14.7 EXCESSIVE OIL CONSUMPTION

There are several causes for excessive oil consumption. These probable causes are:

- Miscalibrated Dipstick
- External Oil Leaks
- Leaking Oil Cooler Core
- Defective Air Compressor
- Defective Turbocharger
- Worn or Damaged Valve or Cylinder Kit

14.7.1 Troubleshooting Procedure for Miscalibrated Dipstick

To determine if an overfilled crankcase is causing excessive oil consumption, perform the following:

1. Ensure the vehicle is parked on level ground.
2. Drain the oil pan. Refill oil pan to the proper capacity. Refer to section 11.1.4.
   
   [a] If a calibration check indicates that the oil level is off by more than 2 mm (0.078 in.), contact your Detroit Diesel regional support office.
   
   [b] Check for oil leaks; refer to section 14.7.2.

14.7.2 Troubleshooting Procedure for External Oil Leaks

To determine if oil leaks are causing excessive oil consumption, perform the following:

1. Steam clean the engine.
14.7 EXCESSIVE OIL CONSUMPTION

| CAUTION: |
| To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked. |

| CAUTION: |
| Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm. |
| Always start and operate an engine in a well ventilated area. |
| If operating an engine in an enclosed area, vent the exhaust to the outside. |
| Do not modify or tamper with the exhaust system or emission control system. |

2. Start and run the engine to operating temperature: 88°C (190°F).
3. Check for leaks at oil lines, connections, mating joints, seals, and gaskets.
   
   [a] If no oil leaks are found, shut down the engine and check for a leaking oil cooler core; refer to section 14.7.4.

   [b] If oil leaks are found, shut down the engine; refer to section 14.7.3.

14.7.3 Engine Oil Leak Repair

Perform the following steps, as necessary, to resolve engine oil leaks:

1. Repair or replace components leaking oil; refer to section 4.
2. Verify repairs made to correct oil leaks; refer to section 14.7.3.1.

14.7.3.1 Test Engine with Repairs Made to Correct Oil Leaks

Perform the following steps to determine if the repairs resolved the oil leaks:
CAUTION:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
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- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system.

1. Start and run the engine to operating temperature: 88° C (190° F).
2. Shut down the engine.
3. Check the engine for oil leaks.
   [a] If no oil leaks are observed, check for a leaking oil cooler core; refer to section 14.7.4.
   [b] If external oil leaks are present, refer to section 14.7.3 and repeat.

14.7.4 Troubleshooting Procedure for a Leaking Oil Cooler Core

To determine if a leaking oil cooler core is causing excessive oil consumption, perform the following:
1. Check for oil in the engine coolant or radiator.
   [a] If oil is present in either the engine coolant or radiator; go to step 2.
   [b] If no oil is present in either the engine coolant or radiator, check for a defective air compressor; refer to section 14.7.6.
2. Remove the oil cooler core and housing.
3. Clean both the oil side and water side of the oil cooler core.
4. Visually inspect the core for cracks.
   [a] If cracks are present, refer to section 14.7.5.
   [b] If no cracks are present, complete a lube oil consumption report; call the Detroit Diesel Technical Service Group for a form.

14.7.5 Oil Cooler Core Replacement

Perform the following for oil cooler core replacement:
1. Remove and install a new oil cooler core. Refer to section 4.6
2. Verify replacement of the oil cooler core; refer to section 14.7.5.1.
### 14.7.5.1 Test Engine with New Oil Cooler Core

Perform the following steps to determine if the replaced oil cooler core reduced oil consumption:

<table>
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<th>CAUTION:</th>
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<tr>
<td>To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.</td>
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- Always start and operate an engine in a well ventilated area.  
- If operating an engine in an enclosed area, vent the exhaust to the outside.  
- Do not modify or tamper with the exhaust system or emission control system. |

1. Start and run the engine to operating temperature: 88°C (190°F).
2. Shut down the engine.
3. Check the engine coolant for the presence of oil.
   
   [a] If no oil is present in the coolant, perform a lube oil consumption test report; refer to section 14.7.5.2.
   
   [b] If oil is present in the coolant, refer to section 14.7.8.

### 14.7.5.2 Test Engine for Reduced Oil Consumption

Perform a lube oil consumption report; call the Detroit Diesel Technical Service Group for a form.

1. Review the oil consumption report.
   
   [a] If the oil consumption report data is within specifications, check for defective air compressor; refer to section 14.7.6.
   
   [b] If the oil consumption report data is not within specifications, call Detroit Diesel Technical Service Group.

### 14.7.6 Troubleshooting Procedure for a Defective Air Compressor

To determine if a defective air compressor is causing excessive oil consumption, perform the following:
1. Perform a crankcase pressure test and record the test results.
2. Disconnect the air discharge line from the air compressor. See Figure 14-1; refer to section 3.1.1.

![Diagram of Air Line Attachments]

A = TO AIR GOVERNOR  
B = FROM INTAKE SIDE OF TURBOCHARGER  
C = TO WET TANK (OR AIR DRYER, IF INSTALLED)

1. Discharge Port  
2. Unloader Air Line  
3. Intake Air Line  
4. Unloader Port  
5. Discharge Air Line  
6. Air Compressor

Figure 14-1  Air Line Attachments

3. Repeat step 1 and record the results.
4. Compare the results of test one with test two.
   [a] If the engine crankcase pressure remained the same, check the turbocharger; refer to section 14.7.8.
   [b] If the engine crankcase pressure decreased, replace the air compressor; refer to section 14.7.7.

14.7.7 Air Compressor Removal

Perform the following steps to remove the defective air compressor:
1. Remove the air compressor from the engine; refer to section 3.1.1.
2. Disassemble and repair the air compressor; refer to OEM guidelines.
3. Install the repaired air compressor to the engine; refer to section 3.1.2.
4. Verify repair of the air compressor; refer to section 14.7.7.1.
14.7.7.1 Test Engine with Repaired Air Compressor

Perform the following steps to determine if the repaired air compressor resolved the excessive crankcase pressure:

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<tr>
<td>Always start and operate an engine in a well ventilated area.</td>
</tr>
<tr>
<td>If operating an engine in an enclosed area, vent the exhaust to the outside.</td>
</tr>
<tr>
<td>Do not modify or tamper with the exhaust system or emission control system.</td>
</tr>
</tbody>
</table>

1. Start and run the engine.
2. Perform a crankcase pressure test.
   - [a] If the engine crankcase pressure exceeds 1.50 kPa (6 in. H₂O), refer to section 14.7.8.
   - [b] If the engine crankcase pressure is within 1.50 kPa (6 in. H₂O), shut down the engine; no further troubleshooting is required.

14.7.8 Troubleshooting Procedure for a Defective Turbocharger

To determine if a defective turbocharger is causing excessive oil consumption, perform the following:

1. Remove the turbocharger drain line connected to the crankcase and place the drain line into a suitable container.
2. Perform a crankcase pressure test.
   - [a] If the engine crankcase pressure is more than 1.50 kPa (6 in. H₂O), replace the turbocharger; refer to section 7.4.2.

14.7.9 Turbocharger Replacement

Perform the following steps to replace a defective turbocharger:
1. Remove the defective turbocharger from the engine; refer to section 7.4.2.
2. Tag the removed turbocharger for remanufacture.
3. Install a new turbocharger to the engine; refer to section 7.4.3.
4. Verify replacement of new turbocharger; refer to section 14.7.9.1.

14.7.9.1 Test Engine with New Turbocharger

Perform the following steps to determine if a new turbocharger resolved the excessive crankcase pressure:

1. Remove the turbocharger drain line connected to the crankcase and place the drain line into a suitable container.
2. Perform a crankcase pressure test.
   
   [a] If the engine crankcase pressure is greater than 1.50 kPa (6 in. H₂O), check for worn or damaged valve or cylinder kit; refer to section 14.7.10.
   
   [b] If the engine crankcase pressure is 1.50 kPa (6 in. H₂O) or less, no further troubleshooting is required.

14.7.10 Troubleshooting Procedure for Worn or Damaged Valve or Cylinder Kit

A loss of cylinder pressure can cause increased oil consumption. The detection and elimination of cylinder pressure losses is vital to engine life and efficient operation. To assist the mechanic in effectively measuring the loss of cylinder pressure, and locating the source of abnormal leaks in individual cylinders, the following test procedure has been developed.

1. Move the vehicle requiring test to the chassis dynamometer; refer to OEM guidelines.
2. Disconnect the air compressor and remove; refer to section 3.1.1.
14.7 EXCESSIVE OIL CONSUMPTION

**CAUTION:**
To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

**CAUTION:**
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
- Always start and operate an engine in a well ventilated area.
- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system.

3. Start the engine.
4. Run the engine and bring the engine coolant temperature to normal operating range, approximately 88-96°C (190-205°F).
5. Run the vehicle to full load and rated speed.
6. Attach a manometer calibrated to read in inches of water, to the oil dipstick opening. Measure and record the crankcase pressure.
7. Shut down the engine.
8. Remove the vehicle from the chassis dynamometer.
9. Review the crankcase pressure test results.
   - [a] If the crankcase pressure exceeds 1.50 kPa (6 in.) H₂O, repair worn or damaged valve(s) or cylinder kit; refer to section 14.7.11.
   - [b] If the crankcase pressure was less than or equal to 1.50 kPa (6 in.) H₂O, perform a cylinder compression test. Refer to section 1.2.2.2.
10. Compare the cylinder compression test results to specifications as listed in Table 1-10.
   - [a] If the cylinder compression is below specifications, repair worn or damaged valve(s) or cylinder kit; refer to section 14.7.11.
   - [b] If the cylinder compression is within specifications, call Detroit Diesel Technical Service Group.

### 14.7.11 Worn or Damaged Valve(s) or Cylinder Kit(s) Repair

Perform the following steps to repair worn or damaged valve(s) and cylinder kit(s):

All information subject to change without notice.
1. Remove the cylinder head; refer to section 1.2.1.
2. Inspect the cylinder head for worn or damaged valves; refer to section 1.17.
3. Inspect the cylinder kit components for worn or damaged liners; pistons or piston rings; refer to section 1.15.3.1.
4. Replace damaged cylinder kit components.
5. Verify repairs made to cylinder head valve(s) or cylinder kit components; refer to section 14.7.11.1.

14.7.11.1 Test Engine with Repaired Cylinder Head Valve(s), and Cylinder Kit

Perform the following steps to determine if the cylinder head valve and cylinder kit repair resolved starting difficulty:

| CAUTION: |
| To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked. |

| CAUTION: |
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- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system. |

1. Attempt to start and run the engine.
   [a] If the engine starts and runs, no further troubleshooting is required.
   [b] If the engine fails to start and run, call the Detroit Diesel Technical Service Group.