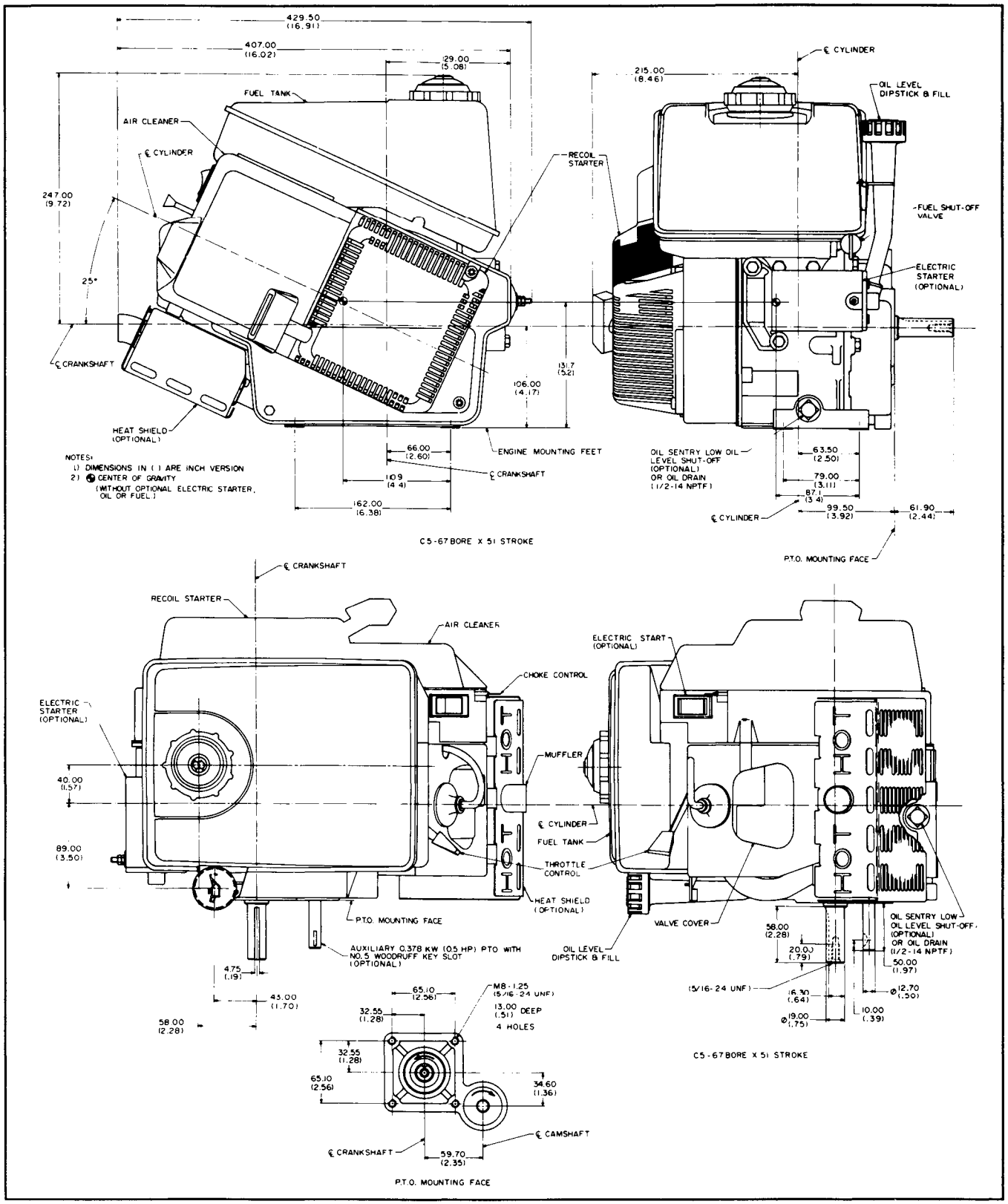


Figure 1-4. Typical CH5 Engine Dimensions.

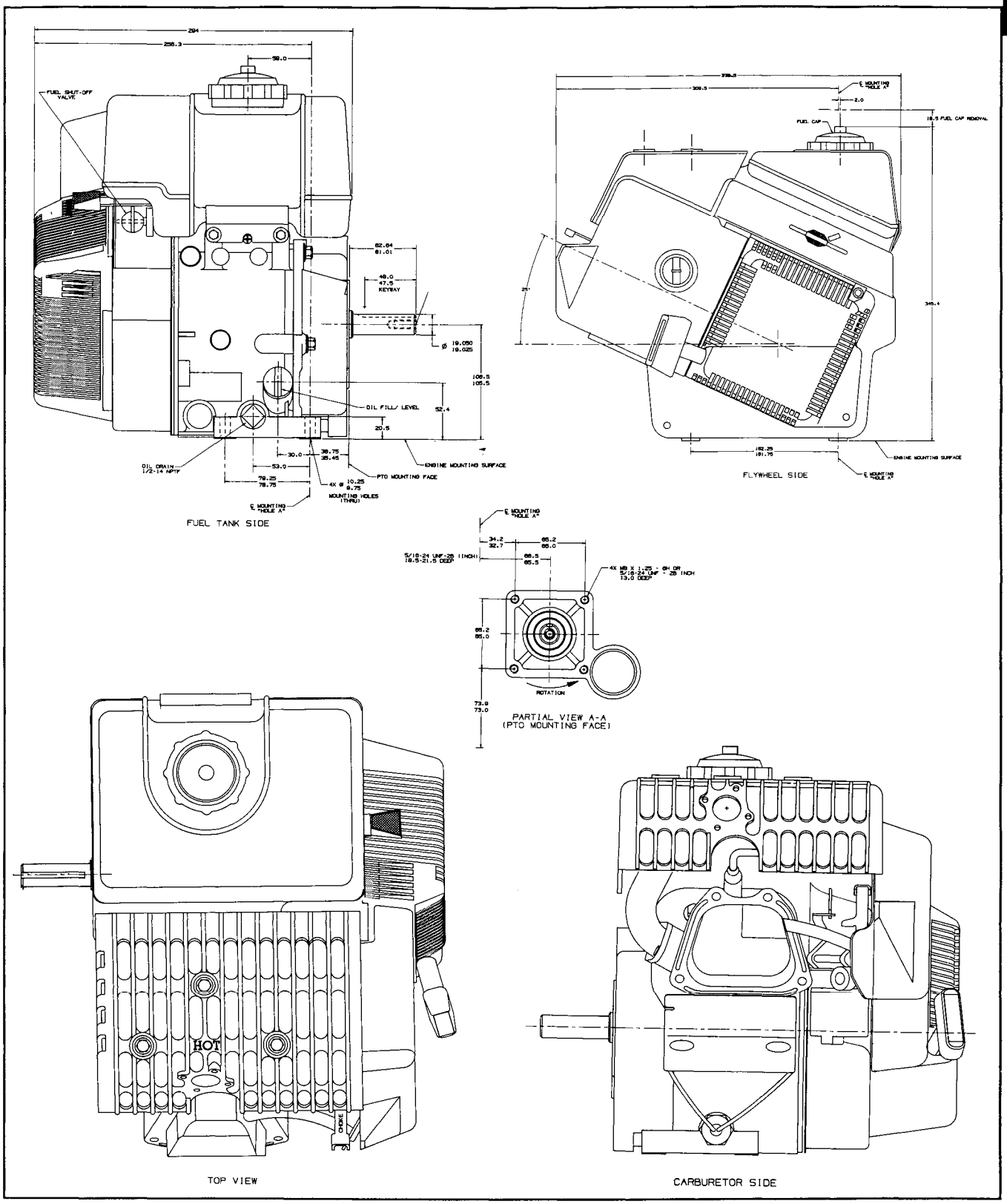


Figure 1-5. Typical CH6 Engine Dimensions.

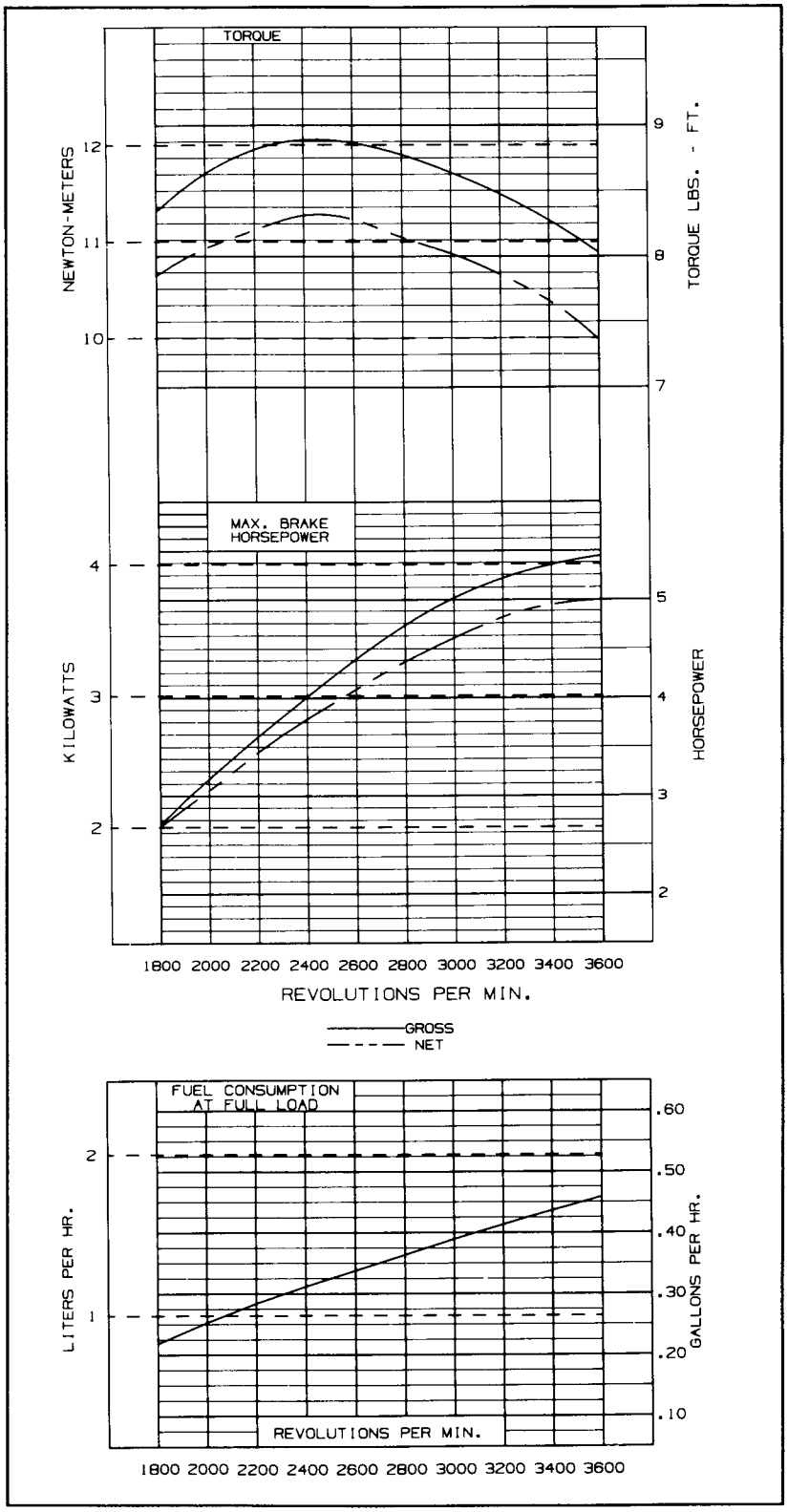


Figure 1-6. CH5 Power, Torque, And Fuel Data.

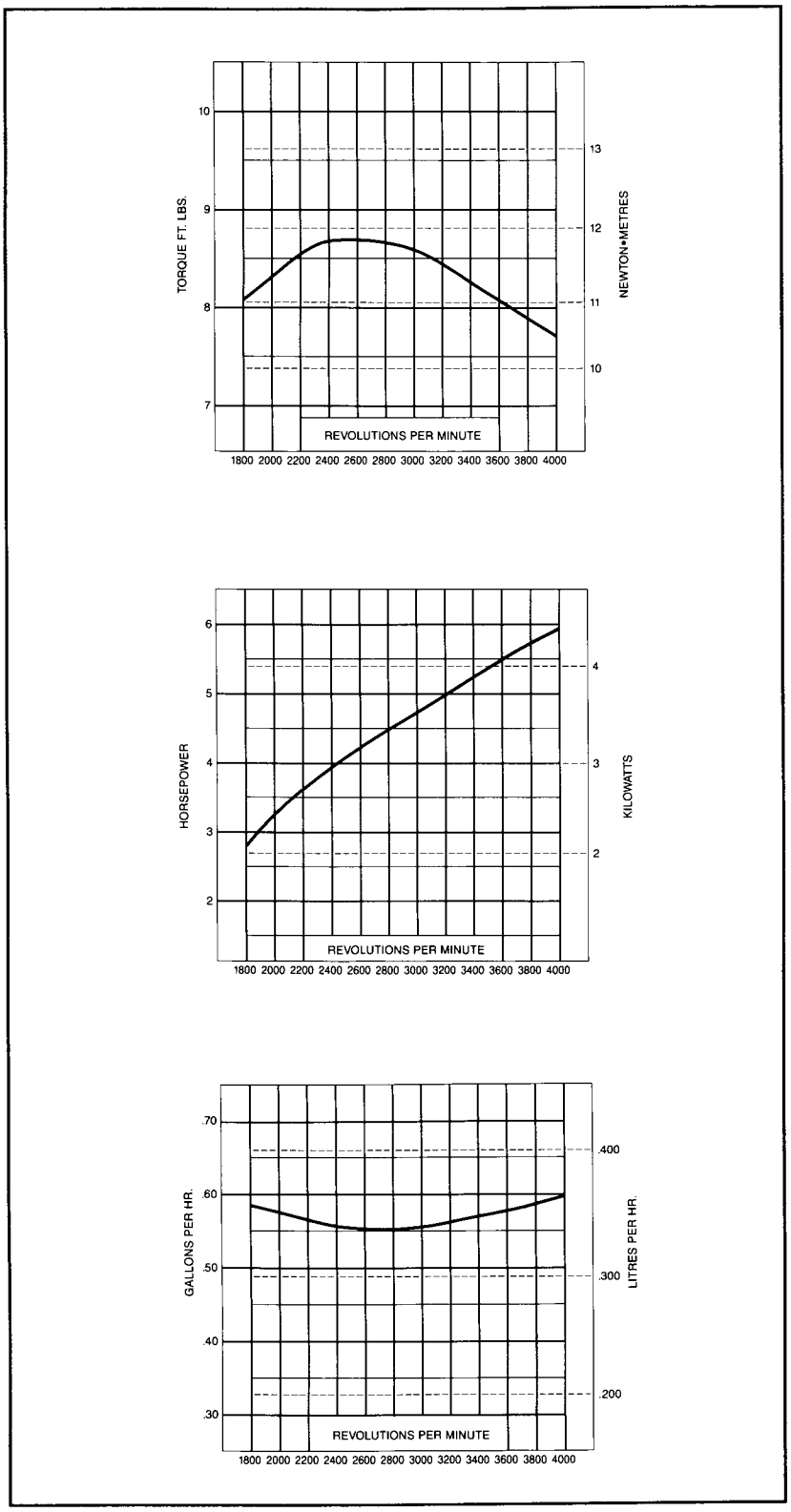


Figure 1-7. CH6 Power, Torque, And Fuel Data.

SPECIFICATIONS, TOLERANCES, AND SPECIAL TORQUE VALUES[1]

DESCRIPTION	CH5 & CH6
General Specifications	
Power (@ 3600 rpm, corrected to SAE J1349) CH5	3.73 kW (5 hp)
Power (@ 4000 rpm, corrected to SAE J1349) CH6	4.47 kW (6 hp)
Peak Torque (@ 2200 rpm) CH5	11.4 N•m (8.4 ft. lb.)
Peak Torque (@ 2600 rpm) CH6	11.6 N•m (8.6 ft. lb.)
Bore	67 mm (2.64 in.)
Stroke	51 mm (2.01 in.)
Displacement	180 cu. cm (10.98 cu. in.)
Compression Ratio	8.5 : 1
Weight (Approx.)	16.33 kg (36 lb.)
Oil Capacity (Approx.)	0.66 liter (0.7 U.S. qt.)
Fuel Tank Capacity (Approx.) CH5	3.78 liter (4.0 U.S. qt.)
Fuel Tank Capactiy (Approx.) CH6	2.84 liter (3.0 U.S. qt.)
Air Cleaner	
Base Nut Torque	6.8 N•m (58 in. lb.)
Angle Of Operation – Maximum (At Full Oil Level)	
Intermittent – All Directions	35°
Continuous – All Directions	20°
Camshaft	
End Play	0.15–0.55 mm (0.0059–0.0217 in.)
Bore I.D. – Max. Wear Limit	
Crankcase	16.030 mm (0.6311 in.)
Closure Plate	25.430 mm (1.0012 in.)
Camshaft Bearing Surface O.D. – Max. Wear Limit	
Crankcase End	15.954 mm (0.6281 in.)
Closure Plate End	25.350 mm (0.9980 in.)

Carburetor

Preliminary Low Idle Fuel Needle Setting	1 Turn
Preliminary High Speed Setting (Adjustable Main Jet Type)	1-1/8 Turn
Fuel Bowl Retaining Screw Torque	9.8 N•m (87 in. lb.)
Throttle Plate Retaining Screw Torque	0.9–1.4 N•m (8–12 in. lb.)

Charging

Stator Air Gap	0.203–0.305 mm (0.008–0.012 in.)
Stator Mounting Screw Torque	4.0 N•m (35 in. lb.)

Closure Plate

Closure Plate Fastener Torque	22.6 N•m (200 in. lb.)

Connecting Rod

Connecting Rod Cap Fastener Torque	9.0 N•m (80 in. lb.)
Connecting Rod-To-Crankpin Running Clearance	
New	0.030–0.056 mm (0.0012–0.0022 in.)
Max. Wear Limit	0.0635 mm (0.0025 in.)
Connecting Rod-To-Crankpin Side Clearance	0.431–0.661 mm (0.0170–0.0260 in.)
Connecting Rod-To-Piston Pin Running Clearance	0.015–0.003 mm (0.0006–0.0011 in.)
Piston Pin End I.D.	
New	14.015–14.023 mm (0.5518–0.5521 in.)
Max. Wear Limit	14.036 mm (0.5526 in.)

Crankshaft

End Play (Free)	0.000–0.056 mm (0.0000–0.0022 in.)
Crankshaft Bore to Crankshaft (CH6 with Sleeve Bearings)*	
Running Clearance - New	0.02-0.09 mm (0.0008-0.0036 in.)
Running Clearance - Max. Wear Limit	0.115 mm (0.0046 in.)
Crankshaft Flywheel End Main Bearing (CH6 with Sleeve Bearings)*	
Outside Diameter - New	30.000 - 30.008 (1.20-1.2003 in.)
O.D. Maximum Wear Limit	29.95 mm (1.198 in.)
Taper - Maximum	0.020 mm (0.0008 in.)

Out-of-Round - Maximum ..... 0.025 mm (0.0010 in.)

Crankshaft Closure Plate End Main Bearing (CH6 with Sleeve Bearings)*
Outside Diameter - New ..... 29.971-29.980 mm (1.1988-1.1992 in.)

O.D. Maximum Wear Limit ..... 29.93 mm (1.1972 in.)

Taper - Maximum ..... 0.020 mm (0.0008 in.)

Out-of-Round - Maximum ..... 0.025 mm (0.0010 in.)

Connecting Rod Journal
O.D. – New ..... 30.947–30.960 mm (1.2184–1.2189 in.)

O.D. – Max. Wear Limit ..... 30.934 mm (1.2179 in.)

Max. Taper ..... 0.025 mm (0.0010 in.)

Max. Out-Of-Round ..... 0.013 mm (0.0005 in.)

Crankshaft T.I.R. – PTO End ..... 0.10 mm (0.004 in.)

*Sleeve bearings standard spec. on CH6 - ball bearings optional specs.

Cylinder Bore

Cylinder Bore I.D. – New ..... 67.000–67.030 mm (2.6378–2.6390 in.)

Cylinder Bore I.D. – Max. Wear Limit ..... 67.049 mm (2.6397 in.)

Cylinder Bore I.D. – Max. Out-Of-Round ..... 0.150 mm (0.0059 in.)

Cylinder Bore I.D. – Max. Taper ..... 0.100 mm (0.0039 in.)

Cylinder Head

Cylinder Head Fastener Torque ..... 22.6 N•m (200 in. lb.)

Max. Out-Of-Flatness ..... 0.076 mm (0.003 in.)

Electric Starter

Drive Pinion Fastener Torque ..... 17.0–19.0 N•m (150–170 in. lb.)

Drive Pinion-To-Flywheel Ring Gear Backlash ..... 0.127–0.635 mm (0.0050–0.0250 in.)

Flywheel

Flywheel Retaining Screw Torque ..... 67.8 N•m (50 ft. lb.)

Fuel Tank

Fuel Tank Fastener Screw Torque ..... 17.0 N•m (150 in. lb.)

Governor

Governor Cross Shaft Bore I.D. – Max. Wear Limit	6.425 mm (0.2530 in.)
Governor Cross Shaft-To-Closure Plate Bore Running Clearance	0.020–0.122 mm (0.0008–0.0048 in.)
Governor Cross Shaft O.D. – Max. Wear Limit	6.296 mm (0.2479 in.)
Governor Gear Shaft-To-Governor Gear Running Clearance	0.025–0.111 mm (0.0010–0.0044 in.)
Governor Gear Shaft O.D.– Max. Wear Limit	9.960 mm (0.3921 in.)

Ignition

Spark Plug Type (Champion Or Equivalent)	RC12YC
Spark Plug Gap	1.02 mm (0.040 in.)
Spark Plug Torque	24.4–29.8 N•m (18–22 ft. lb.)
Ignition Module Air Gap	0.203–0.305 mm (0.0080–0.0120 in.)
Ignition Module Fastener Torque[2]	4.0 or 6.2* N•m (35 or 55* in. lb.)

Muffler

Muffler Retaining Nut Torque	22.6 N•m (200 in. lb.)

Oil Sentry™

Oil Sentry™ Float Switch Torque	13.6 N•m (120 in. lb.)

Piston, Piston Rings, And Piston Pin

Piston-To-Piston Pin Clearance	0.005–0.018 mm (0.0002–0.0007 in.)
Piston Pin Bore I.D. – New	14.006–14.014 mm (0.5514–0.5517 in.)
Piston Pin O.D. – New	13.996–14.000 mm (0.5510–0.5512 in.)
Top Compression Ring-To-Groove Side Clearance	0.040–0.085 mm (0.0016–0.0033 in.)
Middle Compression Ring-To-Groove Side Clearance	0.040–0.072 mm (0.0016–0.0028 in.)
Oil Control Ring-To-Groove Side Clearance	0.140–0.275 mm (0.0055–0.0108 in.)
Top And Center Compression Ring End Gap – New	0.25–0.45 mm (0.010–0.018 in.)
Piston Thrust Face (@D_1)-To-Cylinder Bore Running Clearance – New[3]	0.016–0.059 mm (0.0006–0.0023 in.)

Retractable Starter

Center Screw Torque	7.4–8.5 N•m (65–75 in. lb.)

Throttle Control

Throttle Control lever Fastener Torque	4.3 N•m (38 in. lb.)

Valve Cover

Valve Cover Fastener Torque	3.4 N•m (30 in. lb.)

Valves And Valve Lifters

Intake Valve Stem-To-Valve Guide Running Clearance	0.0392–0.0749 mm (0.00154–0.00295 in.)
Exhaust Valve Stem-To-Valve Guide Running Clearance	0.0610–0.0991 mm (0.00240–0.00390 in.)
Intake Valve Guide I.D. – New	4.990–5.010 mm (0.1965–0.1972 in.)
Intake Valve Guide I.D. – Max. Wear Limit	5.085 mm (0.2002 in.)
Exhaust Valve Guide I.D. – New	4.990–5.010 mm (0.1965–0.1972 in.)
Exhaust Valve Guide I.D. – Max. Wear Limit	5.080 mm (0.2000 in.)
Valve Guide Reamer Size – STD	5.000 mm (0.1968 in.)
Valve Guide Reamer Size – Oversize	5.250 mm (0.2066 in.)
Intake Valve Minimum Lift	5.40 mm (0.213 in.)
Exhaust Valve Minimum Lift	5.40 mm (0.213 in.)
Nominal Valve Seat Angle	45°
Valve-To-Tappet Clearance (Cold)	0.000–0.051 mm (0.0000–0.0020 in.)

NOTES:

1. Values are in Metric units. Values in parenthesis are English equivalents. Lubricate threads with engine oil prior to assembly.
2. For self-tapping (thread forming) fasteners: the higher torque value* is for initial installation into a new cored hole; the lower torque value is for subsequent installation and installation into tapped holes and weld nuts.
3. Measure 6 mm (0.236 in.) above the bottom of the piston skirt at right angles to the piston pin.

TORQUE INFORMATION, SPECIFICATIONS, AND TOLERANCES

Metric Fastener Torque Recommendations For Standard Applications

Tightening Torque: N•m (in. lb.) + or – 10%

	Property Class					
	4.8	5.8	8.8	10.9	12.9	Noncritical Fasteners Into Aluminum
Size						
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.) + or – 10%

	Property Class					
	4.8	5.8	8.8	10.9	12.9	Noncritical Fasteners Into Aluminum
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 (55)	131.5 (97)	184.4 (136)	219.7 (162)	94.9 (70)

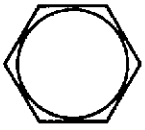
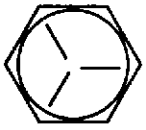
Oil Drain Plugs Tightening Torque: N•m (English Equiv.)

Size	Into Cast Iron	Into Aluminum
1/8" NPT	----------	4.5 (40 in. lb.)
1/4"	17.0 (150 in. lb.)	11.3 (100 in. lb.)
3/8"	20.3 (180 in. lb.)	13.6 (120 in. lb.)
1/2"	27.1 (20 ft. lb.)	17.6 (13 ft. lb.)
3/4"	33.9 (25 ft. lb.)	21.7 (16 ft. lb.)
X-708-1	27.1/33.9 (20/25 ft. lb.)	27.1/33.9 (20/25 ft. lb.)

Torque Conversions

N•m = in. lb. x 0.113
N•m = ft. lb. x 1.356
in. lb. = N•m x 8.85
ft. lb. = N•m x 0.737

English Fastener Torque Recommendations For Standard Applications

Tightening Torque: N•m (in. lb.) + or – 20%				
Bolts, Screws, Nuts And Fasteners Assembled Into Cast Iron Or Steel				Grade 2 Or 5 Fasteners Into Aluminum
	 Grade 2	 Grade 5	 Grade 8	
Size				
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)	5.8 (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.) + or – 20%				
Size				
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)	142.4 (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	149.2 (110)	244.1 (180)	352.6 (260)	———
5/8–18	189.8 (140)	311.9 (230)	447.5 (330)	———
3/4–10	199.3 (150)	332.2 (245)	474.6 (350)	———
3/4–16	271.2 (200)	440.7 (325)	637.3 (470)	———