

# Engine Troubleshooting

| TROUBLE          |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | DIESEL ENGINE TROUBLESHOOTING GUIDE<br>LIQUID OR AIR COOLED |                |       |  |  |  |  |                                     |  |  |  |  |  |
|------------------|--------------------------------------|---|--|----------------|------------------|-----------------|--------------------------|---------------------------|----------------------------|--------------------|---------|------------------------|-------------------|--|---|-------------|-------------------|------------------|-------------------------------|--------------------|----------------------------------|------------------|----------------|---|----------------|-------|--|--|--|--|-------------------------------------|--|--|--|--|--|
| COMPRESSION POOR | CONNECTING ROD BUSHINGS BEARING WORN | COOLANT TEMPERATURE TOO HIGH (FRESH WATER SYSTEM) | COOLANT TEMPERATURE TOO LOW (FRESH WATER SYSTEM) | ENGINE MISFIRE | ENGINE POWER LOW | ENGINE OVERHEAT | FUEL CONSUMPTION TOO LOW | FUEL CONSUMPTION TOO HIGH | FUEL CONSUMPTION EXCESSIVE | GOVERNOR EXCESSIVE | HUNTING | INJECTION CONTROL LOSS | MECHANICAL KNOCKS | OIL CONSUMPTION EXCESSIVE - LIGHT BLUE SMOKE EXHAUST | OIL CONSUMPTION EXCESSIVE - BLACK SMOKE EXHAUST | OIL DILUTED | OIL PRESSURE HIGH | OIL PRESSURE LOW | PISTON CYLINDER AND RING WEAR | STARTER SPEED SLOW | STARTING HARD OR FAILURE TO TURN | SENSITIVITY POOR | VALVE BREAKAGE | VALVE BURNING   | VALVE STICKING | CAUSE |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | STARTING SYSTEM   |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Discharged or Defective Battery                  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Glow Plug or Lead                      |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Load Connected When Starting                     |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Solenoid                               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Starter                                |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Control Circuit                        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | FUEL SYSTEM   |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Fuel System                            |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Air in Fuel System                               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Incorrect Timing                                 |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Restricted Air Intake - Dirty Air Filter         |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Poor Quality Fuel                                |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Dirty Fuel Filters                               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Out of Fuel or Shut Off Closed                   |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Worn or Damaged Transfer Pump, Leaking Diaphragm |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Faulty Injection Pump, Nozzles or Gaskets        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Fuel Line Leaks                                  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Wrong Timing Button in Injection Pump            |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Wrong Thickness Pump Mounting Gaskets            |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Run For Long Periods of Time at NO LOAD          |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | LUBRICATION SYSTEM  |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Low Oil Supply                                   |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Oil Gauge                              |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Excess Oil in Crankcase                          |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Oil Leaks From Engine Base or Connections        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Light or Diluted Crankcase Oil                   |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Leaky Oil Seals                                  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Improper Lubrication                             |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Faulty Oil By-Pass                               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Worn Oil Pump                                    |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Heavy Oil or Clogged Passages                    |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Dirty Oil Filter                                 |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | GOVERNOR SYSTEM   |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Loose or Disconnected Linkage                    |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Binding Linkage                                  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Excessive Wear in Linkage                        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Incorrect Governor Adjustment                    |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | High Spring Sensitivity                          |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Incorrectly Installed Governor Yoke or Cup       |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | COOLING SYSTEM  |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Insufficient Coolant                             |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Faulty Thermostat                                |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Worn Water Pump or Defective Seals               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Water Passages Restricted                        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Blown Head Gasket                                |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Overheating                                      |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Restricted or Too Long Water Lines               |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Defective Expansion Tank Pressure Cap            |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Inadequate Air Circulation                       |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                | INTERNAL ENGINE   |                |       |  |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Poor Compression                                 |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Loose Piston                                     |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Loose Connecting Rod or Crankshaft Bearing       |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Incorrect Valve Clearance                        |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Broken or Weak Valve Spring                      |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | High Exhaust Back Pressure                       |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Valves Not Seating Properly                      |  |  |  |                                     |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Worn Bearings                                    |  |  |  | Worn Cylinder Walls, Pistons, Rings |  |  |  |  |  |
|                  |                                      |   |  |                |                  |                 |                          |                           |                            |                    |         |                        |                   |  |   |             |                   |                  |                               |                    |                                  |                  |                |   |                |       | Sticking Valves                                  |  |  |  | Worn or Dirty Valve Guides          |  |  |  |  |  |