

Source: Leece-Neville Heavy Duty Systems Division - Arcade, NY USA  
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Bulletin No: TSB-1117  
Models: Alternators Utilized With Electric Drive-Line Brake Retarders  
Subject: Mack Trucks equipped with Electric Drive-Line Brake Retarders

Electric Drive-Line Brake retarders require cyclic high amperage demands from the battery and alternator when applied to all vehicles types. To achieve the maximum benefit of an Electric Drive-Line Brake Retarder the alternator, quantity of batteries and charge circuit cabling leading to/from the alternator and batteries should be sized and routed appropriately. Failure to do so limits the capability of the Electric Drive-Line Brake Retarder and compromises the function and reliability of the alternator, Electric Brake Retarder and the batteries.

Within the charging circuit of most vehicles protective devices are also designed into the circuit for safety reasons, limiting the possibility of a fire hazard; such as when the vehicle is in an accident, wire/cabling shorts to earth, a component fails within the circuit, if user installed electrical devices are attached to an incorrect point within the circuit and/or these installed devices require amperage that exceeds the designed amperage rating of the charging circuit.

Prestolite recommends that an alternator no less than 200 amps be utilized in all applications equipped with Electric Drive-Line Brake Retarders. Some applications require a 270 or 320 amp alternator dependant upon vehicle type, application, time of the electric brake retarder and amperage needs of the vehicle. It is important that the charge circuit/cabling and protective devices within the circuit if utilized be sized in accordance with the alternators maximum output rating. Failure to do so will contribute to a low voltage or no charge condition, misdiagnosis of the alternator or failure of the alternator, in addition to poor or low battery life and limited performance of the Electric Drive-Line Brake Retarder.

It has been identified that Mack Trucks are equipped with a protective circuit breaker rated at 105 amps in the negative charge path close to the battery. This protective device in all applications should exceed the working capacity of the charging circuit as it is intended to function and provide ample protection under all probable conditions. However when an Electric Drive-Line Brake Retarder is installed on the truck the amperage required for it to function properly exceeds the original equipment installed circuit breaker capabilities if an alternator larger than 130 amps is installed and requires that it perform within the circuit in a manner of which it was not originally intended to perform. High circuit resistance is present under applied braking of the Electric Drive-Line Brake Retarder and after braking when the alternator is re-charging the batteries due to the high amperage consumption of the Electric Drive Line Brake Retarder being applied under braking. The typical location of this circuit breaker on Mack Trucks is on a tower behind the left rear corner exterior of cab.

**Important:** The information contained in this bulletin is intended for use by trained, professional technicians who have the proper tools, equipment, and training to perform the required maintenance described above. This information is NOT intended for 'do-it-yourselfers', and you should not assume that this information applies to your equipment. If you have any questions regarding this information please visit our website at [www.prestolite.com](http://www.prestolite.com), or contact our technical service department at:

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In many instances Leece Neville 200 amp alternators have been replaced in error or failed due to high resistance in the circuit breaker under the above described operating conditions or the circuit breaker opens due to it not being sized properly as a result of an electric brake retarder being installed. Many users install alternators of a lower output rating which eliminates the recognized operating condition, however, this greatly compromises the ability/performance of the batteries and the Electric Drive-Line Brake Retarder. In these instances, rather than replacing the 200 amp alternator, one can simply upgrade or install a suitable circuit breaker/improve its rating.

Below is a recommended sizing table to aid with selecting or ensuring that proper wire/cable and circuit protection device ratings are in place on your truck if equipped with an Electric Brake Retarder. By following this recommendation it will ensure that circuit resistance exceeds all recommended practices of .25v resistance for the positive and negative charge circuits individually, and greatly improves the reliability of the alternator and batteries while ensuring that the full benefit of the Electric Drive-Line Brake Retarder is achieved. To obtain "How To" instructions for appropriately measuring complete circuit resistance refer to Leece Neville's training manual which can be obtained by visiting

[http://www.prestolite.com/literature/training/PP1127\\_TrainingManual\\_lores.pdf](http://www.prestolite.com/literature/training/PP1127_TrainingManual_lores.pdf)

Alternator Maximum Output Rating	Total Circuit Length	Recommended Minimum Wire Size	Recommended Minimum Circuit Protection
200 Amps	15 Feet or Less 16-25 Feet 26-40 Feet	# 0	200 amp rating or equivalent
220 Amps	15 Feet or Less 16-25 Feet 26-40 Feet	# 0, # 2/0	200 amp rating or equivalent
240 Amps	15 Feet or Less 16-25 Feet 26-40 Feet	# 0, # 2/0	225 amp rating or equivalent
270 Amps	15 Feet or Less 16-25 Feet 26-40 Feet	# 2/0 , # 3/0, # 4/0	250 amp rating or equivalent
320 Amps	15 Feet or Less 16-25 Feet 26-40 Feet	# 2/0 , # 3/0, # 4/0	300 amp rating or equivalent

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