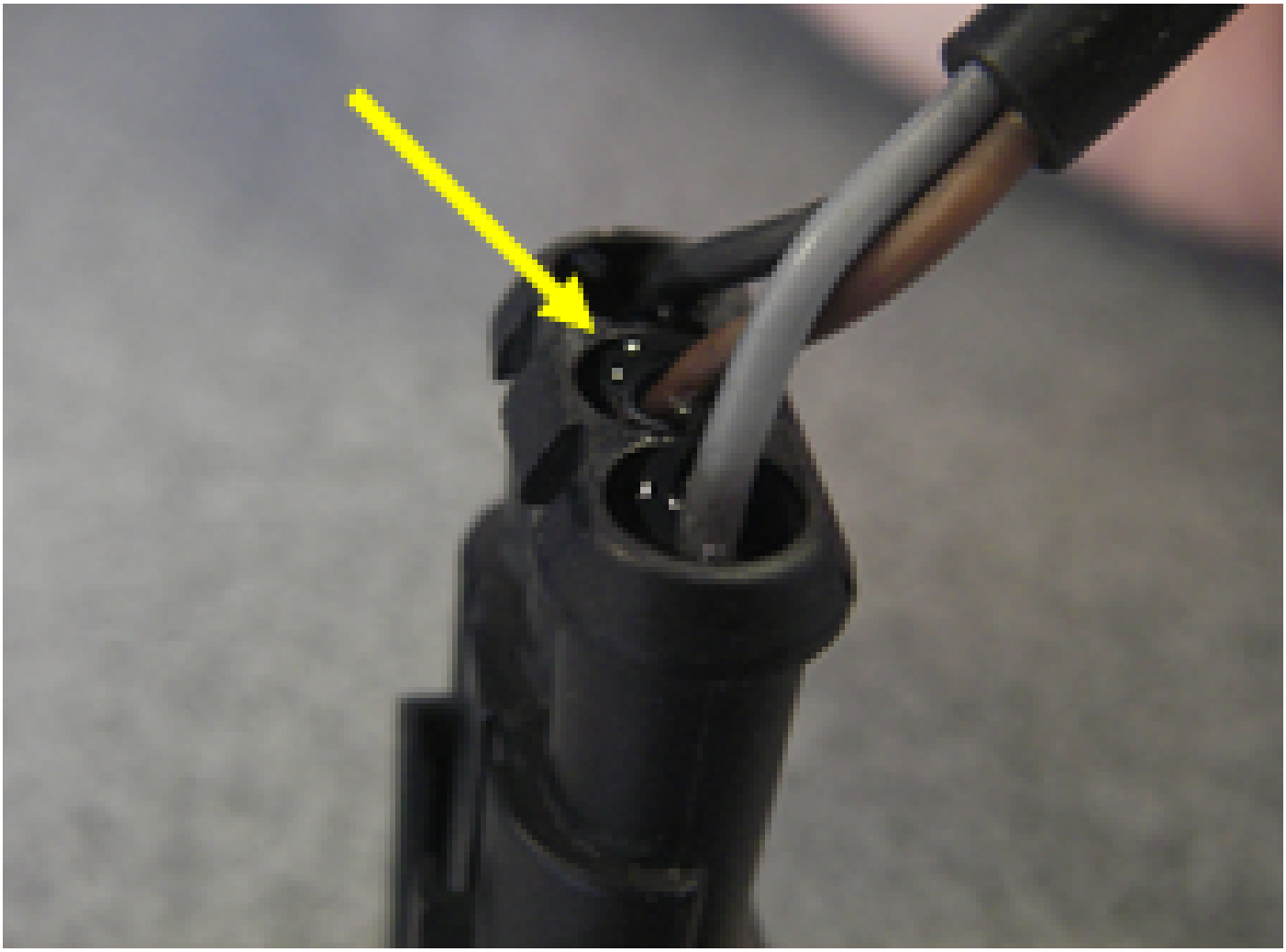

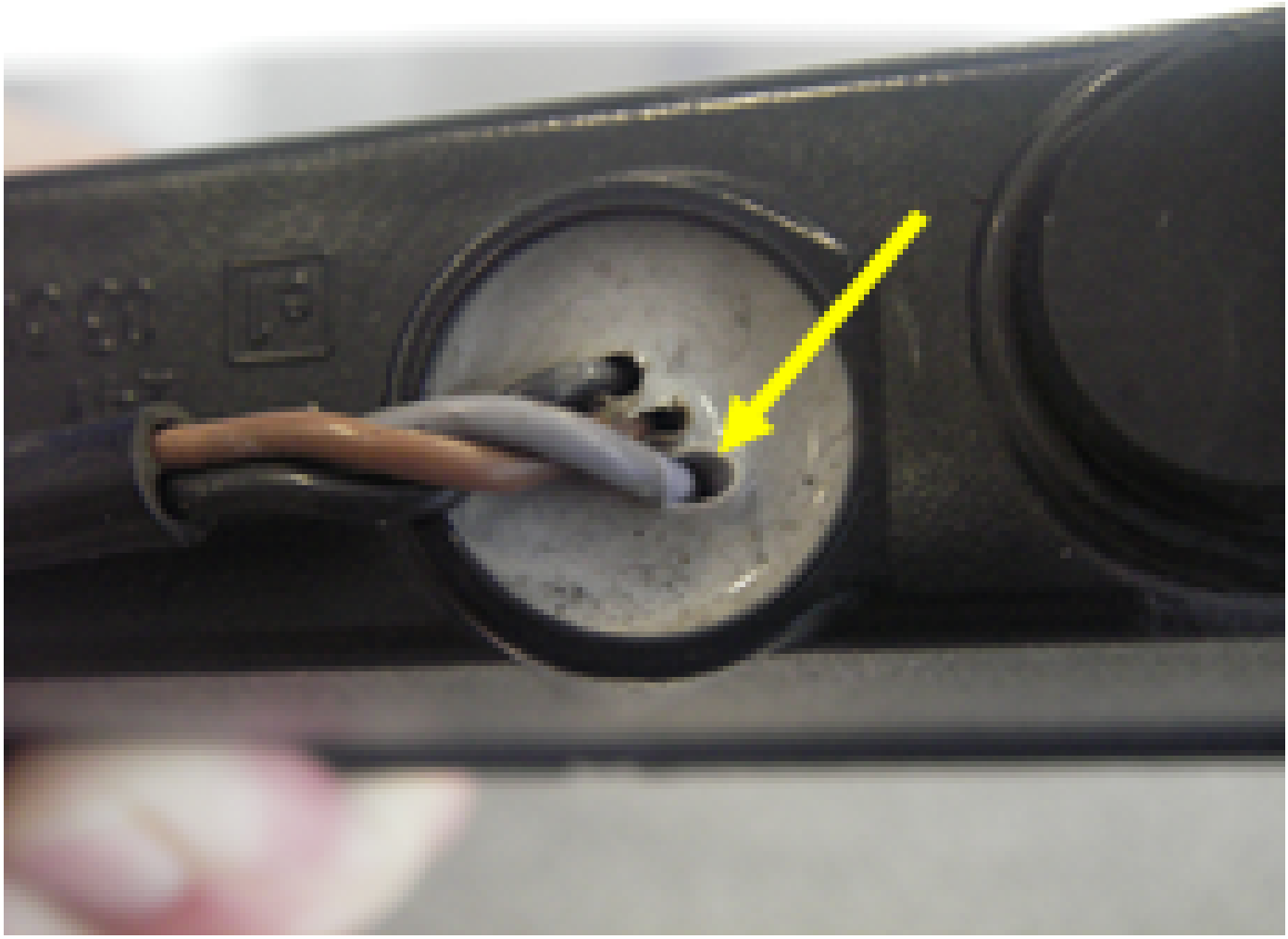

Effect:

Infiltrates and displaces moisture, water and other liquids to 100% without emulsifying with them. Forms a durable protective film on all treated components. Protects without affecting the electrical contacting ability and conductivity. Effectively prevents short-circuits after water damage. Extends the life of electronic and electromechanical devices in areas of high humidity or coastal regions, keeping the devices functional and smooth. Is resistant and protects against aggressive, chlorine fumes and salt air. Preserves all metals and plastics. The spray is 100% silicone free!

Use:

The Hella MPS 100 Mounting Spray protects and insulates all electronic and electromechanical components and devices permanently and effectively against leakage currents, short circuits and corrosion caused by splashes and condensation, flooding or high humidity. Ideally suited as a contacting and mounting spray. Can be used both for prevention and repair.

Instructions of use:

Shake can well before use. Spray on the parts to be treated. Allow to take effect for 5-10 minutes. Do not use on devices powered-on or running motors. Can be used to spray overhead.

Applications:

Car, truck, agriculture, boat, caravan, motorbike, quad bike, bicycle, model-making, household, leisure, hobby, garden, industry, manufacturing, service, installation.

Important safety note

The following technical information and tips for practical use have been set up by HELLA in order to offer professional support to automotive workshops in their daily work. The information available here on this website is only to be used by appropriately trained specialist staff.

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