



GEODYN
SOLUTIONS

Earth Friendly Engine

Geodyn

Design Philosophy

Geodyn have simple and smart design suitable for marine applications with high reliability and performance. The key features are:

Heavy Fuel Engine with same fuel of main engine (Uni-Fuel concept).

Hence, the diesel fuel and heavy fuel oil of the viscosity of upto 700 cSt at 50°C is acceptable.

Economical and Ecological Engine with low fuel consumption, NOx emission, and Smoke, etc. , which is based on the below specific designs;

- Optimized Supercharging with Miller Cycle
- High Fuel Injection Pressure Reliable

Reliable and Practical Engine with simple, smart and robust structure.

- Number of engine components are minimized with Pipe-Free design
- Most of the components are directly accessible for easier maintenance
- 'Individual Part' maintenance concept is provided
- Feed System is fully modularized with direct accessibility

Earth Friendly Engine

Main Features

Performance characteristics

- High Output in the similar range engines
- Low Fuel Oil Consumption
- Quick acceleration & load response

Maintenance

- Easier maintenance by modularized design
- Minimal the number and kind of components

Earth-friendly engine

- Low NOx emissions
- Complies with IMO NOx Tier II
- Low Vibration & Noise

Major Application

Marine

- Propulsion System
- Generating Sets

Offshore

- Drillships
- FPSO

Stationary

- Diesel Power Plant
- Pre-fabricated Power Plant
- Emergency Generating Sets
for Nuclear Power Plant

Engine Operation

IMO NOx EMISSION AND Geodyn ENGINES

Annex VI of the MARPOL 73/78 convention entered into force 12 May 2005. All Geodyn engines included in this booklet comply with the NOx Limits specified in the IMO regulation.

The exhaust emission regulations in Annex VI are now referred to as IMO Tier I, MARPOL Annex VI regulations were amended at the MEPC (Marine Environment Protection Committee) in October 2008. These specify further NOx emission limits to be known as IMO Tier II and Tier III.

IMO Tier II regulations will be entered into force on 1 January 2011 based on keel laying, according to a speed dependent function, with reduction of about 20% in comparison with IMO Tier I (refer to chart). Under IMO Tier III, the NOx emission limits for marine engines will become effective on 1 January 2016 based on keel laying, according to a speed dependent function, with reduction of 80% in comparison with IMO Tier I when the ship is operated in a designated Emission Control Areas (so called ECAs).

Geodyn will adapt all type of Geodyn engine to comply with the new upcoming NOx emission regulations, and do its best to satisfy further request if any from customers.

Engine Operation

Geodyn ENVIRONMENTAL TECHNOLOGIES against IMO Tier II

Geodyn is introducing technologies to meet IMO Tier II regulation with internal engine measures only such as:

- Miller valve timing requiring increased charger air pressure by applying the high pressure ratio turbocharger
- Optimised combustion by applying the combustion control technologies with optimising the piston bowl shape and the F.O Nozzle's specification.

Miller valve timing

This technology is very useful to reduce the NOx emission by optimising the intake valve's closing timing especially, result in changing the effective compression and expansion ratio. In order to apply this technology, the high pressure ratio turbocharger is required to increase the charge air pressure and new developed T/C with high pressure ratio will be mounted on Geodyn engine.

Engine Operation

Optimized combustion

The NOx emission can be reduced by the combustion control technologies with the optimum combination of the piston bowl shape and the F.O Nozzle's specification.

The piston bowl shape and the F.O Nozzle's specification are optimized to meet the IMO Tier II regulation, which are evaluated by 3-D combustion analysis and verified by the measurement at Geodyn Techno Center.

Geodyn ENVIRONMENTAL TECHNOLOGIES against IMO Tier III as one of solutions

SELECTIVE CATALYTIC REDUCTION (SCR)

Geodyn can offer selective catalytic reduction (SCR) technology that can reduce NOx emissions by 85~95%, designed for Tier III limits. Geodyn is optimizing the whole installation, performance and engine in order to achieve low cost of production and give benefits to the customers.

SCRUBBER

Exhaust gas scrubbing is an alternative solution to low sulphur content fuels for reducing SOx emissions. SCRUBBER has been developed by Geodyn for much better quality.

Engine Operation

Geodyn...

The best solution for all type of marine vessels and offshore applications with proven reliability, low emission, low operation cost, multi-fuel capability...

Our extensive R&D facilities enable HHI to provide the customers with high quality and excellent services in all phases of designing, production, assembly and commissioning of Geodyn propulsion packaged system.

Marine Propulsion System

Power Range

| | |
|---------|--|
| H21/32P | 1,200~1,800 kW |
| H25/33P | 1,740~2,610 kW |
| H32/40P | 2,880~4,320 kW / FPP 3,000~4,500 kW / CPP |

General Information

Optimized combustion Long Term Commitment...

To provide the market with reliable, cost effective and earth-friendly solution

Optimized Matching of Geodyn Propulsion Package

- Geodyn H21/32P, H25/33P and H32/40P engine
- C.P. /F.P. propeller with shafting
- Pitch and speed control
- Load control
- Reduction gear
- Shaft generator
- Auxiliary machinery

Application

- Controllable pitch propulsion
- Fixed pitch propulsion
- Azimuth thruster propulsion
- Pump drive

Excellent Performance of Geodyn Propulsion Engine

- Improved transient operation with pulse charging turbocharger
- Invisible smoke with pulse charging turbocharger by part load matching
- Lower thermal load engine with lower exhaust gas temperature
- Low fuel consumption
- Low NOx emission

Power Range

Marine Propulsion

