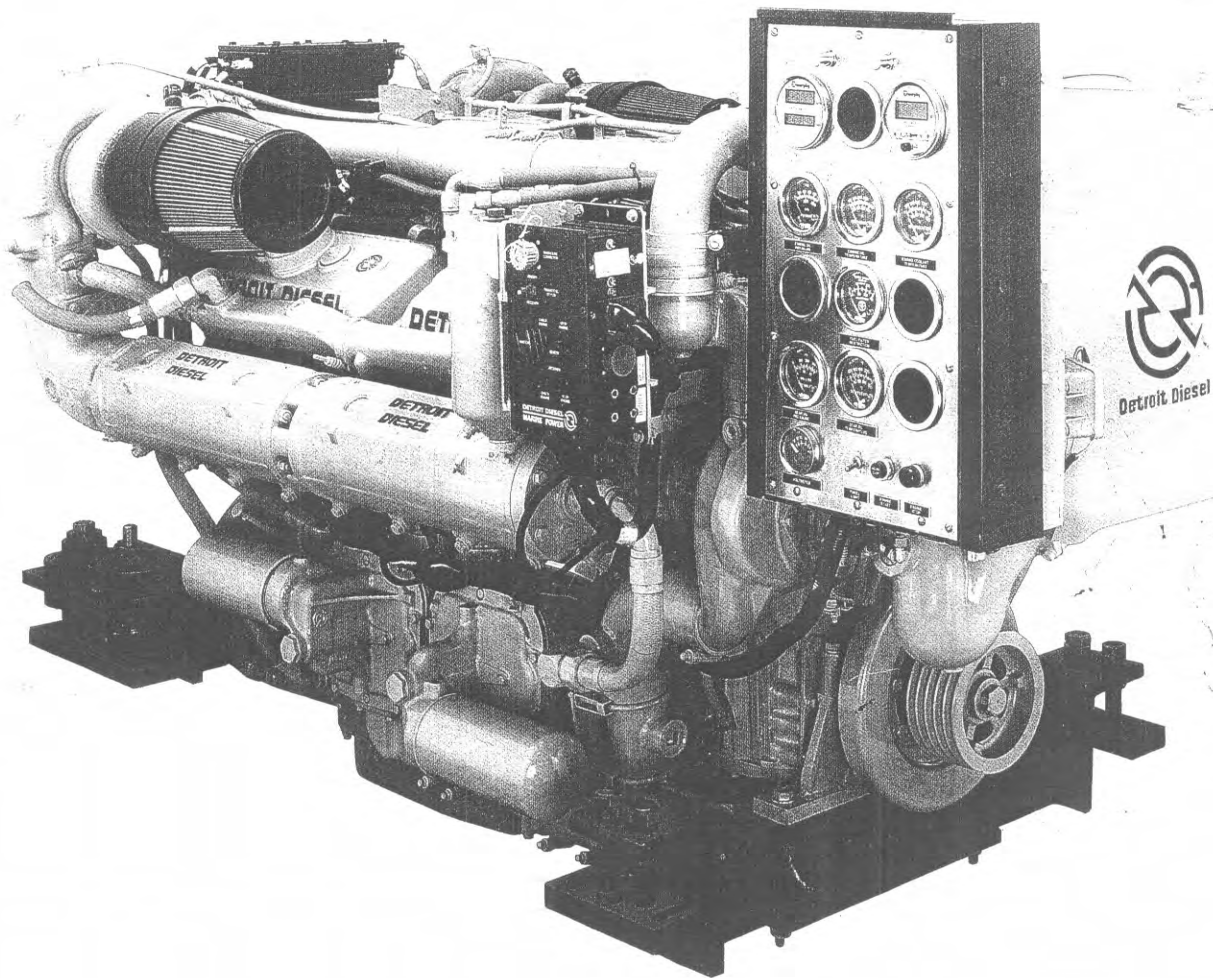


DETROIT DIESEL

Marine Power



For Commercial Craft

Put Your Tough Demands to a Detroit Diesel Marine Engine, the Standard of Marine Propulsion for Over 50 Years.

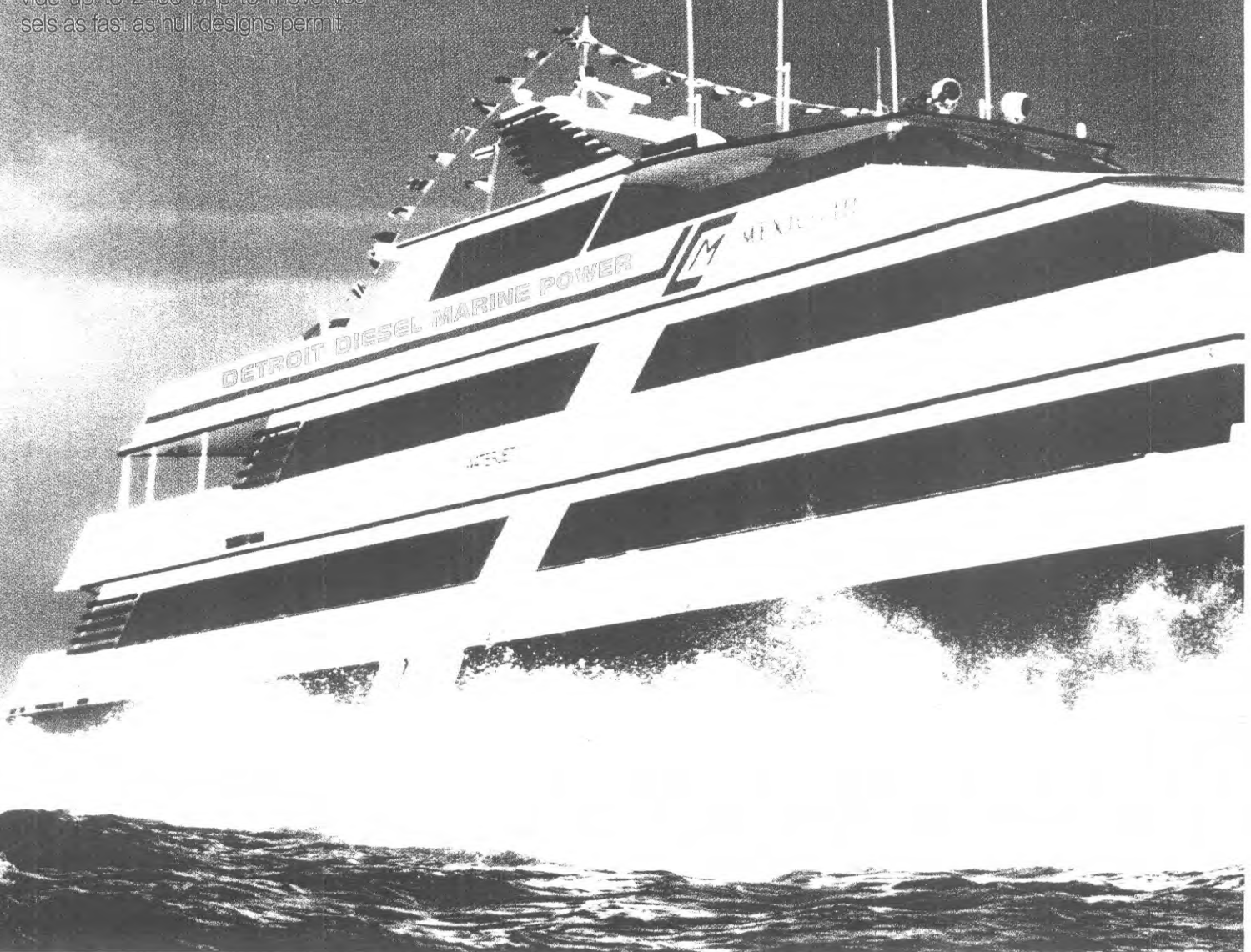
When you choose a Detroit Diesel marine engine, you are choosing quick, sure power, hard-working reliability and durability that can weather the work and elements. This common sense design makes upkeep more affordable.

For speed and reliability: Look to Detroit Diesel for easy starting, immediate load acceptance, quick acceleration and reliable high speed. Premium Detroit Diesel engines provide up to 2400 bhp to move vessels as fast as hull designs permit.

For speed and fuel efficiency: Fishing boats must get to fishing grounds fast but still tow nets efficiently. Detroit Diesel provides the power and the economy for low fuel consumption in continuous service.

For responsive power: Tugs and tow boats need the high, responsive horsepower Detroit Diesel provides for accurate maneuvering of heavy loads in busy waterways.

Power for accessories: If more shipboard power is needed, Detroit Diesels are available to drive independent auxiliary power units, generator sets, pumps, hoists, and other accessories. As members of a common engine family, Detroit Diesel engines have considerable parts interchangeability.



If You've Spent Time On the Water, You've Probably Experienced the Smooth, Responsive Performance of a Detroit Diesel Engine.

Series

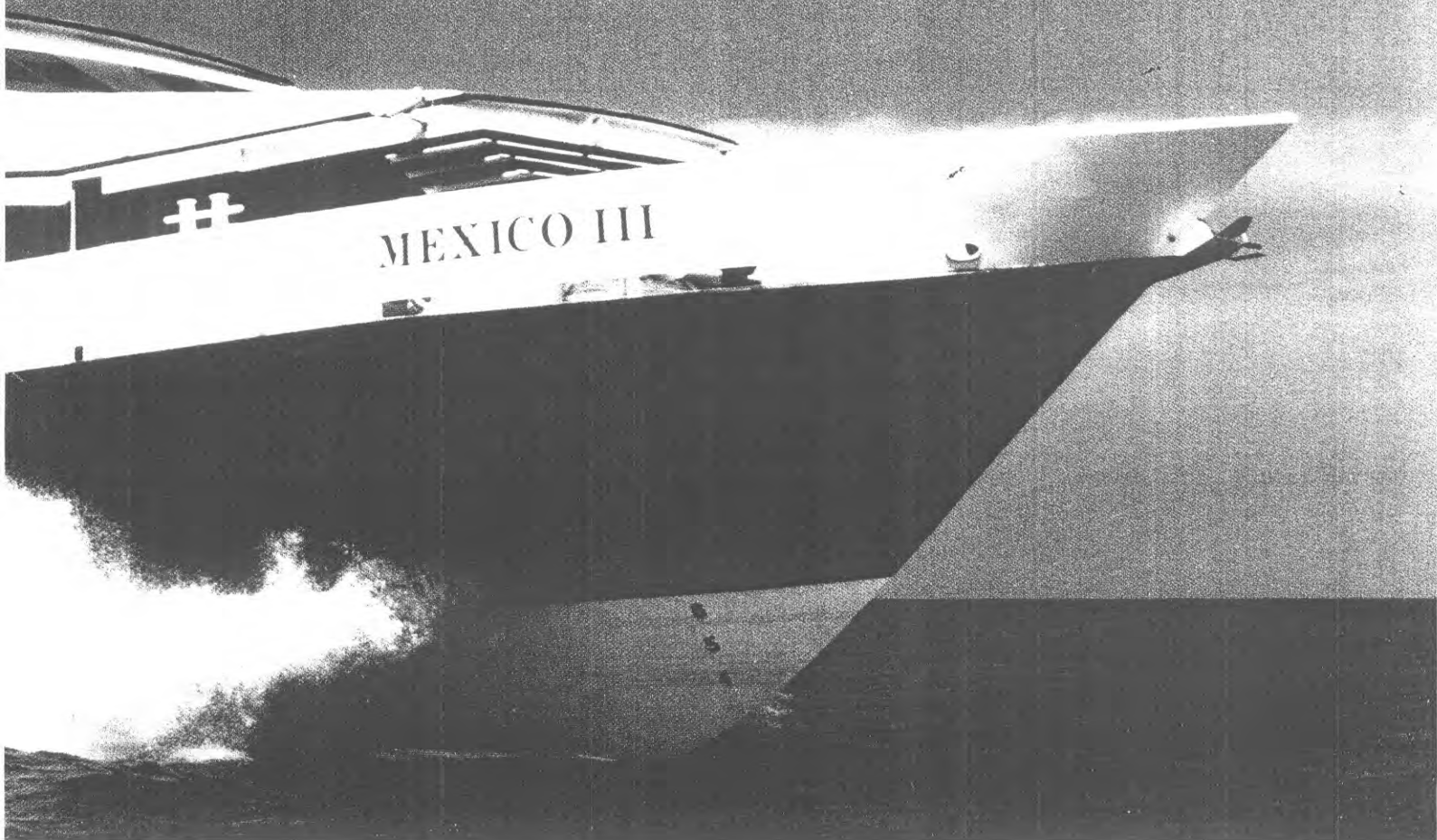
53 UP TO 400 BHP

VOLVO PENTA UP TO 612 BHP

71 UP TO 900 BHP

92 UP TO 1450 BHP

149 UP TO 2400 BHP



Detroit Diesel Provides a Complete Line of Diesels Up to 2400 BHP

Developed for Workboat Operation from the Very Start

Volvo Penta

The in-line six cylinder configuration, which Volvo Penta has developed for heavier workboat engines since the mid-1940's, is the same time tested design in use today. The combustion chambers, turbo units and injection equipment suit the engine speed and load conditions of workboat applications precisely. The result: good overall economy and excellent performance. Detroit Diesel Corp is the authorized distributor of Volvo Penta Diesels for NAFTA.

High Performance Power for Smaller Work Boats

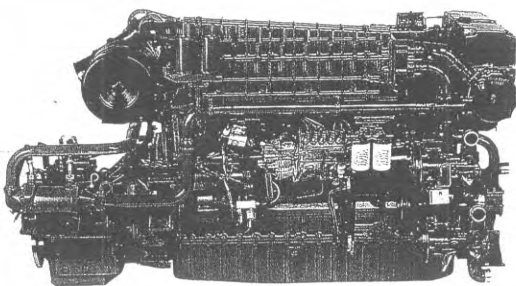
Series 53

The Series 53 provides practical power for compact fishing boats, boom boats, light utility, patrol boats and auxiliary ship-board power. Named for its cylinders-3, 4, and 6V- and the common 53 cubic inches of displacement per cylinder, the Series 53 is a tough, heavy-duty member of the Detroit Diesel engine family.

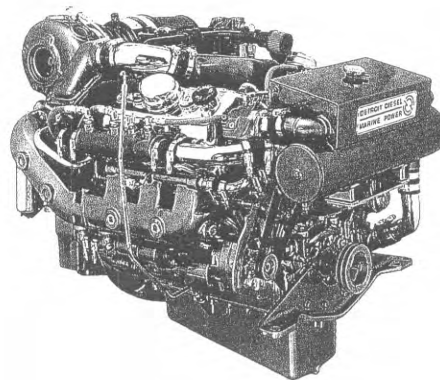
The Standard of Commercial Marine Engines Worldwide

Series 71

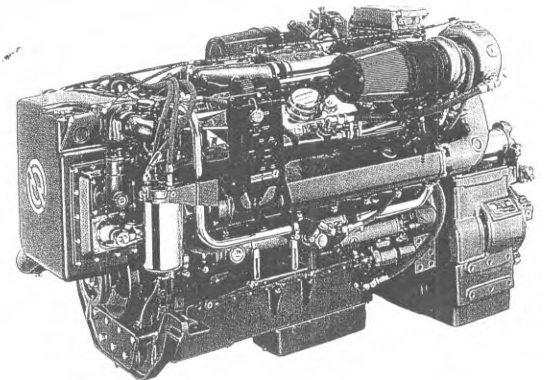
A proven workhorse for over 50 years, the Series 71 was created to power World War II Navy landing craft. From its patriotic beginnings, it has evolved into its current form: an inline 6-71 turbocharged intercooled or a 12 cylinder turbo aftercooled engine. The Series 71 is an available reliable provider of day-to-day service. The extra, intermittent power available is ideal for fast crew boats and special fishing applications.



Volvo Penta



Series 53



Series 71

The Most Compact Power Package Available Today

Series 92

Here is the perfect power for the broadest range of commercial applications. The Detroit Diesel Series 92 is available in 6, 8, 12 and 16 Vee configurations and develops up to 1450 bhp — approximately 25% more power than the comparably sized Series 71. With weight-to-horsepower ratios that are the best in their class, the Series 92 offers a significant weight advantage over competitive diesels.

For Big Load Capacities and Uninterrupted Service

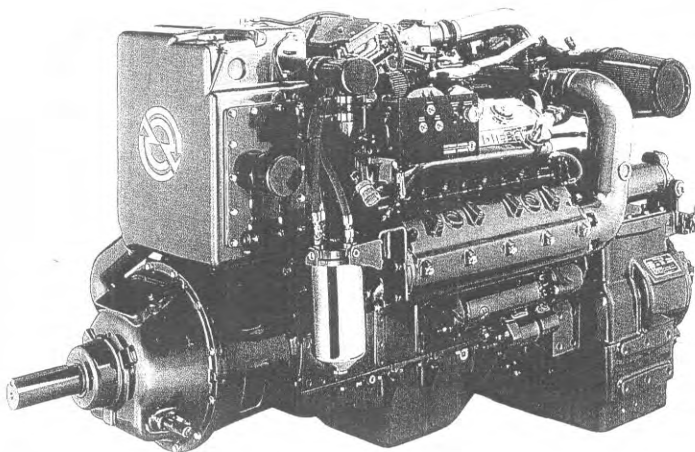
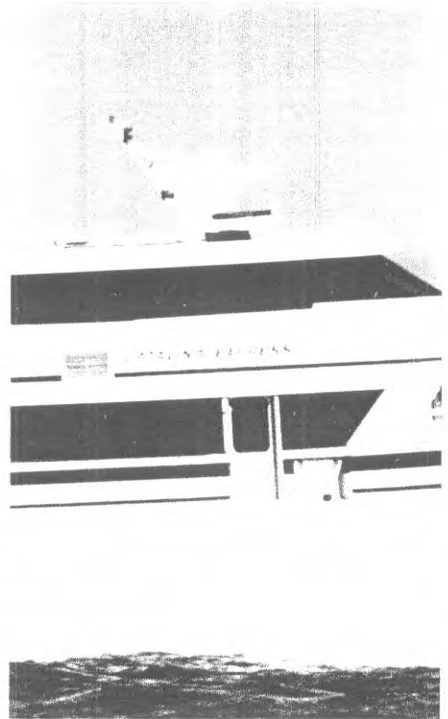
Series 149

The rugged Series 149 was created to meet the tough demands of uninterrupted commercial operation. Intended for crew and cargo boats that must move quickly and economically, and for river, harbor or ocean tug and tow boats, the Series 149 is a compactly designed engine with big load capacity.

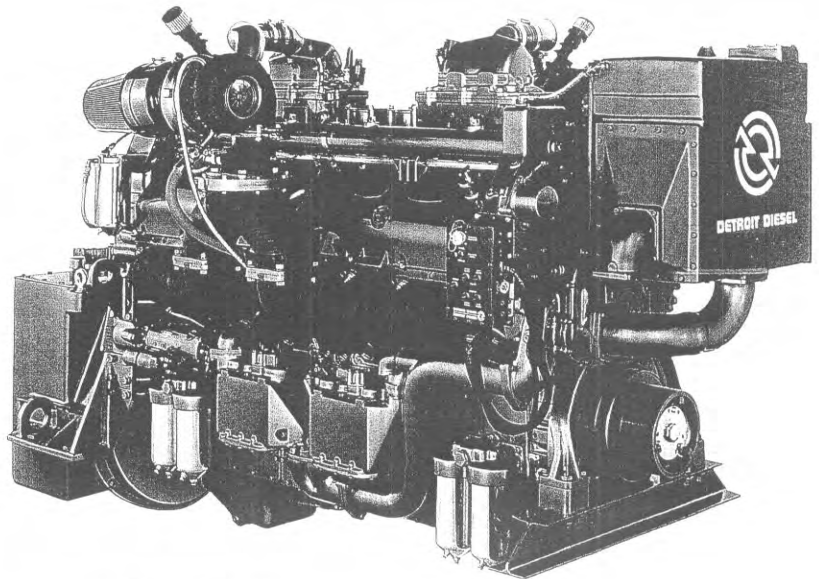
The high power-density design of the Series 149 includes quad turbochargers, intercoolers, bypass blowers and an exhaust

wrapped with advanced design material. This innovative exhaust design provides maximum heat energy to the turbocharger for better performance and fuel economy and insulated surface temperature.

The largest Detroit Diesel engine on the water today, the 8V, 12V and 16V Series 149 require less fuel and less engine room space while providing a cooler, safer work area for crew. The Series 149 is also designed with unit fuel injectors, two-piece camshafts and crankshafts and individual cylinder heads for easier, more efficient on-board service.



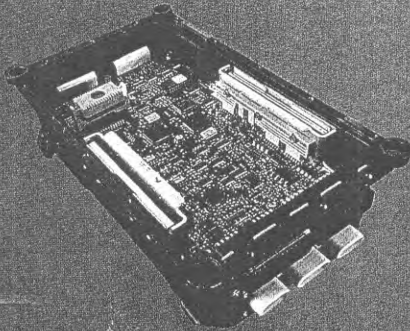
Series 92



Series 149

Detroit Diesel Electronic Controls (DDEC)

Detroit Diesel is the industry leader of electronically controlled engines. First introduced in 1985, there are now nearly 300,000 DDEC equipped engines operating all over the world. DDEC is a computerized electronic engine governing and fuel injection system that replaces mechanical controls in Detroit Diesel engines. In addition, within its onboard computer DDEC offers engine protection and self diagnostics to identify malfunctions in its components as well as the ability to troubleshoot engine problems.

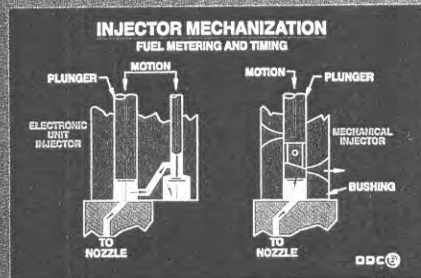


Electronic Control Module (ECM)

Major Components of DDEC are the Electronic Control Module (ECM) and the Electronic Unit Injector (EUI)

The ECM Contains:

- A microprocessor that continuously monitors and analyzes the DDEC system with electronic sensors during engine operation.
- A programmable read-only memory (PROM) that provides instructions for basic engine control functions.
- Electronically erasable, programmable read-only memory (EEPROM) that stores engine calibration values.
- A backup microprocessor to operate the engine should the main microprocessor fail.



With this redundancy built into the ECM, reliability is assured. In fact, of the nearly 300,000 DDEC units in operation all over the world, there has never been a failure of the backup microprocessor.

Electronic Unit Injector (EUI)

- Built on our patented mechanical unit injector design.
- Design simplifies plunger and replaces mechanical rack with an electronic solenoid.
- Allows precise metering and injection timing.

The EUI is actually simpler in the area of the plunger and bushing than the mechanical unit injector. The amount of fuel injected and the timing are determined by information fed into the ECM from sensors located on the engine.



Electronic Unit Injector (EUI)

DDEC Features

Reduced Smoke

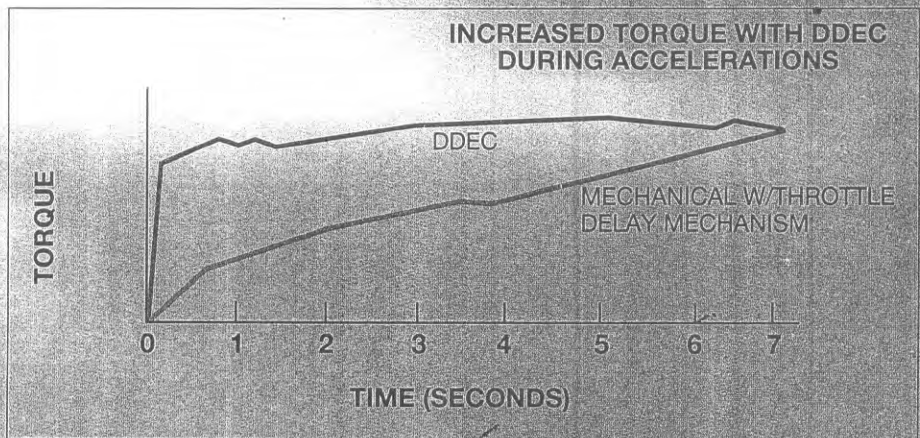
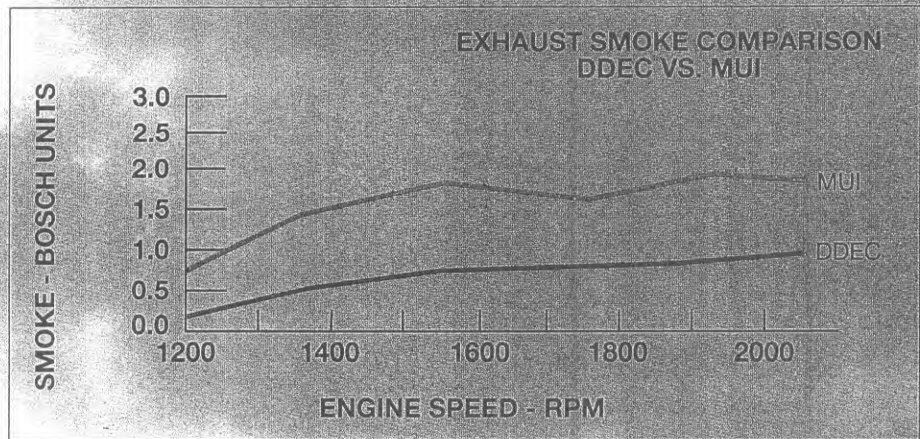
A sensor tells the ECM how much turbo boost or air is available. The ECM matches the proper amount of fuel to insure complete combustion, virtually eliminating black smoke on acceleration. During cold starting, DDEC advances injection timing which reduces fueling to minimize white smoke.

Improved Performance

Another advantage of matching the Air Fuel Ratio is an improved torque rise. This increased torque rise improves vessel acceleration, or the ability to maneuver a load quicker and more efficiently. Engine performance is improved at all RPM's.

Improved Governing Control

DDEC maintains constant governed speed by automatically compensating for intermittent accessory loads. For example, if you are coming into a harbor at idle and an engine driven accessory comes on, your engine's RPM will not drop off. DDEC also provides a low idle speed option.



Improved Engine Synchronization

With DDEC, add-on mechanical synchronization devices for multiple engine installations are a thing of the past. Your engines can be synchronized at the touch of a button and there is no power lag. Engines run smoother and accelerate faster because the engines are running at the same speed,

versus one following the other. This is even more evident in full power turns where variance is less than 10 rpm between engines.

Parts and Service

DDEC is fully warranted under the Detroit Diesel warranty provisions. The Electronic Control Module (ECM) and the Electronic Unit Injectors (EUI) are serviced on an exchange basis.

Detroit Diesel Electronic Controls Deliver Performance and Reliability

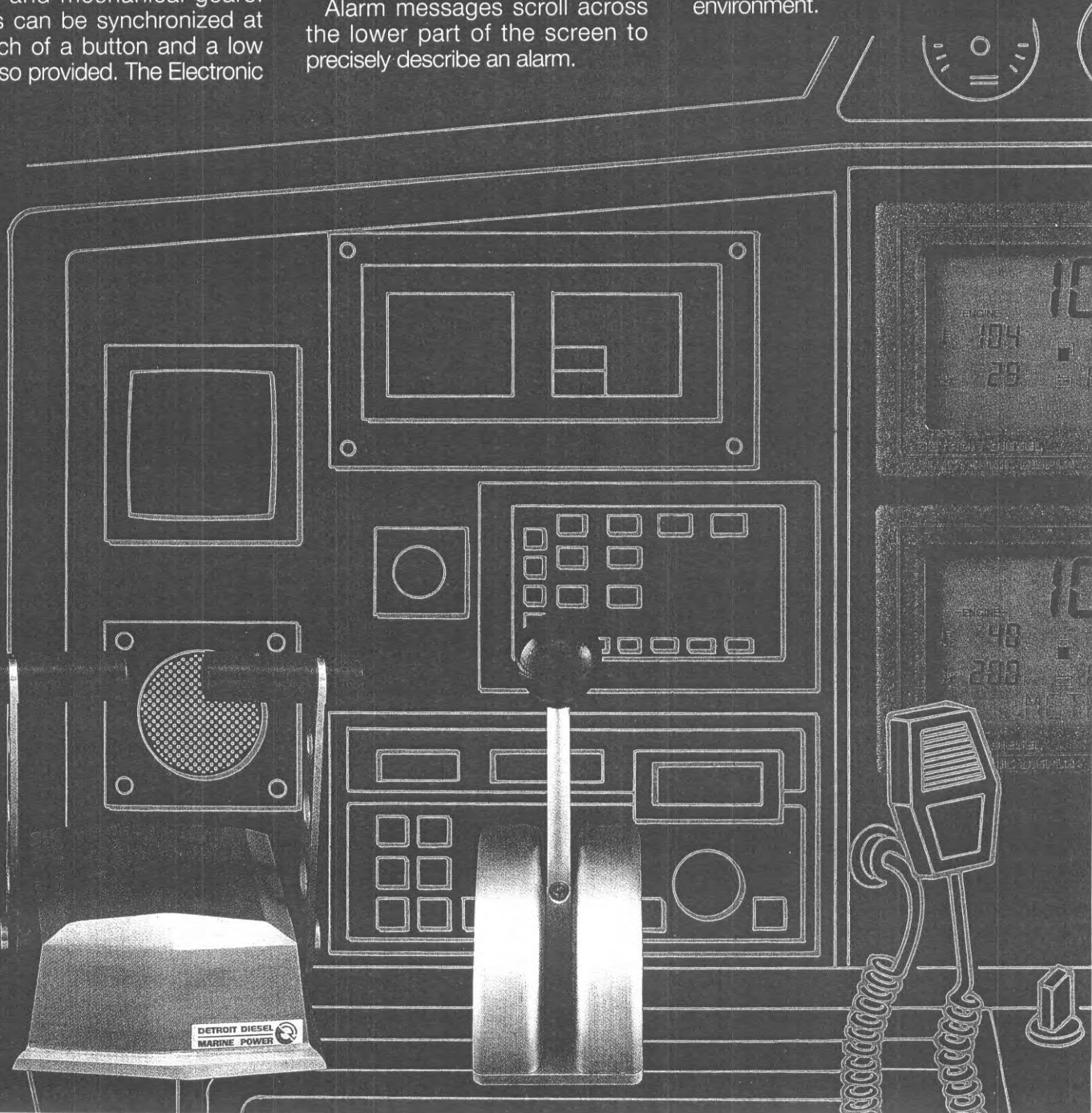
DDC supplies a complete system including single or dual controls for throttle and mechanical gears. Engines can be synchronized at the touch of a button and a low idle is also provided. The Electronic

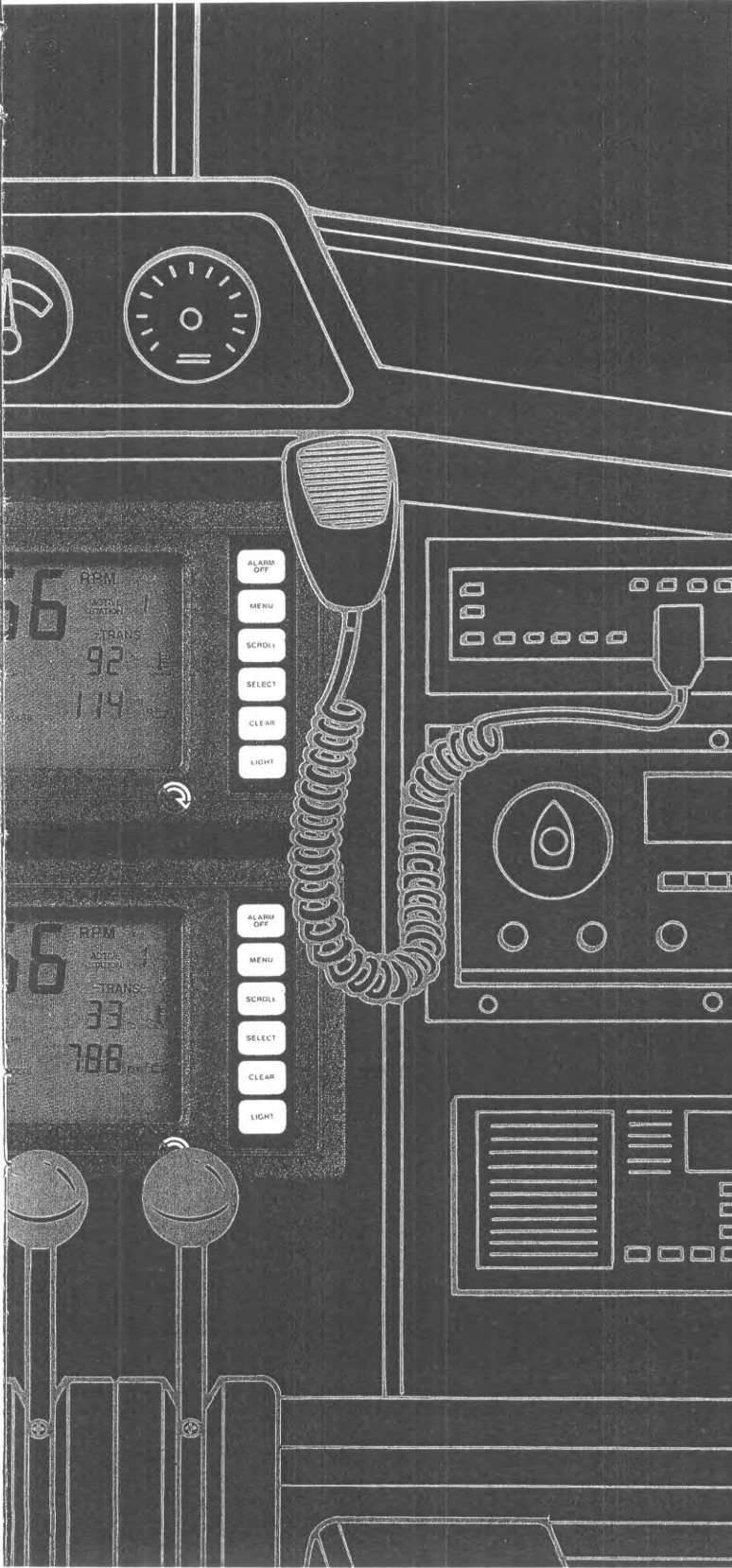
Display Module (EDM) replaces mechanical gauges. It displays engine RPM, oil pressure, engine temperature and fuel burn. The EDM also monitors gear temperature and pressure, identifies which station is active and gear selection of forward, neutral or astern.

Alarm messages scroll across the lower part of the screen to precisely describe an alarm.

The EDM also has a menu that allows the captain to monitor such functions as engine load, trip fuel and trip hours (see DDC literature 6SA395 for more details).

Both controls and displays are completely waterproof and designed to withstand the marine environment.





The Future Is Available Today At Detroit Diesel Corporation

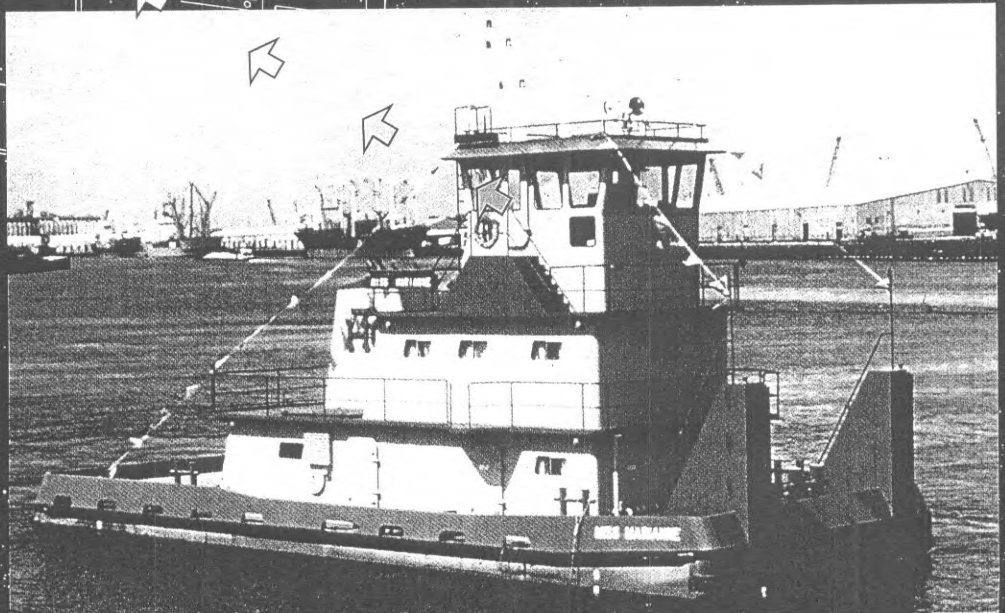
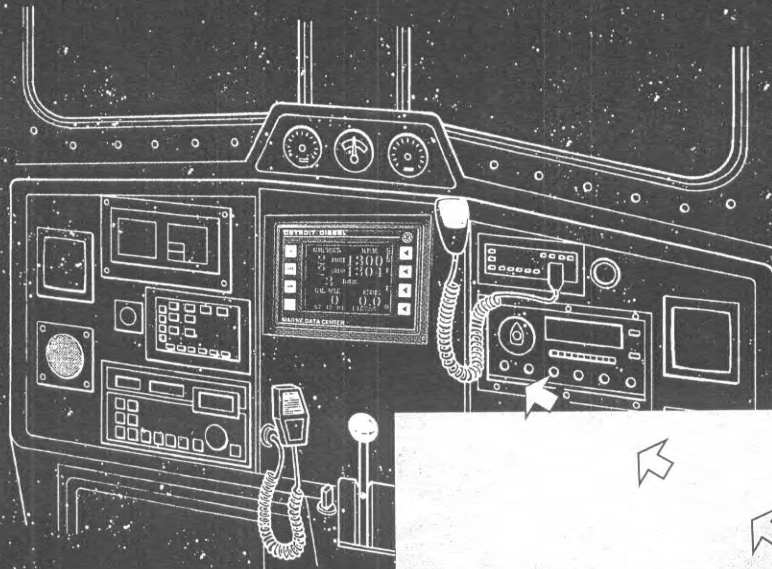
Global Vessel Monitoring System, or GVMS

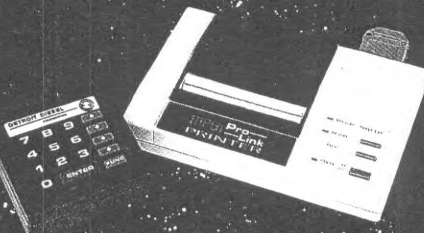
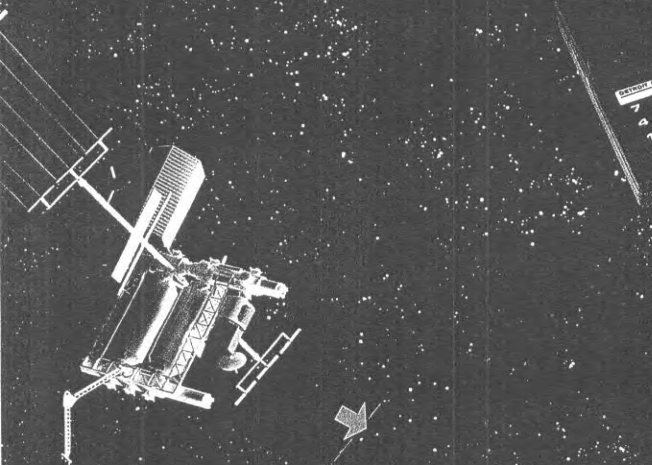
GVMS allows fleet owners to obtain engine performance data and vessel location, no matter where on the globe a vessel is located. An onboard global positioning system relays the ship's position in degrees of latitude and longitude via satellite. Engine data is obtained directly from DDEC. The GVMS system is applicable to both single and multiple vessel fleets.

Record keeping is easy with GVMS. It provides essential information on fuel consumption and engine performance in the form of trip, daily and monthly reports. Engine data is displayed in an easy-to-read EDM format for prompt data recognition and analysis. Onboard printing and hard disc storage of information is also available.

GVMS allows onshore personnel to troubleshoot engine problems

while the vessel remains at sea or on the water by providing critical engine data via satellite. And when NOx emission monitoring is required, GVMS transmits data automatically to an onshore facility where it can be analyzed and recorded.



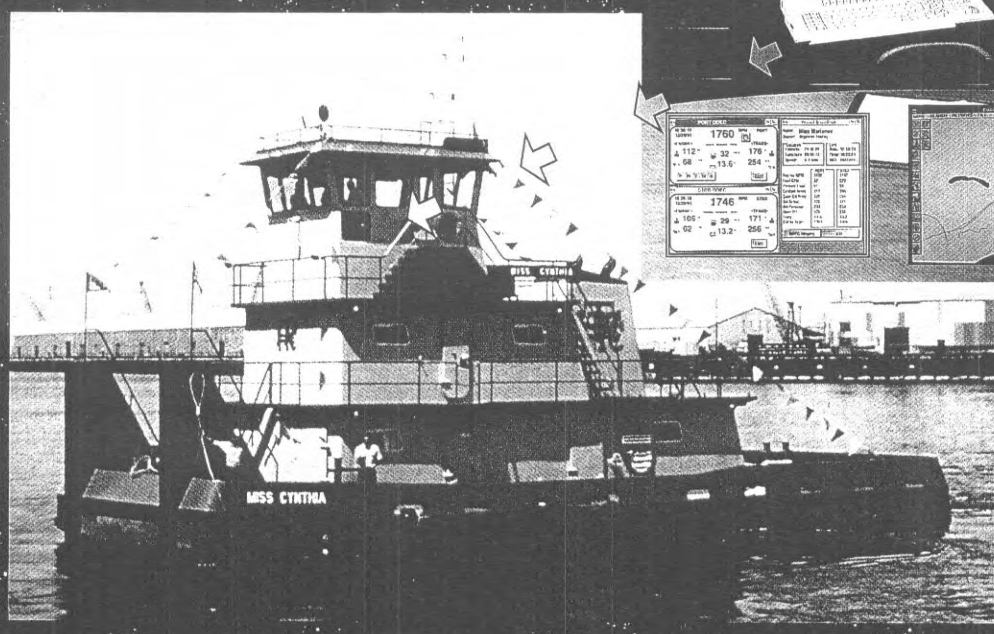


Diagnostic Data Reader

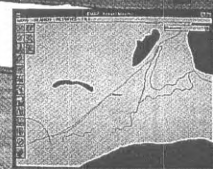
Using an inexpensive hand held diagnostic reader, technicians can retrieve codes in the memory and quickly diagnose engine malfunctions.

TeleDiagnostics

Through the use of GVMS, DDEC engines can be diagnosed anywhere in the world. Linked by satellite, a DDC distributor or factory engineer can evaluate engine parameters to identify malfunctions and direct corrective action.



PORT 1760		PORT 1746	
112	32	176	174
108	13.6	228	
DISTANCE			
11.5	1746		
105	39	171	
02	13.2	258	



Repower with Detroit Diesel for Performance and Dependability

When you choose a Detroit Diesel marine engine, you're selecting a complete propulsion system. All of the equipment necessary to operate the engine reliably and efficiently is standard. DDC marine transmissions are mounted as an integral part of the engine.

Efficient, Affordable Installations

Detroit Diesel offers a marine engine configuration to accommodate nearly every hull plan. And the simplicity of our engine design allows easier, clean, more efficient, and more affordable installations.

Performance and Reliability are Designed-In

Detroit Diesel has rugged features designed for long-term performance. For example, the cylinder block and crankcase are sturdy iron alloy castings. Cylinder liners are heat-treated cast iron with a hard, scuff-resistant surface to

stretch time between overhauls. Connecting rods are drop-forged steel. Crosshead pistons are cast iron — not aluminum — as is the case with many competitors of Detroit Diesel. The cylinder head is cast iron for distortion resistance, and the camshaft is drop-forged steel with hardened cams and journals.

Engineering Design Assistance

Detroit Diesel Corporation offers you their expertise as you design your new boat, or as you plan the repowering of your existing craft. We can work with you or your naval architect to make certain your vessel has the best propulsion system powered with Detroit Diesel marine engines.

Simplified Maintenance

Detroit Diesel marine engines have planned simplified maintenance. Major parts, such as the unit injectors, are quickly accessible and easily inspected and replaced. Most components are built into modular, easily replaced sub-assemblies.

A Worldwide Supplier of Reliable Parts and Outstanding Service

As a Detroit Diesel customer, you can depend on our extensive network of distributors and dealers. These experienced professionals have the parts, general service and emergency service you need to get on the water and keep you there. Detroit Diesel maintains a complete inventory of service parts for all marine engines at distributors, who are strategically located throughout the world and at our parts distribution center in Canton, Ohio. This gives DDC the ability to fill your parts requests overnight.

Detroit Diesel Options and Additional Equipment

- Bow Thrusters
- Electric Systems
- Auxiliary Power
- Electric Sets
- Pumps and Other Equipment
- Other Optional Equipment

DETROIT DIESEL
CORPORATION



13400 Outer Drive, West / Detroit, Michigan 48239-4001
Telephone: 313-592-5000
FAX: 313-592-7288

