

Paxman Vega

Marine Propulsion Diesel Engines

ENGINE SPECIFICATION

895 - 1718 kW brake 1258 - 2300 bhp 1215 - 2332 cv/gp

ENGINE DATA

Inlet Type		100%
Number of cylinders		12, 18
Bore and stroke		140 x 170, 150 x 170 (mm)
Cycle		4 stroke
Compression ratio		15.5:1
Configuration		W/Tail
Operating speed/range		1000-1800 rev/min
Max power		895-2300 kW (brake)
Max prop speed	1000 rev/min	1200-1800 rev/min
	1800 rev/min	1800-2300 rev/min
Fuel/air pump		12/18
Injection system		12/18
Combustion system		12/18
Exhaust system		12/18
Starting system	Electric	12/18
	Gas	12/18
	Hydraulic	12/18
	Other	12/18
Alternate installation		12/18
As motor		12/18
As generator		12/18
Compressor		12/18
Naval Auxiliary Drive		12/18
Turbo		12/18
Specific fuel consumption		12/18
Consuming oil type		12/18
Consuming oil consumption		12/18
Maximum continuous pressure		12/18



CRANKCASE A high grade cast iron casting, carrying and centrifugally cast iron liners which are located at the top of the housing and carry two sealing rings at the lower end. The main bearing caps are located against side thrust by deep fitting faces and lateral set screws. The engines have generously sized crankcase doors to facilitate in situ servicing.

FLYWHEEL HOUSING An SAE 02 casting manufactured from a high grade cast iron, or aluminium, where weight reduction is required, is provided at the drive end of the engine. The housing is bolted to the crankcase with integral feet either side of the housing. The turbocharger and air filter assemblies are supported by a bracket above the housing.

PISTONS One piece aluminium alloy pistons, with two compression and one scraper ring above the fully floating gudgeon pin retained by clips. The top pressure ring is carried in an "Afin" bonded groove insert. Each piston has an integral oil cooling gallery behind the top feet supplied from a fixed jet mounted on the crankcase.

CONNECTING RODS AND BEARINGS Side by side connecting rods machined from steel stampings are obliquely split to allow the rod to pass through the liner. The large end bearings are of lead bronze steel backed identical top and bottom for each rod. The rod is drilled to provide pressure lubrication to the small end.

VALVE AND GEAR DRIVE A train of hardened and ground spur gears at the free end of the engine drives the high level camshaft the governor, lubricating and fuel lift pumps and the engine fresh water pumps. When fitted the sea water pump is also gear driven. The battery charging alternator is belt driven from a drive shaft at the free end. The camshaft, situated in the vee between the cylinder banks, runs in replaceable bearings, it

carries three cams for each cylinder to actuate the inlet and exhaust valves and fuel pump/injector via roller type followers, push rods and rocker arms. Each valve rocker arm actuates a pair of valves via a bridge piece.

CYLINDER HEADS Single unit cast iron cylinder heads are retained by four set bolts which screw into very deep bosses in the crankcase. Each head houses two inlet and two exhaust valves seating on replaceable inserts and a central fuel pump/injector.

CRANKSHAFT AND MAIN BEARINGS Forged steel fully balanced induction hardened shaft carried in identical tin aluminium steel shelled main bearings and located by thrust washers at the drive end. A viscous torsional vibration damper (two or 18) is mounted on an adaptor at the free end of the crankshaft.

FUEL INJECTION SYSTEM A combined fuel pump and injector is centrally located in each cylinder head and retained by a simple clamp. This system eliminates high pressure fuel lines between pump and injector and provides the low volume system necessary for low fuel consumption and low levels of smoke emission. An engine driven fuel feed pump is fitted. To cool the fuel pumps a recirculatory arrangement is used on the low pressure fuel system. The fuel filter is of the canister disposable type. A 24V D.C. solenoid operated shut off valve is fitted between the fuel tank and feed pump.

EXHAUST A fully lagged dry compact manifold system with individual outlets from each turbocharger.

TURBO CHARGING An air cooled exhaust gas driven turbocharger for each bank, having plain bearings, is mounted at the drive end of the engine and lubricated from the engine lubricating oil pressure system. Induction air is drawn

through engine supported oil wetted pan type filters.

OVERSPEED PROTECTION A 24V D.C. solenoid operated shutdown valve is fitted between the air filter and turbocharger inlet. Speed sensing is provided by a perception head mounted in the flywheel housing.

AIR INTERCOOLERS Vege - turbocharged jacket water cooled intercooler. Each turbocharger delivers air to an intercooler incorporated in the engine water jacket system. The intercoolers have cast iron waterboxes, steel brass tubeplates and copper nickel tubes.

Vege - turbocharged sea water cooled intercooler The intercoolers are incorporated in the sea water system and have cast iron waterboxes, (gunmetal optional), naval brass tubeplates and copper nickel tubes.

COOLING Jacket water is circulated through the engine and oil coolers by two pumps gear driven from the free end gear train. A self priming sea water pump having a molybdenum stainless steel shaft, with mechanical seal, hardened bronze impeller, aluminium bronze stationary components and bronze casing is gear driven from the free end of the engine. The heat exchanger with integral wax element thermostatic control valve, cast iron water boxes, naval brass tubeplates and copper nickel tubes is mounted at the free end of the engine and incorporates the coolant make up tank and pressurising valve. All engine sea water piping is fabricated from aluminium brass tubing.

LUBRICATION A full pressure lubrication wet sump system is supplied by an externally mounted gear driven lubricating oil pump. High pressure oil is supplied to all bearing points in the engine via full flow canister "strag away" filters three to each cylinder bank. A jacket water cooled engine mounted

Lubricating oil cooler is supplied for each cylinder bank. Each cooler has aluminium end covers, naval brass subplates and cupro nickel tubes.

PANEL TYPE AIR FILTERS mounted on bracket with trunking attached to the turbo blower.

ENGINE MOUNTED INSTRUMENT PANEL

with:

- Lubricating oil pressure gauge
- Lubricating oil temperature gauge(s)
- Exhaust temperature(s) before turbine
- Boost pressure gauge(s)
- Engine start button
- Hour run recorder
- Electric tachometer

OVER SPEED PROTECTION by induction air shut off, 24V, D.C. solenoid operated.

GOVERNOR DRIVE AND CONTROLS A standard Regulatours Europa 2100 series governor driven from the engine gear train via a bevel wheel drive is located at the free end of the engine. The 2100 has a hand speed control and hand stopdown. The governor power is via a drive speed drive shaft and the governor base mounted to the engine bevel wheel drive gear casing.

GOVERNORS AND CONTROLS A short description of the standard Regulatours Europa governor fitted to Paxman Vega engines and the main provisions of governing requirements of the major classification societies are given below. Other makes of governor can be fitted.

(i) **Electronic Governing - Viking 20** The Viking 20 Digital Governing System uses a powerful micro controller to achieve new standards of governing applicable to diesel engines. A whole family of actuators both electric and hydraulic has been designed to interface the controller with the engines. A full

safe ballhead backup is also included with each engine.

The fundamental control functions and algorithms are pre-programmed, but many parameters are accessible, via a user friendly menu, to allow for setting up and tuning while the engine is running. Non-linear characteristics can be easily entered into the programme allowing accurately matched control over speed and power ranges.

Functions available are:

- Load anticipation feature available to reduce transients.
- Software for multi-engine parallel operation in master/slave masterless or drop modes.
- Engine speed is filtered to reject cyclic speed variations.
- Loss of speed sensing protection is standard.
- Control algorithm includes non-linear gains so that response can be shaped for optimum performance.
- Boost fuel limit, load control, torque limit and acceleration rate are programmable to required laws.

Flexibility to provide many other functions such as:

- Start/Stop Sequencing.
- Fault Monitoring and communication.
- Operation under supervision of a host computer or PLC.

(2) **2100 Series** is of the centrifugal flywheel type with a hydraulic servo-mechanism to provide the output effort. It is completely self contained with its own oil reservoir, oil pump and two hydraulic accumulators one of which acts as a relief valve, provision is made for

connection to an air operated starting booster.

Governing requirement Transient speed changes to meet classification societies' rules should not exceed 10% when full load is suddenly taken off. Governors fitted to Paxman engines are set to a permanent speed droop of 5% unless otherwise required. For more than one engine mechanically coupled through a common gearbox a maximum variation between any two engines is set so as not to exceed 0.50%.

OPERATORS HANDBOOK AND WORKSHOP/SPARES MANUAL

COMMERCIAL PRIMER FINISH

TESTING Engines are tested to a standard schedule when power and speed steps are set and sealed; additional tests are undertaken to customers requirements. Engine test certificates are supplied with each engine.

SPEED SETTING GEAR

OPTIONAL EQUIPMENT

FLYWHEEL AND STARTER RING Flywheel and starter rings are offered in various options to suit the application. The starter ring is heat-treated to the flywheel.

ELECTRIC STARTER MOTOR 24V D.C.

BATTERY CHARGING ALTERNATOR 24V D.C. The battery charging alternator is mounted at the free end of the engine.

MANUAL LUBRICATING OIL PRIMING PUMP

FUEL LIFT PUMP

DUPLEX FUEL OIL FILTERS

SEA WATER PUMP self priming, gear driven from the free end gear train.

HEAT RESISTANCE to the high temperatures of the jacket water, freshwater and seawater/brine.

RESILIENT MOUNTING for quiet

LOW AMBIENT TEMPERATURE STARTING AIDS

EXHAUST BLENDER with air filtered open circuit.

EXHAUST FRESH

STAINLESS STEEL FLEXIBLE EXHAUST BLENDERS

STARTERS/STARTERS

ANTI-SHOCKING

ANTI-SEIZURE

HYDRAULIC OR ELECTRIC SPEED CONTROL

COUPLED LUBRICATION OIL FILTERS (one set per cylinder bank).

ALARM/SHUTDOWN PANEL

A B D I T I O N A L EQUIPMENT

RESILIENT MOUNTING

CONCRETE MOUNTING for installation and fastening.

DESIGN The Company's ability to adapt its technology to suit both fixed and variable pitch propellers. Standard lightweight gearboxes are mounted in the standard standard or alternative configurations. Oil flow and cooling circuits for sea water cooling, air

flow into these gearboxes, the cooling medium being drawn from the sea water circuit. Sea gear can be supplied to suit each application.

Lightweight gearboxes mounted to marine engines are available in one and three gears, which enable engines to be utilized at 100% of the power giving additional flexibility in engine room layout and improved vessel performance.

Slow Speed Drives for special speed duties gearboxes with secondary input or timing ratios can be supplied.

Gearbox controls including 4 engine speed set forward and reverse gearbox control, automatic heavy loading on the engine, gearbox and starting when changing from "fixed" to "float" and vice versa. The type of control and linkage between engine gearbox and motor varies with the class of the gearbox fitted and the vessel in which the equipment is installed. For port and starboard high speed shaft an integrated system of pneumatic system, operated by a command lever is used for the engagement and disengagement of gearbox, for reverse and forward running, and required increase and decrease of engine speed reaction and holds always built into the system to safeguard engine and gearbox during these operations. One up down sea trial at the gearbox and engine when desired or automatic controls are fitted for emergency stoppage, or alternative mechanical remote control system and gearbox interface can also be fitted for the vessel.

ESSENTIALLY RESILIENT COUPLERS

REMOTE CONTROL AND CONDITION MONITORING EQUIPMENT

SHAFTING AND PROPELLERS

AUTOMATIC CONTROL EQUIPMENT Information at many of the plant services is a recognized operational requirement. Standard units to meet specific requirements with the built-in protection of essential operating services can be provided.

Functions which can be automated are:

Start and stop of propulsion and auxiliary diesel engines, increase and decrease of engine speed, manoeuvring ahead, neutral and astern operations of gearboxes, engagement and disengagement of shafting, emergency shaft locks, control of variable pitched propellers.

The opening and closing of sea cocks, starting of air compressors, selection of oil fuelies, fuel and lubricating oil filtering and monitoring, engine protection and warning equipment.

SPARES The Company can supply spares to meet operator's or classification societies' requirements.

TOOLS AND SPARES Standard tools are supplied for normal maintenance duties. A special set of spare parts is supplied.

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100, Victoria Road
Shepperton, Middlesex
U.K. UB8 3PH
Tel: 0894 22222
Telex: 520000
Fax: 0894 22222

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CATEGORY

A

Paxman Vega

Marine Propulsion Ratings Diesel Engines

1074-1718 kW brake 1440-2308 bhp 1480-2332 cvdhp

PERFORMANCE INFORMATION

PERFORMANCE DATA

RATED ENGINE POWER	1074 kW (1440 bhp)		1440 kW (1936 bhp)		1718 kW (2308 bhp)	
	1074 kW (1440 bhp)	1440 kW (1936 bhp)	1440 kW (1936 bhp)	1718 kW (2308 bhp)	1718 kW (2308 bhp)	1440 kW (1936 bhp)
VEGA	1074	1440	1440	1718	1718	1440
	1074	1440	1440	1718	1718	1440

PERFORMANCE DATA

Number of cylinders

6/8

Max. prop. shaft torque (kNm) 1074 1440 1718

Max. prop. shaft torque (bhp) 1440 1936 2308

Max. prop. shaft torque (cvdhp) 1480 1972 2332

PERFORMANCE DATA

Number of cylinders

6/8

Max. prop. shaft

Max. prop. shaft

Max. prop. shaft torque (kNm) 1074 1440 1718

Max. prop. shaft

Max. prop. shaft torque (bhp) 1440 1936 2308

Max. prop. shaft torque (cvdhp) 1480 1972 2332

Max. prop. shaft torque

Max. prop. shaft torque

Max. prop. shaft torque

CATEGORY

1 HIGH SPEED CRAFT

- Fast start/stop
- High speed/variable
- Fast response/variable
- Short engine times
- and
- Wide applications

Standard ISO 15934 certification available

ACTIVE SUPPORT

Active support is available for the Vega engine through the Paxman Vega Active Support Programme. This programme provides a range of services to support the engine throughout its life cycle.

The Vega engine is available in a range of configurations to suit your requirements. Contact your local Paxman representative for more information.

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PERFORMANCE DATA

Max. prop. shaft torque (kNm) 1074 1440 1718

NOTES

1. The Vega engine is available in a range of configurations to suit your requirements. Contact your local Paxman representative for more information.
2. The Vega engine is available in a range of configurations to suit your requirements. Contact your local Paxman representative for more information.



CATEGORY

B

Paxman Vega

Marine Propulsion Ratings Diesel Engines

1820-1480 kW brake 1365-2000 bhp 1385-2000 cv¹

PRESSURE CHARACTERISTICS

RAISED TO 100 RPM

	1000 RPM			1200 RPM	
	1000	1000	1000	1000	1000
VEGA	1000	1000	1000	1000	1000
	1000	1000	1000	1000	1000

CATEGORY

B MEDIUM SPEED CRAFT

- Diesel
- Crankshaft
- Reverse gear
- Long stroke
- Turbo-charged
- 1000-1200 RPM
- 1000-1200 CV¹
- 1000-1200 bhp
- 1000-1200 kW
- 1000-1200 CV¹
- 1000-1200 bhp
- 1000-1200 kW

Category B2B, maximum certified at 1000 RPM

PERFORMANCE

Rated performance achieved at 1000 RPM, 1000 CV¹, 1000 bhp, 1000 kW. Actual performance may vary due to engine condition, ambient conditions, etc.

1000 CV¹ = 1000 kW (1000 CV¹ = 1000 kW)

OPERATING CONDITIONS AND LIMITS

At 1000 RPM, 1000 CV¹, 1000 bhp, 1000 kW, the engine will operate at 1000 CV¹, 1000 bhp, 1000 kW for 1000 hours.

NOTES

1. CV¹ is a metric unit of power and is equal to 735.5 W.
2. Actual performance may vary due to engine condition, ambient conditions, etc.



PERFORMANCE AT 1000 RPM

Number of cylinders	1000	1200	1400	1600
Power (kW)	1000	1000	1000	1000
Power (bhp)	1000	1000	1000	1000
Power (CV ¹)	1000	1000	1000	1000

PERFORMANCE AT 1200 RPM

Number of cylinders	1000	1200	1400	1600
Power (kW)	1000	1000	1000	1000
Power (bhp)	1000	1000	1000	1000
Power (CV ¹)	1000	1000	1000	1000



Dimensions (mm)

Model Type	L	L ₁	H	H ₁	H ₂	H ₃	H ₄	H ₅	H ₆	Weights (kg)			
										Wet Weight W _W	Wet Weight W _{W1}	Wet Weight W _{W2}	
TUSA	10	200	40	100	100	150	100	100	100	100	1.200.000	1.200.000	1.200.000
	15	200	40	100	100	150	100	100	100	1.200.000	1.200.000	1.200.000	
	20	200	40	100	100	150	100	100	100	1.200.000	1.200.000	1.200.000	

Dayman Engine Model
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP

Dayman Engine Model
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP
 10/15/20 HP



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 HANSON ENGINEERING GROUP





CATEGORY

C

Paxman Vega

Marine Propulsion Ratings Diesel Engines

855-1185 kW brake 1200-1600 bhp 1215-1620 cvps

PRESSURE CHARGED/INTERCOOLED

RATING SYSTEM

Paxman	SPECIAL		
	1200 kW	1400 kW	1600 kW
1200	1200	1400	1600
1400	1400	1600	1600

CATEGORY

C LONG RANGE VESSELS

- Operates with unlimited operating range under unrestricted continuous operation
- Long-range fishing vessels
- Cargo and ferries
- etc.
- Other application

For more information visit www.paxman.com

RATING QUANTITIES

Rated maximum Category C
The maximum 15 minutes

Continuously, Category C
150% 150% 150%

At 150% the temperature increase in the cooling water is 10°C (180°F) and the maximum speed is 150% of the rated speed.

NOTES

1. The maximum 15 minutes rating is only valid for the maximum 15 minutes of the operating cycle.
2. The maximum 15 minutes rating is only valid for the maximum 15 minutes of the operating cycle.

EXPERIENCE, *at* prices

Number of engines	1200	1400	1600
1200	1200	1400	1600
1400	1400	1600	1600
1600	1600	1600	1600

PERFORMANCE - BOWL, kW, hp

Number of engines	1200	1400	1600
1200	1200	1400	1600
1400	1400	1600	1600
1600	1600	1600	1600
1800	1800	1800	1800
2000	2000	2000	2000
2200	2200	2200	2200
2400	2400	2400	2400
2600	2600	2600	2600
2800	2800	2800	2800
3000	3000	3000	3000
3200	3200	3200	3200
3400	3400	3400	3400
3600	3600	3600	3600
3800	3800	3800	3800
4000	4000	4000	4000
4200	4200	4200	4200
4400	4400	4400	4400
4600	4600	4600	4600
4800	4800	4800	4800
5000	5000	5000	5000
5200	5200	5200	5200
5400	5400	5400	5400
5600	5600	5600	5600
5800	5800	5800	5800
6000	6000	6000	6000
6200	6200	6200	6200
6400	6400	6400	6400
6600	6600	6600	6600
6800	6800	6800	6800
7000	7000	7000	7000
7200	7200	7200	7200
7400	7400	7400	7400
7600	7600	7600	7600
7800	7800	7800	7800
8000	8000	8000	8000
8200	8200	8200	8200
8400	8400	8400	8400
8600	8600	8600	8600
8800	8800	8800	8800
9000	9000	9000	9000
9200	9200	9200	9200
9400	9400	9400	9400
9600	9600	9600	9600
9800	9800	9800	9800
10000	10000	10000	10000





DIMENSIONS (mm)

MODEL TYPE	DIMENSIONS (mm)								WEIGHTS (kg)			
	L1	L2	L3	L4	H1	H2	H3	H4	WATER PUMP WEIGHT (kg)	COOLING FAN WEIGHT (kg)	CRANKSHAFT WEIGHT (kg)	
D50A	1300	800	2100	1000	500	1000	1000	1000	1000	1000	1000	1000
	1300	800	2100	1000	500	1000	1000	1000	1000	1000	1000	1000
1300		800	2100	1000		1000	1000	1000	1000	DETAILS ON REQUEST		

For more information, contact your distributor or visit our website at www.d50a.com

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DAVIDMAN

VEGA

INDUSTRIAL & OFFSHORE
POWER PACKS
714-1432kW6



DAYMAN

VEGA

DIESELS FOR
RAIL TRACTION
714-1432kW



