# 4 STAGE PUMP 12V149


*OCS owned 4 staged pump (12V149 engine driven) units are skid mounted pumping unit that can be used for high pressure water. Main type of operations performed using these units are pipeline pre-commissioning, Pipeline post burial (Trenching) and Pile remedial operations using Jet/Airlift techniques.*

*The power train used for this pump skids is a Detroit 12V149TI diesel driven engine. 12V149TI engine is turbo charged, intercooled 12 cylinder engine in a V type configuration and in 149 engine series. One of the unique features of the 149 engine is its 5¾-inch bore x 5¾-inch stroke; hence, it is known as a square bore design. 149 series engines have overhead camshafts and the cylinder heads fit into the engine block; this is referred to as the "pothead" design. The blowers are also recessed into the block; this section of the block is called the "airbox". Above the blower is a thick piece of steel that covers the blower and seals the top section of the air box. On a turbocharged engine an intercooler and sometimes by-pass housing is present with the intercooler housing. The 12V engine configurations have two blocks, two crankshafts bolted together, two blowers, and four turbos. The 12V149 engine is a 2 cycle engine with 1792 cubic inches (29.39L) displacement producing 700BHP (522kW) @1200 RPM and upto 1130BHP (843kW)@1900RPM. In order to prevent overstressing the engine is usually run at approximately 1600RPM. The fuel consumption rate varies from 55 USG/hr @1200 RPM to 76 USG/hr @ 1900 RPM*

*OCS owns 3 x 12V149 Diesel engine driven pump skids. The skids have been designed to accommodate* ***4 stage fluid ends*** *(250SLD450-60X4) and high pressure/high volume fluid ends (SLOW 250-550) for pipeline post trenching operations.*

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## 4 STAGE PUMP 12V149

*The performance characteristics for the 12V149 driven fluid ends employed by OCS are as follows:*

| ***4 stage pump specifications*** | |
|---|---|
| *Fluid End* | *250SLD450-60x4* |
| *Flow Rating Head : 260m @ 1480rpm* | *335m$^3$/Hr (1475 USgpm),* |
| *Flow Rating Head : 420m @ 1900rpm* | *429m$^3$/Hr (1889 USgpm),* |
| *Suction Inlet* | *10", #300* |
| *Discharge* | *8", #300* |
| *Power Train* | *GM 12V149TI 2-Stroke Diesel Engine* |
| *Power Output bhp (kW)* | *1130 (843) @ 1900rpm* |
| *Peak Torque –lb ft (N.m)* | *3178 (4309) @ 1400rpm* |
| *Skid Framing* | *6100 x 2400 x 2400mm x 8MT* |
| *No Of Units* | *3* |

*The pumps skids of the units have been designed to comply with DNV criteria (DNV 2.7-3) for offshore portable equipment lifting operations*

*OCS has Equipment passports for individual Engine, Skids and Fluid Ends which must be reviewed before each project to assess the status. The equipment passport gives the working history, maintenance and certification history for Engines, Fluid Ends and Pump skids.*

*It is important to regularly review the list of critical spare parts of the equipment before each project.*

*Where failures occur during operations Equipment bulletins will be issued to document the problem and the remediation solutions applied. The equipment bulletin will be circulated to all field engineers to be informed about the possible failure that can occur during the operation and thereby avoid future failure.*

*This equipment file remains a live document and will be constantly updated by the equipment department.*

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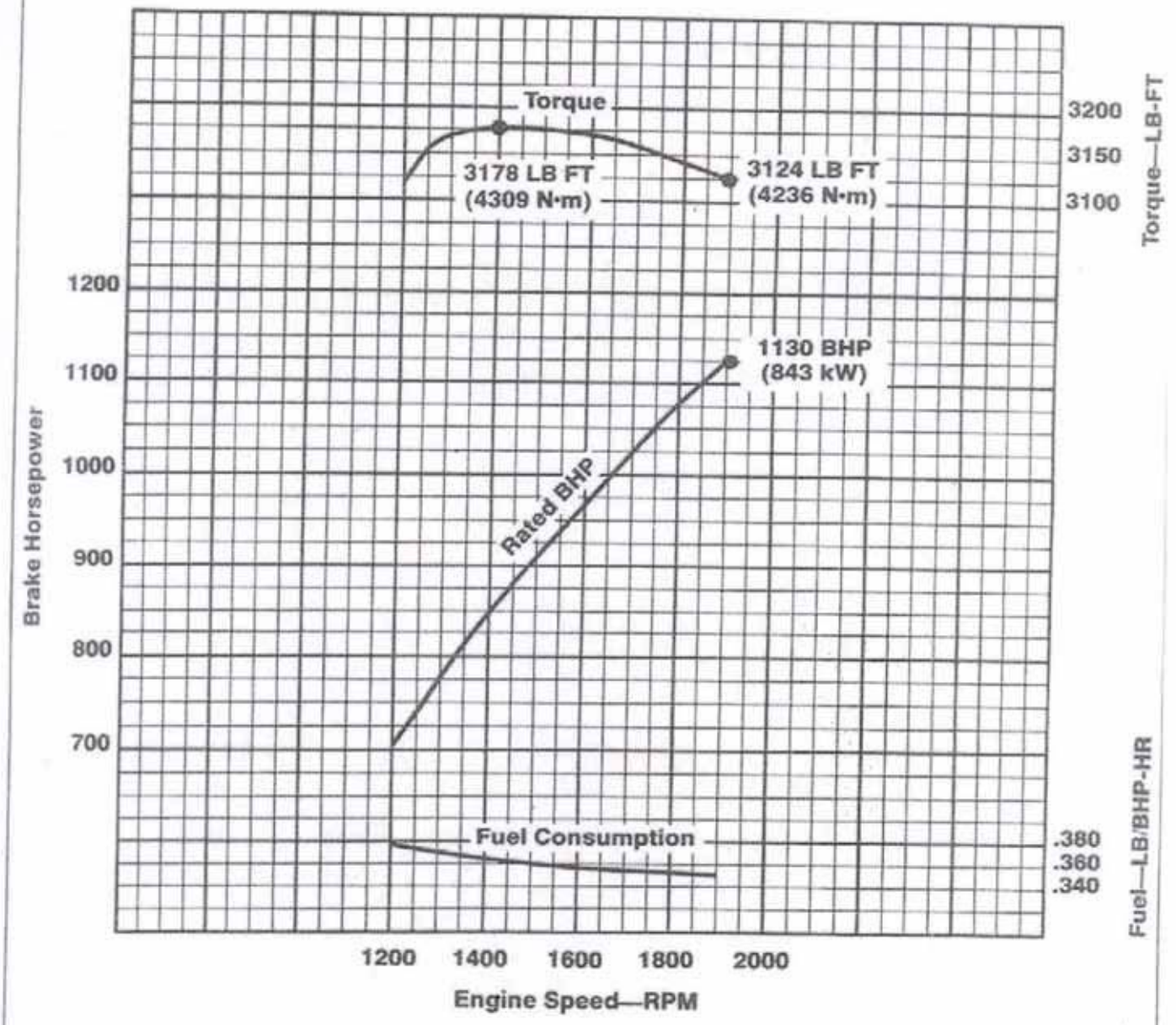
DETROIT DIESEL CORPORATION

12V-149TI
Industrial
Rated BHP
1130 BHP @ 1900 RPM
3178 LB-FT @ 1400 RPM
Injector: 150
Turbocharger: TV7111 (1.08 A/R)

## ENGINE PERFORMANCE CURVE




**Air Intake Restriction - in. $H_2O$ (kPa) . . 10 (2.5)** **Exhaust Back Pressure - in. $H_2O$ (kPa) . . 15 (3.7)**

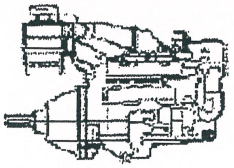
- Power output guaranteed within 5% at SAE J1349 conditions: 77°F (25°C) air inlet temperature; 29.31 in. Hg (99kPa) dry barometer; 100°F (39°C) fuel inlet temperature (.853 specific gravity at 60°F).
- Conversion factors: Power: kW = bhp × 0.746; Fuel: kg/kW•hr = lb/bhp•hr × 0.608; Torque: N•m = lb•ft × 1.356
- Values derived are from currently available data and are subject to change without notice.

**Certified by:** Roy Smith

**Curve No.** E4-9123-32-3
**Date:** 6-10-83
**Rev./Date:** 2/6-16-87
Sht. 1 of 3

# ENGINE DYNAMOMETER TEST REPORT

DATE: 05/25/10



SERIAL NO. 12E5725

WORK ORDER NO: 21338

MODEL NO. 12V149TA

**PRE-STARTING**

PRIME OIL LUBE SYSTEM: CN
PRESSURE TEST FUEL SYSTEM: CN
INSPECT ENGINE RACK CONTROL: CN
INSPECT ENGINE EXTERNALLY FOR MISSING BOLTS AND PLUGS: CN

**BASIC RUN-IN**

WARM ENGINE: CN
CHECK OIL AT ROCKER ARMS: CN
SET IDLE SPEEDS: CN

| TIME | | RPMS | WATER TEMP | OIL PRESSURE | BHP @ RPM |
|---|---|---|---|---|---|
| START | STOP | IDLE/N/L | | | |
| 7:30 | 8:30 | 648/2201 | 180 | 76 | 2065/1200 |
| | | | | | |
| | | | | | |

**RUN-IN INSPECTION**

| | | INT. |
|---|---|---|
| INSPECT FOR LUBE OIL LEAKS | | CN |
| INSPECT FOR FUEL OIL LEAKS | | CN |
| INSPECT FOR WATER LEAKS | | CN |
| CHECK AND TIGHTEN EXTERNAL BOLTS AND PLUGS | | CN |

**INSPECTION AFTER RUN-IN**

| | | SET AT |
|---|---|---|
| CHECK AND ADJUST VALVE ADJUSTMENT (HOT) | | CN |
| CHECK AND ADJUST INJECTOR ADJUSTMENT (INJ SIZE) | | CN |
| CHECK AND ADJUST GOVERNOR GAP | | CN |
| CHECK AND TIGHTEN ALL EXTERNAL BOLTS AND PLUGS | | CN |

**FINAL RUN-IN**

| TIME | | | | | | |
|---|---|---|---|---|---|---|
| START | STOP | RPMS | BHP | AIR BOX PRESSURE | CRANK CASE PRESSURE | |
| | | IDLE - N/L - F/L | | F/L | F/L | |
| 10:00 | 11:00 | 649-2199-2118 | 1362 | OK | OK | |
| | | | | | | |

| FUEL OIL PRESSURE | | WATER TEMP | LUBE OIL TEMP (F) | LUBE OIL PRESSURE |
|---|---|---|---|---|
| IDL-F/L | | | | F/L - IDLE |
| 27-88 | | 180 | | 75-20 |

OPERATOR: _____ DATE: _____

# ENGINE DYNAMOMETER TEST REPORT Industrial Diesel Dyno Only

Date 5/25/10 Serial No. 12E5725

Work Order No. 21338 Model No. 12V149TA

| PRE-STARTING | Init. |
|---|---|
| Prime oil lube system | CN |
| Pressure test fuel system | CN |
| Inspect engine rack control | CN |
| Inspect engine externally for missing bolts and plugs | CN |

| BASIC RUN-IN | Init. |
|---|---|
| Warm engine | CN |
| Check oil at rocker arms | CN |
| Set idle speeds | CN |

| TIME | | RPMS | | WATER TEMP. | OIL PRESSURE | BHP @ RPM | |
|---|---|---|---|---|---|---|---|
| START | STOP | IDLE | N/L | | | | |
| 7:30 | 8:30 | 648 | 2201 | 180 | 76 | 2065 | 1200 |

| RUN-IN INSPECTION | Init. |
|---|---|
| Inspect for lube oil leaks | CN |
| Inspect for fuel oil leaks | CN |
| Inspect for water leaks | CN |
| Check and tighten external bolts and plugs | CN |

| INSPECTION AFTER RUN-IN | Set at | Init. |
|---|---|---|
| Check and adjust valve adjustment (hot) | ✓ | CN |
| Check and adjust injector adjustment (Inj. size) | ✓ | CN |
| Check and adjust governor gap | | |
| Check and tighten all external bolts and plugs | ✓ | CN |

FINAL RUN-IN

| TIME | | RPMS | | | BHP | AIR BOX PRES | CRANK CASE PRES |
|---|---|---|---|---|---|---|---|
| START | STOP | IDLE | N/L | F/L | | F/L | F/L |
| 10:0 | 11:0 | 649 | 2199 | 2118 | 1362 | O.K | O.K |

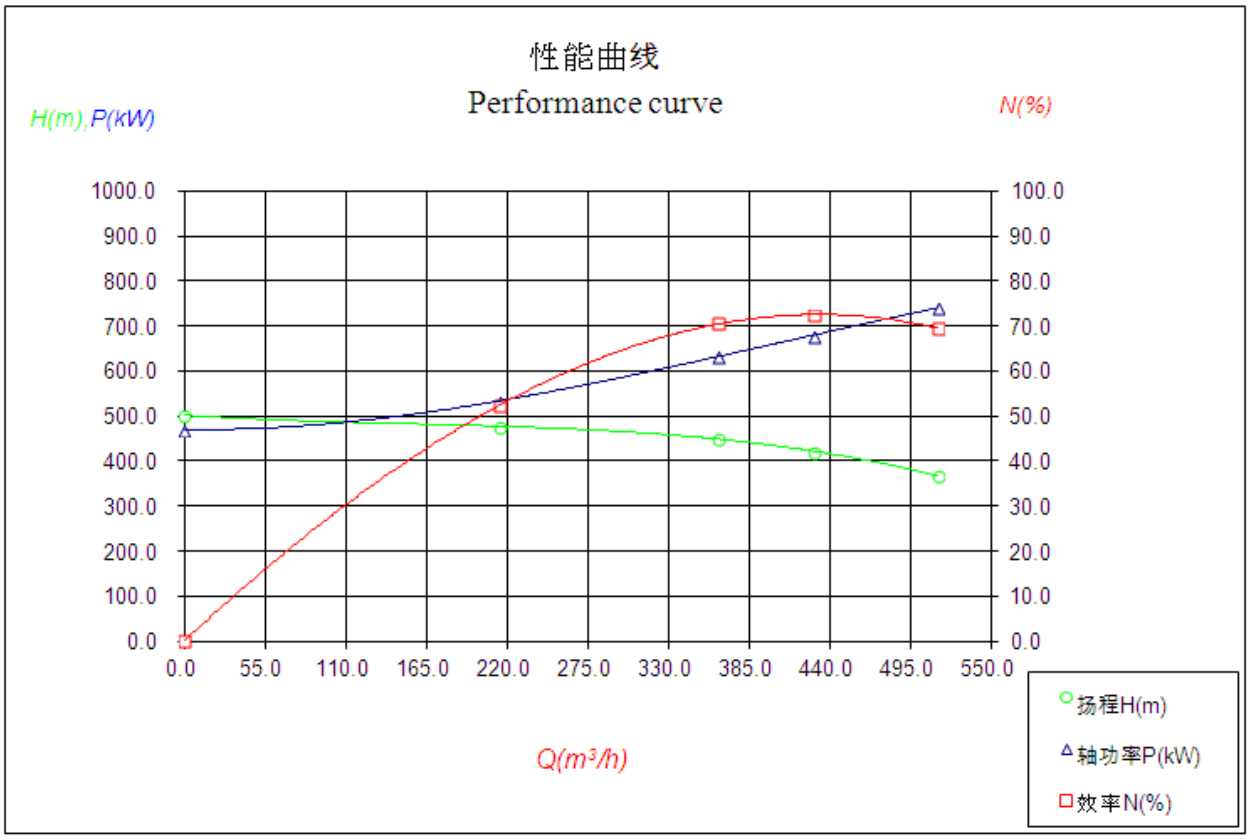
| FUEL OIL PRESSURE | | WATER TEMPERATURE | LUBE OIL TEMP. (F) | LUBE OIL PRESSURE | |
|---|---|---|---|---|---|
| IDL | F/L | F/L | F/L | F/L | IDLE |
| 27 | 88 | 180 | | 75 | 20 |

OPERATOR Cummingsen DATE 5/25/10

# 水泵检测数据表 水泵编号Number:

## （PUMP INSPECTION REPORT）

| 水泵型号type pump | 250SLD450-60*4 | 流量（$m^3/h$）Capacity | 429 | 功率（kW）Power | 843 |
|---|---|---|---|---|---|
| 泵效率Pump Eff(%) | 72.0% | 扬程（m）Head | 420 | 转速（r/min）Speed | 1900 |
| 序号NO | 流量 Capacity（$m^3/h$） | 扬程 Head（m） | 轴功率 Driver shaft power(kw) | 泵效 Pump Eff(%) | 换算至额定转速 transfor to rating speed |
| 1 | 0.00 | 501.95 | 470.07 | 0.0 | |
| 2 | 214.44 | 477.06 | 533.17 | 52.3 | |
| 3 | 363.83 | 449.74 | 631.76 | 70.5 | |
| 4 | 429.29 | 420.91 | 679.87 | 72.4 | |
| 5 | 513.83 | 367.60 | 739.81 | 69.5 | |




**结论：** 合格 **测试：** 胡学刚 **日 期：** 2010年1月

Conclusion: conformity testing: HXG **date:** Jan / 10