

Engine Radiator Mounted Resistive Load Banks

July 29, 2008

This information is general in nature and intended to give the reader an overview of the issues involved. Specific recommendations can only be made after a review of the equipment involved, installation parameters, applicable codes and national standards by competent personnel. Please consult Avtron Loadbank, Inc. with comments or questions about the information contained herein.



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Radiator Load Banks may be provided to perform preventive maintenance testing of the generator set. These load banks are permanently mounted to the front of the engine generator and utilize the cooling air from the engine fan to cool the load bank elements. Since these load banks do not include any blower or blower controls they are typically less expensive to install in many cases.

Radiator/Duct Mounted load banks are intended as a supplemental load to the generator set and are typically sized at 50-60% of the generator rating (not 100%). Sizing the load bank close or at 100% of nameplate rating may require a deeper frame and will add significant external static pressure drop to the radiator cooling air, reducing the amount of cooling air through the radiator. This could affect the operating performance of the generator, engine and cooling system.

Backpressure

While the radiator load bank can provide an economical solution for generator set testing it does present some application issues which need to be understood. The addition of a radiator mounted load bank on the front of the engine cooling radiator does reduce the airflow through the radiator core. This reduction in cooling air flow will reduce the cooling capacity of the engine radiator cooling system and can reduce the ability of the engine generator set to carry its full load capacity under high ambient temperature conditions. Since the load bank elements are present and restricting the air flow even when the load bank is not being used this can reduce the engine generator capability.

In certain cases it may be necessary to increase the depth of the load bank frame to accommodate the load bank elements. This increased depth will also increase the backpressure created by the load bank and further restrict the cooling air flow. The additional back pressure created by the radiator load bank can be estimated when the size of the radiator core and the volume of air (CFM) moving through the radiator are known. Outdoor load banks will further reduce the airflow due to the weather protective louver which is provided.

Manual Controls are usually mounted directly on the side of the load bank enclosure. They can be remotely mounted in a separate NEMA enclosure. The controls include over temperature protection to remove the load bank elements from the generator set in the event of a high temperature indication. The load step controls consist of a toggle switch for each load step and a master load control switch which will enable all selected load steps simultaneously. Optional remote control panels are available to locate the load bank operating controls in a more convenient location.

The controls also include a standard "Remote Load Dump" circuit which can be interlocked with an external control (transfer switch) to remove all load bank elements in the event of a normal utility power failure. This circuit requires a normally closed contact which will open when the utility power fails and is commonly provided by a transfer switch auxiliary contact.

Automatic Controls can be provided to monitor the building load and automatically add and subtract load bank elements to maintain a minimum load on the generator set to prevent wet stacking and maintain the engine. These controls include a remote mounted current transformer to monitor the building load and a sensor which provide adjustable pickup and dropout set



points as well as adjustable timing for the individual load steps. The standard automatic load controller provides five individual set points for automatic control of the load bank.

Mounting provisions include a top and bottom horizontal flange which can be drilled to bolt the load bank to the engine generator set radiator shroud or housing. In most cases the radiator duct adapter flange will extend into the load bank frame. The load bank frame is designed in two inch increments so the frame may be slightly larger than the radiator duct flange.

The enclosure for the load bank and controls can be provided either for standard indoor mounting or may include weather protective design with exhaust louver for outdoor installation. In the case of an outdoor UL listed design there will be an exhaust hood which will extend out a distance equal to the height of the radiator core. UL listed outdoor load banks are limited in size due to this requirement.

Radiator/Duct Mounted load banks can provide an economical solution for generator testing and maintenance. Proper consideration must be given to the installation impact to the generator set for their successful application. Avtron can provide assistance to assure you the best possible load bank for your requirements.

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