MO-0004

DIESEL — NON REVERSIBLE MARINE ENGINE

MODEL    DMRV—16—4 ENGINE     SERIAL NUMBER 72001 TO 72010 Inclusive
B.M.E.P.  182 PSI
NO. CYCLES 4  NO. CYLINDERS 16
BORE    17”  STROKE  21”
H.P.    7000 AT  400 R.P.M.
TOTAL DISPLACEMENT 76,266 CUBIC INCHES

*FUEL INJECTION TIMING              22° Left Bank / 20° Right Bank  BEFORE TOP CENTER
SET  1 inch Left Bank / 7/8 inch Right Bank    BEFORE TOP CENTER ON
51 IN. DIAMETER FLYWHEEL

FIRING ORDER    1L—8R—4L—5R—7L—2R—3L—6R—8L—1R—5L—4R—2L—7R—6L—3R

FUEL INJECTION PUMP RACK AT FULL LOAD 31.5 MM No. 2 Diesel Fuel Oil / 30.0 MM3600 SSU Heavy Fuel
STARTING SYSTEM  Pilot Air — Gear Driven Distributor
CRANKSHAFT ROTATION Clockwise (VIEWED FROM FLYWHEEL END)

*AVERAGE FULL LOAD SHOP DATA

***EXHAUST TEMPERATURE 870°F
AIR MANIFOLD PRESSURE 31 in. Hg (Abs.)
AIR MANIFOLD TEMPERATURE 110°F
AMBIENT TEMPERATURE 72°F
BAROMETRIC PRESSURE 30.11 in. Hg (Abs.)

**FULL LOAD FIRING PRESSURE 1225 PSI No. 2 Diesel Fuel
1200 PSI 3500 SSU Heavy Fuel

*Values based on No. 2 Diesel Fuel Oil

**ABS Allowable Firing Pressure 1400 PSI

Maximum allowable Differential Firing Pressure ±50 PSI from mean.

***Maximum allowable Exhaust Gas Temperature 950°F

VALVE CLEARANCE WITH COLD ENGINE
INTAKE  .040”  EXHAUST  .040”
Coolant Freezing and Boiling Temperatures vs. Ethylene Glycol Concentration (Sea Level)

Recommended Concentration Range: 30-67%
A change of 0.133 mm in the thickness of the distance ring causes a change of 1 kp/cm² in the blow-off pressure.
a — sliding bowl
b — operating slide
c — water outlet
V5 — sealing water
V10 — opening water
V15 — closing water
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>120</td>
<td>240</td>
<td>60</td>
<td>300</td>
<td>180</td>
</tr>
</tbody>
</table>

This chart gives the relative positions of fuel injection cam noses on a six cylinder auxiliary diesel engine with a right hand rotation. At the moment indicated, #1 cylinder is at top dead center and combustion is taking place.
This information is for a two-stroke cycle marine engine and the flywheel is marked with reference to number one cylinder.

<table>
<thead>
<tr>
<th>Firing Order</th>
<th>Top Dead Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 DEGREES</td>
</tr>
<tr>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>16</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>72</td>
</tr>
<tr>
<td>13</td>
<td>99</td>
</tr>
<tr>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>20</td>
<td>135</td>
</tr>
<tr>
<td>3</td>
<td>144</td>
</tr>
<tr>
<td>12</td>
<td>171</td>
</tr>
<tr>
<td>10</td>
<td>180</td>
</tr>
<tr>
<td>17</td>
<td>207</td>
</tr>
<tr>
<td>2</td>
<td>216</td>
</tr>
<tr>
<td>15</td>
<td>243</td>
</tr>
<tr>
<td>7</td>
<td>252</td>
</tr>
<tr>
<td>18</td>
<td>279</td>
</tr>
<tr>
<td>5</td>
<td>288</td>
</tr>
<tr>
<td>11</td>
<td>315</td>
</tr>
<tr>
<td>8</td>
<td>324</td>
</tr>
<tr>
<td>19</td>
<td>351</td>
</tr>
</tbody>
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A = Air intake
B = Air outlet
C = Exhaust outlet
D = Diffuser ring
E = Exhaust gas inlet
F = Fixed blades
G = Turbine blades
H = Compressor "Volute"
K = Exhaust "Volute"
M = Oil supply to shaft
N = Turbine deflator cone
MO-0081

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A: Clearance necessary to mount or dismantle end covers and labyrinths.
B: Driving Shaft
C:
D:
E:
F: Driven Shaft
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SWING CHECK VALVE
USED AS VACUUM BREAKER (OPTIONAL)

1/2"

CONDUIT CONNECTION

MAGNETROL

LOWEST VISIBLE PART OF GAGE GLASS
AT LEAST 2" ABOVE LOWEST PERMISSIBLE WATER LEVEL

3/4" PIPE SIZE BLOW DOWN

DRUM ON WATER TUBE BOILER
GOVERNOR

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BOTH ENGINES RUNNING AT THIS SPEED BEFORE LOAD IS APPLIED

DROOP OF ENGINE "B"
DROOP OF ENGINE "A"
ENGINE "A"
ENGINE "B"

NORMAL SPEED

NO LOAD

FULL LOAD

LOAD
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(COURTESY OF ALFA-LAVAL [MARINE AND POWER DIVISION])
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(COURTESY OF G.E.C. GAD PUBLISHERS)
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Separating temperature

(COURTESY OF WESTFALTA SEPARATOR)
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TO GOVERNOR OUTPUT SHAFT

TO FUEL INJECTION PUMP

TO SHUTDOWN SERVOMOTOR

MULTIPLE POSITION LOCKING HANDLE

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(COURTESY OF NEW SULZER DIESEL)
**Thrust Bearing**

<table>
<thead>
<tr>
<th>Nominal Dimension</th>
<th>Normal Play</th>
<th>Max. Play (worn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f = 200$</td>
<td>$f_1 = 1.0$</td>
<td>2.0</td>
</tr>
<tr>
<td>$g = 540$</td>
<td>$g_1 = \text{min. 0.10}$</td>
<td></td>
</tr>
<tr>
<td>$\pm 0.08$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$G = 540$</td>
<td>$h = 0.46$</td>
<td>0.8</td>
</tr>
<tr>
<td>$\pm 0.30$</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>$k = 20$</td>
<td>$11 + 12 = 5$</td>
<td></td>
</tr>
</tbody>
</table>

**Principal Clearances**

Crankshaft and Thrust Bearing in mm

7 354 366-E

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