Uptime anytime

MAN Energy Solutions
Future in the making
MAN L23/30H

Historical Overview

George Mamalis
Marine New Sales & Promotion
June 6th, 2019
L23/30H GenSet - MAN Engine Development Program

Overview

2010
IMO Tier II

2011
MK II +10%

2012
SFOC Optimized

2013
Monocoque

2014
3-point instal.

2015
IMO Tier III

2016
Increased TBO (MGO)

2017+
DF (Tier III)

1965 Market introduction

T23H - 1970
T23LH - 1973
T23LH-4 - 1982
T23LH-4E - 1984
L23/30 - 1985
L23/30H - 1990

Mk 3
L23/30H

Advantages & Reference List

- Field proven Reliability
- Simple and Easy Operation
- Classic engine design for simple and well known maintenance procedure
- Spare Parts with High Availability
- Competitive Spare Parts Prices
- Long TBO (HFO 16,000 20,000 hours)
- Low Maintenance Cost
- Production close to Shipyard
- Engineering & Production Support
- World Wide Service Organization – 24/7

as per 01/01/18

<table>
<thead>
<tr>
<th>Engine Type</th>
<th>L23/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMP</td>
<td>3.733</td>
</tr>
<tr>
<td>CXZ/SQE</td>
<td></td>
</tr>
<tr>
<td>SXD</td>
<td></td>
</tr>
<tr>
<td>HND</td>
<td></td>
</tr>
<tr>
<td>Weichai</td>
<td></td>
</tr>
<tr>
<td>STX Korea</td>
<td>3.955</td>
</tr>
<tr>
<td>Doosan</td>
<td>910</td>
</tr>
<tr>
<td>Adria &amp; Split</td>
<td>490</td>
</tr>
<tr>
<td>HCP/FSA</td>
<td>95</td>
</tr>
<tr>
<td>MDT FRH</td>
<td>391</td>
</tr>
<tr>
<td>MDT Holeby</td>
<td>526</td>
</tr>
<tr>
<td>MDT India</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>2.188</td>
</tr>
<tr>
<td>Total</td>
<td>12.288</td>
</tr>
</tbody>
</table>
L23/30H

Mk1

- Extended TBOs for Mk1 engines
- NR T/Cs
- L23/30H-720RPM: on HFO 20,000h
- L23/30H-900RPM: 12,000 hours

on certain conditions
L23/30H

*Mk2 Continuous Development*

- 4s (5-8 cylr) / 710 - 1,400 kW
- HFO up to 700 cSt at 50°C
- emission requirements (+ IMO Tier II) & EPA Tier II (900 r/min)
- TCR T/Cs
- Built-in lambda controller increases load response ability & limits fuel oil index during start-up & load changes
- Increased power yield of approx. 10%
# L23/30H

## Mk1 & Mk2 Power Output & TBO Comparison

**RELIABILITY is KEY**

<table>
<thead>
<tr>
<th>Engine Size</th>
<th>kW/Cyl.</th>
<th>Previous</th>
<th>Mk 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>720 rpm (60Hz)</td>
<td>130 kW/Cyl.</td>
<td>142 kW/Cyl.</td>
<td></td>
</tr>
<tr>
<td>5 cylinders*</td>
<td>650*</td>
<td>710</td>
<td></td>
</tr>
<tr>
<td>6 cylinders</td>
<td>780</td>
<td>852</td>
<td></td>
</tr>
<tr>
<td>7 cylinders</td>
<td>910</td>
<td>994</td>
<td></td>
</tr>
<tr>
<td>8 cylinders</td>
<td>1,040</td>
<td>1,136</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engine Size</th>
<th>kW/Cyl.</th>
<th>Previous</th>
<th>Mk 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 rpm (60Hz)</td>
<td>160 kW/Cyl.</td>
<td>175 kW/Cyl.</td>
<td></td>
</tr>
<tr>
<td>6 cylinders</td>
<td>960</td>
<td>1,050</td>
<td></td>
</tr>
<tr>
<td>7 cylinders</td>
<td>1,120</td>
<td>1,225</td>
<td></td>
</tr>
<tr>
<td>8 cylinders</td>
<td>1,280</td>
<td>1,400</td>
<td></td>
</tr>
</tbody>
</table>

**L23/30H Mk 2, 900rpm**

- TBO HFO: 16,000
- Power [kW]: 1050 – 1400
- TBO MDO/MGO: 20,000

**L23/30H Mk 2, 720/750rpm**

- TBO HFO: 20,000
- Power [kW]: 710 – 1305
- TBO MDO/MGO: 32,000
MAN Four-Stroke Marine GenSets

Fuel oil saving for small bore GenSet (part load optimised)

- Improved fuel oil consumption at low load and part load
- Part-load still complies with IMO Tier II limit

---

L23/30H Mk 2
Power range: 600 – 1400 kW
SFOC: 191 g/kWh

Charge Air Blow-off Valve

SFDC (g/kWh)

Based on Project Guide figures for IMO Tier II engines – 60Hz:
ISO reference condition, HFO/MDO, without pumps, tolerance +5% (not included)
MAN GenSet Monocoque Design

Available for all variants of the L23/30H engine

- Design & Installation Cost
- Weight reduction
- Vibration optimisation
- Simplified installation

- 63% weight reduction
- Flat deck
- 8→3 conicals
- Self-leveling
Dual Fuel (DF) GenSets

Pros, Operation & IMO

- Safe & Reliable Operation
- Decades of service experience
- Competitive CAPEX – simplified fuel injection
- Low Maintenance Cost – extended TBO
- \(\rightarrow\) OPEX lower

Flexible GVU Installation - up to 90m from engine.
Thank you for your attention!

The future in here!!
The way to L23/30H Mk3 is set…
All data provided in this document is non-binding. This data serves informational purposes only and is especially not guaranteed in any way. Depending on the subsequent specific individual projects, the relevant data may be subject to changes and will be assessed and determined individually for each project. This will depend on the particular characteristics of each individual project, especially specific site and operational conditions.