



OFFICIEEL DEALER



BIJ KONINKLIJKE BESCHIKKING
HOFLEVERANCIER

EURO VI as Marine engines

Sander Langenberg

Vink diesel bv

- Founded in 1905
- Family-owned business, 4th generation
- Located at the Merwede river, near to Rotterdam
- Royal Warrant Holder, since 2005
- 17 fte employees
- Service, sales, repair, overhaul and installation of diesel engines
- Authorised dealer for MAN, Doosan and DAF diesel engines



EURO VI as marine engines?

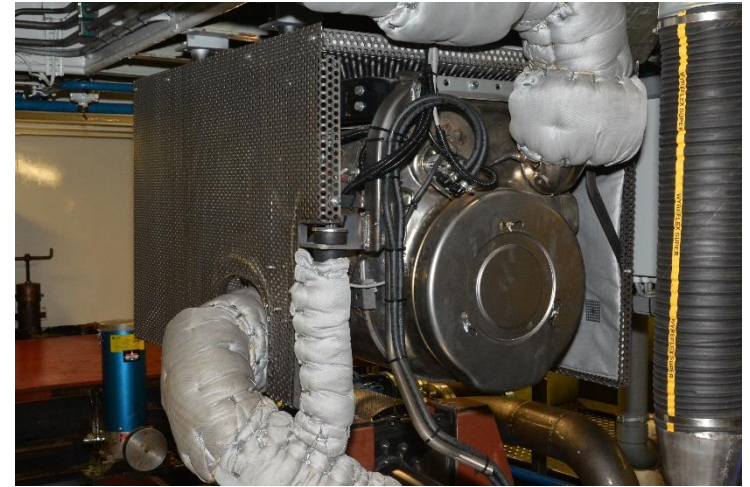
- Benefits of a Paccar MX Euro VI engine
- Modifications
- Field test
- Results
- Projects

Key benefits of a Euro VI engine

1. Ultra modern technology
2. High emission standards
3. Low fuel consumption
4. High torque at low engine speed
5. Engine and After-treatment > one compact system
6. Proven quality and reliability
7. Long service intervals
8. Low Total Costs of Ownership
9. Low sound level
10. High production numbers

Exhaust After-treatment System

- Compact system
- Engine and After Treatment System works harmonious together
- Paccar After Treatment Control Module
- On Board Diagnostic System



Filter box

- Diesel Oxidation Catalyst
- Diesel Particular filter

SCR box

- Exhaust silencer
- Selective Catalytic Converter
- Ammonia Oxidation Catalyst
- Airless AdBlue dosing





Engine modifications

- **Standard Road engine is not suitable as marine engine:**
 - Cooling system
 - Mechanical
 - Electrical system
 - Software modifications
 - Conform directive 2006/87/EG

Electrical system

- Communication
- Monitoring system
- Throttle control
- Back-up supply



Software modifications

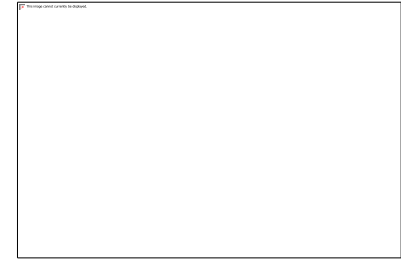
- Reprogram missing inputs on ECU;
- Simulate inputs on EC;
- Throttle signal conversion;
- (Torque request > Speed request);
- Respect of emission limits.



Euro VI as Marine engines

- Emission Euro VI acc. EC e4*595 / 2009
- Emission levels demonstrated after modifications by on board measuring
- On-board diagnostic system

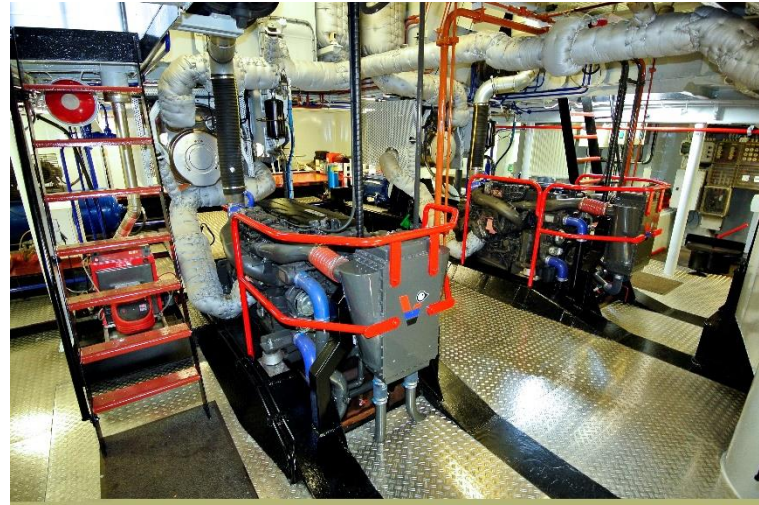
Field test



- Ms. Noord, 2 pcs Vink-Paccar MX 11 -210 propulsion
- Technical feasibility
- Testing – collecting data
- Certification
- Modifications

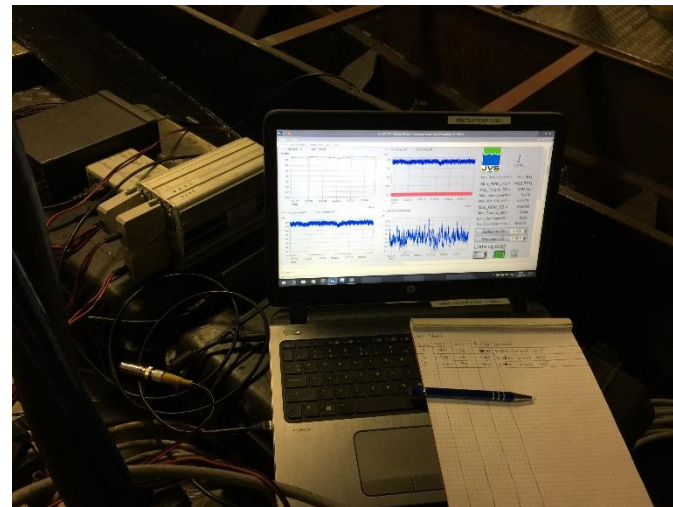
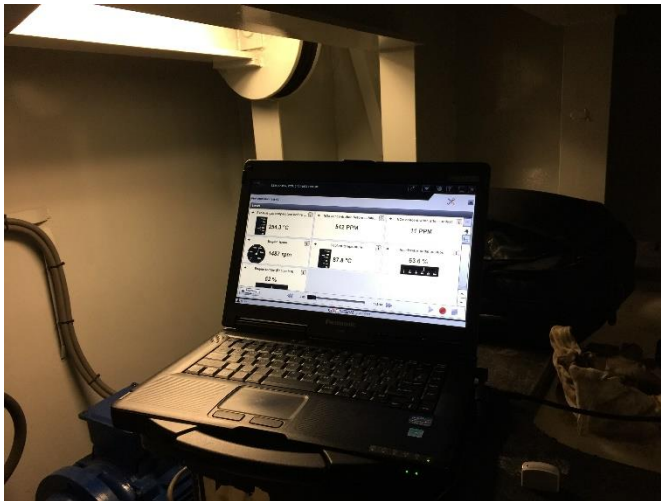


Ms. Noord



Test

- Emission test (E3 cycle)
- Torque measurement
- Fuel consumption



Results of project Ms. Noord

| | | | | | |
|---|-----------|-------------------|-------------|-------------|----------|
| Ship | ms. Noord | | | | |
| Date | 9-1-2018 | | | | |
| Emission measurement Stage V IPV-v/c-4, E3 cyclus | | | | | |
| | | ProMonitoring ① | BlueCo ② | Requirement | |
| Component | | g/kWh | g/kWh | g/kWh | |
| CO | | < 0,006 | 0,01 | 3,5 | Y |
| CxHy | | 0,079 | | 0,19 | Y |
| Nox | | 0,16 | 0,19 | 1,8 | Y |
| PM | | 0,014 | 0 | 0,1 | Y |
| © Vink diesel bv | | | | | |
| ① Promonitoring report r013323 | | | | | |
| ② BlueCo report | | | | | |

Ms. IJmeer



- 37.5m x 9m
- 2 x Vink - MX 11 – 240 kW
- Installed March, 2018



Results of project Ms. IJmeer

| Summary: Results of STAGE V measurements | | | | | |
|--|-----------------------|-------------|------------|------------|-------|
| Engine | | | | | |
| Manufacturer | Paccar | | | | |
| Type | Vink-MX11 240 | | | | |
| Number | K068090 | | | | |
| Location | MS IJmeer | | | | |
| Cycle | E3: 240 kW @ 1700 rpm | | | | |
| Emissions | | Measured | Demand | Comply | |
| NOx relative emission | (g/kWh) | 0,3 | 2,1 | Yes | |
| CO relative emission | (g/kWh) | 0,0 | 3,5 | Yes | |
| CxHy as C relative emission | (g/kWh) | 0,0 | 1,0 | Yes | |
| Particle relative emission | (g/kWh) | 0,05 | 0,1 | Yes | |
| NOx + HC relative emission | (g/kWh) | 0,3 | - | - | |
| | | 100% | 75% | 50% | 25% |
| Fuel consumption | g/kWh | 194,4 | 193,8 | 195,9 | 192,6 |

Ms. Liane



- 39m x 5m
- 377 ton
- 1 x Vink MX 11 -240 kW
- Installed in April, 2018



Ms. Wantij



- 86m x 9m
- 1.653 TON
- 2 x Vink MX 13 - 355 kW
- Installation April – May, 2018

Air set



Baggerbedrijf De Boer
Dutch Dredging



- Self propelled water injection dredger;
- 2 x Vink MX 11 -210 kW propulsion;
- 3 x Vink MX 11 – 390 kVA auxiliary gen sets, PMS;
- Installation planned in May – June, 2018

Vink-Paccar MX engine range

Paccar MX-11

| Excellent performance at low cost | | |
|-----------------------------------|---------------------------|--------------------------|
| Engine type | Performance | Torque |
| MX-11 220 | 220 kW/299 hp at 1675 rpm | 1.650 Nm at 900-1400 rpm |
| MX-11 251 | 251 kW/341 hp at 1675 rpm | 1.500 Nm at 900-1400 rpm |
| MX-11 270 | 270 kW/367 hp at 1600 rpm | 1.900 Nm at 900-1125 rpm |
| MX-11 300 | 300 kW/408 hp at 1600 rpm | 2.100 Nm at 900-1125 rpm |
| MX-11 330 | 330 kW/449 hp at 1600 rpm | 2.300 Nm at 900-1125 rpm |

Paccar MX-13

| Steady state power and torque | | |
|-------------------------------|----------------------------|---------------------------|
| Engine type | Performance | Torque |
| MX-13 315 | 315 kW/428hp at 1600 rpm | 2.300 Nm at 900-1125 rpm |
| MX-13 355 | 355 kW/483 hp at 1600 rpm | 2.500 Nm at 900-1125 rpm |
| MX-13 390 | 390 kW/ 530 hp at 1675 rpm | 2.600 Nm at 1000-1400 rpm |

Engine range Euro VI < 390 kW



Two engines – one shaft



Hybrid solutions

Services

- Propulsion engines
- Auxiliary engines
- Gearboxes
- Installation packages
- Installation
- Commissioning

- 24 x 7 service



www.vinkdiesel.nl



Thank you for your attention



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Sander Langenberg

