



**POWER SOLUTIONS  
INTERNATIONAL**

# 53L

## Natural Gas / LPG

56100034

Revision 5

2022-02-28

| General Engine Data <sup>5</sup>                          |  |                     |             |      |   |   |       |          |                                   |                     |       |         |     |
|---|--|---------------------|-------------|------|---|---|-------|----------|-----------------------------------|---------------------|-------|---------|-----|
| Type  | V-type 4-cycle   |                     |             |      | Flywheel housing                        |   |       |          | SAE #0                            |                     |       |         |     |
| Number of cylinders                                       | 16   |                     |             |      | Flywheel                                |   |       |          | SAE #18                           |                     |       |         |     |
| Aspiration  | Charge Cooled Forced Induction                                       |                     |             |      | Dry Weight                              | Fan to Flywheel                                     |       | lb       | kg                                | 12125               | 5500  |         |     |
| Firing Order  | 1 - 7 - 12 - 14 - 4 - 16 - 2 - 8 - 11 - 13 - 3 - 5 - 10 - 6 - 9 - 15 |                     |             |      |   | Radiator to Flywheel                                |       | lb       | kg                                | 13625               | 6180  |         |     |
| Rotation Viewed from Flywheel                             | Counter-Clockwise  |                     |             |      | Wet Weight                              | Fan to Flywheel                                     |       | lb       | kg                                | 12692               | 5757  |         |     |
| Bore  | in   | mm                  | 5.91        | 150  |   | Radiator to Flywheel                                |       | lb       | kg                                | 14541               | 6596  |         |     |
| Stroke  | in   | mm                  | 7.28        | 185  | CG From Rear Face of Flywheel Housing   |   |       |          | in                                | mm                  | 51.3  | 1303    |     |
| Displacement  | in <sup>3</sup>  | L                   | 3192        | 52.3 | CG Above Crank Centerline               |   |       |          | in                                | mm                  | 7.3   | 186     |     |
| Compression Ratio   | 10.5 : 1   |                     |             |      | Oil Specification                       |   |       |          | SAE 15W-40 Low Ash Gas engine oil |                     |       |         |     |
| Exhaust Manifold Type                                     | Water Cooled   |                     |             |      |   |   |       |          | Ash content 0.25 - 0.5% by weight |                     |       |         |     |
| Turbo Exhaust Outlet Pipe Size                            | in   | mm                  | 3.5         | 89   | Engine Oil Capacity                     |   | Min   | qts      | L                                 | 120                 | 114   |         |     |
| Catalyst Inlet Size (O.D.)                                | in   | mm                  | 6           | 152  |   |   | Max   | qts      | L                                 | 181                 | 171   |         |     |
| Catalyst Dp   | in-H <sub>2</sub> O  | kPa                 | 33          | 8.3  | ECU Oil Pressure Warning <sup>6</sup>   |   |       |          | psi                               | bar                 | 57    | 3.9     |     |
| Maximum Allowable Exhaust Back Pressure                   | in-Hg  | kPa                 | 3.8         | 13   | ECU Oil Pressure Shut Down <sup>6</sup> |   |       |          | psi                               | bar                 | 47    | 3.2     |     |
| Maximum Fuel System Pressure <sup>8</sup>                 | psi  | kPag                | 29          | 200  | Oil Pressure at 1000 RPM (Idle)         |   | Min   | psi      | bar                               | 53                  | 4     |         |     |
| Maximum Operating pressure to MFG                         | in-H <sub>2</sub> O  | kPa                 | 30          | 7.5  |   |   | Max   | psi      | bar                               | 82                  | 6     |         |     |
| Minimum Operating pressure to MFG                         | in-H <sub>2</sub> O  | kPa                 | 20          | 5.0  | Max Allowable Oil Temperature           |   |       |          | °F                                | °C                  | 250   | 121     |     |
| Minimum Gas Supply Pipe Size <sup>13</sup>                | in   | mm                  | 3           | 76   | Coolant Capacity (Engine only)          |   |       |          | gal                               | L                   | 26    | 100     |     |
| Maximum Pressure Drop Across CAC                          | psi  | kPa                 | 1.5         | 10.3 | Coolant Capacity (Radiator only)        |   |       |          | gal                               | L                   | 39    | 148     |     |
| Maximum Allowable Intake Restriction                      | Clean Air Filter   | in-H <sub>2</sub> O | kPa         | 5.2  | 1.3                                     | Radiator Weight (Dry)                               |       |          |                                   | lb                  | kg    | 1500    | 680 |
|   | Dirty Air Filter   | in-H <sub>2</sub> O | kPa         | 14.9 | 3.7                                     | Thermostat Operating Temperature Range <sup>9</sup> |       | Cracking | °F                                | °C                  | 176   | 80      |     |
| Spark Plug Part Number                                    | Denso GK3-5  |                     |             |      | Full Open                               |   |       | °F       | °C                                | 198                 | 92    |         |     |
| Standard Spark Plug Gap <sup>10</sup>                     | in   | mm                  | 0.012       | 0.3  | ECU Coolant Temp Warning                |   |       |          | °F                                | °C                  | 219   | 104     |     |
| Spark Plug Coil - Primary Resistance                      | Ohms   |                     | 0.59Ω ± 10% |      | ECU Coolant Temp Shutdown               |   |       |          | °F                                | °C                  | 230   | 110     |     |
| Battery Voltage   | Volts  |                     | 24          |      | Maximum Radiator Cooling Air Temp       |   |       |          | °F                                | °C                  | 140   | 60      |     |
| Starter Motor Power (2X starters)                         | HP   | kW                  | 13.4        | 10   | Max External Coolant Friction Head      |   |       |          | psi                               | kPa                 | 9     | 60      |     |
|   |  |                     |             |      | CAC Rise Above Ambient Specified        |   |       |          | °F                                | °C                  | 15    | 8       |     |
| Performance Data 60Hz <sup>3,5</sup>                      |  |                     |             |      |   |   |       |          |                                   |                     |       |         |     |
| Nominal Engine Speed                                      | RPM  |                     | 1800        |      | Total Engine Coolant Flow               |   |       |          | gal/min                           | L/min               | 601   | 2274    |     |
| Mean Piston Speed   | ft/min   | m/s                 | 2185        | 11.1 | Cooling Fan Power <sup>11</sup>         |   |       |          | HP                                | kW                  | 107   | 80      |     |
| Steady-State RPM Range - ISO 8528-5 G3                    | RPM  |                     | 1791 - 1809 |      | Cooling Fan Speed                       |   |       |          | RPM                               |                     | 1206  |         |     |
| Charging Alternator Voltage                               | Volts  |                     | 28          |      | Cooling Fan Air Flow <sup>11</sup>      |   |       |          | SCFM                              | m <sup>3</sup> /min | 67300 | 1905.71 |     |
| Charging Alternator Current                               | Amps   |                     | 55          |      |   |   |       |          |                                   |                     |       |         |     |
| Prime 60Hz Natural Gas                                    | Load   |                     | 100%        |      | 75%                                     |   | 50%   |          | 25%                               |                     |       |         |     |
| Power Rating <sup>1,2,3,4</sup> Per ISO 3046              | HP   | kWm                 | 1431        | 1067 | 1073                                    | 800   | 715   | 534      | 358                               | 267                 |       |         |     |
| Brake Mean Effective Pressure                             | psi  | bar                 | 197         | 13.6 | 148                                     | 10.2  | 99    | 6.8      | 49                                | 3.4                 |       |         |     |
| Fuel Consumption <sup>3,4,7,12</sup>                      | lb/hr  | kg/hr               | 513         | 233  | 397                                     | 180   | 287   | 130      | 182                               | 82                  |       |         |     |
|   | ft <sup>3</sup> /hr  | m <sup>3</sup> /hr  | 11453       | 324  | 8879                                    | 251   | 6413  | 182      | 4057                              | 115                 |       |         |     |
| Brake Specific Fuel Consumption                           | lb/(hp-hr)   | g/(kW-hr)           | 0.358       | 218  | 0.370                                   | 225   | 0.401 | 244      | 0.508                             | 309                 |       |         |     |
| Turbine Outlet Temperature                                | °F   | °C                  | 1200        | 649  | 1182                                    | 639   | 1167  | 631      | 1127                              | 608                 |       |         |     |
| Exhaust Flow at Turbine Outlet Conditions (entire engine) | lb/hr  | kg/hr               | 9020        | 4092 | 6987                                    | 3169  | 5036  | 2284     | 3168                              | 1437                |       |         |     |
|   | ACFM   | m <sup>3</sup> /min | 6178        | 175  | 4743                                    | 134   | 3391  | 96       | 2088                              | 59                  |       |         |     |
| Air Induction System <sup>5</sup>                         |  |                     |             |      |   |   |       |          |                                   |                     |       |         |     |
| Combustion Air required (entire engine)                   | lb/hr  | kg/hr               | 8508        | 3859 | 6590                                    | 2989  | 4749  | 2154     | 2987                              | 1355                |       |         |     |
|   | ACFM   | m <sup>3</sup> /min | 1999        | 57   | 1549                                    | 44  | 1116  | 32       | 702                               | 20                  |       |         |     |
| Compressor Outlet Temperature <sup>2</sup>                | °F   | °C                  | 289         | 143  | 234                                     | 112   | 175   | 80       | 126                               | 52                  |       |         |     |
| Thermal Balance <sup>5</sup>                              |  |                     |             |      |   |   |       |          |                                   |                     |       |         |     |
| Total Fuel  | BTU/min  | kW                  | 174425      | 3067 | 135220                                  | 2378  | 97672 | 1717     | 61779                             | 1086                |       |         |     |
| Mechanical Power  | BTU/min  | kW                  | 60679       | 1067 | 45509                                   | 800   | 30340 | 534      | 15170                             | 267                 |       |         |     |
| Heat Rejected to Cooling Water                            | BTU/min  | kW                  | 48148       | 847  | 40361                                   | 710   | 32574 | 573      | 24787                             | 436                 |       |         |     |
| Heat Rejected to CAC                                      | BTU/min  | kW                  | 7430        | 131  | 4256                                    | 75  | 1734  | 30       | 325                               | 6                   |       |         |     |
| Heat Rejection to Exhaust                                 | BTU/min  | kW                  | 53976       | 949  | 40939                                   | 720   | 28628 | 503      | 17044                             | 300                 |       |         |     |
| Engine Radiated Heat                                      | BTU/min  | kW                  | 4192        | 74   | 4155                                    | 73  | 4396  | 77       | 4453                              | 78                  |       |         |     |

1: Max load and overload ratings based on ISO 3046 gross flywheel power. For additional information on ratings and duty cycles see PSI Power Systems Technical Spec #56100017 - Engine Ratings Guidelines

2: Technical data based on ISO 3046-1 standards of 77°F(25°C), barometric pressure 14.5Psia (100kPa) and 30% relative humidity.

3: Production tolerances in engines and installed components can account for power variations of ± 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

4: All fuel and thermal calculations unless otherwise noted are done at ISO 3046 rated load using LHV for NG of 48.17 MJ/kg.

5: All values in the following section are provided for informational purpose only and are non-binding.

6: >1400RPM.

7: See PSI Power Systems Technical Spec. 56100019 - Fuel Standard.

8: Maximum pressure the fuel system components can withstand without being damaged. Operating pressure should fall between the listed minimum and maximum pressures.

9: ± 2 degrees Celsius.

10: ± 0.002" or 0.05mm.

11: At 0.5 in-H<sub>2</sub>O of Package Restriction at STP.

12: Volume calculated using density of 0.717 kg/m<sup>3</sup> for NG, 0.51 kg/L for LPG

13: See 56100051 - MFG Fuel System Setup Guide



| General Engine Data <sup>5</sup>                             |  |                     |             |      |   |  |       |          |                                   |                     |       |      |     |
|--|--|---------------------|-------------|------|---|--|-------|----------|-----------------------------------|---------------------|-------|------|-----|
| Type   | V-type 4-cycle   |                     |             |      | Flywheel housing                        |  |       |          | SAE #0                            |                     |       |      |     |
| Number of cylinders  | 16   |                     |             |      | Flywheel                                |  |       |          | SAE #18                           |                     |       |      |     |
| Aspiration   | Charge Cooled Forced Induction                                       |                     |             |      | Dry Weight                              | Fan to Flywheel  |       | lb       | kg                                | 12125               | 5500  |      |     |
| Firing Order   | 1 - 7 - 12 - 14 - 4 - 16 - 2 - 8 - 11 - 13 - 3 - 5 - 10 - 6 - 9 - 15 |                     |             |      |   | Radiator to Flywheel                                   |       | lb       | kg                                | 13625               | 6180  |      |     |
| Rotation Viewed from Flywheel                                | Counter-Clockwise  |                     |             |      | Wet Weight                              | Fan to Flywheel  |       | lb       | kg                                | 12692               | 5757  |      |     |
| Bore   | in   | mm                  | 5.91        | 150  |   | Radiator to Flywheel                                   |       | lb       | kg                                | 14541               | 6596  |      |     |
| Stroke   | in   | mm                  | 7.28        | 185  | CG From Rear Face of Flywheel Housing   |  |       |          | in                                | mm                  | 51.3  | 1303 |     |
| Displacement   | in <sup>3</sup>  | L                   | 3192        | 52.3 | CG Above Crank Centerline               |  |       |          | in                                | mm                  | 7.3   | 186  |     |
| Compression Ratio  | 10.5 : 1   |                     |             |      | Oil Specification                       |  |       |          | SAE 15W-40 Low Ash Gas engine oil |                     |       |      |     |
| Exhaust Manifold Type  | Water Cooled   |                     |             |      |   |  |       |          | Ash content 0.25 - 0.5% by weight |                     |       |      |     |
| Turbo Exhaust Outlet Pipe Size                               | in   | mm                  | 3.5         | 89   | Engine Oil Capacity                     |  | Min   | qts      | L                                 | 120                 | 114   |      |     |
| Catalyst Inlet Size (O.D.)                                   | in   | mm                  | 6           | 152  |   |  | Max   | qts      | L                                 | 181                 | 171   |      |     |
| Catalyst Dp  | in-H <sub>2</sub> O  | kPa                 | 33          | 8.3  | ECU Oil Pressure Warning <sup>6</sup>   |  |       |          | psi                               | bar                 | 57    | 3.9  |     |
| Maximum Allowable Exhaust Back Pressure                      | in-Hg  | kPa                 | 3.8         | 13   | ECU Oil Pressure Shut Down <sup>6</sup> |  |       |          | psi                               | bar                 | 47    | 3.2  |     |
| Maximum Fuel System Pressure <sup>8</sup>                    | psi  | kPag                | 29          | 200  | Oil Pressure at<br>1000 RPM (Idle)      |  | Min   | psi      | bar                               | 53                  | 4     |      |     |
| Maximum Operating pressure to MFG                            | in-H <sub>2</sub> O  | kPa                 | 30          | 7.5  |   |  | Max   | psi      | bar                               | 82                  | 6     |      |     |
| Minimum Operating pressure to MFG                            | in-H <sub>2</sub> O  | kPa                 | 20          | 5.0  | Max Allowable Oil Temperature           |  |       |          | °F                                | °C                  | 250   | 121  |     |
| Minimum Gas Supply Pipe Size <sup>13</sup>                   | in   | mm                  | 3           | 76   | Coolant Capacity (Engine only)          |  |       |          | gal                               | L                   | 26    | 100  |     |
| Maximum Pressure Drop Across CAC                             | psi  | kPa                 | 1.5         | 10.3 | Coolant Capacity (Radiator only)        |  |       |          | gal                               | L                   | 39    | 148  |     |
| Maximum Allowable<br>Intake Restriction                      | Clean Air Filter   | in-H <sub>2</sub> O | kPa         | 5.2  | 1.3                                     | Radiator Weight (Dry)                                  |       |          |                                   | lb                  | kg    | 1500 | 680 |
|  | Dirty Air Filter   | in-H <sub>2</sub> O | kPa         | 14.9 | 3.7                                     | Thermostat Operating<br>Temperature Range <sup>9</sup> |       | Cracking | °F                                | °C                  | 176   | 80   |     |
| Spark Plug Part Number                                       | Denso GK3-5  |                     |             |      | Full Open                               |  |       | °F       | °C                                | 198                 | 92    |      |     |
| Standard Spark Plug Gap <sup>10</sup>                        | in   | mm                  | 0.012       | 0.3  | ECU Coolant Temp Warning                |  |       |          | °F                                | °C                  | 219   | 104  |     |
| Spark Plug Coil - Primary Resistance                         | Ohms   |                     | 0.59Ω ± 10% |      | ECU Coolant Temp Shutdown               |  |       |          | °F                                | °C                  | 230   | 110  |     |
| Battery Voltage  | Volts  |                     | 24          |      | Maximum Radiator Cooling Air Temp       |  |       |          | °F                                | °C                  | 140   | 60   |     |
| Starter Motor Power (2X starters)                            | HP   | kW                  | 13.4        | 10   | Max External Coolant Friction Head      |  |       |          | psi                               | kPa                 | 9     | 60   |     |
|  |  |                     |             |      | CAC Rise Above Ambient Specified        |  |       |          | °F                                | °C                  | 15    | 8    |     |
| Performance Data 50Hz <sup>3,5</sup>                         |  |                     |             |      |   |  |       |          |                                   |                     |       |      |     |
| Nominal Engine Speed   | RPM  |                     | 1500        |      | Total Engine Coolant Flow               |  |       |          | gal/min                           | L/min               | 460   | 1743 |     |
| Mean Piston Speed  | ft/min   | m/s                 | 1821        | 9.3  | Cooling Fan Power <sup>11</sup>         |  |       |          | HP                                | kW                  | 62    | 46   |     |
| Steady-State RPM Range - ISO 8528-5 G3                       | RPM  |                     | 1778 - 1823 |      | Cooling Fan Speed                       |  |       |          | RPM                               |                     | 1005  |      |     |
| Charging Alternator Voltage                                  | Volts  |                     | 28          |      | Cooling Fan Air Flow <sup>11</sup>      |  |       |          | SCFM                              | m <sup>3</sup> /min | 56080 | 1588 |     |
| Charging Alternator Current                                  | Amps   |                     | 53          |      |   |  |       |          |                                   |                     |       |      |     |
| Prime 50Hz Natural Gas                                       | Load   |                     | 100%        |      | 75%                                     |  | 50%   |          | 25%                               |                     |       |      |     |
| Power Rating <sup>1,2,3,4</sup> Per ISO 3046                 | HP   | kWm                 | 1191        | 888  | 893                                     | 666  | 662   | 444      | 298                               | 222                 |       |      |     |
| Brake Mean Effective Pressure                                | psi  | bar                 | 197         | 13.6 | 148                                     | 10.2   | 98    | 6.8      | 49                                | 3.4                 |       |      |     |
| Fuel Consumption <sup>3,4,7,12</sup>                         | lb/hr  | kg/hr               | 409         | 185  | 318                                     | 144  | 230   | 104      | 145                               | 66                  |       |      |     |
|  | ft <sup>3</sup> /hr  | m <sup>3</sup> /hr  | 9136        | 259  | 7109                                    | 201  | 5140  | 146      | 3230                              | 91                  |       |      |     |
| Brake Specific Fuel Consumption                              | lb/(hp-hr)   | g/(kW-hr)           | 0.343       | 209  | 0.356                                   | 217  | 0.386 | 235      | 0.486                             | 295                 |       |      |     |
| Turbine Outlet Temperature                                   | °F   | °C                  | 1151        | 622  | 1140                                    | 615  | 1111  | 599      | 1051                              | 566                 |       |      |     |
| Exhaust Flow at Turbine Outlet Conditions<br>(entire engine) | lb/hr  | kg/hr               | 7178        | 3256 | 5541                                    | 2513   | 3978  | 1804     | 2488                              | 1128                |       |      |     |
|  | ACFM   | m <sup>3</sup> /min | 4793        | 136  | 3677                                    | 104  | 2600  | 74       | 1574                              | 45                  |       |      |     |
| Air Induction System <sup>5</sup>                            |  |                     |             |      |   |  |       |          |                                   |                     |       |      |     |
| Combustion Air required (entire engine)                      | lb/hr  | kg/hr               | 6769        | 3070 | 5223                                    | 2369   | 3747  | 1700     | 2343                              | 1063                |       |      |     |
|  | ACFM   | m <sup>3</sup> /min | 1559        | 44   | 1203                                    | 34   | 863   | 24       | 540                               | 15                  |       |      |     |
| Compressor Outlet Temperature <sup>2</sup>                   | °F   | °C                  | 308         | 154  | 252                                     | 122  | 188   | 87       | 128                               | 54                  |       |      |     |
| Thermal Balance <sup>5</sup>                                 |  |                     |             |      |   |  |       |          |                                   |                     |       |      |     |
| Total Fuel   | BTU/min  | kW                  | 138855      | 2442 | 108043                                  | 1900   | 78123 | 1374     | 49095                             | 863                 |       |      |     |
| Mechanical Power   | BTU/min  | kW                  | 50500       | 888  | 37875                                   | 666  | 25250 | 444      | 12625                             | 222                 |       |      |     |
| Heat Rejected to Cooling Water                               | BTU/min  | kW                  | 38832       | 683  | 32639                                   | 574  | 26446 | 465      | 20253                             | 356                 |       |      |     |
| Heat Rejected to CAC   | BTU/min  | kW                  | 4160        | 73   | 2169                                    | 38   | 868   | 15       | 200                               | 4                   |       |      |     |
| Heat Rejection to Exhaust                                    | BTU/min  | kW                  | 40157       | 706  | 30370                                   | 534  | 21091 | 371      | 12321                             | 217                 |       |      |     |
| Engine Radiated Heat   | BTU/min  | kW                  | 5207        | 92   | 4990                                    | 88   | 4468  | 79       | 3696                              | 65                  |       |      |     |

1: Max load and overload ratings based on ISO 3046 gross flywheel power. For additional information on ratings and duty cycles see PSI Power Systems Technical Spec #56100017 - Engine Ratings Guidelines

2: Technical data based on ISO 3046-1 standards of 77°F(25°C), barometric pressure 14.5Psia (100kPa) and 30% relative humidity.

3: Production tolerances in engines and installed components can account for power variations of ± 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

4: All fuel and thermal calculations unless otherwise noted are done at ISO 3046 rated load using LHV for NG of 48.17 MJ/kg.

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6: >1400RPM.

7: See PSI Power Systems Technical Spec. 56100019 - Fuel Standard.

8: Maximum pressure the fuel system components can withstand without being damaged. Operating pressure should fall between the listed minimum and maximum pressures.

9: ± 2 degrees Celsius.

10: ± 0.002" or 0.05mm.

11: At 0.5 in-H<sub>2</sub>O of Package Restriction at STP.

12: Volume calculated using density of 0.717 kg/m<sup>3</sup> for NG, 0.51 kg/L for LPG

13: See 56100051 - MFG Fuel System Setup Guide



**POWER SOLUTIONS  
INTERNATIONAL**

# 53L

## Natural Gas / LPG

56100034  
Revision 5  
2022-02-28

| General Engine Data <sup>5</sup>                          |                  |  |                     |             |      |   |                      |       |      |                                   |                     |       |      |
|---|------------------|--|---------------------|-------------|------|---|----------------------|-------|------|-----------------------------------|---------------------|-------|------|
| Type  |                  | V-type 4-cycle   |                     |             |      | Flywheel housing                                    |                      |       |      | SAE #0                            |                     |       |      |
| Number of cylinders                                       |                  | 16   |                     |             |      | Flywheel  |                      |       |      | SAE #18                           |                     |       |      |
| Aspiration  |                  | Charge Cooled Forced Induction                                       |                     |             |      | Dry Weight  | Fan to Flywheel      |       | lb   | kg                                | 12125               | 5500  |      |
| Firing Order  |                  | 1 - 7 - 12 - 14 - 4 - 16 - 2 - 8 - 11 - 13 - 3 - 5 - 10 - 6 - 9 - 15 |                     |             |      |   | Radiator to Flywheel |       | lb   | kg                                | 13625               | 6180  |      |
| Rotation Viewed from Flywheel                             |                  | Counter-Clockwise  |                     |             |      | Wet Weight  | Fan to Flywheel      |       | lb   | kg                                | 12692               | 5757  |      |
| Bore  |                  | in   | mm                  | 5.91        | 150  |   | Radiator to Flywheel |       | lb   | kg                                | 14541               | 6596  |      |
| Stroke  |                  | in   | mm                  | 7.28        | 185  | CG From Rear Face of Flywheel Housing               |                      |       |      | in                                | mm                  | 51.3  | 1303 |
| Displacement  |                  | in <sup>3</sup>  | L                   | 3192        | 52.3 | CG Above Crank Centerline                           |                      |       |      | in                                | mm                  | 7.3   | 186  |
| Compression Ratio   |                  | 10.5 : 1   |                     |             |      | Oil Specification                                   |                      |       |      | SAE 15W-40 Low Ash Gas engine oil |                     |       |      |
| Exhaust Manifold Type                                     |                  | Water Cooled   |                     |             |      |   |                      |       |      | Ash content 0.25 - 0.5% by weight |                     |       |      |
| Turbo Exhaust Outlet Pipe Size                            |                  | in   | mm                  | 3.5         | 89   | Engine Oil Capacity                                 |                      | Min   | qts  | L                                 | 120                 | 114   |      |
| Catalyst Inlet Size (O.D)                                 |                  | in   | mm                  | 6           | 152  |   |                      | Max   | qts  | L                                 | 181                 | 171   |      |
| Catalyst Dp   |                  | in-H <sub>2</sub> O  | kPa                 | 33          | 8.3  | ECU Oil Pressure Warning <sup>6</sup>               |                      |       |      | psi                               | bar                 | 57    | 3.9  |
| Maximum Allowable Exhaust Back Pressure                   |                  | in-Hg  | kPa                 | 3.8         | 13   | ECU Oil Pressure Shut Down <sup>6</sup>             |                      |       |      | psi                               | bar                 | 47    | 3.2  |
| Maximum Fuel System Pressure <sup>8</sup>                 |                  | psi  | kPag                | 29          | 200  | Oil Pressure at 1000 RPM (Idle)                     |                      | Min   | psi  | bar                               | 53                  | 4     |      |
| Maximum Operating pressure to MFG                         |                  | in-H <sub>2</sub> O  | kPa                 | 30          | 7.5  |   |                      | Max   | psi  | bar                               | 82                  | 6     |      |
| Minimum Operating pressure to MFG                         |                  | in-H <sub>2</sub> O  | kPa                 | 20          | 5.0  | Max Allowable Oil Temperature                       |                      |       |      | °F                                | °C                  | 250   | 121  |
| Minimum Gas Supply Pipe Size <sup>13</sup>                |                  | in   | mm                  | 3           | 76   | Coolant Capacity (Engine only)                      |                      |       |      | gal                               | L                   | 26    | 100  |
| Maximum Pressure Drop Across CAC                          |                  | psi  | kPa                 | 1.5         | 10.3 | Coolant Capacity (Radiator only)                    |                      |       |      | gal                               | L                   | 39    | 148  |
| Maximum Allowable Intake Restriction                      | Clean Air Filter | in-H <sub>2</sub> O  | kPa                 | 5.2         | 1.3  | Radiator Weight (Dry)                               |                      |       |      | lb                                | kg                  | 1500  | 680  |
|   | Dirty Air Filter | in-H <sub>2</sub> O  | kPa                 | 14.9        | 3.7  | Thermostat Operating Temperature Range <sup>9</sup> |                      |       |      | Cracking                          | °F                  | °C    | 176  |
| Spark Plug Part Number                                    |                  | Denso GK3-5  |                     |             |      | Full Open   |                      |       |      | °F                                | °C                  | 198   | 92   |
| Standard Spark Plug Gap <sup>10</sup>                     |                  | in   | mm                  | 0.012       | 0.3  | ECU Coolant Temp Warning                            |                      |       |      | °F                                | °C                  | 219   | 104  |
| Spark Plug Coil - Primary Resistance                      |                  | Ohms   |                     | 0.59Ω ± 10% |      | ECU Coolant Temp Shutdown                           |                      |       |      | °F                                | °C                  | 230   | 110  |
| Battery Voltage   |                  | Volts  |                     | 24          |      | Maximum Radiator Cooling Air Temp                   |                      |       |      | °F                                | °C                  | 140   | 60   |
| Starter Motor Power (2X starters)                         |                  | HP   | kW                  | 13.4        | 10   | Max External Coolant Friction Head                  |                      |       |      | psi                               | kPa                 | 9     | 60   |
|   |                  |  |                     |             |      | CAC Rise Above Ambient Specified                    |                      |       |      | °F                                | °C                  | 15    | 8    |
| Performance Data 60Hz <sup>3,5</sup>                      |                  |  |                     |             |      |   |                      |       |      |                                   |                     |       |      |
| Nominal Engine Speed                                      |                  | RPM  |                     | 1800        |      | Total Engine Coolant Flow                           |                      |       |      | gal/min                           | L/min               | 601   | 2274 |
| Mean Piston Speed   |                  | ft/min   | m/s                 | 2185        | 11.1 | Cooling Fan Power <sup>11</sup>                     |                      |       |      | HP                                | kW                  | 107   | 80   |
| Steady-State RPM Range - ISO 8528-5 G3                    |                  | RPM  |                     | 1791 - 1809 |      | Cooling Fan Speed                                   |                      |       |      | RPM                               |                     | 1206  |      |
| Charging Alternator Voltage                               |                  | Volts  |                     | 28          |      | Cooling Fan Air Flow <sup>11</sup>                  |                      |       |      | SCFM                              | m <sup>3</sup> /min | 67300 | 1906 |
| Charging Alternator Current                               |                  | Amps   |                     | 55          |      |   |                      |       |      |                                   |                     |       |      |
| Prime 60Hz LPG  |                  | Load   |                     | 100%        |      | 75%   |                      | 50%   |      | 25%                               |                     |       |      |
| Power Rating <sup>1,2,3,4</sup> Per ISO 3046              |                  | HP   | kWm                 | 1077        | 803  | 808   | 602                  | 538   | 402  | 269                               | 201                 |       |      |
| Brake Mean Effective Pressure                             |                  | psi  | bar                 | 148         | 10.2 | 111   | 7.7                  | 74    | 5.1  | 37                                | 2.6                 |       |      |
| Fuel Consumption <sup>3,4,7,12</sup>                      |                  | lb/hr  | kg/hr               | 445         | 202  | 337   | 153                  | 241   | 109  | 157                               | 71                  |       |      |
|   |                  | gal/hr   | L/hr                | 104         | 395  | 79  | 299                  | 57    | 214  | 37                                | 140                 |       |      |
| Brake Specific Fuel Consumption                           |                  | lb/(hp-hr)   | g/(kW-hr)           | 0.413       | 251  | 0.417   | 253                  | 0.447 | 272  | 0.584                             | 355                 |       |      |
| Turbine Outlet Temperature                                |                  | °F   | °C                  | 1297        | 703  | 1230  | 665                  | 1170  | 632  | 1112                              | 600                 |       |      |
| Exhaust Flow at Turbine Outlet Conditions (entire engine) |                  | lb/hr  | kg/hr               | 7367        | 3342 | 5545  | 2515                 | 3944  | 1789 | 2565                              | 1163                |       |      |
|   |                  | ACFM   | m <sup>3</sup> /min | 5309        | 150  | 3858  | 109                  | 2660  | 75   | 1677                              | 47                  |       |      |
| Air Induction System <sup>5</sup>                         |                  |  |                     |             |      |   |                      |       |      |                                   |                     |       |      |
| Combustion Air required (entire engine)                   |                  | lb/hr  | kg/hr               | 6922        | 3140 | 5209  | 2363                 | 3703  | 1680 | 2407                              | 1092                |       |      |
|   |                  | ACFM   | m <sup>3</sup> /min | 1589        | 45   | 1196  | 34                   | 850   | 24   | 553                               | 16                  |       |      |
| Compressor Outlet Temperature <sup>2</sup>                |                  | °F   | °C                  | 246         | 119  | 189   | 87                   | 142   | 61   | 111                               | 44                  |       |      |
| Thermal Balance <sup>5</sup>                              |                  |  |                     |             |      |   |                      |       |      |                                   |                     |       |      |
| Total Fuel  |                  | BTU/min  | kW                  | 149630      | 2631 | 113266  | 1992                 | 81033 | 1425 | 52932                             | 931                 |       |      |
| Mechanical Power  |                  | BTU/min  | kW                  | 45666       | 803  | 34249   | 602                  | 22833 | 402  | 11416                             | 201                 |       |      |
| Heat Rejected to Cooling Water                            |                  | BTU/min  | kW                  | 45702       | 804  | 38838   | 683                  | 31973 | 562  | 25109                             | 442                 |       |      |
| Heat Rejected to CAC                                      |                  | BTU/min  | kW                  | 4691        | 82   | 2197  | 39                   | 779   | 14   | 157                               | 3                   |       |      |
| Heat Rejection to Exhaust                                 |                  | BTU/min  | kW                  | 47148       | 829  | 33206   | 584                  | 21963 | 386  | 13419                             | 236                 |       |      |
| Engine Radiated Heat                                      |                  | BTU/min  | kW                  | 6424        | 113  | 4776  | 84                   | 3485  | 61   | 2830                              | 50                  |       |      |

1: Max load and overload ratings based on ISO 3046 gross flywheel power. For additional information on ratings and duty cycles see PSI Power Systems Technical Spec #56100017 - Engine Ratings Guidelines

2: Technical data based on ISO 3046-1 standards of 77°F(25°C), barometric pressure 14.5Psia (100kPa) and 30% relative humidity.

3: Production tolerances in engines and installed components can account for power variations of ± 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

4: All fuel and thermal calculations unless otherwise noted are done at ISO 3046 rated load using LHV for NG of 48.17 MJ/kg.

5: All values in the following section are provided for informational purpose only and are non-binding.

6: >1400RPM.

7: See PSI Power Systems Technical Spec. 56100019 - Fuel Standard.

8: Maximum pressure the fuel system components can withstand without being damaged. Operating pressure should fall between the listed minimum and maximum pressures.

9: ± 2 degrees Celsius.

10: ± 0.002" or 0.05mm.

11: At 0.5 in-H<sub>2</sub>O of Package Restriction at STP.

12: Volume calculated using density of 0.717 kg/m<sup>3</sup> for NG, 0.51 kg/L for LPG

13: See 56100051 - MFG Fuel System Setup Guide



**POWER SOLUTIONS  
INTERNATIONAL**

# 53L

## Natural Gas / LPG

56100034  
Revision 5  
2022-02-28

| General Engine Data <sup>5</sup>                          |                  |  |                     |             |             |   |                                   |           |      |  |                     |       |      |     |
|---|------------------|--|---------------------|-------------|-------------|---|-----------------------------------|-----------|------|--|---------------------|-------|------|-----|
| Type  |                  | V-type 4-cycle   |                     |             |             | Flywheel housing                                    |                                   |           |      | SAE #0   |                     |       |      |     |
| Number of cylinders                                       |                  | 16   |                     |             |             | Flywheel  |                                   |           |      | SAE #18  |                     |       |      |     |
| Aspiration  |                  | Charge Cooled Forced Induction                                       |                     |             |             | Dry Weight  | Fan to Flywheel                   |           | lb   | kg   | 12125               | 5500  |      |     |
| Firing Order  |                  | 1 - 7 - 12 - 14 - 4 - 16 - 2 - 8 - 11 - 13 - 3 - 5 - 10 - 6 - 9 - 15 |                     |             |             |   | Radiator to Flywheel              |           | lb   | kg   | 13625               | 6180  |      |     |
| Rotation Viewed from Flywheel                             |                  | Counter-Clockwise  |                     |             |             | Wet Weight  | Fan to Flywheel                   |           | lb   | kg   | 12692               | 5757  |      |     |
| Bore  |                  | in   | mm                  | 5.91        | 150         |   | Radiator to Flywheel              |           | lb   | kg   | 14541               | 6596  |      |     |
| Stroke  |                  | in   | mm                  | 7.28        | 185         | CG From Rear Face of Flywheel Housing               |                                   |           |      | in   | mm                  | 51.3  | 1303 |     |
| Displacement  |                  | in <sup>3</sup>  | L                   | 3192        | 52.3        | CG Above Crank Centerline                           |                                   |           |      | in   | mm                  | 7.3   | 186  |     |
| Compression Ratio   |                  | 10.5 : 1   |                     |             |             | Oil Specification                                   |                                   |           |      | SAE 15W-40 Low Ash Gas engine oil<br>Ash content 0.25 - 0.5% by weight |                     |       |      |     |
| Exhaust Manifold Type                                     |                  | Water Cooled   |                     |             |             |   |                                   |           |      |  |                     |       |      |     |
| Turbo Exhaust Outlet Pipe Size                            |                  | in   | mm                  | 3.5         | 89          | Engine Oil Capacity                                 |                                   | Min       | qts  | L  | 120                 | 114   |      |     |
| Catalyst Inlet Size (O.D.)                                |                  | in   | mm                  | 6           | 152         |   |                                   | Max       | qts  | L  | 181                 | 171   |      |     |
| Catalyst Dp   |                  | in-H <sub>2</sub> O  | kPa                 | 33          | 8.3         | ECU Oil Pressure Warning <sup>6</sup>               |                                   |           |      | psi  | bar                 | 57    | 3.9  |     |
| Maximum Allowable Exhaust Back Pressure                   |                  | in-Hg  | kPa                 | 3.8         | 13          | ECU Oil Pressure Shut Down <sup>6</sup>             |                                   |           |      | psi  | bar                 | 47    | 3.2  |     |
| Maximum Fuel System Pressure <sup>8</sup>                 |                  | psi  | kPag                | 29          | 200         | Oil Pressure at 1000 RPM (Idle)                     |                                   | Min       | psi  | bar  | 53                  | 4     |      |     |
| Maximum Operating pressure to MFG                         |                  | in-H <sub>2</sub> O  | kPa                 | 30          | 7.5         |   |                                   | Max       | psi  | bar  | 82                  | 6     |      |     |
| Minimum Operating pressure to MFG                         |                  | in-H <sub>2</sub> O  | kPa                 | 20          | 5.0         | Max Allowable Oil Temperature                       |                                   |           |      | °F   | °C                  | 250   | 121  |     |
| Minimum Gas Supply Pipe Size <sup>13</sup>                |                  | in   | mm                  | 3           | 76          | Coolant Capacity (Engine only)                      |                                   |           |      | gal  | L                   | 26    | 100  |     |
| Maximum Pressure Drop Across CAC                          |                  | psi  | kPa                 | 1.5         | 10.3        | Coolant Capacity (Radiator only)                    |                                   |           |      | gal  | L                   | 39    | 148  |     |
| Maximum Allowable Intake Restriction                      | Clean Air Filter | in-H <sub>2</sub> O  | kPa                 | 5.2         | 1.3         | Radiator Weight (Dry)                               |                                   |           |      | lb   | kg                  | 1500  | 680  |     |
|   | Dirty Air Filter | in-H <sub>2</sub> O  | kPa                 | 14.9        | 3.7         | Thermostat Operating Temperature Range <sup>9</sup> |                                   | Cracking  | °F   | °C   | 176                 | 80    |      |     |
| Spark Plug Part Number                                    |                  | Denso GK3-5  |                     |             |             |   |                                   | Full Open | °F   | °C   | 198                 | 92    |      |     |
| Standard Spark Plug Gap <sup>10</sup>                     |                  | in   | mm                  | 0.012       | 0.3         | ECU Coolant Temp Warning                            |                                   |           |      | °F   | °C                  | 219   | 104  |     |
| Spark Plug Coil - Primary Resistance                      |                  | Ohms   |                     |             | 0.59Ω ± 10% |   | ECU Coolant Temp Shutdown         |           |      |  | °F                  | °C    | 230  | 110 |
| Battery Voltage   |                  | Volts  |                     |             | 24          |   | Maximum Radiator Cooling Air Temp |           |      |  | °F                  | °C    | 140  | 60  |
| Starter Motor Power (2X starters)                         |                  | HP   | kW                  | 13.4        | 10          | Max External Coolant Friction Head                  |                                   |           |      | psi  | kPa                 | 9     | 60   |     |
|   |                  |  |                     |             |             | CAC Rise Above Ambient Specified                    |                                   |           |      | °F   | °C                  | 15    | 8    |     |
| Performance Data 50Hz <sup>3,5</sup>                      |                  |  |                     |             |             |   |                                   |           |      |  |                     |       |      |     |
| Nominal Engine Speed                                      |                  | RPM  |                     | 1500        |             | Total Engine Coolant Flow                           |                                   |           |      | gal/min  | L/min               | 460   | 1743 |     |
| Mean Piston Speed   |                  | ft/min   | m/s                 | 1821        | 9.3         | Cooling Fan Power <sup>11</sup>                     |                                   |           |      | HP   | kW                  | 62    | 46   |     |
| Steady-State RPM Range - ISO 8528-5 G3                    |                  | RPM  |                     | 1778 - 1823 |             | Cooling Fan Speed                                   |                                   |           |      | RPM  |                     | 1005  |      |     |
| Charging Alternator Voltage                               |                  | Volts  |                     | 28          |             | Cooling Fan Air Flow <sup>11</sup>                  |                                   |           |      | SCFM   | m <sup>3</sup> /min | 56080 | 1588 |     |
| Charging Alternator Current                               |                  | Amps   |                     | 53          |             |   |                                   |           |      |  |                     |       |      |     |
| Prime 50Hz LPG  |                  | Load   |                     | 100%        |             | 75%   |                                   | 50%       |      | 25%  |                     |       |      |     |
| Power Rating <sup>1,2,3,4</sup> Per ISO 3046              |                  | HP   | kWm                 | 898         | 670         | 674   | 503                               | 449       | 335  | 225  | 168                 |       |      |     |
| Brake Mean Effective Pressure                             |                  | psi  | bar                 | 149         | 10.2        | 111   | 7.7                               | 74        | 5.1  | 37   | 2.6                 |       |      |     |
| Fuel Consumption <sup>3,4,7,12</sup>                      |                  | lb/hr  | kg/hr               | 333         | 151         | 263   | 119                               | 193       | 87   | 123  | 56                  |       |      |     |
|   |                  | gal/hr   | L/hr                | 78          | 296         | 62  | 234                               | 45        | 171  | 29   | 109                 |       |      |     |
| Brake Specific Fuel Consumption                           |                  | lb/(hp-hr)   | g/(kW-hr)           | 0.371       | 225         | 0.390   | 237                               | 0.429     | 261  | 0.546  | 332                 |       |      |     |
| Turbine Outlet Temperature                                |                  | °F   | °C                  | 1086        | 586         | 1049  | 565                               | 1016      | 547  | 962  | 517                 |       |      |     |
| Exhaust Flow at Turbine Outlet Conditions (entire engine) |                  | lb/hr  | kg/hr               | 5702        | 2586        | 4355  | 1976                              | 3114      | 1413 | 1979   | 898                 |       |      |     |
|   |                  | ACFM   | m <sup>3</sup> /min | 3678        | 104         | 2753  | 78                                | 1931      | 55   | 1189   | 34                  |       |      |     |
| Air Induction System <sup>5</sup>                         |                  |  |                     |             |             |   |                                   |           |      |  |                     |       |      |     |
| Combustion Air required (entire engine)                   |                  | lb/hr  | kg/hr               | 5369        | 2435        | 4092  | 1856                              | 2922      | 1325 | 1856   | 842                 |       |      |     |
|   |                  | ACFM   | m <sup>3</sup> /min | 1223        | 35          | 932   | 26                                | 666       | 19   | 423  | 12                  |       |      |     |
| Compressor Outlet Temperature <sup>2</sup>                |                  | °F   | °C                  | 194         | 90          | 154   | 68                                | 122       | 50   | 102  | 39                  |       |      |     |
| Thermal Balance <sup>5</sup>                              |                  |  |                     |             |             |   |                                   |           |      |  |                     |       |      |     |
| Total Fuel  |                  | BTU/min  | kW                  | 116398      | 2047        | 89499   | 1574                              | 64594     | 1136 | 41684  | 733                 |       |      |     |
| Mechanical Power  |                  | BTU/min  | kW                  | 38102       | 670         | 28577   | 503                               | 19051     | 335  | 9526   | 168                 |       |      |     |
| Heat Rejected to Cooling Water                            |                  | BTU/min  | kW                  | 34954       | 615         | 29275   | 515                               | 23596     | 415  | 17917  | 315                 |       |      |     |
| Heat Rejected to CAC                                      |                  | BTU/min  | kW                  | 2379        | 42          | 1069  | 19                                | 352       | 6    | 57   | 1                   |       |      |     |
| Heat Rejection to Exhaust                                 |                  | BTU/min  | kW                  | 34056       | 599         | 24163   | 425                               | 15845     | 279  | 9100   | 160                 |       |      |     |
| Engine Radiated Heat                                      |                  | BTU/min  | kW                  | 6907        | 121         | 6415  | 113                               | 5751      | 101  | 5084   | 89                  |       |      |     |

1: Max load and overload ratings based on ISO 3046 gross flywheel power. For additional information on ratings and duty cycles see PSI Power Systems Technical Spec #56100017 - Engine Ratings Guidelines

2: Technical data based on ISO 3046-1 standards of 77°F(25°C), barometric pressure 14.5Psia (100kPa) and 30% relative humidity.

3: Production tolerances in engines and installed components can account for power variations of ± 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

4: All fuel and thermal calculations unless otherwise noted are done at ISO 3046 rated load using LHV for NG of 48.17 MJ/kg.

5: All values in the following section are provided for informational purpose only and are non-binding.

6: >1400RPM.

7: See PSI Power Systems Technical Spec. 56100019 - Fuel Standard.

8: Maximum pressure the fuel system components can withstand without being damaged. Operating pressure should fall between the listed minimum and maximum pressures.

9: ± 2 degrees Celsius.

10: ± 0.002" or 0.05mm.

11: At 0.5 in-H<sub>2</sub>O of Package Restriction at STP.

12: Volume calculated using density of 0.717 kg/m<sup>3</sup> for NG, 0.51 kg/L for LPG

13: See 56100051 - MFG Fuel System Setup Guide