

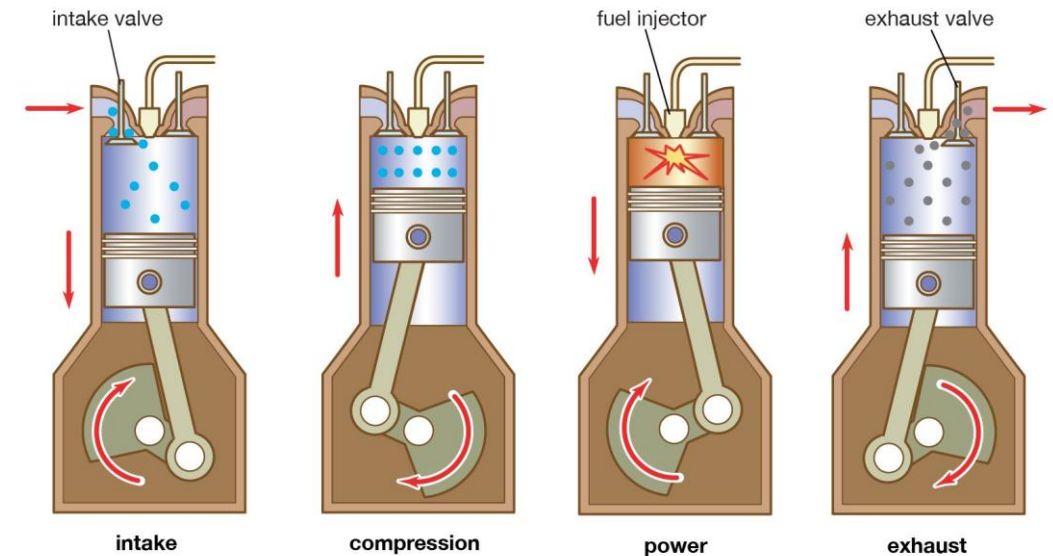


Internal Combustion Engines (Key Topic)

ម៉ាស៊ីនដំណើរការដោយចំហេះឥន្ធនៈ

Internal Combustion Engines (Key Topic)

- Basic principle of an internal combustion engine
- Diesel vs. gasoline engines
- Main engine components
- Fuel system
- Lubrication and cooling systems



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INTERNAL COMBUSTION ENGINES

- Internal Combustion Engine

- An internal combustion ចំហេះឥន្ធនៈ engine converts បំប្លែង chemical ថាមពល គីមី energy from fuel into mechanical work កម្លាំងចលក
- Combustion takes place inside the engine cylinder ធុងស៊ីឡាំងម៉ាស៊ីន
- These engines are widely used in agricultural and transport machinery

INTERNAL COMBUSTION ENGINES

- Basic Principle គោលការមូលដ្ឋាន
 - Fuel and air are mixed, compressed, and ignited inside the cylinder
 - Combustion creates high pressure សំពាធខ្ពស់ that pushes the piston down
 - The piston movement is converted into rotational motion by the crankshaft (ដុំបង្វិល)

INTERNAL COMBUSTION ENGINES

- Four-Stroke Cycle វដ្តនៃបួនជំហាន
 - Most engines operate on a four-stroke cycle: intake, compression, power, and exhaust (ស្រូបឧស្ម័នចូល បង្កើនកំហាប់ឬ សំពាធ, បង្កើតថាមពល, បញ្ចេញចោល)
 - Each stroke has a specific function in the combustion process
 - This cycle repeats continuously during engine operation

DIESEL VS. GASOLINE ENGINES

- Diesel vs. Gasoline
 - Diesel engines use compression ignition, gasoline engines use spark ignition
 - Diesel engines compress air only, gasoline engines compress air-fuel mixture
 - Different systems are used for fuel injection and ignition

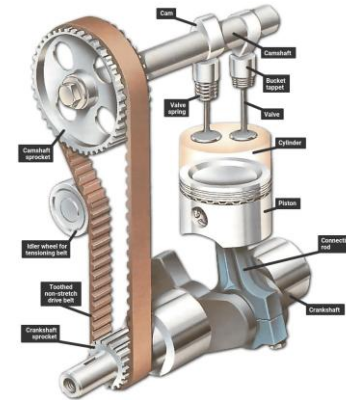
DIESEL VS. GASOLINE ENGINES

- Characteristics
 - Diesel engines are more fuel-efficient ស៊ីតិចជាង and produce higher torque កម្លាំងខ្លាំងជាង
 - Gasoline engines run smoother and are easier to start
 - Diesel engines are commonly used in heavy machinery

MAIN ENGINE COMPONENTS

- Main Components

- Key components include cylinder, piston (ប៊ូស្តុង ពីស្តុង), crankshaft ក្លោច លក្រោម, camshaft ក្លោចលក្រោមលើ, and valves



- Each part has a specific role in the engine operation
- All components must work together precisely

MAIN ENGINE COMPONENTS

- Piston and Cylinder
 - The piston moves up and down inside the cylinder
 - It transfers combustion force to the crankshaft ភ្លេចលក់ក្រោម
 - Proper sealing is necessary for efficient operation

MAIN ENGINE COMPONENTS

- Crankshaft and Camshaft
 - The crankshaft converts linear motion into rotational motion
 - The camshaft controls the opening and closing of valves
 - Their synchronization ចលនាស៊ីមេទ្រី is critical for engine performance

FUEL SYSTEM

- Fuel System
 - The fuel system stores, filters, and delivers មានផ្ទុក ចម្រោះ និងបញ្ជូន fuel to the engine
 - It must provide the correct amount of fuel at the right time
 - Clean fuel is essential for proper engine operation

FUEL SYSTEM

- **Main Components**

- Fuel tank, fuel pump, fuel filter, and injector ប៊ិច (or carburetor)
- Each component ensures proper fuel flow and pressure
- Faults in this system can cause starting and performance problems

LUBRICATION SYSTEM

- **Lubrication System** (ប្រព័ន្ធអ៊ីល)

- The lubrication system reduces friction between moving parts
- It also helps to remove heat and prevent wear កកិត
- Proper lubrication increases engine lifetime

LUBRICATION SYSTEM

- **Main Components**

- Oil pump, oil filter, oil passages បំពង់បង្ហូរ, and engine oil
- Oil circulates និចលករ through the engine to protect components
- Regular oil changes are necessary

COOLING SYSTEM

- **Cooling System**

- The cooling system removes excess heat from the engine
- It prevents overheating and engine damage
- Maintaining correct temperature is essential

COOLING SYSTEM

- **Main Components**

- Radiator រេអាត័រ, coolant ទឹកសម្រាប់ប្រព័ន្ធបញ្ចុះកំដៅ ពីឈាមទឹកក្រូច, water pump, and thermostat វ៉ែរម៉ូស្តាត (ឧបករណ៍បិទបើកទឹកcoolant)
- Coolant circulates through the engine and radiator
- The thermostat controls temperature regulation

COOLING SYSTEM

- **System Importance**

- Proper cooling and lubrication are critical for engine reliability
ដំណើរការម៉ាស៊ីនដោយមានទំនុកចិត្ត
- Failure of these systems can lead to serious engine damage