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Specifications

Engine

Item	Specification
Displacement	4.957 L (302 CID)
No. of cylinders	8
Bore	92.2 mm (3.629 in)
Stroke	92.7 mm (3.649 in)
Firing order	1-5-4-8-6-3-7-2
Spark plug	12405
Spark plug gap	1.25-1.35 mm (0.049-0.053 in)
Compression ratio	11.0:1
Engine weight (without accessory drive components)	431.0 lb (195.5 kg)

Lubricants

Item	Specification
Motorcraft® SAE 5W-20 Premium Synthetic Blend Motor Oil (US); Motorcraft® SAE 5W-20 Super Premium Motor Oil (Canada)	XO-5W20-QSP (US); CXO-5W20-LSP12 (Canada)

Engine Oil Capacity

Item	Specification
Service fill including oil filter	8.0 qt (7.6 L)

Oil Pressure

Item	Specification

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Oil pressure @ idle with engine at normal operating temperature	10 –15 psi (69 –103 kPa)
Oil pressure @ 2,000 rpm with engine at normal operating temperature	30 –40 psi (207 –276 kPa)

Cylinder Head and Valve Train

Item	Specification
Combustion chamber volume	3.33 –3.51 in³ (54.5 –57.5 cm³)
Valve stem diameter - intake	0.2368 –0.2380 in (6.015 –6.044 mm)
Valve stem diameter - exhaust	0.2368 –0.2380 in (6.015 –6.044 mm)
Valve stem-to-guide clearance - intake	0.0008 –0.0027 in (.02 –.069 mm)
Valve stem-to-guide clearance - exhaust	0.0018 –0.0037 in (.045 –.094 mm)
Valve head diameter - intake	1.46 in (37 mm)
Valve head diameter - exhaust	1.22 in (31 mm)
Valve face runout	0.0020 in (.05 mm)
Valve face angle	3 angle
Valve seat width - intake	0.051 –0.059 in (1.3 –1.5 mm)
Valve seat width - exhaust	0.055 –0.063 in (1.4 –1.6 mm)
Valve seat runout	0.0016 in (.04 mm)
Valve seat angle	121/91/61 degrees
Valve spring free length - intake	2.020 in (51.32 mm)
Valve spring free length - exhaust	2.020 in (51.32 mm)
Valve spring perpendicularity - intake	0.118 in (3 mm)
Valve spring perpendicularity - exhaust	0.118 in (3 mm)
Valve spring compression force - intake	650 N
Valve spring compression force - exhaust	650 N
Valve spring installed height - intake	1.5748 in (40 mm)
Valve spring installed height - exhaust	1.5748 in (40 mm)

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Valve spring installed force - intake	265 N
Valve spring installed force - exhaust	265 N
Roller follower ratio	2:1
Cylinder head gasket surface flatness	0.025 mm (0.001 in) in any 25 mm (1 in) x 25 mm (1 in) area; 0.050 mm (0.002 in) in any 150 mm (6 in) x 150 mm (6 in) area; 0.1 mm (0.004 in) overall

Hydraulic Lash Adjuster

Item	Specification
Diameter — intake	0.472 in (12 mm)
Diameter — exhaust	0.472 in (12 mm)
Clearance-to-bore	0.0007 –0.0020 in (.018 –.05 mm)
Hydraulic leakdown rate — intake	0.45-3 seconds [a]
Hydraulic leakdown rate — exhaust	0.45-3 seconds [a]
Collapsed lash adjuster gap	0.0138 –0.0335 in (.35 –.85 mm)

Camshaft

Item	Specification
Lobe lift - intake	0.2348 in (5.963 mm)
Lobe lift - exhaust	0.2161 in (5.488 mm)
Journal diameter	1.1268 in (28.62 mm)
Journal bore inside diameter	1.1292 –1.1282 in (28.682 –28.657 mm)
Journal-to-bearing clearance	0.0010 –0.0030 in (.025 –.075 mm)
Runout	0.0016 in (.04 mm)
End play	0.0059 in (.15 mm)

Cylinder Block

Item	Specification
Cylinder bore diameter	3.6299 –3.6307 in (92.2 –92.22 mm)

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Cylinder bore maximum taper	0.0005 in (.013 mm)
Cylinder bore maximum out-of-round	0.0004 in (.01 mm)
Main bearing bore inside diameter	2.850 –2.851 in (72.4 –72.424 mm)
Head gasket surface flatness	0.0254 mm (0.001 in) across any 38.1 mm (1.5 in) square

Crankshaft

Item	Specification
Main bearing journal diameter	2.657 –2.658 in (67.481 –67.505 mm)
Main bearing journal maximum taper	0.0002 in (.004 mm)
Main bearing journal maximum out-of-round	0.0002 in (.006 mm)
Main bearing journal-to-main bearing clearance	0.0010 –0.0018 in (.025 –.045 mm)
Connecting rod journal diameter	2.086 –2.087 in (52.983 –53.003 mm)
Connecting rod journal maximum taper	0.0002 in (.004 mm)
Connecting rod journal maximum out-of-round	0.0002 in (.006 mm)
Crankshaft maximum end play	0.0110 in (.28 mm)

Piston and Connecting Rod

Item	Specification
Piston diameter - single grade	3.6284 –3.6289 in (92.161 –92.175 mm)
Piston-to-cylinder bore clearance (at grade size) [b]	0.0010 –0.0023 in (.025 –.059 mm)
Piston ring end gap - top	0.0059 –0.0098 in (.15 –.25 mm)
Piston ring end gap - intermediate	0.0118 –0.0217 in (.3 –.55 mm)
Piston ring end gap — oil control	0.0059 –0.0177 in (.15 –.45 mm)
Piston ring groove width - top	0.0480 –0.0492 in (1.22 –1.25 mm)
Piston ring groove width - intermediate	0.0480 –0.0488 in (1.22 –1.24 mm)
Piston ring groove width— oil control	0.0996 –0.1004 in (2.53 –2.55 mm)
Piston ring width - top	0.0461 –0.0469 in (1.17 –1.19 mm)
Piston ring width - intermediate	0.0461 –0.0469 in (1.17 –1.19 mm)
Piston ring-to-groove clearance - top	0.0012 –0.0031 in (.03 –.08 mm)
Piston ring-to-groove clearance - intermediate	0.0012 –0.0028 in (.03 –.07 mm)
Piston pin bore diameter	0.8663 –0.8665 in (22.004 –22.01 mm)

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Piston pin diameter	0.8660 –0.8661 in (21.997 –22 mm)
Piston pin length	2.390 –2.402 in (60.7 –61 mm)
Piston pin-to-piston fit (clearance)	0.0002 –0.0005 in (.004 –.013 mm)
Connecting rod-to-pin clearance	0.0001 –0.0007 in (.003 –.018 mm)
Connecting rod pin bore diameter	0.8663 –0.8667 in (22.003 –22.015 mm)
Connecting rod length (center-to-center)	5.93 in (150.7 mm)
Connecting rod maximum allowed bend	0.0015 in (.038 mm)
Connecting rod maximum allowed twist	0.0020 in (.05 mm)
Connecting rod bearing-to-crankshaft clearance	0.0011 –0.0027 in (.028 –.069 mm)
Connecting rod side clearance (as assembled to crank) — standard play	0.0128 in (.325 mm)
Connecting rod side clearance (as assembled to crank) — max. play	0.0197 in (.5 mm)

a. Time required for the plunger to leak down 1.6 mm of travel with 222 N force and leakdown fluid in the lash adjuster
b. Before Grafal coating.