MAINSTREAM ENGINEERING CORPORATION

Diesel/JP-8 Generator

Solutions Through Advanced Technology®
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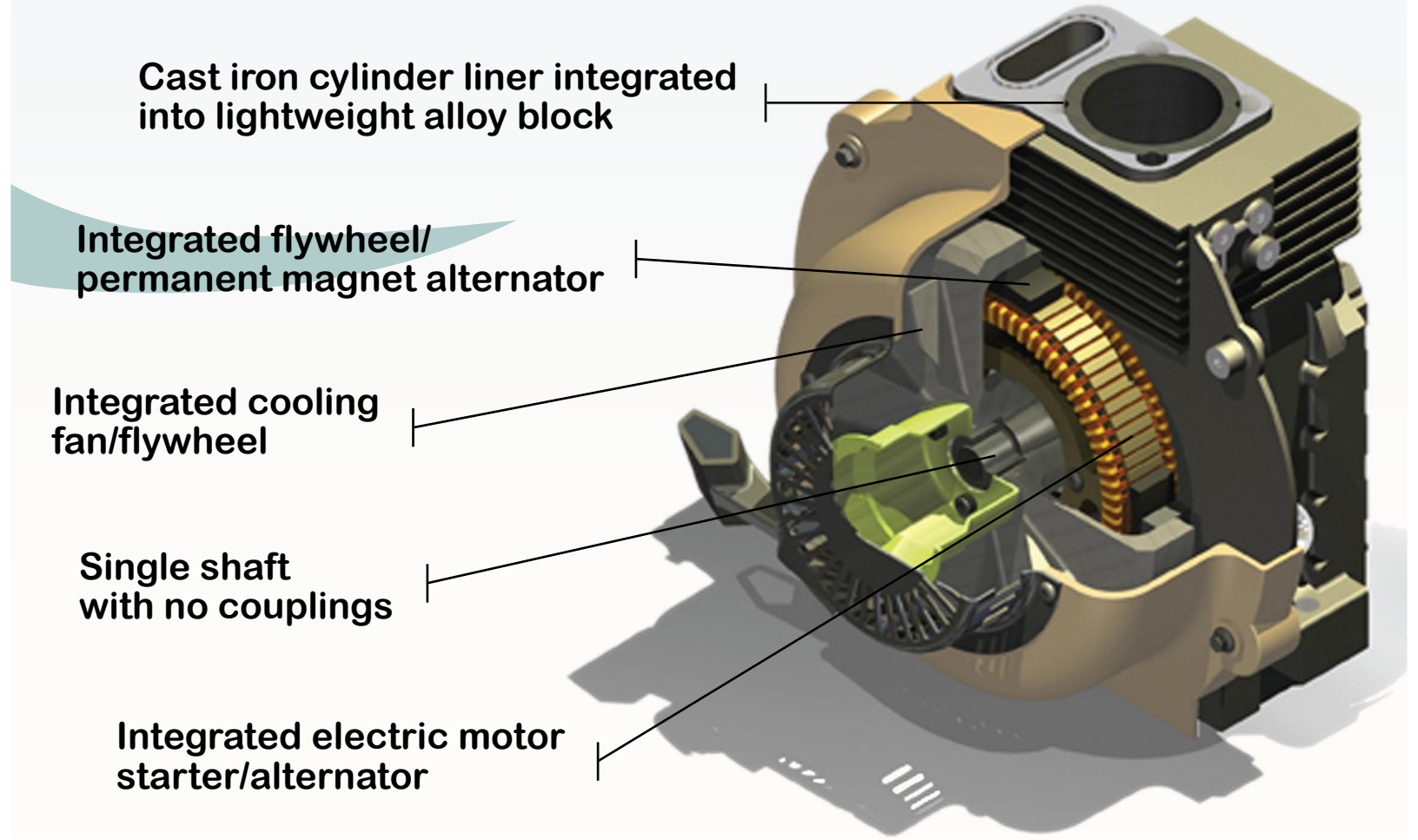
Mainstream Engineering Corporation is the only manufacturer in the United States of diesel (and JP-8) engines with an output shaft power of less than 4 hp. Because Mainstream designs and fabricates the engine, we can provide integrated solutions that other manufacturers cannot. More often, these other manufacturers are assemblers of commercial components. Mainstream's research and development department designs and fabricates components and systems specifically for the rugged military environment. This expertise allows us to produce highly integrated yet simple machines that have tremendous advantages when compared to other legacy military systems.

Benefits of Integration

- **Reduced Size:** Mainstream's generators are 36 percent smaller than existing military generators.*
- **Reduced Weight:** Mainstream's generators weigh 21 percent less than existing military generators.*
- **Increased Reliability:** Mainstream's generators are 6x more reliable than existing military generators.*
- **Custom Designs:** Mainstream can develop custom engine and generator designs for your application.



*Mainstream's 2-kW Generator as compared to the Dewey 2-kW MTG (MEP-501A)

Integrated Alternator/Flywheel

The Mean Time Between Essential Function Failure (MTBEFF) of some military generators is as low as 490 hours. They fail prematurely because the generator assembler does not manufacture the engine; the generator is not designed as a single integrated unit. The assembler merely couples a commercial unit to a commercial alternator. The coupling between these two is often the first component to fail.

Mainstream has eliminated the failure component by designing an alternator that is integrated into the flywheel of the engine. The cooling fan for the engine is also integrated into the flywheel, eliminating another potential failure item.

Another common failure mechanism is the alternator. Many military alternators have moving electrical contacts (brushes) on the stator or rotor, which dramatically reduces the MTBEFF of these generators. Mainstream's generators feature brushless, permanent magnet alternators. These designs are inherently simpler and more reliable.

The bottom line is that Mainstream's flywheel-integrated brushless alternator provides smaller, lighter and more reliable generators.

Integrated Starter/Alternator Electronics

Integrated Starter/Alternator (ISA) technology provides the functionality of an alternator and a starter motor in a single unit. Traditionally, an alternator is coupled to the output shaft of the engine. The alternator converts mechanical shaft power to electrical output power. A separate motor starter engages a geared flywheel to provide electric starting. These starter motors increase the overall parts count and reduce system reliability. Mainstream is the first to introduce ISA technology into the portable generator market. A single electric machine provides the electrical output to the load and the electrical input for starting.

High efficiency power electronics actively rectify the alternator output to produce an exceptionally clean and regulated DC voltage output. In fact, the power quality exceeds all standards in MIL-STD-1332B. This means that load and engine speed changes do not affect the output voltage of the generator. The same electronics are used for electric starting. A NATO slave receptacle is provided for starting from a suitable 24-VDC supply such as a HMMWV.

Mainstream's ISA provides the following advantages:

- ***Clean output power****—exceeds MIL-STD-1332B*
- ***High reliability****—no gears or clutch mechanisms to wear out on the starting motor*
- ***Automatic start/stop****—the electronics can monitor the bus voltage and current to automatically start and stop the generator. This feature is useful in backup power and battery recharging applications.*

Mainstream Engineering Corporation is a solutions-oriented research, development and manufacturing business founded in 1986. Our engineering mission is to research and develop emerging technologies and to engineer these technologies into superior quality, military and private sector products that provide a technological advantage. Areas of expertise include thermal control, energy conversion, turbomachinery, chemical technology and materials science.

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www.mainstream-engr.com

200 Yellow Place • Rockledge, FL 32955
321.631.3550 • *fax* 321.631.3552
sales@mainstream-engr.com