

### Internal

The following identifies the main internal components of a typical engine assembly. Some variants may differ in detail.

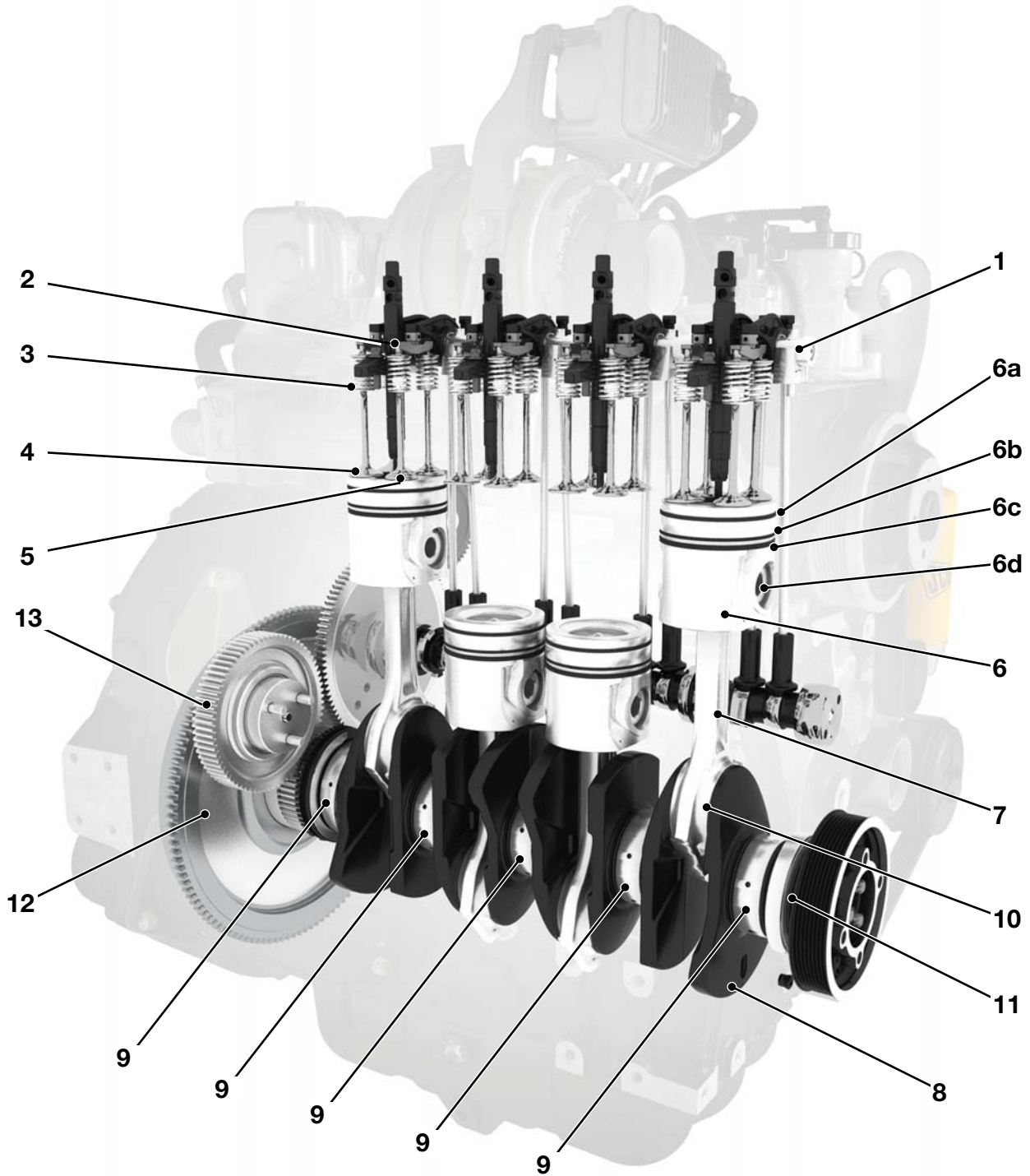


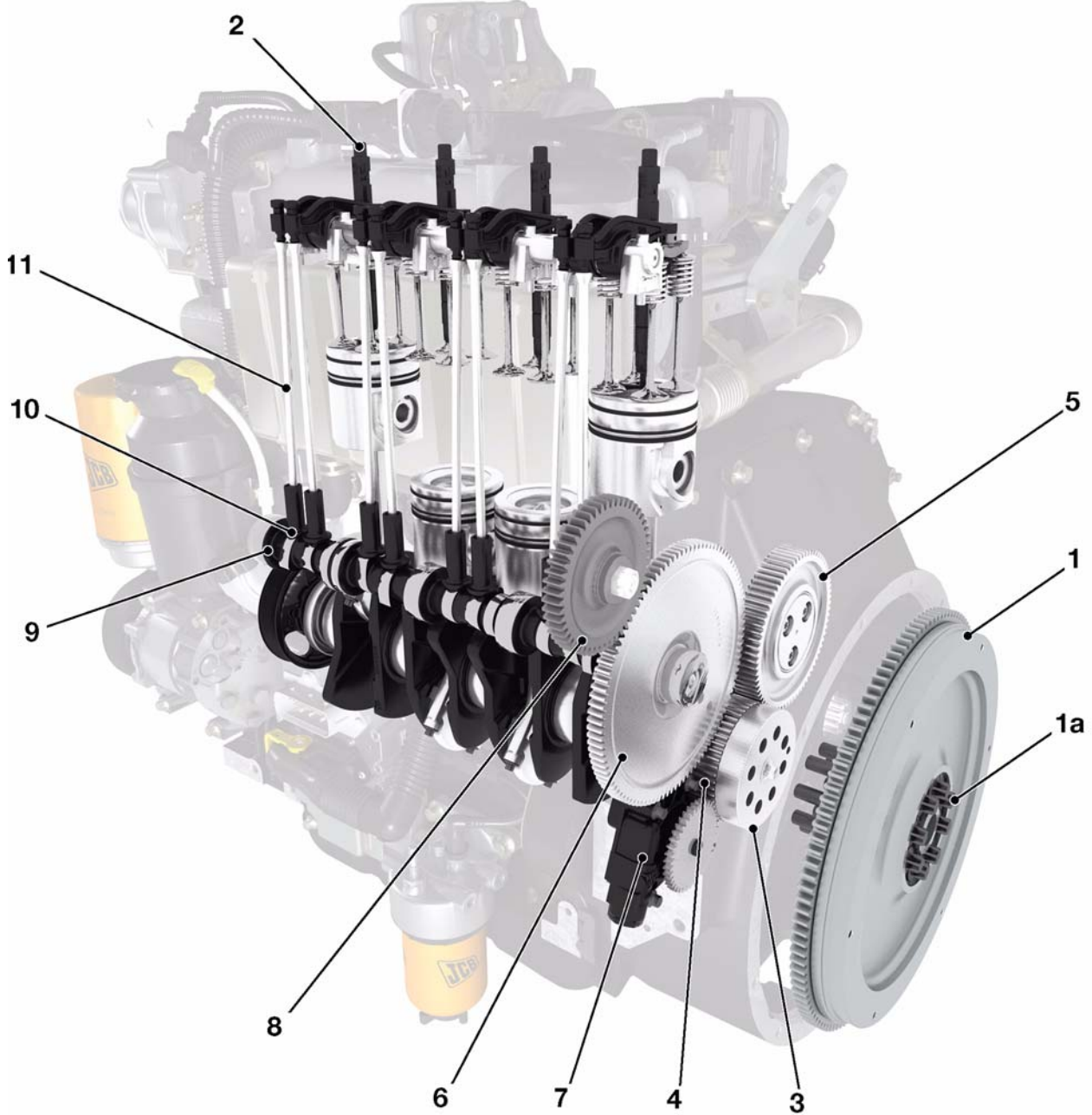
Fig 1. Engine - As viewed on the front right side

T065139-1

⇒ [Table 1. \(□ 4-3\)](#)

**Table 1. Engine - As viewed on the front right side**

<a href="#">⇒ Fig 1. (□ 4-2)</a>			
1	Rocker assembly	7	Connecting rod assembly (4 off)
2	Valve bridge piece (8 off)	8	Crankshaft
3	Valve spring (16 off)	9	Main bearing - crankshaft (5 off)
4	Inlet valve (8 off)	10	Big end bearing - crankshaft/connecting rod (4 off)
5	Exhaust valve (8 off)	11	Front crankshaft oil seal
6	Piston assembly (4 off)	12	Flywheel
6a	Piston ring - top compression (4 off)	13	High duty P.T.O. idler gear (if fitted)
6b	Piston ring - 2nd compression (4 off)		
6c	Piston ring - oil control (4 off)		
6d	Gudgeon pin (4 off)		



**Fig 2. Engine - As viewed on the rear left side**

**Table 2. Engine - As viewed on the rear left side**

⇒ Fig 2. (□ 4-4)

1	Flywheel	6	Camshaft drive gear
1a	Flywheel - crankshaft fixing bolts (8 off)	7	Lubrication oil pump
2	Fuel injector (atomiser) (4 off)	8	High pressure fuel pump drive gear
3	Flywheel hub	9	Camshaft
4	Crankshaft drive gear	10	Tappet (8 off)
5	High duty P.T.O. idler gear (if fitted)	11	Push rod (8 off)

## Basic Description

The JCB ecoMax engine is a 4 cylinder diesel engine in which the fuel is ignited by compression ignition (C.I.). The engine operates on a four stroke cycle, → [The Four Stroke Cycle \( 4-8\)](#).

The engine is started by electric starter motor. The motor turns the engine via a pinion and teeth on the engine flywheel **3-1**.

When the engine runs the crankshaft **3-2** drives the camshaft **3-3** via gears. The camshaft opens and closes the inlet and exhaust valves **3-4** and **3-5** via push rods **3-6** in time with the four stroke cycle. The engine has 16 valves, 2 inlet and 2 exhaust valves for each cylinder.

The crankshaft also drives a mechanical high pressure fuel pump via gears **3-7**. The pump is part of the electronically controlled common rail fuel injection system. See **Fuel System**.

Air is drawn into the engine via inlet manifold and exhaust gasses exit via exhaust manifold. The engine uses a variable geometry turbocharger **3-8** which pressurises the air at the inlet manifold.

A mechanical lubrication oil pump **3-9** is driven by the crankshaft via gears. The pump pressurises and circulates oil for engine lubrication and cooling purposes.

A drive belt **3-10** again driven by the crankshaft, drives a coolant circulation pump, alternator, radiator cooling fan and other ancillaries such as an air conditioning compressor.