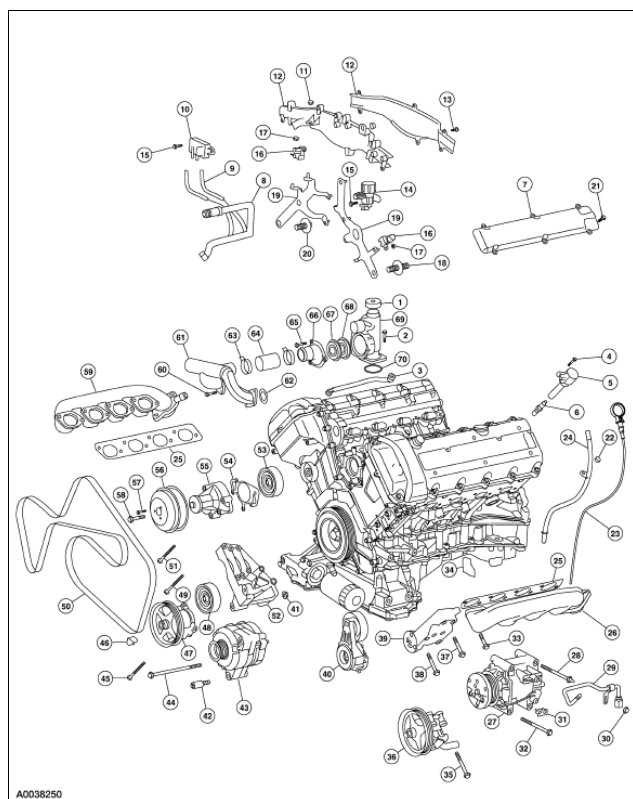


69	6059	Engine front cover assembly
70	6D081	Idler pulley seal
71	6C075	Front cover seal (inner)

Lower End Exterior Dress



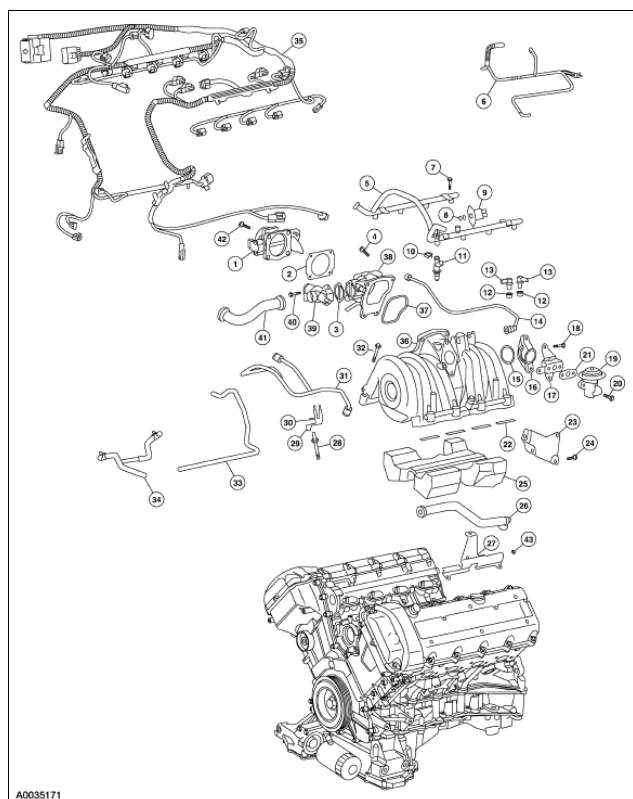
Item	Part Number	Description
1	8A511	Thermostat housing cap
2	W500215	Bolt (4 req'd)
3	6C342	Breather hose part load
4	W500205	Bolt (8 req'd)
5	12A366	Ignition coil (8 req'd)
6	12405	Spark plug (8 req'd)
7	12025	Coil cover (2 req'd)
8	9D477	EGR valve to exhaust manifold tube
9	9P761	EGR valve to exhaust manifold vacuum line (2 req'd)
10	9J460	Differential pressure feedback EGR assembly
11	W700430	Nut (2 req'd)
12	14W163	Wire harness channel and cover
13	W500202	Bolt (6 req'd)
14	9J459	EGR vacuum regulator solenoid
15	W500202	Bolt (4 req'd)
16	18801	Radio ignition interference capacitor (2 req'd)
17	W705035	Nut (1 req'd)
18	W520411	Stud bolt
19	14W163	Wiring harness bracket (2 req'd)

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20	W705036	Bolt
21	W500205	Bolt (12 req'd)
22	W520411	Nut
23	6752	Oil level indicator
24	6754	Oil level indicator tube
25	9448	Exhaust manifold gasket (2 req'd)
26	9431	Exhaust manifold, LH
27	19D629	A/C compressor
28	W705060	Stud bolt
29	3E576	Jumper tube
30	W520412	Nut
31	3R801	Bracket
32	W704750	Bolt (3 req'd)
33	W701240	Bolt (16 req'd)
34	7N840	Flexplate inspection cover
35	W704752	Bolt (4 req'd)
36	3A696	Power steering pump
37	W500315	Bolt (3 req'd)
38	W704752	Bolt (2 req'd)
39	3K738	PAS bracket
40	6B209	Drive belt tensioner
41	W520414	Nut
42	W70539	Bolt and bushing assembly
43	10300	Generator
44	W704756	Bolt
45	W704752	Bolt (4 req'd)
46	3R801	Bracket
47	8C648	Hydraulic cooling fan pump
48	19A216	Idler pulley, flanged
49	W704752	Bolt (2 req'd)
50	8620	Drive belt
51	W500315	Bolt (3 req'd)
52	3D743	Hydraulic cooling fan pump bracket
53	19A216	Idler pulley, non-flanged
54	8507	Water pump gasket
55	8501	Water pump
56	8509	Water pump pulley
57	W705629	Bolt (3 req'd)
58	W500304	Bolt (5 req'd)
59	9430	Exhaust manifold, RH
60	W500215	Bolt (4 req'd)
61	8A520	Water outlet pipe assembly
62	8255	O-ring seal
63	W525972	Clamp (2 req'd)

64	9F287	Hose
65	W500014	Bolt (3 req'd)
66	8594	Thermostat housing cover
67	8575	Thermostat
68	8A571	O-ring seal
69	8K515	Thermostat housing
70	9K462	O-ring seal

Upper End Exterior Dress



Item	Part Number	Description
1	9E926	Throttle body
2	9E936	Throttle body gasket
3	9F670	Idle air control valve gasket
4	W701662	Bolt (4 req'd)
5	9S441	Fuel injection supply manifold
6	9E498	Vacuum harness
7	W500013	Bolt (4 req'd)
8	W705818	O-ring seals (2 req'd)
9	9F972	Fuel pressure sensor
10	9N976	Clip (8 req'd)
11	9F593	Fuel injector (8 req'd)
12	9H490	Seal (2 req'd)
13	9S497	Stub pipe (2 req'd)
14	9D289	Purge hose
15	6L438	Seal

16	9H450	EGR flange
17	9P962	EGR valve adapter
18	W701568	Bolt (3 req'd)
19	9D460	Exhaust recirculation valve
20	N807843	Bolt (2 req'd)
21	9D476	EGR valve gasket
22	9439	Intake manifold gasket (8 req'd)
23	9Y426	Heat shield
24	W500211	Bolt (4 req'd)
25	6N041	Noise insulator
26	9K617	Crankcase ventilation hose
27	6N081	Bracket
28	W705479	Stud bolt
29	14536	Bracket
30	W520411	Nut
31	9P903	Air assist hose
32	W500313	Bolt (9 req'd)
33	9F814	Throttle body heater return hose
34	9F813	Throttle body heater feed hose
35	12B637	Engine sensor control wiring harness
36	9425	Intake manifold
37	6C653	Throttle body adapter gasket
38	9632	Throttle body adapter
39	9F715	Idle air control valve
40	W701662	Bolt (2 req'd)
41	9P903	Air assist tube
42	W701568	Bolt (4 req'd)
43	W520411	Nut (2 req'd)

Identification

For quick identification refer to the safety certification decal.

- The decal is located on the LH front door lock face panel.
- Find the engine code (letter or number) on the decal, then refer to the Engine Identification Chart to determine engine type and size. For additional information, refer to [Section 100-01](#).
- The symbol code on the identification tag identifies each engine for determining parts usage; for example, engine displacement in liters or cubic inch displacement and model year.

Engine Code Information

The engine code information label is located on the valve cover. The label contains, among other information:

- the engine calibration number
- the engine build date
- the engine plant code
- the engine code

Emission Calibration Label

NOTE: The engine codes and the calibration numbers must be used when making inquiries or ordering parts.

The emission calibration number label is located on the LH side door or LH door post pillar. It identifies:

- the engine calibration number
- the engine code number
- the revision level

These numbers are used to determine if parts are unique to specific engines.

Exhaust Emission Control System

Refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

Induction System

The air/fuel mixture needed for burning in the cylinders is provided by the multiport fuel injection (MFI) system. Refer to Section 303-04 for additional information.

Fuel is:

- supplied from the fuel tank by the fuel pump.
- regulated by the fuel pressure sensor.
- delivered to the injector supply manifold.

A dual damper has been added to reduce pressure fluctuations caused by the fuel injectors.

Crankshaft

The crankshaft is supported on the bottom of the cylinder block by five steel-backed, over-plated, aluminum crankshaft main bearings.

To provide smooth engine operation, the piston crankpins are positioned to provide a power impulse every 90 degrees of crankshaft rotation. The spacing provides smooth and quiet operation.

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 direct acting mechanical tappets to actuate the valves.

Valve Train

The valves are actuated by a direct acting mechanical bucket and shim. The direct acting mechanical tappets and shims:

- provide lash adjustment through a shim selected by thickness.
- ride on the camshaft lobes.

Positive Crankcase Ventilation System

The engine is equipped with a positive, closed-type crankcase ventilation system which recycles the crankcase

vapors to the throttle body.

Engine Lubrication System

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

- crankshaft and thrust bearings
- camshaft bearing journals
- primary chain and drive sprockets
- connecting rod bearings

All other parts are lubricated by gravity flow or splash of the oil.

Oil Pump

The rotary spur oil pump develops the oil pressure.

- The oil pump is bolted to the front of the cylinder block.
- The oil pump is rotated by the crankshaft.
- A full flow oil filter is externally mounted on the upper sump.

If the filter element becomes blocked, a spring-loaded bypass valve opens to allow uninterrupted flow of oil to the engine.

Engine Cooling System

The engine is liquid-cooled:

- by a centrifugal water pump driven by the drive belt.
- a water thermostat is used to restrict coolant flow until the engine reaches normal operating temperature.

Drive Belt System

Accessories mounted on the front of the engine are belt-driven by the crankshaft and an automatically tensioned serpentine drive belt is routed over the following components:

- water pump
 - A/C compressor
 - generator (GEN)
 - drive belt tensioner
 - drive belt idler pulley
 - crankshaft pulley
 - power steering pump
 - hydraulic cooling fan pump
-

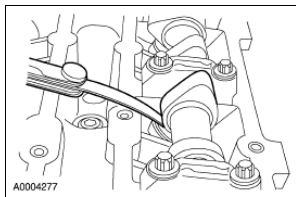
Engine

Refer to Section 303-00 .

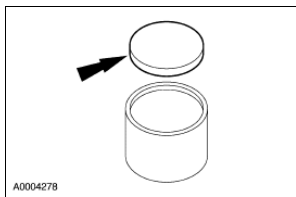
Valve Clearance Adjustment

1. Remove the timing chains. For additional information, refer to Timing Drive Components Primary or Timing Drive Components Secondary in this section.
2. **NOTE:** Measure each valve clearance at base circle before removing the camshafts. The shims are not repairable with the camshafts in place. Failure to measure all clearances prior to removing the camshafts will cause unnecessary repetition of the procedure.

Use a feeler gauge to measure each valve clearance and record its location.



3. Remove the camshafts. For additional information, refer to Camshaft in this section.
4. Remove the shims.



5. **NOTE:** The shims are marked for thickness; example: 2.22 mm = 222 on shim.

NOTE: The corrected shims allow the following valve clearances.

- Intake valve clearance: 0.18-0.22 mm (0.00709-0.00866 in)
- Exhaust valve clearance: 0.23-0.27 mm (0.00906 - 0.01063 in)

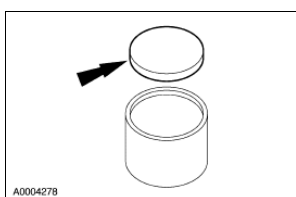
NOTE: A midrange clearance is the most desirable:

- Intake: 0.20 mm (0.00787 in)
- Exhaust: 0.25 mm (0.01 in)

NOTE: Select shims using this formula: required shim thickness = measured clearance plus the base shim thickness minus most desirable clearance.

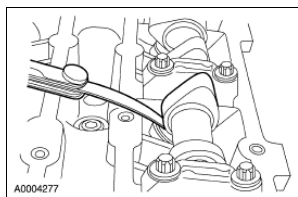
Select shims and mark the installation location.

6. Replace the shims.



7. Install the camshaft. For additional information, refer to Camshaft in this section.

8. Measure the new valve clearances.



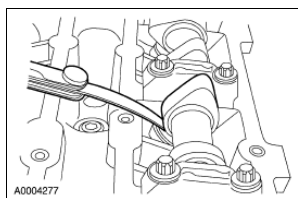
9. Install the timing chains. For additional information, refer to Timing Drive Components Primary or Timing Drive Components Secondary in this section.

Valve Clearance Check

1. Remove the valve covers. For additional information, refer to Valve Cover LH or Valve Cover RH in this section.
2. Remove the spark plugs.
3. **NOTE:** The engine will have to be rotated with the crankshaft pulley bolt to bring each valve to base circle.

NOTE: The valve clearance must be measured with the camshaft at base circle.

Measure and record all valve clearances.



4. If the valve clearances are out of specification, refer to Valve Clearance Adjustment in this section.
 5. To assemble, reverse the inspection procedure.
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