

CORRECT WIRE SIZE = OPTIMAL PERFORMANCE

Many installers replace their stock alternators with higher amperage output units. Reasons for this include added aftermarket customizations such as stereos, winches, running lights and other accessories. It is critical that when replacing an OE alternator with a higher amperage unit that the proper wire size be used. Running the extra amperage through the original wiring will most often result in premature alternator failure and in many cases failure of the original wire (think fire) and other components. It is also critical to install any and all aftermarket add-on devices with the proper wire size.

Since all wires have resistance, the longer the wire, the greater the resistance. This means that for longer wiring runs you need to use a larger wire to compensate. Without getting into the actual theory, just remember that high wire resistance results in loss of voltage. This phenomenon is referred to as “voltage drop”, and for lower voltage automotive systems, the loss of 1V or even a 1/2V can be significant. On longer wire runs, plan on using a larger size wire. There are specific voltage drop calculations that depend on the wire size in use, the length of the wire, the load applied, and the voltage in use. Below is a handy chart based on these calculations for a 12 volt DC system.

Total System Length (Positive Feed + Negative Return)

	24"	48"	72"	96"	120"	144"	168"	192"	240"
10	16ga	16ga	16ga	14ga	14ga	14ga	12ga	12ga	10ga
15	16ga	16ga	14ga	14ga	14ga	12ga	10ga	10ga	8ga
20	16ga	14ga	14ga	12ga	12ga	10ga	10ga	8ga	8ga
25	14ga	14ga	12ga	10ga	10ga	10ga	8ga	8ga	6ga
30	14ga	14ga	12ga	10ga	10ga	8ga	8ga	8ga	6ga
40	14ga	12ga	10ga	8ga	8ga	8ga	6ga	6ga	4ga
50	12ga	12ga	10ga	8ga	6ga	6ga	6ga	4ga	4ga
A	60	12ga	10ga	8ga	8ga	6ga	6ga	4ga	4ga
M	70	12ga	10ga	8ga	6ga	6ga	4ga	4ga	4ga
P	80	12ga	8ga	8ga	6ga	4ga	4ga	4ga	2ga
E	90	12ga	8ga	6ga	6ga	4ga	4ga	2ga	2ga
R	100	10ga	8ga	6ga	4ga	4ga	4ga	2ga	2ga
A	120	10ga	8ga	6ga	4ga	4ga	2ga	2ga	2ga
G	140	10ga	6ga	4ga	4ga	2ga	2ga	2ga	1ga
E	160	8ga	6ga	4ga	2ga	2ga	2ga	1ga	1/0
	180	8ga	6ga	4ga	2ga	2ga	1ga	1/0	1/0
	200	8ga	4ga	4ga	2ga	1ga	1/0	1/0	2/0
	250	6ga	4ga	2ga	1ga	1/0	1/0	2/0	3/0
	300	6ga	4ga	2ga	1ga	1/0	2/0	3/0	3/0
	350	6ga	2ga	1ga	1/0	2/0	3/0	3/0	4/0
	400	4ga	2ga	1ga	1/0	3/0	3/0	4/0	
	450	4ga	2ga	1/0	2/0	3/0	4/0	4/0	
	500	4ga	1ga	1/0	3/0	4/0	4/0		
	600	4ga	1ga	2/0	3/0	4/0			
	700	2ga	1/0	3/0	4/0				