Ensuring 10-Second Start Capability

10-second Start Capability

When writing genset bid specifications that include 10-second starting capability, consider all the factors necessary to guarantee satisfactory performance of the installation.

The following requirements ensure 10-second starting:

1. Adequately sized and fully charged cranking batteries; a trickle-charge system can ensure a consistent charge.
2. When an air starter is specified, the air system must supply the required air volume and maintain a 100-psi (689.5 kPa) minimum pressure.
3. Combustion air temperature must be a minimum of 70°F (21°C).
4. A jacket water heater is recommended to maintain a minimum of 90°F (32°C) jacket water temperature.
5. A readily available supply of clean fuel.
6. Generator rotating members not exceeding the rotating mass of the standard Caterpillar generator.

Minimize Variables

Fuel quality and ambient conditions are two variables out of your control once a genset is commissioned. However, you can specify fuel and temperature requirements to minimize the impact of these variables.

Fuel quality is not generally a cause of problems in North America, but minimum quality standards should be included in your specifications, as outlined under Construction Specifications Institute (CSI) 105.000. Caterpillar engines can be operated on a variety of fuels, including natural gas.

Preferred fuels include a variety of distillates, such as No. 1 and No. 2 fuel oil, No. 1-D and No. 2-D diesel fuel oil, per American Society for Testing Materials (ASTM) D396-80 and D975-80, respectively. A complete profile of fuel standards is outlined in Caterpillar Engine Data Sheet 60.1 and available through our service department for your reference.

Clean fuel, meeting Caterpillar's fuel recommendations, will provide your customer with outstanding engine service life and performance. ASTM D613 includes standards on a fuel's cetane number, which is a measure of the ignition quality of fuel oil. Cetane numbers, based on American Petroleum Institute (API) gravity and mid-boiling point of a fuel, are available on the ASTM D975 cetane index. Caterpillar engines require cetane numbers in the range of 35 to 40.

In areas where fuel quality is less certain, fuel analysis by lab sample may be helpful in determining the need for fuel additives and/or a water separator. Cashman can provide fuel analysis services to further ensure satisfactory engine performance.

Biodiesel

Biodiesel continues to gain attention as environmental concerns rise and availability improves. Generally, Cat engines will operate well on a blend of biodiesel mixed with distillate diesel fuel not to exceed 20% biodiesel. Biodiesel must meet the standards as set forth by ASTM 6751-09. It is important to note that due to the basic nature of biodiesel, it becomes more unstable in storage than distillate fuel. Therefore, we don't recommend its use in standby applications.

Jacket Water Heaters

A jacket water heater may be specified in order to maintain coolant temperature of 90°F (32 °C) (CSI 201.J10), and must be installed if ambient temperature drops below 70°F (21°C), to ensure 10-second starting. Heaters, either 240- or 480-volt AC single-phase powered, should include adjustable thermostats to allow for manual temperature control.

Closing Multiple Gensets within 10 Seconds

Critical and Life Safety Loads required to be on in 10 seconds or less can exceed the rating of one generator set in a multiple-unit paralleling system. In this case, we are often asked to have two or more generator sets paralleled and closed prior to closing the "Priority One" breaker to adequately supply these loads. While we have successfully accomplished this at several sites, it's not a practice we recommend. First, it's impossible to predict, and rare we can have a system work every single time. Second, the success is relative to the number of gensets in the system. The more machines in the system, the higher the odds are that two gensets will synchronize and close inside the 10-second window.

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Regardless, it's a risky business. The advent of superior paralleling controls and tighter engine controls have provided us with better options. As just one example, split bus systems with bus ties were at one time expensive, complicated, and unreliable; Caterpillar Switchgear and Gensets have since made this sequence of operations both reliable and cost-effective.

Call Cashman for Assistance - 1.800.937.2326

We are ready to assist you in writing a specification that will assure your customer of trouble-free, 10-second starting operation. If you have a bid in progress, or anticipate writing specifications for 10-second starting capability, please call us and allow us to assist you in the process.

We have the equipment, the expertise, complete preventive maintenance and service programs, and the dedicated professional staff to ensure your genset specifications will provide anticipated performance.