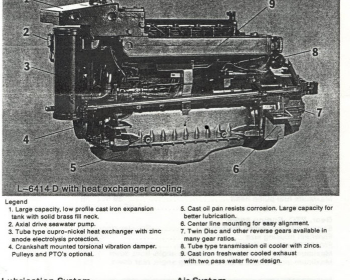
LUGGER®

L-6414D
145HP @ 2500 RPM

Specifications

Model L-6414D
Cylinders ..... 6 inline
Displacement ... 414 cu. in. (6.78 ltr)
Operating cycle 4
Bore ..... 4.19 in. (106 mm)
Stroke ..... 5.0 in. (127 mm)
Compression ratio 16.8:1
Aspiration ..... Natural
Approx. weight ... 1450 lbs (660 kg) keel cooled w/o gear
Approx. weight ... 1490 lbs (675 kg) heat exchanger w/o gear



L-6414 D with heat exchanger cooling

Legend
1. Large capacity, low profile cast iron expansion tank with solid brass fill neck.
2. Axial drive seawater pump.
3. Tube type cupro-nickel heat exchanger with zinc anode electrolysis protection.
4. Crankshaft mounted torsional vibration damper. Pulleys and PTO's optional.
5. Cast oil pan resists corrosion. Large capacity for better lubrication.
6. Center line mounting for easy alignment.
7. Twin Disc and other reverse gears available in many gear ratios.
8. Tube type transmission oil cooler with zincs.
9. Cast iron freshwater cooled exhaust with two pass water flow design.

Features and Standard Equipment

Engine Block

- John Deere six cylinder base block.
- Four cycle operation for fuel efficiency.
- Seven main bearings for rigid crankshaft support.
- Balanced forged-steel crankshaft with induction hardened bearing surfaces.
- Forged-steel connecting rods.
- Replaceable wet cylinder liners for heat dissipation, longer life and lower rebuild costs.
- Cast-iron cylinder head designed to swirl fuel and air for efficient combustion.
- Steel alloy valves with replaceable seats and chrome plated stems.
- Exhaust and intake valve rotators reduce valve wear.
- Three ring aluminum alloy pistons with iron ring inserts.
- Top compression ring's Keystone design reduces carbon build-up under light load conditions. Second compression ring is rectangular. Oil scraper third ring.

Fuel System

- Compact distributor-type injection pump with automatic pressure adjustment and temperature compensation.
- Small diameter injectors with exclusive edge filter design.
- Electric, energize-to-run, rack solenoid.
- Two stage fuel filter with replaceable element and drain.
- Diaphragm-type, mechanically driven transfer pump.

Lubrication System

- Crankshaft drive, positive displacement, gear-type oil pump.
- Two full-flow, spin-on oil filters with by-pass.
- Oil spray piston cooling for longer life.
- Freshwater oil cooler extends oil life and dissipates heat.
- Cast oil pan resists corrosion and dampens noise.

Cooling System

- Freshwater cooling system with two thermostats for safety, quick warm-ups and even cooling.
- Large capacity, cast-iron expansion tank with brass filler neck.
- Cast-iron exhaust manifold with two pass water flow for even temperature control.
- Complete system protection from electrolysis by zinc anodes.
- Available in either heat exchanger or keel cooled configurations.
- Heat exchanger configuration includes: Axially driven, Jabsco-type sea water pump and easy-clean tube type cupro-nickle heat exchanger.

Air System

- Replaceable, dry-type air filter silences intake noise.
- Freshwater cooled, cast-iron exhaust manifold with free exhaust flow.
- Optional wet or dry exhaust elbows, flex joints and muffler available.

Electrical System

- 12 volt, negative ground, marine grade electrical system includes: starter motor, 61 amp battery charging alternator and voltage regulator.
- Instrument panel includes: tachometer, engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter and key switch.
- Engine and panel are prewired and connected by a 20 foot wiring harness with water-resistant plugs.
- High water temperature and low oil pressure warning system with alarm horn.

Installation

Cooling (General)
Fresh-water circulating pump flow at 2200 RPM .... 57 gal.(216 ltr)
Heat rejection to jacket water ..... 4032 BTU-min.

Cooling (Heat Exchanger)
Raw-water intake ..... 1.5 in. NPT (38mm)
Raw-water discharge diameter ..... 1.5 in. NPT (38mm)
Raw-water pump flow at 2500 RPM ..... 24 gpm (91 lpm)
Raw-water pump max. suction head ..... 39 in. (1 m)
Maximum raw-water temperature at inlet ..... 85 F (30 C)
Fresh-water system capacity ..... 9 gal. (19 ltr)

Cooling (Keel Cooled)
Water hose inside diameter ..... 2¾ in. (60mm)
Head diameter ..... 1½ in. (38mm)
Turbo tube length * ..... 18 ft. (5.5 m)
One inch plain round tube length * ..... 40 ft. (12 m)
Skin cooler aluminum * ..... 18 sq. ft. (1.7 m^2)
Skin cooler steel * ..... 52 sq. ft. (4.8 m^2)
* Based on 70 F sea water temperature and minimum boat speed of 9 knots at full speed. Return water on keel cooling 70° to 130 F.

Electrical
Minimum battery capacity ..... 172 amp. hours
Battery cable size ..... 0 up to 10 ft. run
Standard instrument harness length ..... 20 ft. (6.1 m)

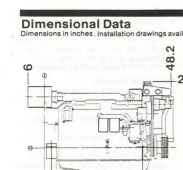
Air
Engine air consumption at 2500 RPM ..... 210 cfm ($6 m^3$/min)
Minimum engine room vent area ..... 90 sq. in. (650 cm^2)
Exhaust gas flow at 2500 RPM ..... 515 cfm ($19 m^3$/min)
Exhaust gas temp. at 2500 RPM ..... 1000°F (593°C)
Maximum exhaust backpressure ..... 30 in. (75 cm) H_2O
Suggested dry exhaust I.D. ..... 3 in. (76 mm)
Suggested wet exhaust I.D. ..... 4 in. (100 mm)

Fuel and Oil
Minimum fuel suction line ..... ⅜ in. (9.5mm)
Minimum fuel return line ..... ⅜ in. (9.5mm)
Maximum fuel pump head ..... 39 in. (1 m)
Crankcase oil capacity ..... 18 US qts. (17 ltr)

Gear, PTO, Engine Angle
Engine rotation (facing flywheel) ..... Counter-clockwise
Flywheel housing size ..... SAE 2
Front PTO size (optional) ..... SAE 5
Maximum intermittent engine operating angle, front down ..... 0°
Maximum intermittent engine operating angle, rear down ..... 15°

Dimensional Data

Dimensions in inches. Installation drawings available.



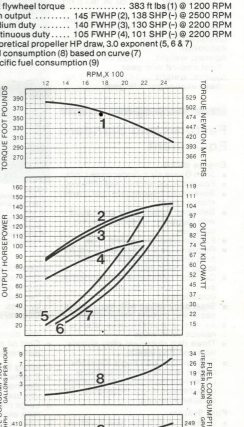
Marine Gears

The following gears are rated by the gear manufacturers for this engine's horsepower, torque and RPM. Please note application limitations and consult your dealer for gear recommendations for your vessel.

Manufacturer	Model	Application
Twin Disc	MG-506-1	ALL
Twin Disc	MG-5050	ALL
Hurth	800	ALL
Borg Warner	AS-72	Pleasure Boat

Performance Data

Max flywheel torque ..... 383 ft lbs (1) @ 1200 RPM
High output ..... 145 FWHP (2), 138 SHP (~) @ 2500 RPM
Medium duty ..... 140 FWHP (3), 130 SHP (~) @ 2200 RPM
Continuous duty ..... 105 FWHP (4), 101 SHP (~) @ 2200 RPM
Theoretical propeller HP draw, 3.0 exponent (5, 6 & 7)
Fuel consumption (8) based on curve (7)
Specific fuel consumption (9)



LUGGER

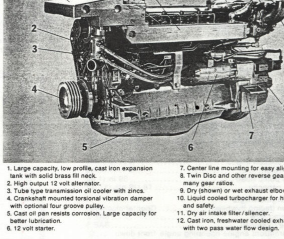
Mfg. by Alaska Diesel Electric
Box 70543, Seattle, WA 98107 (206) 789-3880

LUGGER

L-6414T
175 HP @ 2200 RPM

Specifications

Model L-6414T
Cylinders ..... 6 inline
Displacement ... 414 cu. in. (6.78 ltr)
Operating cycle 4
Bore ..... 4.19 in. (106mm)
Stroke ..... 5.0 in. (1.27mm)
Compression ratio 16.3:1
Aspiration ..... Turbocharged
Approx. weight ... 1475 lbs (670 kg) keel cooled w/o gear
Approx. weight ... 1515 lbs (685 kg) heat exchanger w/o gear



1. Large capacity, low profile, cast iron expansion tank with solid brass fill neck.
2. High output 12 volt alternator.
3. Tube type transmission oil cooler with zincs.
4. Crankshaft mounted torsional vibration damper with optional four groove pulley.
5. Cast oil pan resists corrosion. Large capacity for better lubrication.
6. 12 volt starter.
7. Center line mounting for easy alignment.
8. Twin Disc and other marine gears available in many gear ratios.
9. Dry (shown) or wet exhaust elbows.
10. Liquid cooled turbocharger for high output and safety.
11. Dry air intake filter/silencer.
12. Cast iron, freshwater cooled exhaust manifold with two pass water flow design.

Features and Standard Equipment

Engine Block

- John Deere six cylinder base block.
- Four cycle operation for fuel efficiency.
- Seven main bearings for rigid crankshaft support.
- Balanced forged-steel crankshaft with induction hardened bearing surfaces.
- Forged-steel connecting rods.
- Replaceable wet cylinder liners for heat dissipation, longer life and lower rebuild costs.
- Cast-iron cylinder head designed to swirl fuel and air for efficient combustion.
- Steel alloy valves with replaceable seats and chrome plated stems.
- Exhaust and intake valve rotators reduce valve wear.
- Three ring aluminum alloy pistons with iron ring inserts.
- Top compression ring's Keystone design reduces carbon build-up under light load conditions. Second compression ring is rectangular. Oil scraper third ring.

Fuel System

- Compact distributor-type injection pump with automatic pressure adjustment and temperature compensation.
- Small diameter injectors with exclusive edge filter design.
- Electric, energize-to-run, rack solenoid.
- Two stage fuel filter with replaceable element and drain.
- Diaphragm-type, mechanically driven transfer pump.

Lubrication System

- Crankshaft drive, positive displacement, gear-type oil pump.
- Two full-flow, spin-on oil filters with by-pass.
- Oil spray piston cooling for longer life.
- Freshwater oil cooler extends oil life and dissipates heat.
- Cast oil pan resists corrosion and dampens noise.

Cooling System

- Freshwater cooling system with two thermostats for safety, quick warm-ups and even cooling.
- Large capacity, cast-iron expansion tank with brass filler neck.
- Cast-iron exhaust manifold with two pass water flow for even temperature control.
- Complete system protection from electrolysis by zinc anodes.
- Available in either heat exchanger or keel cooled configurations.
- Heat exchanger configuration includes: Axially driven, Jabsco-type sea water pump and easy-clean tube type cupro-nickle heat exchanger.

Air System

- Turbo-compressor to increase horsepower, lower specific fuel consumption and lower thermal loading for longer life.
- Turbo-compressors are freshwater cooled for safety, long life and lower engine room temperatures.
- Replaceable, dry-type air filter silences intake noise.
- Freshwater cooled, cast-iron exhaust manifold with free exhaust flow to turbo-compressor.
- Optional wet or dry exhaust elbows, flex joints and muffler available.

Electrical System

- 12 volt, negative ground, marine grade electrical system includes: starter motor, 75 amp battery charging alternator and voltage regulator.
- Instrument panel includes: tachometer, engine hour meter, coolant temperature gauge, oil pressure gauge, DC voltage meter and key switch.
- Engine and panel are prewired and connected by a 20 foot wiring harness with water-resistant plugs.
- High water temperature and low oil pressure warning system with alarm horn.

Installation

Cooling (General)

Fresh-water circulating pump flow at 2200 RPM	57 gal.(216 ltr)
Heat rejection to jacket water	4536 BTU-min.

Cooling (Heat Exchanger)

Raw-water intake	1.5 in. NPT (38mm)
Raw-water discharge diameter	1.5 in. NPT (38mm)
Raw-water pump flow at 2200 RPM	24 gpm (91 lpm)
Raw-water pump max. suction head	39 in. (1 m)
Maximum raw-water temperature at inlet	85 F (30 C)
Fresh-water system capacity	5 gal. (19 ltr)

Cooling (Keel Cooled)

Water hose inside diameter	2⅜ in. (60mm)
Head diameter	1½ in. (38mm)
Turbo tube length *	24 ft. (7.3 m)
One inch plain round tube length *	50 ft. (15.3 m)
Skin cooler aluminum *	24 sq. ft. (2.3 m²)
Skin cooler steel *	65 sq. ft. (6 m²)

* Based on 70 F sea water temperature and minimum boat speed of 6 knots at full speed. Return water on keel cooling 70 to 130 F.

Electrical

Minimum battery capacity	172 amp. hours
Battery cable size	0 up to 10 ft. run
Standard instrument harness length	20 ft. (6.1 m)

Air

Engine air consumption at 2200 RPM	360 cfm (10.2m³/min)
Minimum engine room vent area	110 sq. in. (706 cm²)
Exhaust gas flow at 2200 RPM	885 cfm (33 m³/min)
Exhaust gas temp. at 2200 RPM	975 F (523 C)
Maximum exhaust backpressure	30 in. (75 cm) H_2O
Suggested dry exhaust I.D.	4 in. (100 mm)
Suggested wet exhaust I.D.	5 in. (127 mm)

Fuel and Oil

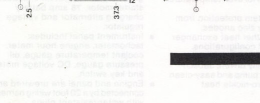
Minimum fuel suction line	⅜ in. (9.5mm)
Minimum fuel return line	⅜ in. (9.5mm)
Maximum fuel pump head	39 in. (1 m)
Crankcase oil capacity	18 US qts. (17 ltr)

Gear, PTO, Engine Angle

Engine rotation (facing flywheel)	Counter-clockwise
Flywheel housing size	SAE 2
Front PTO size (optional)	SAE 5
Maximum intermittent engine operating angle, front down	0
Maximum intermittent engine operating angle, rear down	15°

Dimensional Data

Dimensions in inches . Installation drawings available.



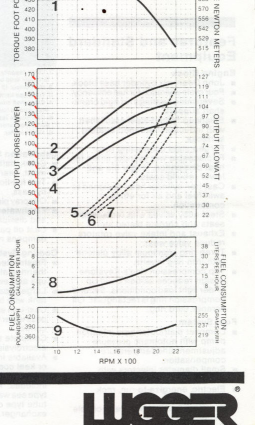
Marine Gears

The following gears are rated by the gear manufacturers for this engine's horsepower, torque and RPM. Please consult your Lugger dealer for gear recommendations for your vessel.

Manufacturer	Model	Application
Twin Disc	MG-506-1	ALL
Twin Disc	MG-5050	ALL
Hurth	630	Commercial
Hurth	800	ALL

Performance Data

Max flywheel torque	445 ft lbs (1) @ 1400 RPM
High output	175 FWHP (2), 154 SHP (~) @ 2200 RPM
Medium duty	165 FWHP (3), 135 SHP (~) @ 2200 RPM
Continuous duty	120 FWHP (4), 116 SHP (~) @ 2200 RPM
Theoretical propeller HP draw, 3.0 exponent (5, 6 & 7)	
Fuel consumption (8) based on curve (5)	
Specific fuel consumption (9)	



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