



Course Vehicle Repair  
Section: Diesel Technology



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# Torque vs RPM

## Diesel vs Gasoline Engines

### What You Will Do

You will physically model torque and RPM (Revolutions Per Minute) to understand why:

- Diesel engines produce high torque at low RPM.
- Gasoline engines require higher RPM to produce high torque.

### Materials You Will Need

- Broom
- 4–6 textbooks or canned goods for weight
- Bookbag or backpack
- Pencil
- Paper

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## Difference Between Diesel and Gas Engines

The primary difference between diesel and gas engines is how they ignite fuel: gas engines use spark plugs to ignite a fuel-air mixture, while diesel engines use compression to heat air to extreme temperatures, causing fuel to self-ignite upon injection. Diesel engines are more fuel-efficient and create higher torque, while gas engines typically run cleaner and at higher RPMs.

### Important Terms

- **Torque** – Torque is a measure of the rotational or twisting force that causes an object to spin.
- **RPM** – RPM (revolutions per minute) measures the number of full rotations an object makes around a fixed axis every 60 seconds.

To simplify this, **RPM** is how fast a shaft is turning and **torque** is how much power is applied to it.

### Build the Torque Model

1. Load as much weight as you think you can handle into the bookbag or backpack.
2. Hold the broom handle near the end you sweep with.
3. Place the other end of the broom handle through a loop or handle of the bag.

#### Test A: High RPM / Low Torque (Gasoline-Like)

1. While holding the broom handle with one hand, quickly raise the bag off the floor.
2. Was it difficult to raise the weight?

**Test B: Low RPM / High Torque (Diesel-Like)**

1. Repeat the test. This time try raising it slowly. Is it easier this time? Moving slower represents lower RPM.
2. Repeat the previous step, but this time hold the broom handle with both hands. Using both hands represents higher torque.

## Diesel or Gasoline?

Which type of engine do you think each of these vehicles uses and why?

Vehicle	Diesel or Gas Engine?	Why?
Family Car		
Jet Ski		
Freight Train		
Cargo Ship		
Motorcycle		
Semi Truck		
Construction Crane		