## The Lugger 12V140A. Today's intelligent alternative to the engines of the past.

Until now, a large vessel owner has been trapped in a power dilemma.

On one hand are engines based on old technology. Expensive to operate, these old stand-bys have stretched power ratings and short rebuild cycles.

On the other are extremely sophisticated, very expensive engines. It takes a factory trained technician just to do routine maintenance.

Enter the Lugger 12V140A. This engine combines advanced technology with common sense design. It gives high performance but never at the expense of long life or reliability.

**Proven at sea.**

The 12V shares many components with the Lugger 6140A which has proven itself in all types of craft worldwide. The 12V brings these time tested components and design concepts to the large vessel owner.

**Put more in.**

No other engine in this horsepower range gives you all the long life features of the 12V. Nodular iron pistons with dual circuit oil spray cooling. Individual, four valve cylinder heads. Replaceable wet cylinder liners. Liquid cooled turbochargers. Aftercoolers with a dedicated freshwater cooling circuit. Bosch injection. Dual air, fuel, water and oil filtration. Optional front power take off. The list goes on and on. Which is why the 12V will run on and on.

**Take less out.**

With 1860 c.i.d., the 12V has 25% more cubes than its nearest competitor. Its 0.69 hp/cid ratio is conservative versus the competitor's 0.95. And its maximum speed is 2100 rpm instead of 2300. Now, which engine do you think will last longer?

**Compact size, light weight.**

The 12V gives you more displacement but doesn't take up more room. It's actually over five inches shorter than the competition.

Light too. Weighing 7,276 pounds, it has a power-to-weight ratio of 5.6 pounds per horsepower.

**Cut fuel costs.**

The 12V's performance comes from superior engineering and four cycle operation. So does its remarkably low fuel consumption rates. With an SFC that goes as low as 0.327 lbs/hp/hr, the 12V will lower your operating costs and extend your vessel's range.

**Easy to service.**

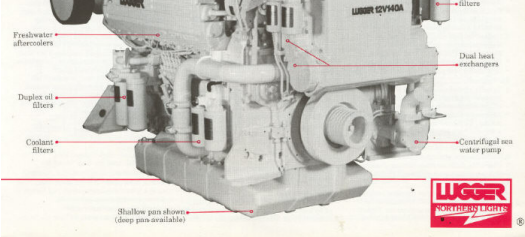
Clean design eliminates trouble spots. Hoses, belts, impellers and electronic gadgets have been engineered away. What's left is accessible and easy to maintain. Individual heads, wet liners and pan access doors allow one cylinder to be rebuilt without disturbing the rest. And, since it has only 12 cylinders instead of 16, rebuilds are 25% less painful.

**Clean, quiet operation.**

Internal oil lines and close tolerance machining eliminate oil leaks. Low load smoke is cut by clean burn combustion design and freshwater aftercooling. Four cycle operation and vibration attenuation features make it quiet and smooth. In the engine room or on deck, the 12V is an easy shipmate to live with.

**Solve your power dilemma.**

Contact your Lugger dealer or factory branch for information and application information on the Lugger 12V140A. The intelligent alternative to yesterday's diesels.

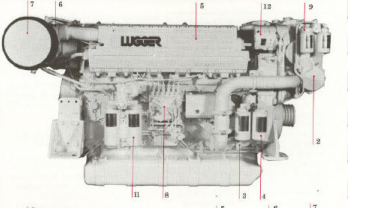



LUGGER NORTHERN LIGHTS ®

## Features and Equipment

**Engine Block**

- Komatsu 12 cylinder, heavy duty, industrial diesel engine block.
- Four cycle for quiet, fuel efficient operation.
- Internal ribs for compact size and strength.
- One-piece, forged steel crankshaft with induction hardened bearing journals.
- Large alloy steel connecting rods.
- Replaceable wet cylinder liners for heat dissipation, longer life and lower rebuild costs. Liner surface is Tuffride treated to prevent scuffing and to lower oil consumption. Two coolant inlet ports for uniform cooling and reduction of liner cavitation.
- Individual cylinder heads simplify service. One cylinder can be rebuilt without disturbing the rest. Two intake ports produce optimum *swirl* for clean combustion. Short exhaust ports provide maximum energy to turbo and reduce thermal loading.
- Pistons are nodular cast-iron rather than aluminum. This metallurgical breakthrough gives Luggers the following advantages:
  - Equal thermal expansion of the piston and liner allows a closer fit between them. Power loss past rings is reduced.
  - Keystone compression rings reduce carbon build-up under light load operation.
  - Iron is stronger. This allows the top compression ring to be closer to the piston crown minimizing the combustion dead zone and increasing efficiency.
- Dual circuit oil spray piston cooling.
- Massive wrist pins for strength.
- Light weight, only 5.7 lbs. Less than aluminum pistons used in competitive engines.
- One piece design can't come apart.
- Four valves per cylinder for better breathing. Double valve springs for increased seating tension. Replaceable valve seats and guides. Valves have rotators for even wear.
- Roller cam followers reduce friction and extend life of valve train.




**Cooling System**

- Freshwater heat exchanger or keel cooling configurations available.

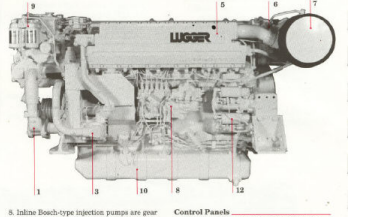
1. Heat exchanger cooling has Gilkes gear driven centrifugal seawater pump.
2. Two easy-clean tube-type heat exchangers.
3. Freshwater centrifugal pumps are gear driven. No power drive belt to fail.
- Cast iron, freshwater cooled exhaust manifolds are inside the "V". Alternate side mounted injection pumps for ease of service.
4. Coolant conditioner-filter with spin-on elements controls acidity and removes particulates from the freshwater system.
- Coolant pipes with o-ring seals. Fewer hoses.
- Zinc anodes help prevent electrolysis.

**Air System**

5. Turbo/fin aftercoolers use freshwater, not corrosive seawater, to cool the intake air for efficient combustion and increased power.
- Aftercooler circuit is separate from engine cooling. Dedicated gear driven freshwater pump and heat exchanger allows air temperature to be independantly controlled to optimize output and reduce low load smoke.
6. Turbochargers are liquid cooled for safety.
7. Cleanable, foam air filter-silencer element.
- Single adjustable exhaust cases installation.

**Fuel System**

- High pressure, direct fuel injection system design gives superior fuel atomization and fuel economy and clean combustion. System is easy to bleed and minimizes oil dilution.




8. Inline Bosch-type injection pumps are gear driven. Two synronized six cylinder pumps reduce rebuild and replacement costs.
- Bosch-type rebuildable injectors are placed in the center of the cylinder for the most efficient fuel spray pattern and easy access.
- Injectors fit in liquid cooled liner to control nozzle and head temperatures.
9. Two duplex fuel filters. Spin-on elements can be changed while engine is running.

**Lubrication System**

10. Shallow oil pan (above). Deep oil pan with service access doors (see drawing).
- Internal oil passages. No oil leaks.
- Stainless steel, plate-type, freshwater oil cooler with thermostat, controls oil temperature to reduce parasitic power losses.
11. Duplex, full flow, spin-on oil filters can be changed while engine is running.

**Electrical System**

12. 24 Volt, negative ground, marine grade electrical system includes two 7.5 kW (10hp) starters and 12V/35A battery charging alternator. Other alternators optional.
- Engine and panel are prewired and connected by a 40-foot wiring harness with water-resistant plugs. Harness extensions optional.

**Control Panels**

- Main Panel: Standard, includes VDO Blue Line square bezel instruments. Tachometer, engine hour meter, coolant temperature gauge, oil pressure gauge, DC volt meter, stop button and key switch. Warning lights and audible alarm for LOP/HWT.
- Second Panel: Standard, includes VDO Blue Line exhaust temperature gauge, turbo boost gauge and gear oil pressure gauge.
- Flybridge Panel: Optional, includes VDO Blue Line tach, oil pressure gauge, coolant temperature gauge, alarm horn, alarm lights, light rheostat, stop and start buttons.

**Marine Gears**

- **Twin Disc**
  Pleasure craft; High Output: MGN272 Commercial; Medium/Continuous: MG530
- **ZF**
  Pleasure craft; High Output: Model BW195 Commercial; Medium duty: Model BW255

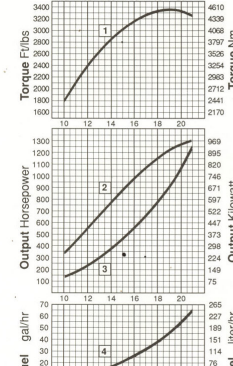
**Other Features**

- SAE 2, front-power-take-off is optional.
- SAE A, 9 tooth, acebusry drive pad for power steering pump is standard.
- Operator's and parts manuals.
- White polyurethane paint for long life finish.

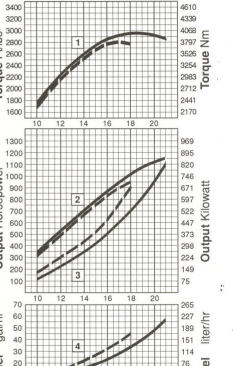
## Performance Data

| Duty Rating | High Output | Medium Duty | Continuous Duty |
|---|---|---|---|
| Rated Output | 1300 hp (969 kW) at 2100 rpm | 1150 hp (857 kW) at 2100 rpm | 950 hp (708 kW) at 1800 rpm |
| Shaft Output | 1254 hp (935 kW) at 2100 rpm | 1110 hp (828 kW) at 2100 rpm | 917 hp (684 kW) at 1800 rpm |
| Maximum Torque | 3372 ft lbs at 1900 rpm | 2957 ft lbs at 1900 rpm | 2811 ft lbs at 1700 rpm |
| Calculated Fuel Consumption US gals per hour (Liters per hour) | 22.0 (83) at 1500 rpm<br>31.9 (121) at 1700 rpm<br>45.4 (171) at 1900 rpm<br>64.3 (243) at 2100 rpm | 19.4 (73) at 1500 rpm<br>28.3 (107) at 1700 rpm<br>40.2 (152) at 1900 rpm<br>56.9 (215) at 2100 rpm | 13.3 (50) at 1200 rpm<br>20.8 (79) at 1400 rpm<br>30.8 (117) at 1600 rpm<br>44.3 (168) at 1800 rpm |

### High Output




### Medium and Continuous




**Curves:** 1. Maximum torque at flywheel. 2. Flywheel power. 3.Theoretical prop power draw (3.0 exponent). 4. Fuel use based on prop power draw. 5. Specific fuel consumption (weight of fuel needed to produce one hp for one hour based on FWHP curve 2).

**Notes:** 1. Ratings based on SAE J-1349 standards.
2. Fuel consumption rates are based on theoretical prop shaft horsepower draw. Your fuel consumption will vary higher or lower depending on your vessel and operating conditions.
3. Max. cruise rpm for High Output and Medium Duty ratings is 200 rpm below highest attainable rpm, or 1900 rpm, whichever is lower.

# Specifications and Installation Data

## SPECIFICATIONS AND WEIGHTS

Model Number ..... L12V140A
Type ..... V-12 cylinder, 4 cycle, turbocharged-aftercooled, direct injected, liquid cooled marine diesel.
Displacement ..... 1860 in³ (30.48 liters)
Compression Ratio ..... 13.7:1
Bore x Stroke ..... 5.51 in (140 mm) x 6.5 in (165 mm)
Approximate dry weight:
Keel cooled, less gear ..... 6976 lbs (3164 kg)
Heat exchanger cooling, less gear ..... 7276 lbs (3300 kg)

## INSTALLATION DATA

### Cooling (General)

Freshwater circulating flow at rated speed
High Output and Medium Duty ..... 211 gpm (800 lpm)
Continuous Duty ..... 180 gpm (684 lpm)
Heat rejection to jacket water
High Output ..... 31,522 BTU/min
Medium Duty ..... 27,885 BTU/min
Continuous Duty ..... 23,520 BTU/min

### Cooling (Heat Exchanger)

Raw-water intake ..... 3 in (76 mm)
Raw-water discharge diameter ..... 3 in (76 mm)
Raw-water pump flow at rated speed
High output and Medium Duty ..... 135 gpm (511 lpm)
Continuous Duty ..... 120 gpm (455 lpm)
Raw-water pump maximum suction head ..... 39 in (1 m)
Maximum raw-water temperature at inlet ..... 85° F (30° C)
Freshwater system capacity ..... 37.8 gal (143 ltr)

### Cooling (Keel Cooled)*

* Based on 70° F seawater temperature and minimum boat speed of 8 knots at full speed. Return water on keel cooling 70° to 130° F.

Water hose inside diameter ..... 4 in (102 mm)
Keel cooler head diameter ..... 4 in NPT
Turbo tube length
High Output ..... 180 ft (55 m)
Medium Duty ..... 160 ft (49 m)
Continuous Duty ..... 140 ft (43 m)
Skin cooler-aluminum
High Output ..... 195 ft² (18 m²)
Medium Duty ..... 170 ft² (16 m²)
Continuous Duty ..... 150 ft² (14 m²)
Skin cooler-steel
High Output ..... 650 ft² (60 m²)
Medium Duty ..... 575 ft² (55 m²)
Continuous Duty ..... 485 ft² (45 m²)

### DC Electrical

Voltage ..... 24 DC
Minimum battery capacity ..... 200 amp hours
Minimum battery cable size ..... 00 up to 10 ft run
Standard instrument harness length ..... 40 ft (12 m)

### Air Intake and Exhaust

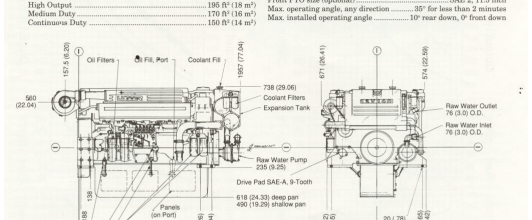
Engine air consumption at rated speed
High Output ..... 3167 ft³/min (90 m³/min)
Medium Duty ..... 2750 ft³/min (78 m³/min)
Continuous Duty ..... 2470 ft³/min (70 m³/min)
Minimum engine room intake vent area
High Output ..... 842 in²/(0.54 m²)
Medium Duty ..... 731 in²/(0.47 m²)
Continuous Duty ..... 657 in²/(0.42 m²)
Exhaust gas flow at rated speed
High Output ..... 6355 ft³/min (180 m³/min)
Medium Duty ..... 5614 ft³/min (159 m³/min)
Continuous Duty ..... 4625 ft³/min (131 m³/min)
Exhaust gas temperature at rated speed
High Output ..... 714°F (382°C)
Medium Duty ..... 680°F (363°C)
Continuous Duty ..... 670°F (357°C)
Maximum exhaust back pressure ..... 30 in (762 mm) $H_2O$
Suggested dry exhaust I.D. ..... 10 in (254 mm)
Suggested wet exhaust I.D. ..... 14 in (356 mm)
Optional wet exhaust muffler ..... Vernatone MKII PN: 13-00240

### Fuel and Oil

Minimum fuel suction and return line ..... 3/4 in (19 mm)
Maximum fuel pump head ..... 39 in (1 m)
Crankcase oil capacity ..... 35.5 US gal (135 ltr)

### Gear, PTO, Engine Angle

Engine rotation (facing flywheel) ..... Counter-clockwise
Flywheel housing size ..... SAE 0, 18 inch
Front PTO size (optional) ..... SAE 2, 11.5 inch
Max. operating angle, any direction ..... 35° for less than 2 minutes
Max. installed operating angle ..... 10° rear down, 0° front down




Dimensions are given from datum lines marked with a Ⓓ. Example: Coolant fill is 29.06 inches from the crankshaft center datum line.