# ENGINE NO START/HARD START

| Possible Causes |
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| DTC/PRODUCT IMPROVEMENT |
| BATTERY VOLTAGE |
| STARTING ACCESSORIES |
| ENGINE TIMING |
| FUEL SUPPLY SYSTEM |
| INJECTION SYSTEM |
| FUEL RETURN |
| AIR SYSTEM |
| OTHER VEHICLE SYSTEMS |
| BASE ENGINE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding.(Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure)**

### 1. DTC/PRODUCT IMPROVEMENT

1. Check for any TSB's related to customer's complaint or DTC's present.
2. Follow appropriate guidelines in DTC troubleshooting tree or instructions in TSB.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 2
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### 2. BATTERY VOLTAGE

1. Check for low battery voltage.

**Is battery voltage okay?**

**No**
- Repair low battery voltage.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure)

**Yes**
- Go To 3
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### 3. STARTING ACCESSORIES

1. Inspect the Ignition switch (check for proper output voltage and/or open circuit).
2. Inspect the Starter.
3. Inspect the Grid Heaters.
4. Inspect the Fuel Heater.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 4
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### 4. ENGINE TIMING

1. Inspect speed indicator ring for damaged/missing teeth.
2. Inspect for dirty or damaged pins at Crankshaft position sensor (CKP) or Camshaft position sensor (CMP).
3. Verify proper overhead adjustments.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 5
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### 5. FUEL SUPPLY SYSTEM

1. Verify proper fuel quality, grade and level in vehicle.
2. Use scan tool to monitor fuel rail pressure. If pressure does not fluctuate more then +/- 500 psi of setpoint than the fuel system is not the cause of the complaint. Proceed to step 6. If condition exist continue.
3. Verify proper low pressure supply to the Injection Pump by performing the “*IN-TANK FUEL LIFT PUMP FLOW TEST - DIESEL” Procedure.
4. Use the “*HIGH PRESSURE FUEL PUMP PERFORMANCE TEST - DIESEL” to check for failed fuel pump.
5. Perform “*CHECKING PRESSURE LIMITING VALVE ON THE FUEL - DIESEL”.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 6
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**6. INJECTION SYSTEM**

1. Perform “*INJECTOR RETURN FLOW TEST”. If okay go next step.
2. Check for correct injectors and injector shims.
3. Visuslly inspect injector wire nuts and pass through connectors for damage or corrosion.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 7
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**7. FUEL RETURN**

1. Check for kinked or restricted fuel return lines.
2. Check fuel tank venting.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 8
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**8. INTAKE SYSTEM**

1. Check for inlet restriction, inspect air filter for excessive dirt/debris. Verify air intake lines are not kinked or restricted.
2. Check for air system leaks. Perform “*INTAKE AIR SYSTEM PRESSURE TEST - DIESEL”.
3. Inspect Turbocharger for wheel clearance and proper wastegate operation.
4. Check for exhaust restriction. Verify proper exhaust brake operation. Check for kinked or blocked exhaust pipes.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 9
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**9. OTHER VEHICLE SYSTEMS**

1. Verify proper operation of the Transmission Clutch.
2. Verify proper operation of the Transmission.
3. Verify proper operation of the Vehicle brakes (check for dragging).
4. Verify proper operation of the Cooling fan operation cycle time.

5. Verify proper operation of the Engine driven accessories.
6. Verify proper operation of the Accelerator pedal (restricted or out of calibration).
7. Verify no excess Electrical Noise.
8. Verify no Moisture in harness connector or corroded terminals.

**Is vehicle repaired?**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)

**No**
- Go To 10
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**10. BASE ENGINE**

1. Inspect speed indicator ring for damaged/missing teeth.
2. Check for internal engine damage.

**Repair Complete.**

**Yes**
- Repair complete.
- Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). (Refer to 28 - DTC-Based Diagnostics/ MODULE, Powertrain Control (PCM) - Standard Procedure)
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