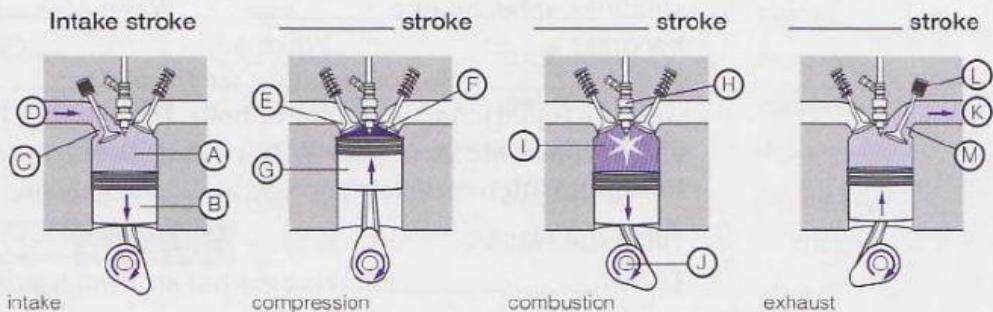


Revision: Engines and Motions

1 Write the headings for the operation of a four-stroke diesel engine. Find letters for parts in the diagrams and write them in the text.



Intake stroke. Air (1) *D* alone is drawn into the cylinder (2) _____ through the intake port (3) _____ by the vacuum created by the descending piston (4) _____.

Compression stroke. The intake valve (5) _____ closes and the piston ascends (6) _____. Air is compressed in the top of the cylinder (7) _____ and is heated to 700–900° C.

Combustion stroke. Diesel oil (8) _____ is injected into the top of the cylinder by the oil injector (9) _____. It mixes with the compressed air above the piston. Combustion drives the piston downwards, and turns the crankshaft (10) _____.

Exhaust stroke. The exhaust valve (11) _____ opens. Exhaust gases (12) _____ are pushed out of the cylinder through the outlet port (13) _____ by the rising piston.

2 Read the article about the hybrid car. Which two things make the wheels go round?

You drive a hybrid car like an ordinary car. When you slow down, the electric motor turns into a generator, which recharges the batteries. At traffic lights, the petrol engine switches off. Take your foot off the brake and the car starts, using only its electric motor to provide maximum acceleration.

A hybrid car is more energy-efficient than one with a petrol engine alone. You can travel twice as far on 1 litre of petrol than in a petrol-driven car. In addition, the quantity of CO₂ that comes out of the exhaust is about 1 tonne less per year from a hybrid. Acceleration from 0–100 kph is 10.9 seconds, which is the same as for a 2-litre petrol engine.

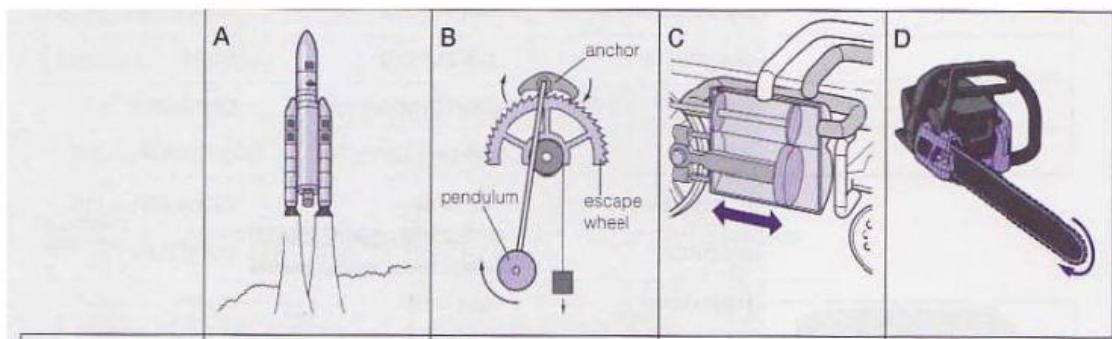
Hybrid car owners pay less tax, and they have lower fuel consumption too. In addition to all this, they get a quiet car with good performance.

3 What do these words refer to?

1 which (line 2) a) the functioning of the electric motor b) slowing down
 2 its (line 3) a) the car b) the brake c) your foot
 3 one (line 5) a) a car b) energy c) a hybrid car
 4 that (line 7) a) 1 tonne of CO₂ b) the quantity of CO₂ c) CO₂,
 5 which (line 8) a) the given acceleration b) the given speed c) the given time
 6 they (line 11) a) less tax b) car owners c) hybrid car owners

4 Write the following words in the right box of the chart:

oscillates from side to side rotary rotates linear clocks rockets
 moves upwards and downwards or horizontally oscillating moves forwards
 circular saws hand-held saws reciprocating



Type of Motion				
How it moves				
Examples of machines				