



SNS COLLEGE OF TECHNOLOGY
COIMBATORE - 35
DEPARTMENT OF MECHANICAL ENGINEERING



Comparison Between Petrol Engine and Diesel Engine

Petrol and diesel engines are the two most common internal combustion engines (ICEs), differing in their fuel types, working principles, and applications. Here's a detailed comparison:

1. Basic Working Principle

Aspect	Petrol Engine	Diesel Engine
Ignition Method	Spark ignition (SI)	Compression ignition (CI)
Air-Fuel Mixture	Pre-mixed in the carburetor or injectors.	Diesel is injected into compressed air.
Compression Ratio	Lower (6:1 to 10:1)	Higher (16:1 to 22:1)

2. Fuel and Combustion

Aspect	Petrol Engine	Diesel Engine
Fuel Used	Petrol (highly volatile and light fuel).	Diesel (less volatile and heavier fuel).
Combustion Process	Relies on an external spark for ignition.	Relies on heat generated by air compression.
Efficiency	Lower thermal efficiency (~25-30%).	Higher thermal efficiency (~30-40%).

3. Construction and Design

Aspect	Petrol Engine	Diesel Engine
Weight	Lighter construction.	Heavier construction due to higher compression.
Components	Spark plug, carburetor/injectors.	Fuel injector, glow plug (for cold starts).
Durability	Comparatively less durable.	More robust and durable.

4. Performance

Aspect	Petrol Engine	Diesel Engine
Power Output	Higher power-to-weight ratio.	Produces higher torque.
Operating Speed	Operates at higher RPM.	Operates at lower RPM.
Noise and Vibration	Quieter and smoother operation.	Noisier with more vibration.

5. Cost

Aspect	Petrol Engine	Diesel Engine
Initial Cost	Generally cheaper.	More expensive due to heavy construction.
Running Cost	Higher due to petrol cost and lower efficiency.	Lower due to diesel cost and higher efficiency.
Maintenance Cost	Lower maintenance requirements.	Higher maintenance requirements.

6. Environmental Impact

Aspect	Petrol Engine	Diesel Engine
Emissions	Emits more CO and hydrocarbons.	Emits more NOx and particulate matter.
Carbon Footprint	Slightly higher due to less efficiency.	Slightly lower due to better efficiency.

7. Applications

Aspect	Petrol Engine	Diesel Engine
Typical Use	Used in light-duty vehicles (cars, bikes).	Used in heavy-duty vehicles (trucks, buses, generators).
Versatility	Better for short trips and city driving.	Better for long-distance and high-load operations.

Key Advantages

Petrol Engine:

- Lower initial cost.

- Quieter operation.
- Higher speed capability.

Diesel Engine:

- Higher fuel efficiency.
 - Greater torque for heavy loads.
 - Longer lifespan.
-

Key Disadvantages**Petrol Engine:**

- Higher running cost.
- Lower efficiency.
- Less torque generation.

Diesel Engine:

- Noisier and heavier.
- Higher emissions of NOx and particulates.
- More expensive upfront.