

Splicing the Passive Signal Cable for the MSI BL Sensors

It is imperative to have a waterproof splice in the signal cable to prevent the ingress of water into the cable. Water in the cable may be mixed with salts and other contaminants, which will either form a high impedance short or even a low voltage DC source. Either of these cases will result in deteriorating signals.

Normally, splicing is not recommended due to the possibility of failures and the expense and time of doing a proper splice. But, there are occasions when splicing is required, and with the proper materials and a level of craftsmanship, there will be no electrical losses associated with the splice.

The key items when doing the splice are as follows:

- C The cable that is spliced to the passive cable attached to the BL sensor should be the same as that supplied with the BL sensor. The outer jacket must be either High Density Polyethylene, Teflon, or Kynar. These are the only materials that are rated for direct burial.
- C The cable must be an RG-58 coaxial cable.
- C The electrical connection must be soldered.
- C The splice must be sealing with an electrical sealing resin, such as 3M Scotchcast 2130. It is recommended that a splice kit such as a 3M 82-F1 Inline Splice Kit be used to provide the form for the sealing resin. Care should be taken to ensure that the wires are not touching each other and that they are positioned away from the walls of the form.
- C The outer jacket on both cables must be abraded (roughened) in a radial manner to promote good adhesion to the cable and to prevent capillary leak paths.
- C After completing the splice, perform a function check on the sensor, paying particular attention to the resistance ($> 20 \text{ MO}$), capacitance (dependent on cable length - must calculate an expected value based on capacitance of the sensor plus the additional capacitance due to the additional cable), and dissipation factor (< 0.03). A functional test of the sensor should also be performed using an oscilloscope to ensure that the sensor is generating a proper response when a vehicle passes over the sensor.