

A commercial heritage.

Initially designed for Alaskan fishermen, Lugger's have always been dependable. Used as prime movers on Northern Lights marine generator sets, they are well known by commercial and pleasure craft owners for long life and smooth, quiet operation. Today, electronically controlled Lugger's are adding US EPA Tier II compliance to their reputation for reliability, simplicity and durability.



An ironclad marinization.

Lugger 1066 (106 mm bore - 6 cylinder), 6.8 liter diesels have heavy-duty tractor blocks. This high torque design provides a strong foundation; but a marine engine is only as good as its marinization. A Lugger's expansion tank and liquid-cooled exhaust manifold is cast iron to withstand temperature fluctuations and resist electrolysis. Some engines only use bypass water to cool their exhaust manifolds. Lugger integrates the manifold into the cooling system mainstream. This, and two-pass water flow, assure even temperature control and eliminates hot spots.

Low RPM horses vs. paper ponies.

Light-duty, small-displacement diesels operate at speeds up to 4200 rpm. This means high piston speed and short life. Lugger power comes from large cubic inch displacement and long stroke design. With less spread between maximum and cruise RPM, a higher percentage of the available horsepower is usable. Lower rpm also means less noise and wear, more complete fuel combustion

and longer life.

Turbocharged or turbo-aftercooled.

All L1066s have turbochargers to increase power without resorting to high speed operation. Lugger turbochargers are liquid-cooled for safety.

Need more power? Choose the "A" or "H" models. These have an aftercooler that lowers the temperature of the combustion air. Cool, oxygen rich air gives you more power.

Wet liners protect your investment.

Lugger cylinder liners are surrounded by coolant for better heat dissipation. The liners are replaceable to reduce overhaul costs. Unlike "linerless" throw-aways, a Lugger can be rebuilt in the boat, over and over again.

Electronic engine control lower fuel costs.

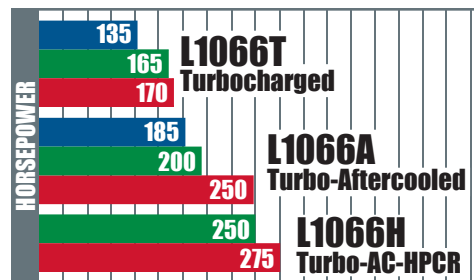
ECU controlled, direct fuel injection, long stroke and precise fuel metering all add up to excellent fuel economy.

Easy to live with.

Low RPM Lugger's are naturally quiet. No high RPM whine. Just a steady rhythm. A special silencer-filter reduces air intake noise. The cast rocker arm cover reduces valve noise and traps crankcase oil vapors to keep your engine room clean. Quiet and smooth; 1066s have torsional dampeners that decrease engine vibration.

If it isn't there, it can't break.

That's why the pipes, hoses, belts and gaskets common on other engines have been engineered away from Lugger's. This makes them easy to maintain too. Service points are



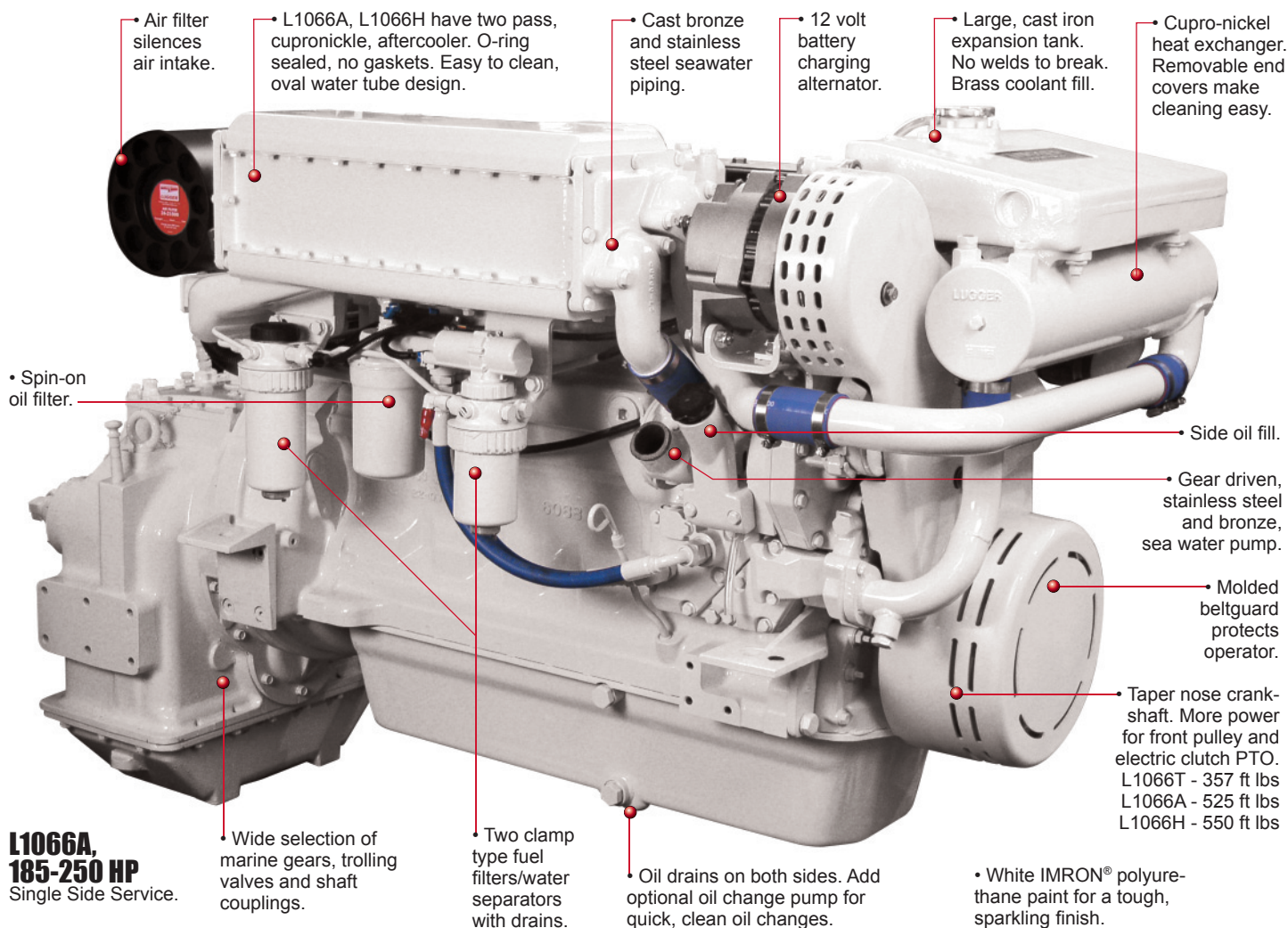
on one side of the engine for easy access and the in-line design gives you elbow room in the engine room.

Take power from both ends.

With an optional front power-take-off (PTO), your Lugger can power your vessel's bow thrusters, roller furling, anchor winches and other hydraulic auxiliary systems. It's more than an engine, it's a total marine power system.

Thorough testing.

Every Lugger engine is thoroughly tested and quality controlled before it leaves our factory, to ensure the reliability, durability and quality Lugger's are known for.



These are the features that make a good engine block into a great

Engine Block

- Six cylinder, four cycle, in-line, liquid cooled, overhead valve, marine diesels with heavy-duty, industrial-grade engine blocks.
- Replaceable wet cylinder liners for long life and low rebuild costs.
- Balanced, forged crankshaft with induction hardened journals and rolled fillets for long life.
- Bimetallic valves have chrome stems and valve rotators.
- Replaceable valve seats and guides.
- **L1066T, L1066A:** Two valves per cylinder.
- **L1066H:** Four valves per cylinder give increased air flow and allow injectors to be centered in the cylinder for an optimal spray pattern to increase power and fuel efficiency.
- Three ring aluminum alloy pistons. Ni-Resist insert for the top ring. Keystone piston ring reduces carbon buildup under light load.
- Torsional crankshaft vibration damper.
- Self adjusting eight groove poly-vee drive belt powers the alternator and jacket-water pump.



Direct Fuel Injection Systems

- **L1066T, L1066A:** Electronically controlled rotary

fuel injection pump for higher injection pressures, variable timing control and precise fuel metering. Higher power with lower emissions.

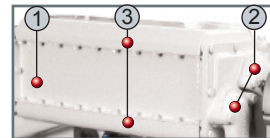
- **L1066H:** High-pressure common rail (HPCR) fuel injection for high output, improved fuel economy, better load response and low emissions. HPCR continuously supplies injectors with highly pressurized fuel. Higher pressure means better fuel atomization. Injectors are electronically operated by an engine control unit giving nearly infinite control of fuel quantity, injection timing and multiple injections per power cycle. Pilot injection reduces cold start smoke and noise.
- Ring clamp fuel filters with air vent and drain.
- Diaphragm-type, mechanically driven fuel transfer pump with manual priming lever.

Lubrication System

- 250 hour oil change with standard oil and fuel.
- Positive displacement gear-type oil pump.
- Full flow, spin-on oil filter.
- Oil spray cooling reduces piston crown temperature for longer life.
- Large capacity oil pan.
- Cast aluminum, rocker cover traps valve train noise and is a closed loop crankcase vent.
- Jacket water, plate-type, full flow oil cooler reduces heat and thermal breakdown of oil.

Air System

- Turbocharger (1) turbine housings are jacket water cooled for safety. Round flange lets optional wet or dry exhaust elbows rotate for easy exhaust system installation.
- **L1066A & H** Aftercooler has aircraft quality, 70/30 cupro-nickel, two pass element (1). Oval water tubes are easy to clean and promote better heat transfer than round. Corrugated air cooling fin design supports tubes better than plate fin type. Seawater piping (2) is cast bronze and stainless steel; water never touches the cast aluminum air ducts (3). No gaskets; all components are machined and have o-ring seals. Seawater direct from the gear driven pump, for maximum cooling. Dry bolt hole design for improved serviceability and system durability.
- Dry air filter silences intake noise.

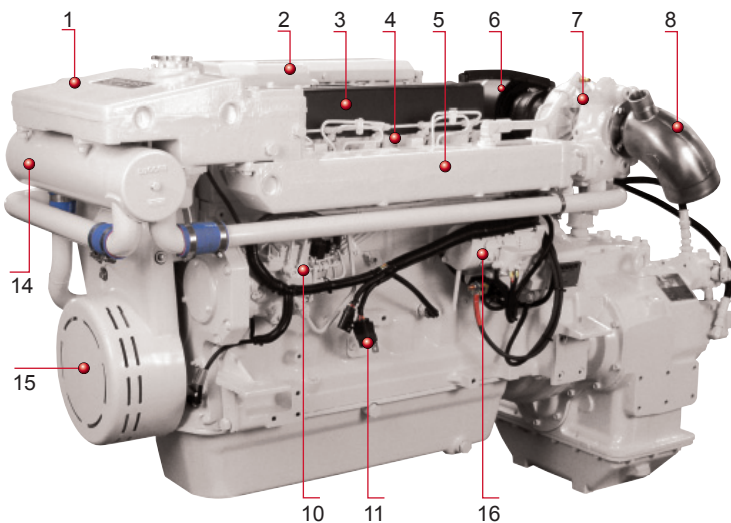


Cooling System

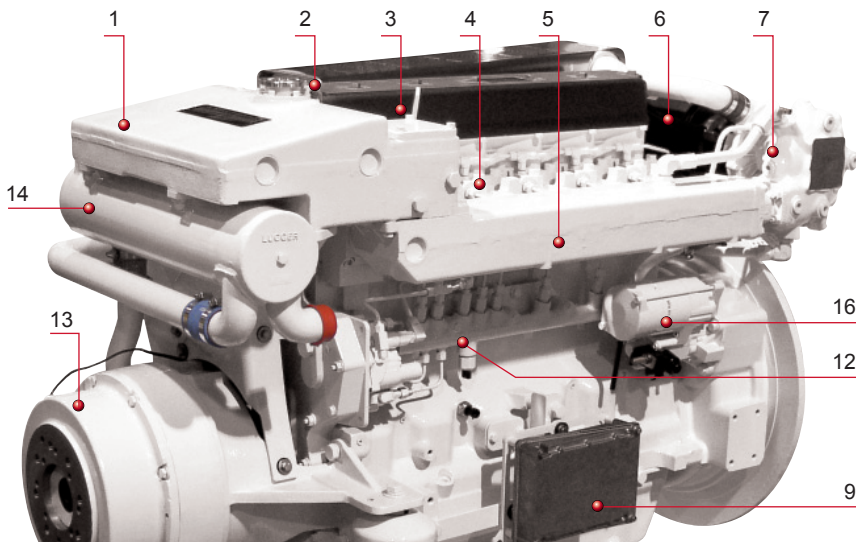
- Jacket water cooling system has two thermostats for safety and quicker warm-ups.
- Cast iron expansion tank. No welds to break. Large brass filler neck for easy filling.
- Cast-iron exhaust manifold has double pass jacket water flow for even temperature control, fast warm-up and no hot spots.
- Heat exchanger cooling has: Gear driven, flexible impeller seawater pump (1). Easy to clean, tube-type heat exchanger is cupro-nickel for long life. Zinc anodes for electrolysis protection.
- **L1066T** is available in keel cooled version.



L1066A: 185 HP to 250 HP



L1066H: 275 HP, electronic HPCR, 4-valve head, turbo-aftercooled.



L1066 Long Life Features

1. Cast iron expansion tank.
2. Cupro-nickel aftercooler for more power (1066A & 1066H).
3. Cast rocker arm cover reduces valve train noise. Closed loop crankcase vent keeps oil vapor inside the engine for a cleaner engine room.
4. Fuel injectors. Electronic fuel injectors on 1066H.
5. Jacket-water cooled, cast iron exhaust manifold. Two pass coolant flow for even temperature control.
6. Air filter/intake silencer.
7. Jacket-water cooled turbo turbine housing for safety.
8. Optional, stainless steel, wet exhaust elbow rotates for easy installation.
9. Engine control unit. Water resistant module protects ECU for electronic fuel injection and ESP engine system profiler. L1066A, above left, shown with optional off-engine ECU.
10. Electronically controlled rotary fuel injection pump. (L1066T and L1066A).
11. CANbus plug for ESP monitor.
12. Electronically controlled, high pressure, common rail, fuel injection system (L1066H).
13. Optional, front power-take-off with electric clutch. 357, 525, 550 ft lbs of power. See chart.
14. Cupro-nickel heat exchanger with removable end covers for easy cleaning.
15. Molded belt guard.
16. Starter placed high and dry.

ESP and DC Electrical System

- 12 volt, negative ground, DC system has circuit breaker, starter motor and battery charging alternator with regulator.
- Electronic System Profiler supplies a SAE J1939 engine information data stream for standard monitor (shown below).
- Instrument panel has tachometer, DC volt meter, hourmeter, coolant temperature gauge, oil pressure gauge, stop button, key switch and gauge light rheostat. Warning lights and audible alarm for low oil pressure and high water temperature.
- Engine and panel are prewired. 20-foot wire harness with plug-ins is standard.



Special Equipment

- Cast iron, centerline mounting brackets.
- Belt guard protects operator.
- Sparkling white IMRON® polyurethane paint protection. Excellent service visibility.
- Operator's and parts manuals are supplied.

L1066 Series Accessories and Options

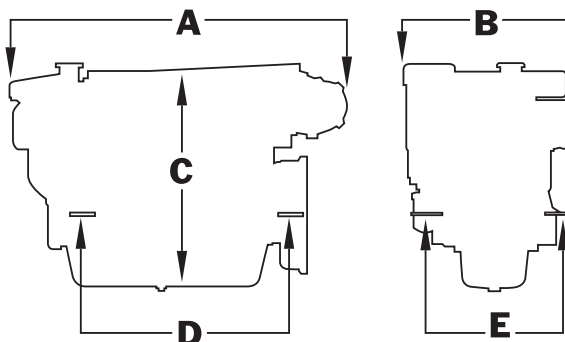
- Monitor uses Engine System Profiler (ESP) data stream to show engine operation conditions.
- Coolant level sensor/alarm.
- Wiring harness extensions.
- Plug-in flybridge and auxiliary instrument panels.
- 12 volt isolated ground, 24 volt standard and isolated ground DC electrical systems.
- Alternators: 12 volt/90 amps, 12 volt/140 amps, 24 volt/75 amps as a second alternator or in place of the original.
- Twin Disc® or ZF® reverse gears. Trolling valves. Shaft couplings.
- Spare parts kits.
- Front crankshaft pulleys: 3-A/B or 4-A grooves.
- Racor® fuel filters.
- "A" pad accessory drive on keel cooled L1066T only.
- Fiberglass water lift exhaust muffler.
- Stainless steel wet exhaust elbow.
- Dry exhaust elbows & flex.
- Vibration isolating, flexible engine mounts.
- High output front PTO (power take off) with 12 volt or 24 volt clutch and SAE B or C splined pump mount pad. At the touch of a button you have hydraulic pump power to power your vessel's auxiliary systems:
 - L1066T - 357 ft lbs
 - L1066A - 525 ft lbs
 - L1066H - 550 ft lbs



Data below based on High Output rated engines at maximum RPM.

Model Number	L1066T	L1066A	L1066H
High Output - fwhp (kW) @ RPM	170 (126) 2500	250 (185) 2400	275 (203) 2400
Medium Duty - fwhp (kW) @ RPM	165 (122) 2400	200 (148) 2200	250 (185) 2200
Continuous Duty - fwhp (kW) @ RPM	135 (100) 2200	185 (137) 2400	Not Available
Cylinders / Configuration / Cycle	6 / Inline / 4	6 / Inline / 4	6 / Inline / 4
Displacement - CID (ltr)	414 (6.8)	414 (6.8)	414 (6.8)
Operating Cycle/Aspiration	4 / Turbocharged	4 / Turbo-Aftercooled	4 / Turbo-Aftercooled
Bore x Stroke - in (mm)	4.19 x 5 (106 x 127)	4.19 x 5 (106 x 127)	4.19 x 5 (106 x 127)
Cooling (General)			
Coolant circ pump flow - gpm (lpm)/rpm	63 (240) / 2500	61 (230) / 2400	61 (230) / 2 400
Heat rejection to jacket water - BTU-min	5570	5382	5453
Cooling (Heat Exchanger) available on all models			
Rawwater intake/discharge dia. - in (mm)	1.25 (32)	2 (51)	2 (51)
Rawwater pump flow - gpm (lpm) / rpm	31 (117) / 2500	53 (200) / 2400	53 (200) / 2400
Rawwater pump max. suction head - in (m)	39 (1)	39 (1)	39 (1)
Max. raw water temp. at inlet -°F (°C)	86° (30°)	86° (30°)	86° (30°)
Jacket-water system capacity - US gal (ltr)	6.5 (24.6)	6.5 (24.6)	6.5 (24.6)
Cooling (Keel Cooled)* available on L1066T only			
*Based on 70° F seawater and min. full boat speed of 8 knots. Return water from keel cooler: 70° - 130° F.			
Water hose inside diameter - in (mm)	2-3/8 (60)	HE only	HE only
Head diameter - inch NPT	1-1/2	HE only	HE only
Turbo tube length - ft (m)	24 (7.3)	HE only	HE only
1 in. plain round tube length - ft (m)	56 (17)	HE only	HE only
Skin cooler aluminum - sq ft (m ²)	26 (2.4)	HE only	HE only
Skin cooler steel - sq ft (m ²)	85 (8.9)	HE only	HE only
Electrical			
Min. 12V battery capacity - amp hrs / CCA	200 / 800	200 / 800	200 / 800
Battery cable size up to 10 ft run	"000"	"000"	"000"
Standard panel harness length - ft (m)	20 (6)	20 (6)	20 (6)
Air and Exhaust			
Engine air consumption - cfm (m ³ /min) / rpm	417 (11.8) / 2500	629 (17.8) / 2400	622 (17.6) / 2400
Min. engine room vent area - sq in (m ²)	113 (0.073)	184 (0.12)	182 (0.12)
Exhaust gas flow at - cfm (m ³ /min) / rpm	1038 (29.4) / 2500	1465 (41.5) / 2400	1480 (41.9) / 2400
Exhaust gas temperature -°F (°C) / rpm	876 (469) / 2 500	860 (460) / 2400	883 (473) / 2400
Max. exhaust back pressure - in (mm) H ₂ O	30 (762)	30 (762)	30 (762)
Suggested dry/wet exhaust I.D. - in (mm)	3 (75) / 4 (100)	4 (100) / 5 (127)	4 (100) / 5 (127)
Fuel and Oil			
Minimum fuel suction/return line - in (mm)	3/8 (10)	3/8 (10)	3/8 (10)
Maximum fuel pump head - in (m)	39 (1)	39 (1)	39 (1)
Crankcase oil capacity - US qts (ltr)	19 (18)	32.5 (34.34)	32.5 (34.34)
Other Data			
Engine rotation (facing flywheel)	Counter-CW	Counter-CW	Counter-CW
Flywheel housing size - SAE #	2	2	2
Opt. front PTO size - SAE # / ft lbs torque	5 / 357	5 / 525	5 / 550
Maximum operating down angle front/rear	0° / 12°	0° / 12°	0° / 12°
Weight w/o gear - heat exchanger - lbs(kg)	1982 (1080)	2155 (1174)	2162 (1178)
Weight w/o gear - keel cooled - lbs(kg)	1960 (1068)	n/a	n/a

Dimensional Data: Do NOT use for installation. Contact factory for installation drawings.



Dimensions subject to change without notice.

Dimensions: L1066T inch (mm)	
A length	54.94 (1395.5)
B width	27.29 (693.2)
C height	36.20 (919.5)
D mounts	33.98 (863)
E mounts	25.5 (647.7)
Dimensions: L1066A inch (mm)	
A length	56.62 (1438.9)
B width	29.65 (753.1)
C height	37.31 (947.6)
D mounts	33.98 (863)
E mounts	25.5 (647.7)
Dimensions: L1066H inch (mm)	
A length	55.62 (1412.7)
B width	28.89 (733.8)
C height	37.31 (947.6)
D mounts	33.98 (863)
E mounts	25.5 (647.7)

Model Number	L1066T
High Output FWHP / kW / rpm	170 / 126 / 2500
Medium Duty FWHP / kW / rpm	165 / 122 / 2400
Continuous FWHP / kW / rpm	135 / 100 / 2200

Model Number	L1066A
High Output FWHP / kW / rpm	250 / 185 / 2400
Medium Duty FWHP / kW / rpm	200 / 148 / 2200
Continuous FWHP / kW / rpm	185 / 137 / 2400

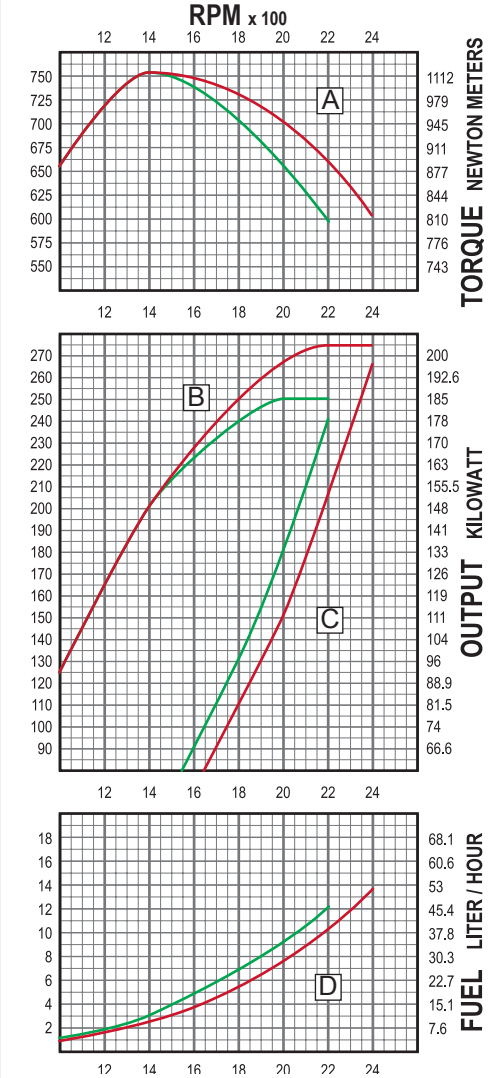
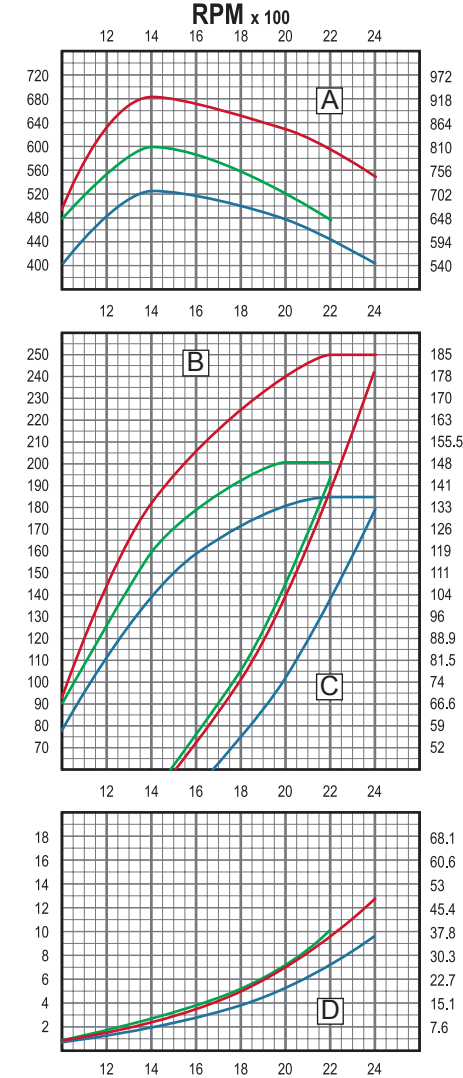
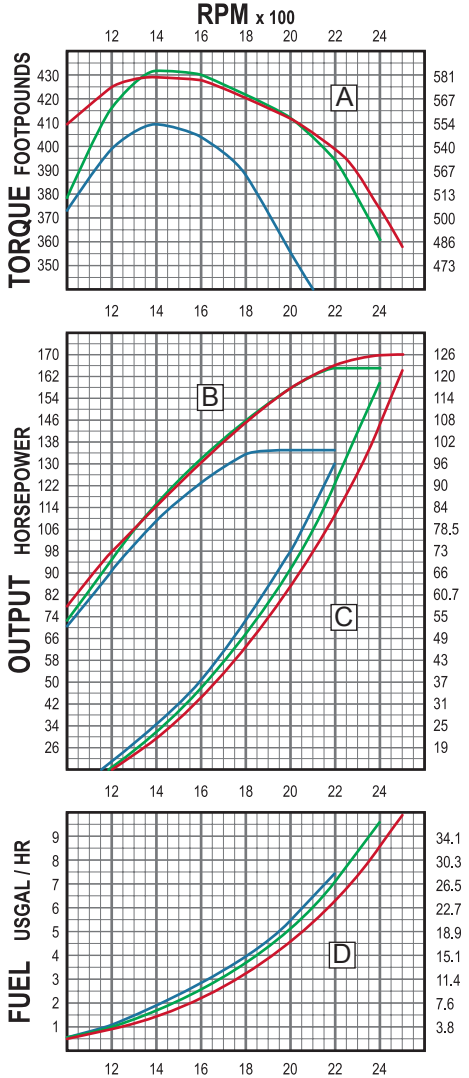
Model Number	L1066H
High Output FWHP / kW / rpm	275 / 203 / 2400
Medium Duty FWHP / kW / rpm	250 / 185 / 2200

Rating Definitions: Following are the definitions of duty ratings for Lugger. Please contact your Lugger representative to verify your application.

High Output: Based on a load factor of 20% or less. A maximum of five minutes at full throttle, followed by not less than ten minutes at cruise power or below. For applications up to 200 total hours per year.

Medium Duty: Based on a load factor of 66% or less. A maximum of two hours at full throttle, followed by at least one hour at cruise power or below. For applications up to 4000 total hours per year.

Continuous Duty: Based on a load factor of 100%. No limit on time at full throttle. No limit on hours per year.



Rating Curve	CONTINUOUS				MEDIUM DUTY			
	A	B	C	D	A	B	C	D
RPM	ft/lbs	fwhp	pdhp	gph	ft/lbs	fwhp	pdhp	gph
1000	373	71	12	0.6	378	72	11.6	0.6
1200	398	91	21	1.1	416	95	19.9	1
1400	409	109	33.6	1.8	431	115	31.7	1.7
1600	404	123	50	2.7	430	131	47	2.5
1800	388	133	71	3.9	423	145	67	3.6
2000	355	135	98	5.4	412	157	92	5.1
2200	322	135	130	7.4	394	165	123	7.1
2400	--	--	--	--	361	165	159	9.6

Rating Curve	CONTINUOUS				MEDIUM DUTY			
	A	B	C	D	A	B	C	D
RPM	ft/lbs	fwhp	pdhp	gph	ft/lbs	fwhp	pdhp	gph
1000	404	77	13	0.7	478	91	18	0.9
1200	481	110	22.3	1.1	551	126	31.4	1.6
1400	525	140	35.4	1.8	596	159	50	2.5
1600	519	158	52.9	2.6	584	178	74	3.7
1800	502	172	75	3.7	560	192	105.7	5.3
2000	475	181	103.4	5.2	525	200	145	7.3
2200	442	185	137.5	7.1	477	200	193	10.1
2400	405	185	178.5	9.5	--	--	--	--

Rating Curve	MEDIUM DUTY				HIGH OUTPUT			
	A	B	C	D	A	B	C	D
RPM	ft/lbs	fwhp	pdhp	gph	ft/lbs	fwhp	pdhp	gph
1000	657	125	22.7	1.2	657	125	19.2	1
1200	718	164	39.2	1.9	718	164	33.2	1.6
1400	754	201	62	3.1	754	201	52.7	2.6
1600	739	225	92.8	4.5	745	227	78.6	3.8
1800	700	240	132	6.4	727	249	112	5.4
2000	656	250	181	8.9	704	268	153	7.5
2200	597	250	241	12.1	657	275	204	10.2
2400	--	--	--	--	602	275	265.4	13.5

Notes:

1. Max. cruise rpm for High Output and Medium Duty ratings is 200 rpm below highest attainable rpm.

Curves:

A. Max. torque at flywheel.

B. Flywheel power. Prop shaft power is 3-3.5% lower due to transmission/reduction gear power loss.

C. Theoretical prop power draw (3.0 exponent).

D. Fuel consumption based on theoretical propeller horsepower draw. Your fuel consumption will vary higher or lower depending on your vessel and operating conditions.

Dealer

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