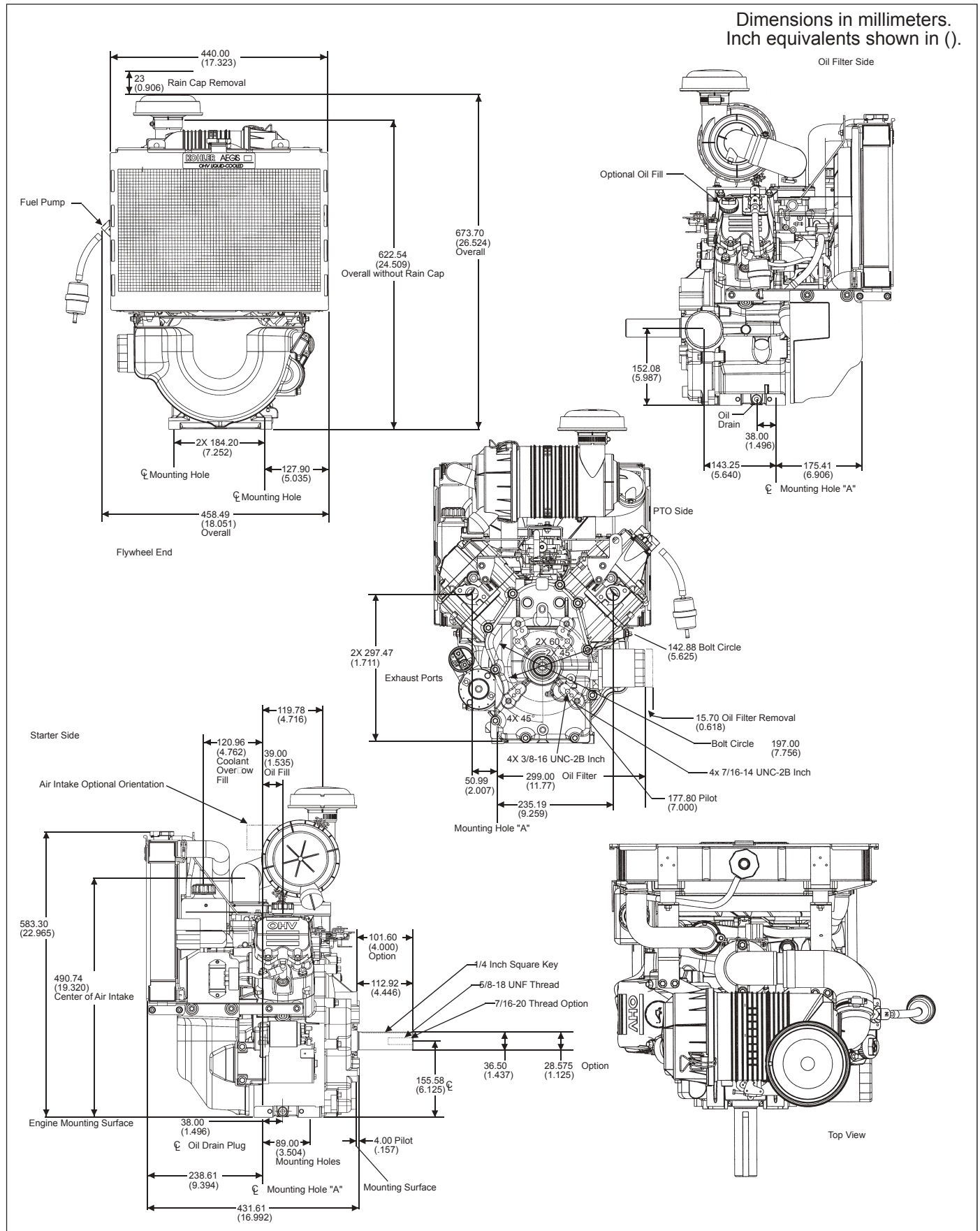


Engine Dimensions



Specifications

ENGINE IDENTIFICATION NUMBERS

Kohler engine identification numbers (model, specification and serial) should be referenced for efficient repair, ordering correct parts, and engine replacement.

Model	LH630
Liquid Cooled	
Horizontal Shaft	
Numerical Designation	
Specification	LH630-0001
Serial	4123500328
Year Manufactured Code	Factory Code
<u>Code</u>	<u>Year</u>
41	2011
42	2012
43	2013

GENERAL SPECIFICATIONS^{3,6}

GENERAL SPECIFICATIONS ^{3,6}		LH630	LH640	LH685	LH690	LH750	LH755
Bore		77 mm (3.03 in.)		80 mm (3.15 in.)		83 mm (3.3 in.)	
Stroke		67 mm (2.64 in.)				69 mm (2.7 in.)	
Displacement		624 cc (38.1 cu. in.)		674 cc (41.1 cu. in.)		747 cc (45.6 cu. in.)	
Oil Capacity (re-fill)		1.6-1.8 L (1.7-1.9 U.S. qt.)					
Maximum Angle of Operation (@ full oil level) ⁴		20°					

TORQUE SPECIFICATIONS^{3,5}

TORQUE SPECIFICATIONS ^{3,5}		LH630	LH640	LH685	LH690	LH750	LH755
Carburetor and Intake Manifold							
Intake Manifold Fastener (torque in 2 increments)	First to 7.4 N·m (66 in. lb.) Finally to 9.9 N·m (88 in. lb.)						
Thermostat Housing Mounting Fastener	6.2-7.3 N·m (55-65 in. lb.)						
Carburetor Mounting Fastener	9.9 N·m (88 in. lb.)						
Closure Plate							
Closure Plate Fastener	24.4 N·m (216 in. lb.)						
Connecting Rod							
Cap Fastener (torque in increments)	11.3 N·m (100 in. lb.)						
Crankcase							
Breather Cover Fastener	10.7 N·m (95 in. lb.) into new hole 7.3 N·m (65 in. lb.) into used hole						
Oil Drain Plug	13.6 N·m (10 ft . lb.)						
Cylinder Head							
Cylinder Head Fastener (torque in 2 increments)	First to 16.9 N·m (150 in. lb.) Finally to 33.9 N·m (300 in. lb.)						
Rocker Pivot Fastener	11.3 N·m (100 in. lb.)						

³ Values are in Metric units. Values in parentheses are English equivalents.

⁴ Exceeding maximum angle of operation may cause engine damage from insufficient lubrication.

⁵ Lubricate threads with engine oil prior to assembly.

⁶ Any and all horsepower (hp) references by Kohler are Certified Power Ratings and per SAE J1940 & J1995 hp standards. Details on Certified Power Ratings can be found at KohlerEngines.com.

TORQUE SPECIFICATIONS^{3,5}

LH630 LH640 LH685 LH690 LH750 LH755

Electric Starter

Starter Thru Bolt	5.6-9.0 N·m (49-79 in. lb.)
Starter Mounting Screw	15.3 N·m (135 in. lb.)
Starter Brush Holder Fastener	2.5-3.3 N·m (22-29 in. lb.)
Starter Solenoid Fastener	4.0-6.0 N·m (35-53 in. lb.)
Starter Solenoid Positive (+) Brush Lead Retaining Nut	8.0-11.0 N·m (71-97 in. lb.)

Fan/Flywheel

Rear Fan Shaft to Mounting Bracket Nut	15.8 N·m (140 in. lb.)
Front Fan Assembly to Fan Shaft Nut	15.8 N·m (140 in. lb.)
Fan/Pulley/Hub Assembly Fastener	6.8 N·m (60 in. lb.)
Flywheel Retaining Screw	66.4 N·m (49 ft. lb.)
Lower Flywheel Cover Mounting Screw	into hex or weld nuts 9.9 N·m (88 in. lb.) into Timmerman clips/nuts 2.2-2.8 N·m (20-25 in. lb.)
Lower Pulley Mounting Screw	24.3 N·m (215 in. lb.)

Governor

Governor Lever Nut	6.8 N·m (60 in. lb.)
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Ignition

Spark Plug	27 N·m (20 ft. lb.)
Ignition Module Fastener	6.2 N·m (55 in. lb.) into new hole 4.0 N·m (35 in. lb.) into used hole
Rectifier-Regulator Fastener	4.0 N·m (35 in. lb.)

Muffler

Muffler Retaining Nuts	24.4 N·m (216 in. lb.)
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Speed Control

Speed Control Bracket Assembly Fastener	10.7 N·m (95 in. lb.) into new holes 7.3 N·m (65 in. lb.) into used holes
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Stator

Stator Mounting Screw	6.2 N·m (55 in. lb.)
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Valve Cover/Rocker Arms

Valve Cover Fastener	6.2 N·m (55 in. lb.)
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Water Pump

Mounting Screw	9.9 N·m (88 in. lb.)
Pulley Mounting Screw	9.9 N·m (88 in. lb.)

CLEARANCE SPECIFICATIONS³

LH630 LH640 LH685 LH690 LH750 LH755

Camshaft

End Play (with shim)	0.076/0.127 mm (0.0030/0.0050 in.)
Running Clearance	0.025/0.063 mm (0.0010/0.0025 in.)
Bore I.D. New Max. Wear Limit	20.000/20.025 mm (0.7874/0.7884 in.) 20.038 mm (0.7889 in.)
Camshaft Bearing Surface O.D. New Max. Wear Limit	19.962/19.975 mm (0.7859/0.7864 in.) 19.959 mm (0.7858 in.)

³ Values are in Metric units. Values in parentheses are English equivalents.

⁵ Lubricate threads with engine oil prior to assembly.

Specifications

CLEARANCE SPECIFICATIONS³

LH630

LH640

LH685

LH690

LH750

LH755

Connecting Rod

Connecting Rod-to-Crankpin Running Clearance New Max. Wear Limit	0.043/0.068 mm (0.0016/0.0026 in.) 0.083 mm (0.0032 in.)
Connecting Rod-to-Crankpin Side Clearance	0.26/0.63 mm (0.0102/0.0248 in.)
Connecting Rod-to-Piston Pin Running Clearance	0.015/0.028 mm (0.0006/0.0011 in.)

Crankcase

Governor Cross Shaft Bore I.D. New Max. Wear Limit	8.025/8.075 mm (0.3159/0.3179 in.) 8.088 mm (0.3184 in.)
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Crankshaft

End Play (free)	0.070/0.590 mm (0.0028/0.0230 in.)
Crankshaft Sleeve Bearing I.D. (crankcase) New Max. Wear Limit	40.974/40.987 mm (1.6131/1.6136 in.) 41.000 mm (1.6141 in.)
Crankshaft Bore (in closure plate) New Max. Wear Limit	40.974/41.000 mm (1.6131/1.6141 in.) 41.038 mm (1.6156 in.)
Crankshaft Bore (in closure plate)-to-Crankshaft Running Clearance New	0.039/0.087 mm (0.0015/0.0034 in.)
Main Bearing Journals O.D. - New O.D. - Max. Wear Limit Max. Taper Max. Out-of-Round	40.913/40.935 mm (1.6107/1.6116 in.) 40.84 mm (1.608 in.) 0.022 mm (0.0009 in.) 0.025 mm (0.0010 in.)
Crankshaft to Sleeve Bearing (crankcase) Running Clearance New	0.039/0.074 mm (0.0015/0.0029 in.)
Connecting Rod Journal O.D. - New O.D. - Max. Wear Limit Max. Taper Max. Out-of-Round	35.955/35.973 mm (1.4156/1.4163 in.) 35.94 mm (1.415 in.) 0.018 mm (0.0007 in.) 0.025 mm (0.0010 in.)
Crankshaft T.I.R. PTO End, Crank in Engine Entire Crank, in V-Blocks	0.15 mm (0.0059 in.) 0.10 mm (0.0039 in.)

Cylinder Bore

Cylinder Bore I.D. New	77.000/77.025 mm (3.0315/3.0325 in.)	80.000/80.025 mm (3.1496/3.1506 in.)	83.006/83.031 mm (3.2679/3.2689 in.)
Max. Wear Limit	77.063 mm (3.0340 in.)	80.065 mm (3.1522 in.)	83.069 mm (3.2704 in.)
Max. Taper Max. Out-of-Round	0.12 mm (0.0047 in.) 0.05 mm (0.0020 in.)		

Cylinder Head

Max. Out-of-Flatness	0.076 mm (0.003 in.)
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³Values are in Metric units. Values in parentheses are English equivalents.

CLEARANCE SPECIFICATIONS³

LH630 LH640 LH685 LH690 LH750 LH755

Governor

Governor Cross Shaft to Crankcase Running Clearance	0.025/0.126 mm (0.0009/0.0049 in.)
Governor Cross Shaft O.D. New Max. Wear Limit	7.949/8.000 mm (0.3129/0.3149 in.) 7.936 mm (0.3124 in.)
Governor Gear Shaft O.D. New Max. Wear Limit	5.990/6.000 mm (0.2358/0.2362 in.) 5.977 mm (0.2353 in.)
Governor Gear Shaft -to-Governor Gear Running Clearance	0.090/0.160 mm (0.0035/0.0063 in.)

Ignition

Spark Plug Gap	0.76 mm (0.030 in.)
Ignition Module Air Gap	0.203/0.305 mm (0.008/0.012 in.)

Piston, Piston Rings, and Piston Pin

Piston Style A 			
Piston-to-Piston Pin	0.006/0.018 mm (0.0002/0.0007 in.)		
Piston Pin Bore I.D. New Max. Wear Limit	17.006/17.013 mm (0.6695/0.6698 in.) 17.025 mm (0.6703 in.)		
Piston Pin O.D. New Max. Wear Limit	16.995/17.000 mm (0.6691/0.6693 in.) 16.994 mm (0.6691 in.)		
Top Compression Ring-to-Groove Side Clearance	0.040/0.086 mm (0.0016/0.0034 in.)	0.050/0.096 mm (0.0020/0.0038 in.)	0.014/0.041 mm (0.0005/0.0016 in.)
Middle Compression Ring-to-Groove Side Clearance	0.040/0.086 mm (0.0016/0.0034 in.)	0.030/0.076 mm (0.0012/0.0030 in.)	0.012/0.039 mm (0.0004/0.0015 in.)
Oil Control Ring-to-Groove Side Clearance	0.046/0.196 mm (0.0018/0.0077 in.)	0.046/0.196 mm (0.0018/0.0077 in.)	0.026/0.176 mm (0.0010/0.0070 in.)
Top and Middle Compression Ring End Gap New Bore Top Ring Middle Ring	0.180/0.380 mm (0.0071/0.0150 in.) 0.250/0.450 mm (0.0098/0.0177 in.)	0.180/0.430 mm (0.0071/0.0169 in.) 0.250/0.460 mm (0.0098/0.0181 in.)	0.250/0.56 mm (0.0098/0.022 in.) ----
Used Bore (Max.)	0.77 mm (0.030 in.)	0.80 mm (0.0315 in.)	0.94 mm (0.037 in.)
Piston Thrust Face O.D. ⁷ New	76.968/76.986 mm (3.0302/3.0309 in.)	79.963/79.981 mm (3.1481/3.1488 in.)	82.973/82.991 mm (3.2666/3.2673 in.)
Max. Wear Limit	76.840 mm (3.0252 in.)	79.831 mm (3.1430 in.)	82.841 mm (3.3136 in.)
Piston Thrust Face-to-Cylinder Bore ⁷ Running Clearance	0.014/0.057 mm (0.0005/0.0022 in.)	0.019/0.062 mm (0.0007/0.0024 in.)	0.015/0.058 mm (0.0005/0.0022 in.)

³ Values are in Metric units. Values in parentheses are English equivalents.

⁷ Measure 6 mm (0.2362 in.) above bottom of piston skirt at right angles to piston pin.

CLEARANCE SPECIFICATIONS³

LH630
LH640
LH685
LH690
LH750
LH755

Piston, Piston Rings, and Piston Pin (continued)

Piston Style B 			
Piston-to-Piston Pin		0.006/0.017 mm (0.0002/0.0007 in.)	
Piston Pin Bore I.D.			
New		17.006/17.012 mm (0.6695/0.6698 in.)	
Max. Wear Limit		17.025 mm (0.6703 in.)	
Piston Pin O.D.			
New		16.995/17.000 mm (0.6691/0.6693 in.)	
Max. Wear Limit		16.994 mm (0.6691 in.)	
Top Compression Ring-to-Groove Side Clearance		0.030/0.070 mm (0.001/0.0026 in.)	
Middle Compression Ring-to-Groove Side Clearance		0.030/0.070 mm (0.001/0.0026 in.)	
Oil Control Ring-to-Groove Side Clearance		0.060/0.190 mm (0.0022/0.0073 in.)	
Top Compression Ring End Gap			
New Bore		0.100/0.279 mm (0.0039/0.0110 in.)	0.189/0.277 mm (0.0074/0.0109 in.)
Used Bore (Max.)		0.490 mm (0.0192 in.)	0.531 mm (0.0209 in.)
Middle Compression Ring End Gap			
New Bore		1.400/1.679 mm (0.0551/0.0661 in.)	1.519/1.797 mm (0.0598/0.0708 in.)
Used Bore (Max.)		1.941 mm (0.0764 in.)	2.051 mm (0.0808 in.)
Piston Thrust Face O.D.			
New		79.966 mm (3.1483 in.) ⁸	82.978 mm (3.2668 in.) ⁷
Max. Wear Limit		79.821 mm (3.1426 in.) ⁸	82.833 mm (3.2611 in.) ⁷
Piston Thrust Face-to-Cylinder Bore Running Clearance		0.025/0.068 mm (0.0010/ 0.0027 in.) ⁸	0.019/0.062 mm (0.0007/ 0.0024 in.) ⁷

Valves and Valve Lifters

Hydraulic Valve Lift er to Crankcase Running Clearance	0.0124/0.0501 mm (0.0005/0.0020 in.)
Intake Valve Stem-to-Valve Guide Running Clearance	0.038/0.076 mm (0.0015/0.0030 in.)
Exhaust Valve Stem-to-Valve Guide Running Clearance	0.050/0.088 mm (0.0020/0.0035 in.)
Intake Valve Guide I.D.	
New	7.038/7.058 mm (0.2771/0.2779 in.)
Max. Wear Limit	7.134 mm (0.2809 in.)
Intake Valve Stem Diameter	
New	6.982/7.000 mm (0.2749/0.2756 in.)
Exhaust Valve Guide I.D.	
New	7.038/7.058 mm (0.2771/0.2779 in.)
Max. Wear Limit	7.159 mm (0.2819 in.)
Exhaust Valve Stem Diameter	
New	6.970/6.988 mm (0.2744/0.2751 in.)
Valve Guide Reamer Size	
Standard	7.048 mm (0.2775 in.)
0.25 mm O.S.	7.298 mm (0.2873 in.)
Intake Valve Lift	8.88 mm (0.3496 in.)
Exhaust Valve Lift	8.88 mm (0.3496 in.)
Nominal Valve Seat Angle	45°

³ Values are in Metric units. Values in parentheses are English equivalents.

⁷ Measure 6 mm (0.2362 in.) above bottom of piston skirt at right angles to piston pin.

⁸ Measure 13 mm (0.5118 in.) above bottom of piston skirt at right angles to piston pin.

GENERAL TORQUE VALUES

English Fastener Torque Recommendations for Standard Applications				
Bolts, Screws, Nuts and Fasteners Assembled Into Cast Iron or Steel				Grade 2 or 5 Fasteners Into Aluminum
Size	 Grade 2	 Grade 5	 Grade 8	 
Tightening Torque: N·m (in. lb.) ± 20%				
8-32	2.3 (20)	2.8 (25)	—	2.3 (20)
10-24	3.6 (32)	4.5 (40)	—	3.6 (32)
10-32	3.6 (32)	4.5 (40)	—	—
1/4-20	7.9 (70)	13.0 (115)	18.7 (165)	7.9 (70)
1/4-28	9.6 (85)	15.8 (140)	22.6 (200)	—
5/16-18	17.0 (150)	28.3 (250)	39.6 (350)	17.0 (150)
5/16-24	18.7 (165)	30.5 (270)	—	—
3/8-16	29.4 (260)	—	—	—
3/8-24	33.9 (300)	—	—	—

Tightening Torque: N·m (ft. lb.) ± 20%				
5/16-24	—	—	40.7 (30)	—
3/8-16	—	47.5 (35)	67.8 (50)	—
3/8-24	—	54.2 (40)	81.4 (60)	—
7/16-14	47.5 (35)	74.6 (55)	108.5 (80)	—
7/16-20	61.0 (45)	101.7 (75)	142.5 (105)	—
1/2-13	67.8 (50)	108.5 (80)	155.9 (115)	—
1/2-20	94.9 (70)	142.4 (105)	223.7 (165)	—
9/16-12	101.7 (75)	169.5 (125)	237.3 (175)	—
9/16-18	135.6 (100)	223.7 (165)	311.9 (230)	—
5/8-11	149.5 (110)	244.1 (180)	352.6 (260)	—
5/8-18	189.8 (140)	311.9 (230)	447.5 (330)	—
3/4-10	199.3 (147)	332.2 (245)	474.6 (350)	—
3/4-16	271.2 (200)	440.7 (325)	637.3 (470)	—

Metric Fastener Torque Recommendations for Standard Applications						
Size						Noncritical Fasteners Into Aluminum
Property Class						
Tightening Torque: N·m (in. lb.) ± 10%						
M4	1.2 (11)	1.7 (15)	2.9 (26)	4.1 (36)	5.0 (44)	2.0 (18)
M5	2.5 (22)	3.2 (28)	5.8 (51)	8.1 (72)	9.7 (86)	4.0 (35)
M6	4.3 (38)	5.7 (50)	9.9 (88)	14.0 (124)	16.5 (146)	6.8 (60)
M8	10.5 (93)	13.6 (120)	24.4 (216)	33.9 (300)	40.7 (360)	17.0 (150)
Tightening Torque: N·m (ft. lb.) ± 10%						
M10	21.7 (16)	27.1 (20)	47.5 (35)	66.4 (49)	81.4 (60)	33.9 (25)
M12	36.6 (27)	47.5 (35)	82.7 (61)	116.6 (86)	139.7 (103)	61.0 (45)
M14	58.3 (43)	76.4 (56)	131.5 (97)	184.4 (136)	219.7 (162)	94.9 (70)

Torque Conversions	
N·m = in. lb. x 0.113	in. lb. = N·m x 8.85
N·m = ft. lb. x 1.356	ft. lb. = N·m x 0.737