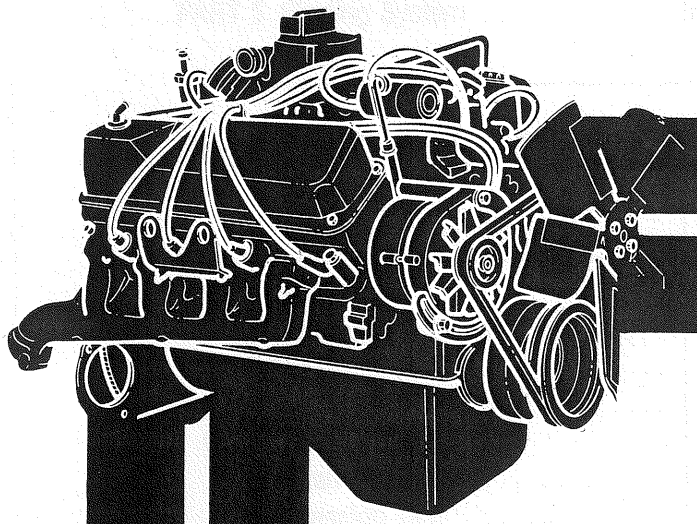
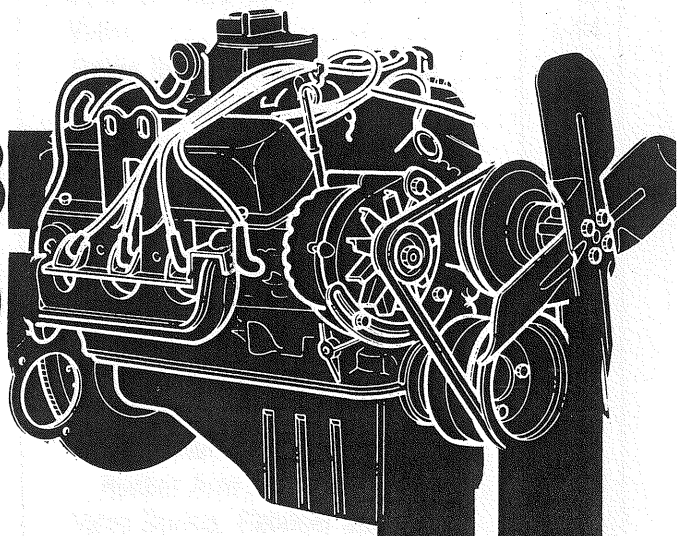
Ford

Power Products

SERVICE MANUAL



CSG-850 (302 CID)



WSG-858 (351 CID)

INDUSTRIAL AND MARINE ENGINES

IEO
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IDENTIFICATION INDUSTRIAL AND IRRIGATION

An Identification Decal (Figure 1) is affixed to each engine. The decal contains the engine serial number which identifies this unit from all others. Next is the engine displacement which determines the engine specifications, then the model number and S.O. or special options which determines the parts or components required on this unit. Use all the numbers when seeking information or ordering replacement parts for this engine.

MARINE

If this tag is destroyed or painted over, it will be very difficult to distinguish between various levels of engines; that is, for example, to distinguish between the standard output and low output or even standard rotation versus reverse rotation.

To identify Ford engines by the Marine Manufacturer serial or model number designation refer to your Parts and Service News.

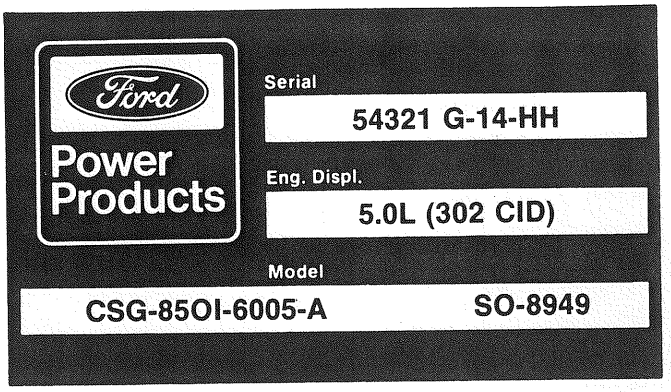

FIG. 1 Identification Decal — Industrial — Typical

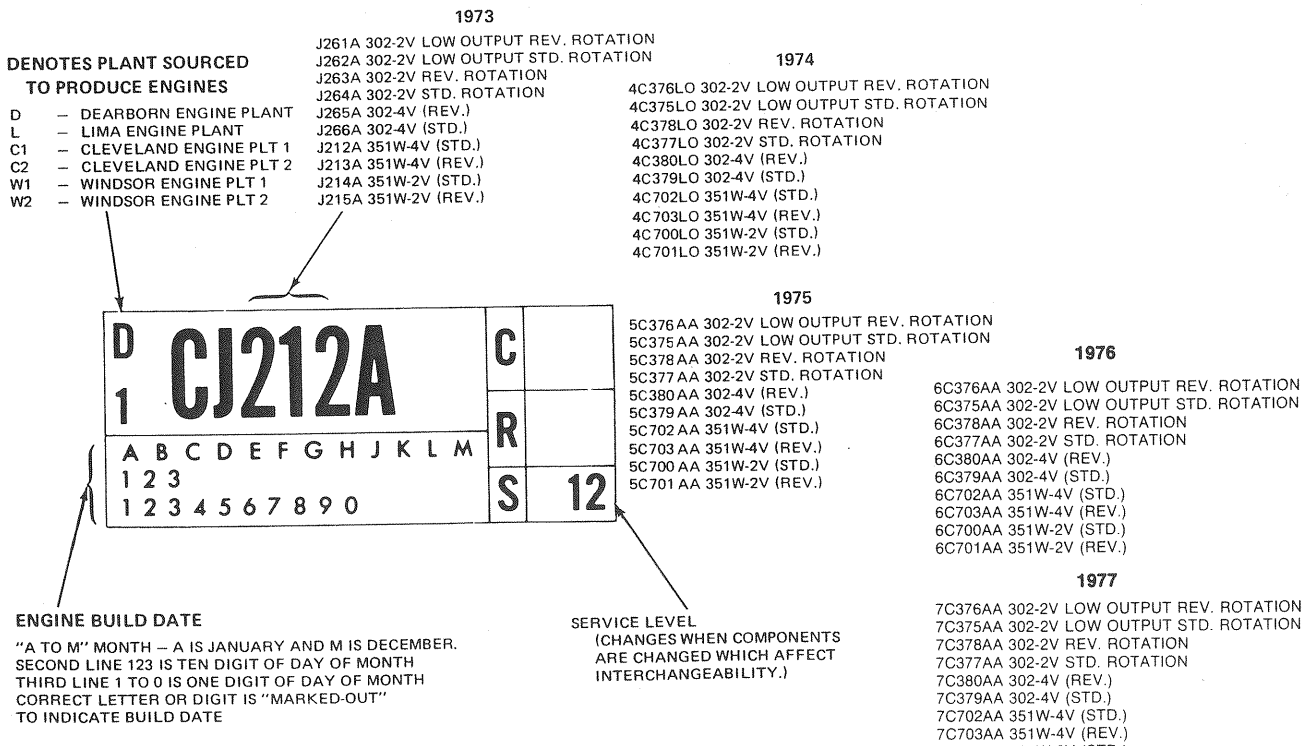

FIG. 2 Marine Identification Decal — Typical

DESCRIPTION AND OPERATION

The Ford 5.0L and 5.8L 8-cylinder gasoline engines are available as engine assemblies and are available in industrial or marine versions. In addition, optional equipment is available to custom tailor each engine to individual requirements.

The Ford 5.0L 8-cylinder engine (Figure 3) and the Ford 5.8L 8-cylinder engine (Figure 4) are designed by Ford Motor Company to incorporate many features for smooth, powerful operation, long life and service. The cylinder block is cast iron for maximum strength and rigidity. They have five main bearings and full-length, full-circle water jackets. These full-length, full-circle water jackets help eliminate hot spots and provide more uniform cylinder wall expansion under heavy-duty operation. The cylinders are numbered from front to rear, on the right bank 1, 2, 3, 4 and on the left bank 5, 6, 7, 8. The firing order is 1-5-4-2-6-3-7-8 for the 5.0L engine and 1-3-7-2-6-5-4-8 for the 5.8L engine. (All marine engines are available in either standard or reverse rotation of the camshaft and crankshaft depending upon the engine installation. The firing order for the standard rotation is 1-3-7-2-6-5-4-8 and the reverse rotation is 1-8-4-5-6-2-7-3, except the 5.0L low output engine. The firing order for the 5.0L low output engine is 1-5-4-2-6-3-7-8 for the standard rotation and 1-8-7-3-6-2-4-5 for the reverse rotation.)

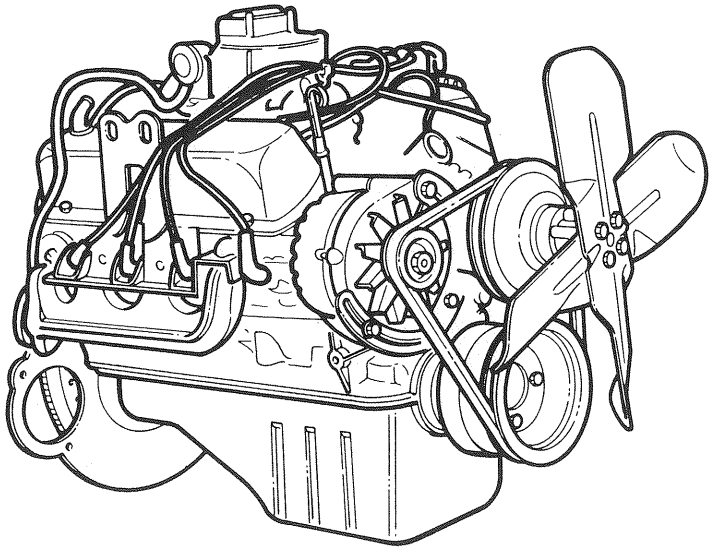

FIG. 3 CSG-850 Engine — Typical (Left 3/4 Front View)

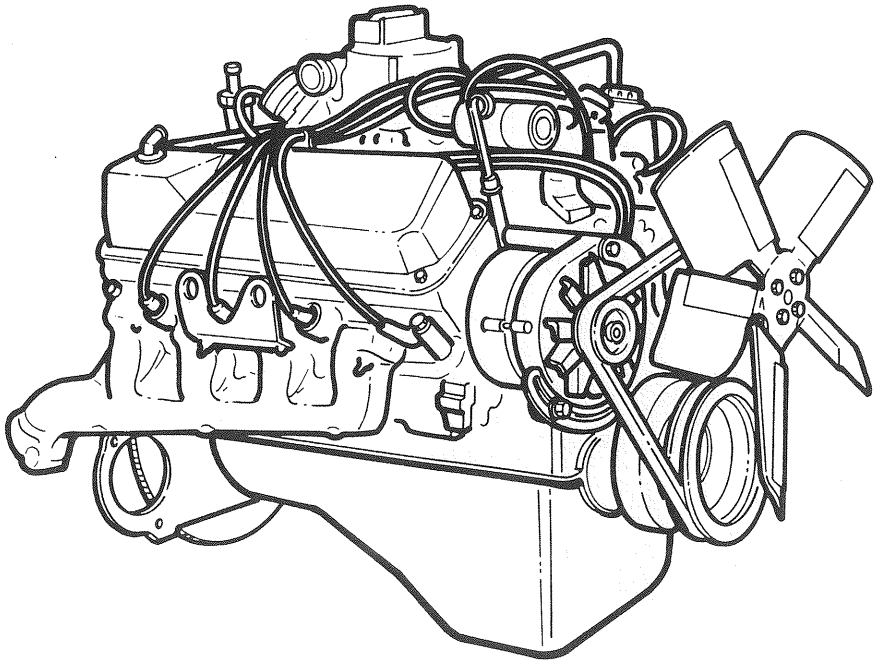

FIG. 4 WSG-858 Engine — Typical (Left 3/4 Front View)

CAMSHAFT IDENTIFICATION

Engine	Application	Rotation	Intake Lift	Exhaust Lift
CSG-850 (302)	Low Output	Standard	0.230	0.238
CSG-850 (302)	Low Output	Reverse	0.230	0.238
CSG-850 (302)	except Low Output	Standard	0.260	0.278
CSG-850 (302)	except Low Output	Reverse	0.260	0.278
CSG-850 (302-4V)		Standard	0.278	0.283
CSG-850 (302-4V)		Reverse	0.278	0.283
WSG-858 (351)		Standard	0.278	0.283
WSG-858 (351)		Reverse	0.278	0.283

FIG. 5 Marine Engine Camshaft Identification Chart

The crankshaft is carried in five replaceable copper-lead alloy main bearings. Crankshaft end thrust is controlled by the center bearing. (Marine engines use four crankshaft assemblies, two for the 302 including the 302 low output engine and two for the 351W. Standard or reverse rotation is the determining factor on which crankshaft is used. A different damper assembly is used for each crankshaft and can be identified by the part number stamped on the face of the damper and the direction of rotation as indicated by the timing marks on the damper.)

The camshaft is supported by five bearings pressed into the block. It is driven by a timing chain from the crankshaft. (There are six different camshafts available for marine engines, two for the 302 low output engine, depending upon standard or reverse rotation and four for the other engines depending upon whether a two or four venturi carburetor is used and whether the engine is standard or reverse rotation. The camshafts are identified as per the chart in Figure 5.)

Camshaft end play is controlled by a plate bolted to the front of the block. The distributor is driven by a gear at the front end of the camshaft. (Distributors used on marine engines may vary. The parts are not interchangeable between different makes of distributors, but complete distributors can be interchanged. The 302 marine engines use a Prestolite or Mallory distributor. The 351W marine engines use a Prestolite, GPD or Mallory distributor.)

The cylinder head assemblies contain the fuel intake and exhaust passages, the valves, and the valve rocker arm assemblies. Valve guides are an integral part of the head. Hard-faced intake and exhaust valve seat inserts are standard. The intake and exhaust valves are actuated through hydraulic-type valve lifters, tubular push rods and individual rocker arms. The large intake and exhaust valves are the free-turning type which rotate slightly each time the valve opens and closes. Rotation promotes self-cleaning and long life.

The self-adjusting valve lifters are housed in bores located in the cylinder block valve lifter chamber. The valve lifters operate directly on the camshaft, thereby transmitting the thrust of the camshaft lobes, by means of hydraulic pressure, to the push rods which actuate the valve train.

All marine engines use heavy duty valves and all have free rotating intake and exhaust valves, except the low output 302 engines. Free rotating valves rotate slightly each time the valve opens and closes.

On the low output 302 marine engines, the intake valves are free rotating while the exhaust valves are the positive rotating type. A positive rotating spring retainer produces a definite amount of rotation each time the valve opens and closes.

The low output 302 marine engines use the regular 302 cylinder head while all the other marine engines use a 351W engine cylinder head. The intake and exhaust valve parts of the 351W cylinder head are larger than those of the 302 head. Accordingly, the diameter of the intake and exhaust valves of all engines using the 351W head are larger and the length of the stems slightly longer. Valves with oversize stems are available for all marine engines.

The same spring is used for intake and exhaust valves of all marine engines except the low output 302 engine. These springs are identified by color coding. The color code for all springs other than those for the low output 302 is three green stripes. The intake valve spring for the low output 302 is light red while the exhaust valve spring is color coded purple.

The cylinder head gasket used on all marine engines is the composition type with a stainless steel core and should be installed dry, that is, without any sealer.

The intake manifold has two sets of fuel passages, each with its own separate inlet connection to the carburetor. A heat crossover passage permits exhaust gases to circulate through the intake manifold, thereby providing the initial heat necessary to assist in vaporizing the incoming fuel charge.