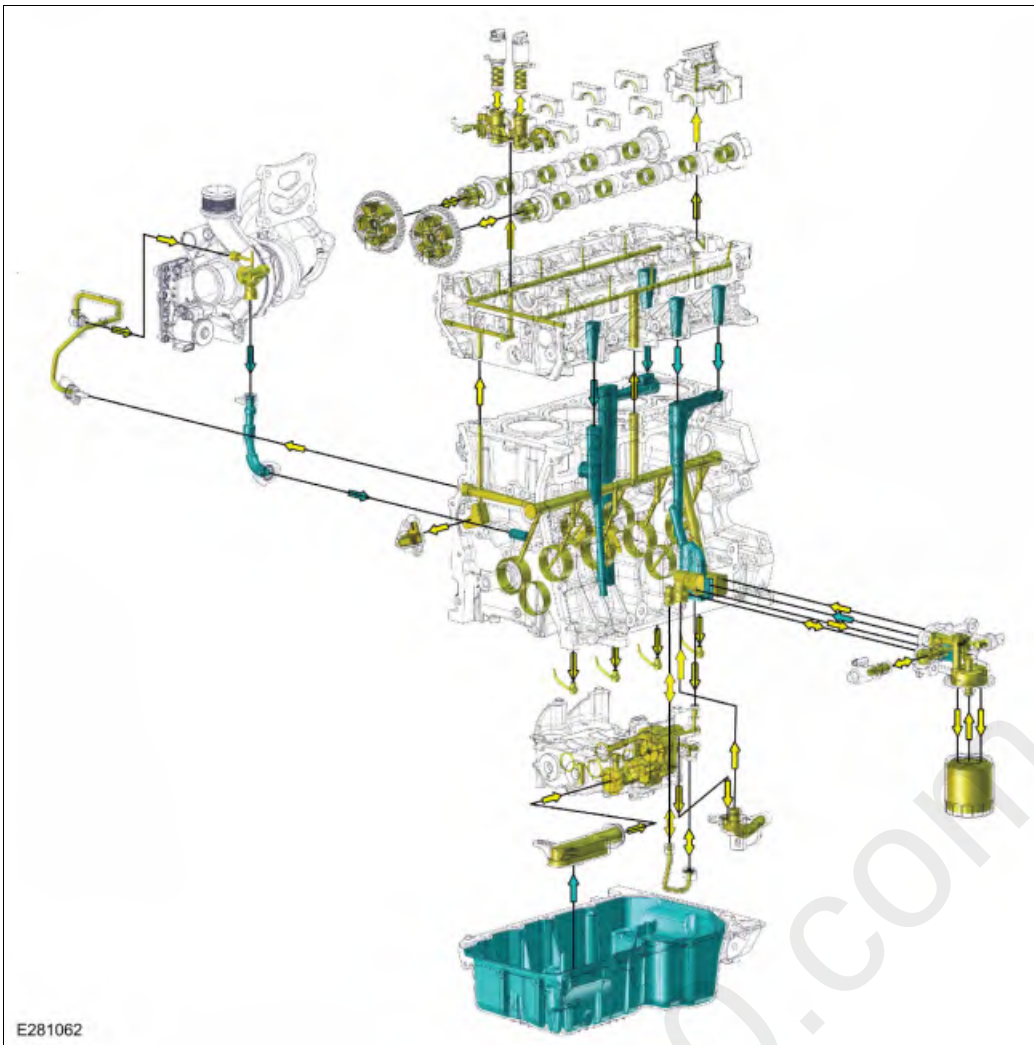




Item	Description
Yellow	High pressure oil flow
Blue	Oil return/low pressure oil flow

Lubrication System

The engine lubrication system is of the force-feed type in which oil is supplied under full pressure to the crankshaft, connecting rod bearings, timing chain tensioners, camshaft bearing caps and VCT solenoids. The flow of oil to the valve tappets and valve train is controlled by a restricting orifice located in the cylinder head gasket.

The lubrication system is designed to provide optimum oil flow to critical components of the engine through its entire operating range.

The heart of the system is a continuously variable vane style oil pump, regulated with a pressure control solenoid valve.

Generically, this design operates as follows:

- Maximum oil pump displacement has been selected to provide adequate volume to insure required pressure at both hot idle and maximum speed.
- An internal relief valve protects the system from excessive pressure during high viscosity conditions. When activated, it vents bypassed oil back to the oil pan.
- In conditions other than hot idle and maximum speed, system flow and pressure are controlled with a solenoid valve, receiving commands from the powertrain control module (PCM), to deliver correct oil pressure for all operation conditions based on engine speed, load, and oil temperature.
- The solenoid valve regulates oil pump performance by controlling oil pressure in the internal control chamber of the oil pump.

Ti-VCT

The Ti-VCT system allows variable control of the valves that optimizes combustion at full load providing improved power and low speed torque (broadening the torque curve) which enables variable valve overlap which provides better fuel economy and emissions and provides optimized cold start operation with improved exhaust emissions.

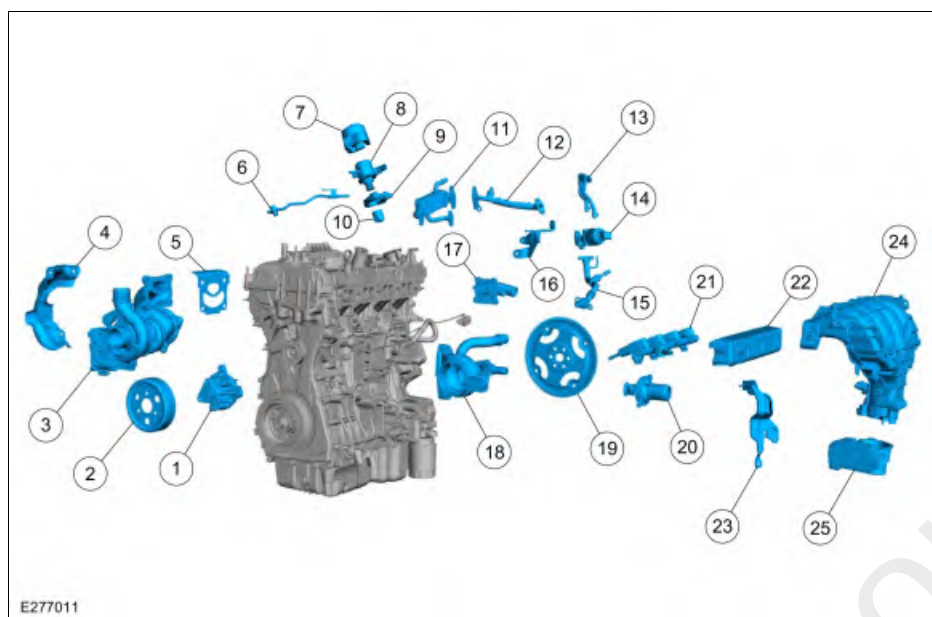
Valve Train

The valve train uses Direct Acting Mechanical Buckets (DAMB). The camshaft lobes are positioned directly above mechanical buckets which are positioned on top of the valves.

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Engine Component View

Engine â€” External Components



Item	Part Number	Description
1	8501	Coolant pump
2	8509	Coolant pump pulley
3	9G438	Turbocharger
4	9G479	Turbocharger heat shield
5	9448	Turbocharger gasket
6	8B535	Coolant outlet tube
7	9C374	High-pressure fuel pump cover
8	9D376	High-pressure fuel pump
9	9178	High-pressure fuel pump mounting plate
10	9C587	High-pressure fuel pump tappet
11	9F464	Exhaust gas recirculation (EGR) cooler
12	9E469	EGR inlet tube
13	9J433	EGR transducer
14	9D475	EGR valve
15	9E470	EGR outlet tube
16	9D484	EGR recirculation bracket
17	8K556	Coolant outlet
18	8B516	Coolant pump adapter
19	6375	Flexplate
20	8575	Thermostat assembly
21	9F797	Fuel rail
22	9U550	Fuel rail shield
23	9A397	Crash bracket
24	9424	Intake manifold

