



Course Vehicle Repair
Section: Diesel Technology



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Naturally Aspirated vs. Blown Engines

What You Will Do

Physically model airflow, compare engine performance, and explain the difference between:

- Naturally Aspirated (NA) engines
- Blown engines (turbocharged or supercharged)

Materials You Will Need

- 2 balloons
- Straw
- Tape
- Fan or hair dryer on cool setting
- Cotton balls or paper wadded into balls
- Measuring tape
- Pencil and paper

Important Terms

- **Naturally Aspirated** – Engines that pull in air without external devices boosting air intake.
- **Blown Engines** – Engines using forced induction to force more air into the combustion chamber, boosting power without increasing engine size.
- **Turbocharged** – A type of forced induction that uses a turbine powered by the engine's exhaust gases to compress air into the intake.
- **Supercharged** – A type of forced induction that is mechanically driven (usually by a belt) directly by the engine's crankshaft.

Advantages of a Blown Engine

By forcing more air into the combustion chamber, a turbocharger or supercharger significantly increases the engine's power output compared to a naturally aspirated version.

Test 1: Natural Aspiration Test

1. Place a cotton paper ball on a table.
2. Use a fan or hair dryer on the cool setting to try to move the ball as far as possible.
3. Measure distance moved.
4. Record results.

Test 2: Turbo/Supercharger Test

1. Inflate a balloon and pinch the end closed.
2. Tape a straw to the balloon opening.
3. Aim the straw at the ball.
4. Release the balloon air quickly.
5. Measure how far the paper ball moves.
6. Record results.

Part 3: Compare Results

How far did the ball move in Test 1? How about Test 2?

The balloon forced extra air out quickly, just like a turbocharger or supercharger pushes more air into an engine. More air allows more fuel to burn, creating more horsepower and torque than a naturally aspirated engine of the same size.