Modern Automotive Technology
Chapter 48
Engine Mechanical Problems
Chapter 48

Learning Objectives

- Explain why proper diagnosis is important to engine repair
- List common engine mechanical problems
- Discuss how to find abnormal engine noises
- Summarize the common causes of engine mechanical problems
What does this concept car have in common with every car on the road today?
Sooner or later, the engine will have some kind of mechanical failure!
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1. BLUE-GRAY SMOKE coming from the exhaust indicates motor oil is entering combustion chambers.

2. A WET COMPRESSION TEST should be done if cylinder pressure (compression) reads below specs.
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Worn Valve Guides
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Dry and Wet Compression Tests

- **Dry compression test**: Compression gauge reads low
- **Squirt 30W oil in cylinder**: Oil can
- **Wet compression test**: Compression pressure goes up
- **One tablespoon maximum**: Oil coats and seals worn rings or cylinder
- **Rings bad if pressure increases**: Pressure leaking past worn rings or cylinders
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3. DIESEL ENGINE COMPRESSION READINGS will average approximately 275 to 400 psi.

4. COOLANT IN THE OIL is caused by a mechanical problem that allows engine coolant to leak into the engine crankcase.
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5. **WHITE SMOKE** from the exhaust may be due to internal coolant leak into cylinder combustion chambers.

6. A **BURNED PISTON** is often the result of pre-ignition or detonation damage.
Single Overhead Cam Engine

- Throttle body
- Intake manifold
- Hydraulic rocker arm
- Camshaft
- Camshaft sprocket
- Valve cover
- Exhaust manifold
- Exhaust valves
- Balance shaft
- Timing belt
- Oil pan
- Timing belt cover
7. BLACK SMOKE from the exhaust is usually caused by extremely rich air-fuel mixture, not an engine mechanical problem.

8. A GASOLINE ENGINE COMPRESSION READINGS should run around 125 to 175 psi.
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A Blown Head Gasket
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9. A BURNED VALVE results when the heat from combustion blows away a small portion of the valve face.

10. ENGINE BLOW-BY occurs when combustion pressure blows past the piston rings into the lower block and oil pan areas of the engine.
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A Burned Valve

- No margin
- Burned face
- Warped head
- Worn stem
11. Worn rocker or shaft
12. Broken valve spring
13. Valve guide wear
14. Worn cam lobe
15. Worn lifter
16. Burned valve or seat
17. Worn push rod
18. Incorrect valve lash adjustment
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