

Technical Note**Link**

512-0100-01-01 Rev 1

Bypassing starter current around the Link shunt**Introduction**

In DC electrical systems that contain starting motors for large diesel engines, starting currents can exceed 1000 amps. Some installers and users prefer that this high current have the shortest possible path between the batteries and the starter and prefer that the current not flow through the Link shunt. There are several methods of wiring installation that can accommodate these stipulations.

Standard Shunt

The standard Link shunt is rated at 50 millivolts at 500 amps. This means that if 500 amps are flowing through the shunt, the voltage drop across the shunt will be 50 millivolts. If this were continuous current, this would equal 25 watts. The Link will measure this small voltage and interpret from it how much current is flowing through the shunt. The shunt can carry short duration surge currents (starting currents) well above 500 amps without being damaged. However, anything over 50 mV will be measured by the Link as 500 amps. There may be concern that including the shunt in the starter circuit would lengthen the path to the batteries or possibly cause overheating of the shunt in the event that the engine was difficult to start. In this case, there are several options for bypassing the shunt or reducing the potential for overheating problems.

Direct Connection

Most small starter motors use their case housing and the engine block as the negative current path. Some large starter motors, however, have both positive and negative terminals on them. If this is the case, the starter's negative terminal can be connected directly to the negative post of the starting battery/bank. This will result in only the starter current bypassing the shunt since this terminal is isolated from the engine block. All other DC loads or sources that have a common negative connection with the engine block will have their current still passing through the shunt and therefore being measured by the Link. In this application, the starter current will not be measured by the Link. Even though high current is involved during starting, it is normally for a short duration that not very many amp hours will be missed by the Link.

Heavy Duty Shunt

There is a heavy-duty shunt available (PN# 84-2013-00). It can be used to replace a single shunt or be used in place of one half of a dual shunt. It is also rated at 50 mV at 500 A, but can dissipate much more heat. It can handle the starting currents for very large engines. The ground end of both shunts needs to be connected together with heavy cable.

Solenoid Bypass

If the starter motor uses the engine block for a negative current path, a solenoid can be used to bypass the shunt during engine starting. The solenoid contacts are wired between the engine block and the negative side of the battery bank that is to be used for starting. The coil in the solenoid would be connected in parallel with the starter solenoid coil so that they will both energize at the same time. This will make for a direct path during starting between the engine block and the battery bank.

If either of the two banks are used for starting, the solenoid contacts can be connected between the negative terminals of the two banks. What this will do is effectively parallel two halves of the shunt during starting and double its current-carrying capability.

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Part number: 512-0100-01-01 Rev 1

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