

DESCRIPTION AND OPERATION

ENGINE

Overview

NOTE: Vehicles built before 8/13/2012 are equipped with a single accessory drive belt. Vehicles built on or after 8/13/2012 are equipped with an accessory drive belt and a separate A/C compressor drive belt.

The 2.0L GTDI 4-cylinder engine has the following features:

- Dual overhead camshafts
- Four valves per cylinder
- Composite intake manifold
- Aluminum cylinder head
- Aluminum cylinder block
- **GTDI**
- Twin Independent Variable Cam Timing (Ti-VCT)

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 the correct parts are obtained. These codes contain all the pertinent information relating to the dates, optional equipment and revisions.

Engine Code Information Label

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

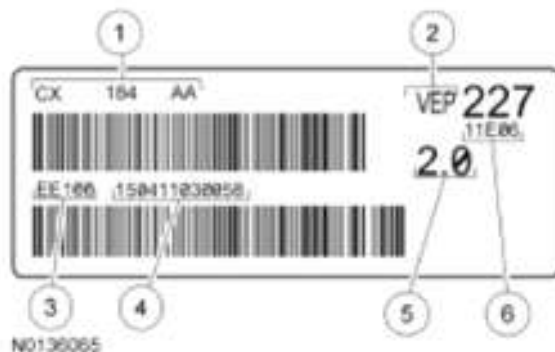
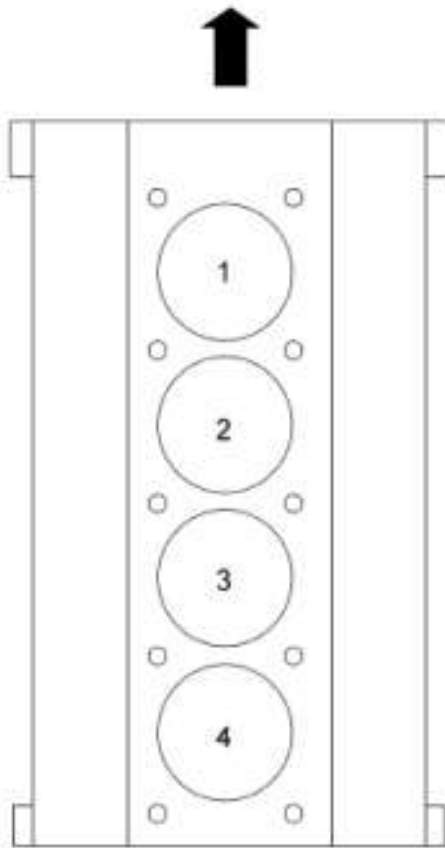


Fig. 1: Engine Code Information Label
Courtesy of FORD MOTOR CO.

Item	Description
1	Engine part number
2	Valencia Engine Plant
3	Plant code

4	Engine serial number
5	Engine displacement
6	Engine build date YYM(A-L)DD

Engine Cylinder Identification



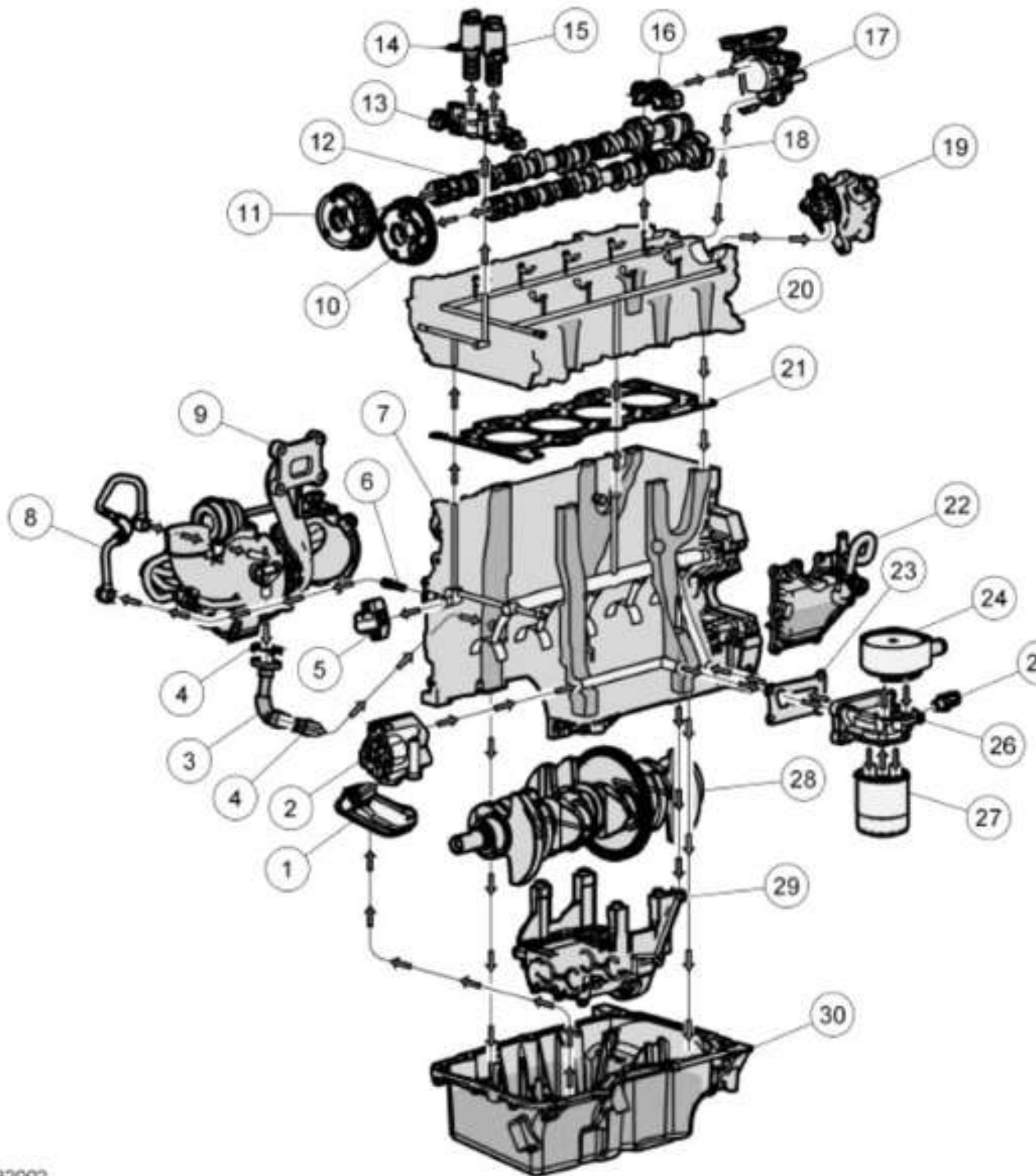
N0070002

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

System Operation

Engine Oil Flow Illustration





N0132002

Item	Service Part Number	Description
1	6622	Oil pump screen and pickup tube
2	6600	Oil pump
3	6K677	Turbocharger oil return tube
4	6N652	Turbocharger oil return tube gasket (2 required)
5	6K254	Timing chain tensioner

6	6L663	Turbocharger oil filter
7	6010	Cylinder block
8	6K679	Turbocharger oil supply tube
9	6K682	Turbocharger
10	6C524	Intake VCT phaser and sprocket
11	6C525	Exhaust VCT phaser and sprocket
12	6A272	Exhaust camshaft
13	-	Camshaft front bearing cap (part of 6049)
14	6B297	Variable Camshaft Timing (VCT) oil control solenoid
15	6B297	Variable Camshaft Timing (VCT) oil control solenoid
16	-	Camshaft rear bearing cap (part of 6049)
17	9B374	Fuel pump housing
18	6A271	Intake camshaft
19	2A451	Vacuum pump
20	6049	Cylinder head
21	6051	Head gasket
22	6A785	Crankcase vent oil separator
23	6A636	Oil filter adapter gasket
24	6A642	Oil cooler (early build only)
25	9278	Engine Oil Pressure (EOP) sensor
26	6881	Oil filter adapter
27	6714	Oil filter
28	6300	Crankshaft assembly
29	6K360	Balance shaft assembly
30	6675	Oil pan

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 positive displacement internal gear oil pump.

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

- The oil pump is chain driven off of 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.

Valve Train

The valve train uses **DAMB** . The camshaft lobes are positioned directly above mechanical buckets which are positioned on top of the valves.

Twin Independent Variable Camshaft Timing (TiVCT)

The Twin Independent Variable Cam Timing (Ti-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.