

# DESCRIPTION AND OPERATION

## ENGINE

The 5.0L (302 CID) is a V-8 engine with the following features:

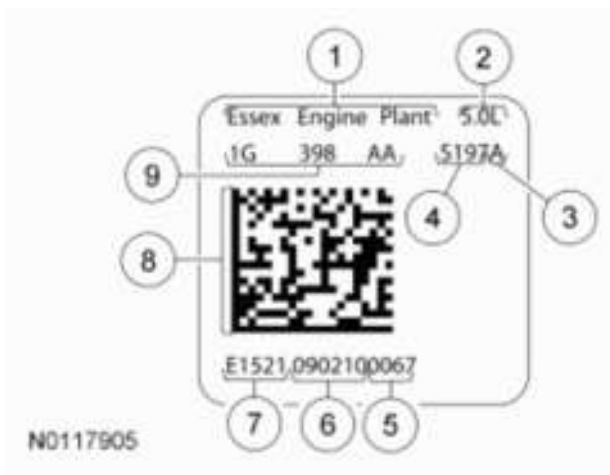
- Dual overhead camshafts
- Four valves per cylinder
- Sequential Multi-Port Fuel Injection (SFI)
- Aluminum cylinder heads
- Aluminum, 90-degree V-cylinder block
- Individually chain-driven camshafts with a hydraulic timing chain tensioner on each timing chain
- Electronic ignition system with 8 ignition coils
- Engine oil cooler

### Engine Identification

Always refer to these labels when installation of new parts is necessary or when checking engine calibrations. The engine parts often differ within a CID family. Verification of the identification codes will make sure that the correct parts are obtained. These codes contain all the pertinent information relating to the dates, optional equipment and revisions. The Ford Master Parts Catalog contains a complete listing of the codes and their applications.

### Engine Code Information Label

The engine code information label, located on the valve cover, contains the following:



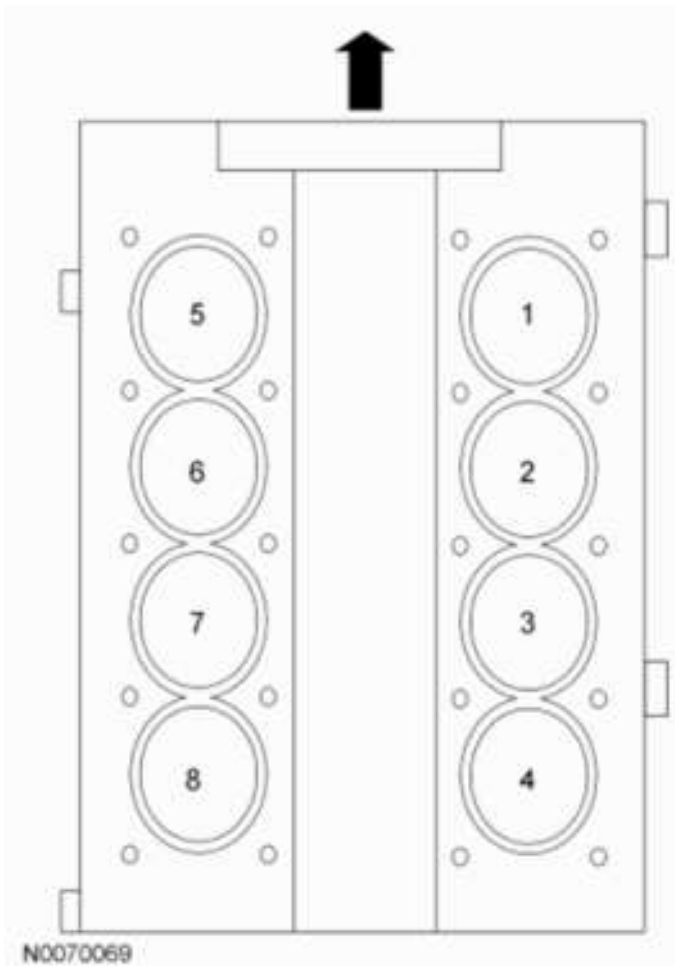
**Fig. 1: Identifying Engine Code Information Label**  
Courtesy of FORD MOTOR CO.

### ENGINE CODE INFORMATION LABEL DESCRIPTION CHART

Item	Description
1	Essex engine plant
2	Engine displacement
3	Transmission

4	Vehicle line
5	Sequential number
6	Engine build date (DDMMYY)
7	Essex engine plant
8	Bar code
9	Engine part number

### Engine Cylinder Identification



**Fig. 2: Identifying Engine Cylinder Identification Label**  
 Courtesy of FORD MOTOR CO.

### Induction System

The **SFI** provides the fuel/air mixture needed for combustion in the cylinders. The 8 solenoid-operated fuel injectors:

- are mounted in the fuel injection supply manifold and the intake manifold above the cylinder heads.
- meter fuel into the air intake stream in accordance with engine demand.
- are positioned so that their tips direct fuel just ahead of the engine intake valves.
- supply fuel from the fuel tank by a fuel pump mounted in the fuel tank.

## **Crankshaft**

The crankshaft is supported on the bottom of the cylinder block by 5 crankshaft main bearings.

## **Camshafts**

The camshafts:

- are arranged in pairs, one each (intake and exhaust) on each cylinder head.
- are synchronized through a secondary timing chain.
- depress the roller followers to actuate the valves.

## **Valve Train**

The valves are actuated by a hydraulic lash adjuster and roller follower. The hydraulic lash adjusters and roller followers:

- provide hydraulic lash adjustment.
- ride on the camshaft lobes.

## **Twin Independent Variable Camshaft Timing (VCT) System**

The twin independent VCT system allows variable control of intake valve closing which 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.

## **PCV System**

All engines are equipped with a closed-type PCV system recycling the crankcase vapors to the upper intake manifold.

## **Engine Lubrication System**

The engine lubrication system is of the force-feed type in which oil is supplied under full pressure to the:

- crankshaft main bearings.
- crankshaft thrust main bearing.
- connecting rod bearings.
- oil galleries.
- piston cooling jets.

All other parts are lubricated by splash of the oil.

## **Oil Pump**

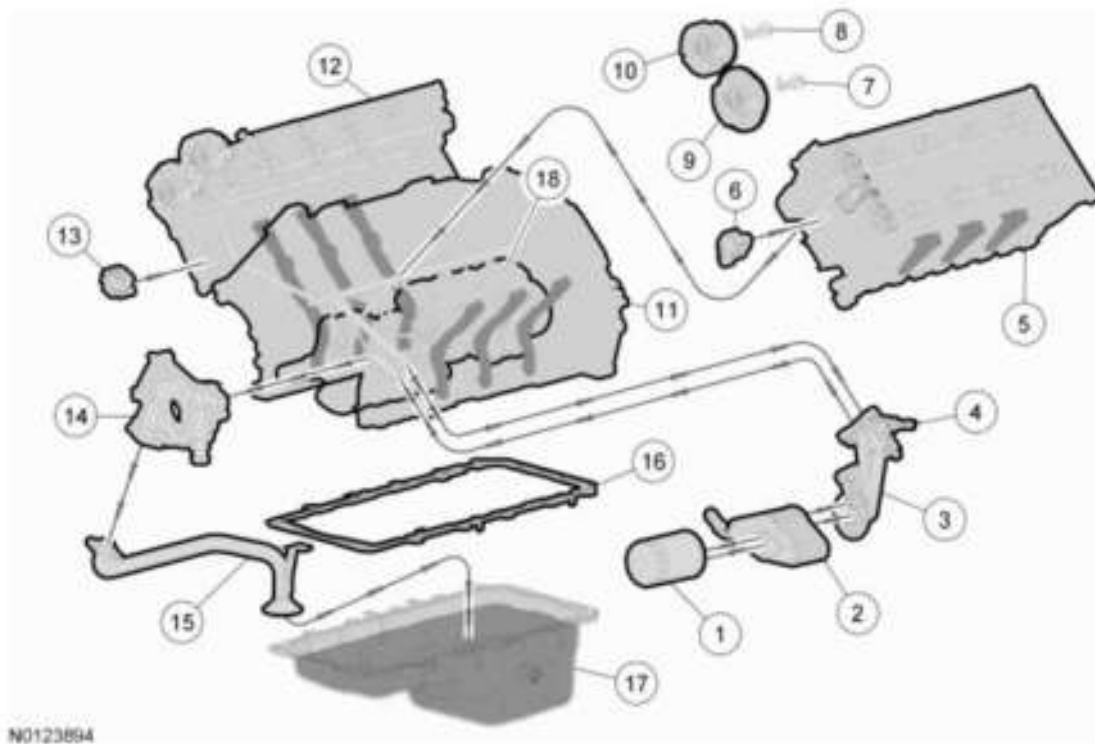
The lubrication system of the 5.0L (4V) engine is designed to provide optimum oil flow to critical components of the engine through its entire operating range. The heart of the system is a positive displacement internal gear oil pump using top seal rotors.

Generically, this design is known as a gerotor pump, which operates as follows:

- The oil pump is mounted on the front face of the cylinder block.
- The inner rotor is piloted on the crankshaft post and is driven through flats on the crankshaft.
- System pressure is limited by an integral, internally-vented relief valve which directs the bypassed oil back to the inlet side of the oil pump.
- Oil pump displacement has been selected to provide adequate volume to make sure of correct oil pressure both at hot idle and maximum speed.
- The relief valve calibration protects the system from excessive pressure during high viscosity conditions.
- The relief valve is designed to provide adequate connecting rod bearing lubrication under high-temperature and high-speed conditions.

**Engine Oil Flow Illustration**

**Engine Assembly**



**Fig. 3: Exploded View Of Engine Oil Flow**  
 Courtesy of FORD MOTOR CO.

**ENGINE OIL FLOW DESCRIPTION CHART**

Item	Part Number	Description
1	6714	Oil filter
2	6A642	Oil filter cooler
3	6881	Oil filter adapter
4	9278	Engine Oil Pressure (EOP) switch
5	6049	Cylinder head - LH
6	6L266	Timing chain tensioner - LH

7	6250	Exhaust camshaft
8	6250	Intake camshaft
9	6256	Exhaust camshaft Variable Camshaft Timing (VCT)
10	6256	Intake camshaft <b>VCT</b>
11	6010	Cylinder block
12	6049	Cylinder head - RH
13	6L266	Timing chain tensioner - RH
14	6600	Oil pump
15	6622	Oil pump screen and pickup tube
16	6710	Oil pan gasket
17	6675	Oil pan
18	6K868	Piston cooling jet (4 required)