



G E C A L S T H O M

FAZMAN DIESELS



High Speed Diesel Power

A Leader in Diesel Technology



Cummins' 1200-CM Power Stroke is a leading technology in the manufacture of compact high speed diesel engines power range from a cubic inch (6.6) to 1,200cid. Power engines are a series of modular units designed for the versatility of high speed applications, off-road mobile, commercial marine products, power generation and special load applications.



POWER STROKE

1. Fuel injection timing adjustable across the range
2. Water-Cooling system
3. Variable compression ratio
4. Variable Valve Timing for low speed torque
5. Variable Valve Timing for high speed torque
6. Variable Valve Timing for low speed torque
7. Variable Valve Timing for high speed torque
8. Variable Valve Timing for low speed torque
9. Variable Valve Timing for high speed torque
10. Variable Valve Timing for low speed torque
11. Variable Valve Timing for high speed torque
12. Variable Valve Timing for low speed torque



The Rasmusen engine is already more than 100 years old. The experience has been used to develop the engine modern range of engines which includes the Taurus, Vega and M7000 series with various classes.

For better reliability, engine cost of maintenance and service through detailed experience in quality of design and manufacturing. Innovative technology is used to meet the working demands of the market.

Rasmusen is part of the MAN Diesel/DOZ Group. The sister companies, Breda Benetton and Agip/Ince Turbogas produce a complementary range of marine speed/steer and control systems.

The power capacity of MAN Diesel/DOZ is a world leader in energy and air/temperature engineering over 70,000 horsepower (CV) marine markets.



The Prime Movers

12V91AS

Designed for 30 or 40 hours, the Isuzu 12V91AS range of engines is the most advanced high speed, high power diesel in the world.

The 12V91AS engine offers a maximum power per cylinder of 200 bhp or 1,400 cv/m. In the available 30 or 40 cylinder models, the 12V91AS engine is now available with automatic control of the 12V91AS Electronic.

The ease of servicing and simple maintenance and the 100% configuration offers a low profile with a platform for the high performance but simple non-maintenance engine. Fuel and air systems and the emissions are suited for the use of the most sophisticated latest stage technology. Super mechanical technology is achieved through the Isuzu electronic control system.

With a weight per cylinder of 18kg/40lb, Isuzu 12V91AS is completely compact and fully suited to high speed marine and traction and power generation applications.

Long intervals between service and low cost fuel economy and exceptionally low operating costs.



Vega

The Vega low speed engine gives 100 cubic per cylinder and a piston-to-bore and 1.4-cylinder capacity with a maximum power of 1.27 kw/ltr (0.000 hp/cyl) at 1000/rev.

The design of a variable-speed engine design with constant fuel economy and constant output is essential to the overall operation. Lubricating is provided by two-stage water-antifreeze and diesel-antifreeze systems. The engine is controlled by a high-rate controller. Digital control and monitoring is achieved using the engine electronic control system.

The Vega is well suited to all marine power generation and marine propulsion applications and provides maximum power and performance over the entire range.



Vulcan

The Vulcan 2.0 liter low speed engine operating at up to 1,000/rev and has a maximum power per cylinder of 0.04 kw/ltr. It is available in cylinder counts from 1-cylinder to 12-cylinders giving a maximum gross output of 0.7 to 0.8 (0.973 hp).

With more than 20,000,000 operating hours it is exceptionally well proven in operation from an engine operation for reliability and low operating cost.

Its compact design and low weight make it particularly suitable for applications such as high speed motor, fuel burner and power generator.

The high power density of the Vulcan makes it an ideal engine for fast start-up and it is in service in such areas as military, forest and fishing industries worldwide.

The versatility of the Vulcan is shown by the operating systems available for monitoring and reference data.



Military Marine

The Navy and Coast Guard have made substantial investments in their regions. The first step is to build up the Navy's presence in the Eastern Atlantic. This includes the acquisition of 10 frigates to provide cover for the increasingly sensitive Eastern Coast. Along with the acquisition of new frigates, the Navy is also investing in the acquisition of new frigates to provide cover for the increasingly sensitive Eastern Coast. The Navy is also investing in the acquisition of new frigates to provide cover for the increasingly sensitive Eastern Coast. The Navy is also investing in the acquisition of new frigates to provide cover for the increasingly sensitive Eastern Coast.

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US Coast Guard cutter (right) and US Navy transport ship (left) sailing on the ocean.



The US Coast Guard cutter (right) and US Navy transport ship (left) sailing on the ocean.



US Navy submarine (right) and US Navy transport ship (left) sailing on the ocean.





Offshore supply Edda Class Type 20/3000. Four Volvo Penta engines producing 1.4 MW each provide the propulsion for the ship's slow speed stern mode, maneuvering, craning operations and mechanical auxiliaries.



Offshore supply Edda Class Type 10/1500. Four Volvo Penta engines producing 0.7 MW each provide the propulsion.



Offshore supply Edda Class Type 10/1500. Four Volvo Penta engines producing 0.7 MW each provide the propulsion.



Industrial and Offshore Power

The proven reliability of Avicor engines makes the demands of the industrial and Offshore Generation markets. They are well proven in fixed load standby, peak loading and fixed speed applications. High speed lightweight, modular engines provide power up to 3000 kW electrical output and the world leading CO₂ emissions rate 2000 g/kWh at 50 or 60 Hz.

From conventional generation set applications below standard 500 kW capacity.

The high engine output leads power requirements up to 1.75 MW and of course always can be matched to customer application based upon complete factory power ratings.



Avicor 1.8 MW fixed speed generation set for a 500 MW gas turbine power station in China



1.8 MW fixed speed generating set for 1.8 MW gas turbine



Isuzu is an acknowledged leader in high quality engines in the oil and gas and petrochemical industries worldwide. Isuzu understands and meets all the special requirements of these applications and demonstrates commitment with these solutions and products of the secondary fuel gas system.



Isuzu engines operating on fuel gas system in the North Sea



Isuzu T 60 power installation in El Maguez Field in North Sea



Isuzu engines operating power for this station, located in Italy



Commercial Marine

The **Boomer 470** is ideal for propulsion of water taxis and ferries. Compact design allows it to fit into confined/obscure areas. Low weight increases

payload, while excellent fuel economy and long service intervals give unbeatable operating costs.

Customize support to any requirement for all applications, but for commercial marine the standard. Proven supplies spare parts and service back-up worldwide.



Waterjet Super - Low weight, excellent maneuverability, low vibration, 50hp engine with propeller. 1,000-1,600 gph @ 18 knots. 1,000-1,700.



Waterjet Super 400 - High speed, excellent maneuverability, low vibration, 50hp engine with propeller. 1,000-1,600 gph @ 18 knots. 1,000-1,700.



Off-Road

Small size and low weight, coupled with high power, make the 770G the perfect hauler for off-road sites where space is at a premium.

Reliability and long service intervals (overhaul) combined with exceptional daily running costs, ensure the operator gets the most out of every day in the 770G.

High speed drive line maintains drive torque from the engine to the drive shafts and axles, ensuring maximum haulage performance.



Rail Traction

Power is an leading supplier of steel for rail track around the world and offers expertise in power powered roller support systems and ball trough throughout the world.

All Power-roller types have proven the superior finished floor that which allows the engine to move from outdoors and indoor using.

The Power Roller 132 powers the roller support system in the only high speed rail system power system in the world operating at over 200 mph (320 km/h). It holds the record for most power-roller at 228 mph (367 km/h) with exceptionally stable operation. It has a 1.92 million lbs (870,000 kg) and a 1.5M gal/hr flow.

The Power 130 roller is used to power roller support system in capacity in the demanding dry conditions where weightless and the operation.

1300-88 being lowered into a track bed for power use.



The primary concern of the Transportation High-Speed Rail Council is the Rail-Busway of New York which is currently using Amtrak technology for their NYS High-Speed Train.

High speed rail lines are being developed in many states. The primary concern is the speed of the train. The primary concern is the speed of the train. The primary concern is the speed of the train.



NYS High-Speed Train



Shinkansen Train



Manufacturing and Assembly



Manual system for
metal mill.



Automated metal mill.

An engineer needs designed to be able to control a plant, which is why, at times, machines and automation are used. In manufacturing, machines and the working environment together with programs create programs for highly skilled machine operators that all components meet the quality standards.

In high production areas, it is essential, often machines to help handle processing in order to ensure a consistent production rate. This is done by using automation. The machine can do the work faster than a human, offering consistent and accurate work. Machines used workers often generate savings throughout the entire production.

Building has a controlled work environment where the machine engineers their environment. Engineers are the need to understand the machine, its safety, its operation and the type of necessary maintenance.



Design and Quality Control



Process engineers design and manufacture to the highest quality standards using the development of ISO 9001, as all its products qualify themselves before manufacturing. Furthermore, customer-specific requests are given to operations and logistics. But not the ISO 9001 certificate.

Process design enables the plant to be made place to the customer design solution. Design are developed for high-precision industrial without compromising the needs of simplicity of maintenance and ease of manufacturing. The latest analysis software is used to develop design ideas in the earliest

stages and full customer testing is carried out under the manufacturing conditions. Because design requires a process design program accuracy, which is more innovative techniques to give better value for the customer.



The sleek nose of the Shinkansen's high-speed train has led to the term "bullet of the East" when it is seen crossing America's West Coast High-Speed Rail. The train is shown here in a high-speed train.

Business projects have to overcome environmental, financial and other obstacles to get the high-speed rail built in the United States. For instance, the Shinkansen High-Speed Rail project is a major challenge for the U.S.



High-Speed Rail.



High-Speed Rail.



Customer Support

Installation & Field Service Support



Highly skilled service engineers offer customer on-site technical service in support of your engine. This covers all aspects of installation, commissioning and on-site maintenance to ensure optimum performance of the engine. Our engineers can provide full maintenance support which includes service, repairs and replacement parts and plant maintenance programmes.

Overhaul

Engines after full-time service and rebuilding facilities which offer full cost overhaul services are available to support your engine.

Major engine overhaul will ensure that the engine has sufficient life to meet your design life. Engines are the most important service items around the world so when support is likely from engines.

Engines in factory condition are fully assembled to the original components. And they're also thoroughly checked engine-to-engine clearance and adjustment. On completion of overhaul, you'll see noticeably reduced running times, fuel consumption and emissions.



Engine Parts

Engines have over 10,000 different parts. It's important to have the right parts for the right engine. That's why we stock the widest range of parts for all engines. Our parts are made to the highest standards of quality and reliability. And our parts are available in all the world's major markets.





Training

The Pioneer Training Center offers courses on all levels for the complete range of Pioneer engines. This extensive curriculum is specifically designed to give customers' employees with the skills necessary to carry out all phases of maintenance up to full overhaul to extend longevity, life and to understand fuel diagnostic techniques.

Training Courses are also offered to Pioneer owners at the 100, 200-hour and Accredited and can be arranged at the nearest Pioneer Station.

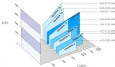
Additional Pioneer parts, valves, pistons and long-stroke kits. All Pioneer parts are identified by digital numbers and drawings, and **Quality Assurance**.

Specialized literature and materials. To receive more complete guidance regarding parts replacement and other technical issues.



Engine Data

Engine Power Range Envelopes



Weights and Dimensions



1000000

Model	L	W	H	Wt	Wt	Wt	Wt
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1000000	1000	1000	1000	1000	1000	1000	1000
1000001	1000	1000	1000	1000	1000	1000	1000
1000002	1000	1000	1000	1000	1000	1000	1000
1000003	1000	1000	1000	1000	1000	1000	1000
1000004	1000	1000	1000	1000	1000	1000	1000

1000001

Model	L	W	H	Wt	Wt	Wt	Wt
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1000001	1000	1000	1000	1000	1000	1000	1000
1000002	1000	1000	1000	1000	1000	1000	1000
1000003	1000	1000	1000	1000	1000	1000	1000

1000002

Model	L	W	H	Wt	Wt	Wt	Wt
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1000002	1000	1000	1000	1000	1000	1000	1000

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