14.8 EXCESSIVE CRANKCASE PRESSURE

There are several causes for excessive crankcase pressure. These probable causes are:

- Obstruction or Damage to Rocker Cover Breather
- Defective Air Compressor
- Defective Turbocharger
- Worn or Damaged Valve or Cylinder Kit

14.8.1 Troubleshooting Procedure for Obstruction or Damage to Rocker Cover Breather

To determine if an obstructed or damaged breather is causing excessive crankcase pressure, perform the following:

1. Perform a crankcase pressure test. If the engine crankcase pressure is greater than 1.50 kPa (6 in. H₂O), replace wire mesh element; refer to section 14.8.2.

14.8.2 Rocker Cover Breather Resolution

Perform the following steps to replace wire mesh element:

1. Remove the valve rocker cover.
2. Remove the wire mesh element from the rocker cover.
3. Install a new wire mesh element to the rocker cover.
4. Install the rocker cover to the engine.
5. Verify replacement of the wire mesh element; refer to section 14.8.2.1.

14.8.2.1 Test Engine with New Wire Mesh Element

Perform the following steps to determine if the new wire mesh element resolved the excessive crankcase pressure:
14.8 EXCESSIVE CRANKCASE PRESSURE

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.

1. Start and run the engine.
2. Perform a crankcase pressure test.
   [a] If the engine crankcase pressure is less than 1.50 kPa (6 in. H₂O), no further troubleshooting is required. Shut down the engine.
   [b] If the engine crankcase pressure is greater than 1.50 kPa (6 in. H₂O), check the air compressor; refer to section 14.8.3. Shut down the engine.

14.8.3 Troubleshooting Procedure for Defective Air Compressor

To determine if a defective air compressor is causing excessive crankcase pressure, 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.

![Air Line Attachments Diagram](image)

**Figure 14-1**  
Air Line Attachments

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

3. Repeat step 1 and record the test 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 14.8.5.
   
   [b] If the engine crankcase pressure decreased, repair the air compressor; refer to section 14.8.4.

### 14.8.4 Air Compressor Repair

Perform the following steps to repair the defective air compressor:

1. Remove the air compressor from the engine; refer to section 3.1.1.
2. Install the repaired air compressor to the engine; refer to section 3.1.2.
3. Verify repair of the air compressor; refer to section 14.8.4.1.
14.8 EXCESSIVE CRANKCASE PRESSURE

14.8.4.1 Test Engine with Repaired Air Compressor

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

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<td>Do not modify or tamper with the exhaust system or emission control system.</td>
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1. Start and run the engine.
2. Perform a crankcase pressure test.
   a. If the engine crankcase pressure is within 1.50 kPa (6 in. H₂O), no further troubleshooting is required. Shut down the engine.
   b. If the engine crankcase pressure is not within 1.50 kPa (6 in. H₂O), check the turbocharger; refer to section 14.8.5. Shut down the engine.

14.8.5 Troubleshooting Procedure for a Defective Turbocharger

To determine if a defective turbocharger is causing excessive crankcase pressure, perform the following:

<table>
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<td>Ensure that the engine is not allowed to operate longer than necessary to perform the crankcase pressure test. A complete loss of crankcase oil will severely damage the engine.</td>
</tr>
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</table>

1. Remove the turbocharger drain line connected to the crankcase and place the drain line into a suitable container; refer to section 7.4.2.
2. Perform a crankcase pressure test.
If the engine crankcase pressure is less than 1.50 kPa (6 in. H₂O), replace the turbocharger; refer to section 14.8.6. Shut down the engine.

If the engine crankcase pressure indicates no change, check for a worn or damaged valve or cylinder kit; refer to section 14.8.7. Shut down the engine.

14.8.6 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 replacement turbocharger to the engine; refer to section 7.4.3.

14.8.6.1 Test Engine with New Turbocharger

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

1. Perform a crankcase pressure test.
   [a] If the engine crankcase pressure is 1.50 kPa (6 in. H₂O) or less, no further troubleshooting is required.
   [b] If the engine crankcase pressure is greater than 1.50 kPa (6 in. H₂O), check for a worn or damaged valve or cylinder kit; refer to section 14.8.7.

14.8.7 Troubleshooting Procedure for Worn or Damaged Valve or Cylinder Kit

To determine if a worn or damaged cylinder kit is causing excessive crankcase pressure, perform the following:

1. Move the vehicle requiring test to the chassis dynamometer; refer to OEM guidelines.
2. Remove air compressor; refer to section 3.1.1.
14.8 EXCESSIVE CRANKCASE PRESSURE

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.

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.
7. Measure and record crankcase pressure.
8. Shut down the engine.
9. Remove the vehicle from the chassis dynamometer.
10. Review the crankcase pressure test.
   [a] If the crankcase pressure is greater than 1.50 kPa (6 in. H₂O), go to step 11.
   [b] If the crankcase pressure is less than 1.50 kPa (6 in. H₂O), no further troubleshooting is required.
11. Perform the cylinder compression test.
   [a] If cylinder pressure is below specifications, go to section 1.A and refer to section 14.8.8.
   [b] If cylinder pressure is within specifications, call Detroit Diesel Technical Service Group.

14.8.8 Worn or Damaged Valve or Cylinder Kit Repair

Perform the following steps for a worn or damaged valve or cylinder kit:
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, piston or piston rings; refer to section 1.15.3.1.
4. Verify repair to cylinder valve(s) or cylinder kit components; refer to section 14.8.8.1.

14.8.8.1 Test Engine with Repairs Made to Correct Worn or Damaged Valve or Cylinder Kit

Perform the following to determine if the repaired valve or cylinder kit resolved the excessive crankcase pressure:

1. Move the vehicle requiring test to the chassis dynamometer; refer to OEM guidelines.
2. Disconnect air compressor; refer to section 3.1.1.

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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.
7. Measure and record crankcase pressure.
8. Shut down the engine.
9. Remove the vehicle from the chassis dynamometer.
10. Compare the cylinder pressure test results to specifications. Refer to section 1.A.

[a] If cylinder pressure is within specifications, no further troubleshooting is required.

[b] If cylinder pressure is not within specifications, call Detroit Diesel Technical Service Group.