

SPECIFICATIONS

MATERIAL SPECIFICATIONS

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Item	Specification	Fill Capacity
Motorcraft® SAE 5W-30 Premium Synthetic Blend Motor Oil (US); Motorcraft® SAE 5W-30 Super Premium Motor Oil (Canada) XO-5W30-QSP (US); CXO-5W30-LSP12 (Canada)	WSS- M2C946-A	5.4 L (5.7 qt)

TORQUE SPECIFICATIONS

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Description	Part Number	Torque
A/C compressor bolt	W714077	25 Nm (18 lb-ft)
A/C compressor nut	W520413	25 Nm (18 lb-ft)
A/C compressor stud	W712610	9 Nm (80 lb-in)
A/C compressor tube bracket bolt	W503302	25 Nm (18 lb-ft)
Accessory drive belt tensioner bolts (early build)	Part of 6A228	25 Nm (18 lb-ft)
Accessory drive belt tensioner bolts (late build)	W500114	25 Nm (18 lb-ft)
Balancer shaft assembly bolts	6A313	Refer to <u>BALANCE SHAFT BACKLASH</u>
Battery terminal nut	N805320	9 Nm (80 lb-in)
Bellhousing-to-engine bolts	W714288, W500124	48 Nm (35 lb-ft)
Bellhousing-to-engine stud bolt	W715721	48 Nm (35 lb-ft)
Bellhousing-to-oil pan bolts	W500235	48 Nm (35 lb-ft)
Brake vacuum pump adapter	6K269	63 Nm (46 lb-ft)
Brake vacuum pump bolts	W500015	10 Nm (89 lb-in)
Camshaft bearing cap bolts	W703383	Refer to <u>CAMSHAFTS</u>
Camshaft phaser and sprocket bolts	6279	Timing Drive Components
CAC inlet tube clamp	Part of 6C646	5 Nm (44 lb-in)
CAC intermediate tube mounting bracket fasteners	W520201, W702928	8 Nm (71 lb-in)
CAC outlet tube clamp	Part of 6K863	5 Nm (44 lb-in)
Connecting rod cap bolts	6214	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
Coolant outlet bolts	W500015	10 Nm (89 lb-in)
Coolant pump bolts	W500015	25 Nm (18 lb-ft)
Coolant pump pulley bolts	W500221	20 Nm (177 lb-in)
CKP sensor	W701219	7 Nm (62 lb-in)

Crankshaft pulley bolt	6K340	Refer to <u>CRANKSHAFT PULLEY - EARLY BUILD</u> or <u>CRANKSHAFT PULLEY - LATE BUILD</u>
Crankshaft rear seal with retainer plate bolts	W500212	Refer to <u>CRANKSHAFT REAR SEAL WITH RETAINER PLATE</u>
Crankcase vent oil separator bolts	W500214	10 Nm (89 lb-in)
CHT sensor	6G004	11 Nm (97 lb-in)
Cylinder head bolts	6065	Refer to <u>CYLINDER HEAD</u>
Degas bottle bolts	W706681	9 Nm (80 lb-in)
Engine appearance cover mounting stud	6A957	5 Nm (44 lb-in)
Engine coil-on-plug bolts	W500301	8 Nm (71 lb-in)
Engine coil-on-plug stud bolts	W715638	8 Nm (71 lb-in)
Engine eye lift bolts	W500033	47 Nm (35 lb-ft)
Engine front cover bolts	W500215, W500300, W500328, W711261	Refer to <u>ENGINE FRONT COVER</u>
Engine mount bolts	W712507	90 Nm (66 lb-ft)
Engine mount nuts	W520214	125 Nm (92 lb-ft)
EOP	9278	15 Nm (133 lb-in)
Engine piston oil cooler bolts	W500211	10 Nm (89 lb-in)
Engine plug bolt	W700115	20 Nm (177 lb-in)
Flexplate bolts	W706161	Refer to <u>FLEXPLATE</u>
Fuel injection pump bolts	W500414	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
Fuel injection pump bracket bolts	W702362	17 Nm (150 lb-in)
Fuel injection pump housing	W702700	15 Nm (133 lb-in) plus an additional 60 degrees
Fuel jumper tube bolt	W708662	8 Nm (71 lb-in)
Fuel rail bolts	W500313	8 Nm (71 lb-in) plus an additional 26 degrees
Generator bolts	W503302	25 Nm (18 lb-ft)
Generator terminal nut	W711953	17 Nm (150 lb-in)
Ground wire bolt (on cylinder head)	W715723	20 Nm (177 lb-in)
Ground wire stud bolt (on LH inner fender)	W710897	10 Nm (89 lb-in)
Ground wire nut (on starter stud bolt)	W805024	18 Nm (159 lb-in)
Ground strap bolt (on RH inner fender)	W705661	11 Nm (97 lb-in)
Ground strap nut (on engine front cover stud bolt)	W707137	9 Nm (80 lb-in)
High pressure fuel tube bracket bolts	W500015	10 Nm (89 lb-in)

High pressure fuel tube flare nuts	part of 9H589	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
Idler pulley bolt (late build)	part of 19A216	25 Nm (18 lb-ft)
Idler pulley bracket bolts (early build)	W500113	25 Nm (18 lb-ft)
Idler pulley bracket nuts (early build)	W520413	25 Nm (18 lb-ft)
Intake manifold bolts	W500313	Refer to <u>INTAKE MANIFOLD</u>
KS bolts	W500310	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
Main bearing beam bolts	6345	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
Oil cooler (early build only)	W706487	Refer to <u>OIL COOLER</u>
Oil filter	6714	8 Nm (71 lb-in) plus an additional 180 degrees
Oil filter adapter bolts	W500225	25 Nm (18 lb-ft)
Oil pan drain plug	6730	27 Nm (20 lb-ft)
Oil pan bolts	W500224, W706284	Refer to <u>OIL PAN</u>
Oil pan-to-bellhousing bolts	W500122	48 Nm (35 lb-ft)
Oil pump drive chain tensioner shoulder bolt	W703651	10 Nm (89 lb-in)
Oil pump bolts	W712022	Refer to <u>OIL PUMP</u>
Oil pump screen and pickup tube bolts	W706282	10 Nm (89 lb-in)
Oil pump sprocket bolt	W704397	25 Nm (18 lb-ft)
RH halfshaft bracket bolts	W500113	25 Nm (18 lb-ft)
RH halfshaft bracket nuts	W701731	25 Nm (18 lb-ft)
Starter motor stud bolts	W715721	35 Nm (26 lb-ft)
Starter wire terminal nut (large)	W706414	12 Nm (106 lb-in)
Starter wire terminal nut (small)	W705790	5 Nm (44 lb-in)
Thermostat housing bolts	W500015	10 Nm (89 lb-in)
Timing chain guide bolts	W703643	10 Nm (89 lb-in)
Timing chain tensioner bolts	6K282	10 Nm (89 lb-in)
Torque converter nuts	W715618	40 Nm (30 lb-ft)
Transaxle mount bolt	W500761	150 Nm (111 lb-ft)
Transaxle control selector cable bracket bolts	W714824	25 Nm (18 lb-ft)
Turbocharger heat shield bolts	W714133	10 Nm (89 lb-in)
Turbocharger coolant tube bolts	W715500	28 Nm (21 lb-ft)
Turbocharger inlet tube bolt	W700005	5 Nm (44 lb-in)
Turbocharger inlet tube clamp	-	5 Nm (44 lb-in)

Turbocharger inlet tube stud bolt	W714640	5 Nm (44 lb-in)
Turbocharger oil drain tube bolts	W500212	10 Nm (89 lb-in)
Turbocharger oil supply tube bolts	6C712	25 Nm (18 lb-ft)
Turbocharger outlet tube clamp	-	5 Nm (44 lb-in)
Turbocharger-to-cylinder head studs	W704474	17 Nm (150 lb-in)
Turbocharger-to-cylinder head nuts	W713095	REFER to <u>ENGINE - EARLY BUILD</u> or REFER to <u>ENGINE - LATE BUILD</u>
TCM bracket bolt	W506432	11 Nm (97 lb-in)
TCM bracket nut	W714682	63 Nm (46 lb-ft)
Valve cover retainers	Part of 6K271	Refer to <u>VALVE COVER</u>
VCT solenoid bolts	W500211	10 Nm (89 lb-in)

GENERAL SPECIFICATIONS

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Item	Specification
Engine	
Displacement	2.0L (122 CID)
No. cylinders	4
Bore/stroke	87.5 mm (3.4449 in) - 83.1 mm (3.2717 in)
Fire order	1-3-4-2
Oil pressure (hot @ 2, 000 rpm)	200 kPa (29 psi) - 414 kPa (60 psi)
Compression ratio	9.3:1
Spark plug	12405
Spark plug gap	0.8 mm (0.0315 in)
Engine weight (without accessory drive components)	141 kg (311 lb)
Cylinder Block	
Cylinder bore diameter	87.5 mm (3.4449 in) - 87.53 mm (3.4461 in)
Cylinder bore maximum out-of-round	0.008 mm (0.0003 in)
Main bearing bore diameter	57.018 mm (2.245 in) - 57.040 mm (2.246 in)
Head gasket surface flatness	0.1 mm (0.0039 in) - 0.05 mm (0.002 in)/200 mm (7.874 in) x 200 mm (7.874 in)
Piston and Connecting Rod	
Piston diameter (grade 1)	87.465 mm (3.4435 in) - 87.475 mm (3.4439 in)
Piston diameter (grade 2)	87.4725 mm (3.4438 in) - 87.4875 mm (3.4444 in)
Piston diameter (grade 3)	87.485 mm (3.4443 in) - 87.495 mm (3.4447 in)
Piston-to-cylinder bore clearance	0.0225 mm (0.0009 in) - 0.0475 mm (0.0019 in)

Piston ring groove width - compression (top)	1.23 mm (0.0484 in) - 1.25 mm (0.0492 in)
Piston ring groove width - compression (bottom)	1.23 mm (0.0484 in) - 1.25 mm (0.0492 in)
Piston ring groove width - oil ring	2.03 mm (0.0799 in) - 2.05 mm (0.0807 in)
Piston skirt coating thickness	0.009 mm (0.0004 in) - 0.019 mm (0.0007 in)
Piston pin diameter	22.497 mm (0.8857 in) - 22.5 mm (0.8858 in)
Piston pin length	55.7 mm (2.1929 in) - 56 mm (2.2047 in)
Piston-to-pin clearance	0.0035 mm (0.0001 in) - 0.045 mm (0.0018 in)
Piston pin-to-connecting rod clearance	0.003 mm (0.0001 in) - 0.018 mm (0.0007 in)
Piston ring width - compression (top)	1.2 mm (0.05 in)
Piston ring width - compression (bottom)	1.2 mm (0.05 in)
Piston ring width - oil	2 mm (0.08 in)
Piston ring gap (in bore) - compression (top)	0.17 mm (0.0067 in) - 0.27 mm (0.0106 in)
Piston ring gap (in bore) - compression (bottom)	0.45 mm (0.0177 in) - 0.65 mm (0.0256 in)
Piston ring gap (in bore) - oil	0.15 mm (0.0059 in) - 0.45 mm (0.0177 in)
Connecting rod bearing-to-crankshaft clearance	0.027 mm (0.0011 in) - 0.052 mm (0.002 in)
Connecting rod bearing thickness	1.495 mm (0.0589 in) - 1.519 mm (0.0598 in)
Connecting rod crankshaft bore diameter	55.025 mm (2.1663 in) - 55.045 mm (2.1671 in)
Connecting rod pin bore diameter	22.510 mm (0.8862 in) - 22.516 mm (0.8865 in)
Connecting rod length (center-to-center)	155.869 mm (6.1366 in)
Connecting rod side clearance (assembled to crank)	2.59 mm (0.1020 in) - 3.69 mm (0.1453 in)
Axial clearance	0.014 mm (0.0006 in) - 0.36 mm (0.0142 in)
Crankshaft	
Main bearing journal diameter	51.978 mm (2.0464 in) - 52.002 mm (2.0473 in)
Main bearing clearance	0.016 mm (0.0006 in) - 0.046 mm (0.0018 in)
Connecting rod journal diameter	51.978 mm (2.0464 in) - 52.002 mm (2.0473 in)
End play	0.22 mm (0.0087 in) - 0.45 mm (0.0177 in)
Cylinder Head	
Cylinder head gasket surface flatness	0.08 mm (0.0031 in) maxim overall, a maximum of 0.05 mm (0.0020 in) within 150 mm (5.9055 in) and a maximum of 0.025 mm (0.0010 in) within 25 mm (0.9843 in)

Maximum valve lift @ 0 lash - exhaust	7.4 mm (0.291 in)
Maximum valve lift @ 0 lash - intake	8.3 mm (0.327 in)
Valve guide diameter	5.509 mm (0.2169 in) - 5.539 mm (0.2181 in)
Valve seat width - intake/exhaust	1.40 mm (0.0551 in) - 1.50 mm (0.0591 in)
Valve seat angle	45
Valve seat runout	0.075 mm (0.003 in)
Valve lash adjuster bore diameter	31 mm (1.2205 in) - 31.03 mm (1.2217 in)
Cam bore diameter	25.015 mm (0.9848 in) - 25.04 mm (0.9858 in)
Valve	
Valve head diameter - intake	32.5 mm (1.2795 in)
Valve head diameter - exhaust	28 mm (1.1024 in)
Valve stem diameter - intake	5.5 mm (0.2165 in)
Valve stem diameter - exhaust	5.5 mm (0.2165 in)
Valve stem-to-guide clearance - intake	0.03 mm (0.0012 in) - 0.07 mm (0.0028 in)
Valve stem-to-guide clearance - exhaust	0.03 mm (0.0012 in) - 0.07 mm (0.0028 in)
Valve face runout	0.05 mm (0.002 in)
Valve face angle	44.67 - 45
Valve Spring - Compression Pressure	
Intake and exhaust (installed)	18 kg (40 lb)
Intake (valve open) 9.2 mm (0.3622 in) of lift	46 kg (101 lb)
Exhaust (valve open) 9.2 mm (0.3622 in) of lift	46 kg (101 lb)
Free length	47.91 mm (1.8862 in)
Assembled height	37.9 mm (1.4921 in)
Valve Tappet	
Diameter	30.98 mm (1.2197 in) - 30.964 mm (1.2191 in)
Tappet-to-valve clearance - intake	0.19 mm (0.0075 in) - 0.31 mm (0.0122 in)
Tappet-to-valve clearance - exhaust	0.30 mm (0.0118 in) - 0.42 mm (0.0165 in)
Tappet-to-bore clearance	0.02 mm (0.0008 in) - 0.06 mm (0.0024 in)
Camshaft	
Lobe lift - intake	8.3 mm (0.327 in)
Lobe lift - exhaust	7.4 mm (0.291 in)
Runout	0.03 mm (0.0012 in)
Thrust clearance	0.115 mm (0.0045 in) - 0.145 mm (0.0057 in)

Journal diameter	24.96 mm (0.9827 in) - 24.98 mm (0.9835 in)
Journal-to-bore clearance	0.035 mm (0.0014 in) - 0.08 mm (0.0031 in)