

NEW HOLLAND

MZ14H

MZ16H

MZ18H

**REPAIR
MANUAL**



MZ14H, MZ16H, AND MZ18H REPAIR MANUAL CONTENTS

SECTION 1 - GENERAL INFORMATION

SECTION 2 - MODEL/SERIAL NUMBER LOCATION

SECTION 3 - GREASING AND LUBRICATION

SECTION 4 - TRANSAXLE

SECTION 5 - CHASSIS

SECTION 6 - MOWER DECKS

SECTION 7 - ELECTRICAL SYSTEM

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in the each book.

The sections listed above are the sections utilized for the MZ14H, MZ16H, and MZ18H series tractors.

SECTION 1 - GENERAL INFORMATION

CONTENTS

Section	Description	Page
	General Information	1-2
	Think Safety First.....	1-2
	General Specifications.....	1-3
	Hydrostatic Transaxles	1-8
	Torque Specifications	1-10
	Standard Torque For Dry, Zinc Plated, and Steel Fasteners (Inch Series).....	1-11
	Standard Torque For Dry, Zinc Plated, and Steel Fasteners (Metric Fasteners)	1-12
	Other Torque Specifications	1-13
	Equivalents and Conversions	1-14

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This symbol means WARNING or PERSONAL SAFETY INSTRUCTION - read the instruction because it has to do with your safety. Failure to comply with the instruction may result in personal injury or even death.

This manual is intended as a service and repair manual only. The safety instructions provided herein are for troubleshooting, service, and repair of the MZ14H, MZ16H, MZ18H zero radius tractor. The MZ14H, MZ16H, MZ18H zero radius tractor and attachment operator's manuals contain safety information and operating tips for safe operating practices. Operator's manuals are available through your New Holland dealer.

THINK SAFETY FIRST

AVOID UNEXPECTED STARTING OF ENGINE...

Always turn off the engine and disconnect the spark plug wire(s) before cleaning, adjusting, or repair.

AVOID LACERATIONS AND AMPUTATIONS...

Stay clear of all moving parts whenever the engine is running. Treat all normally moving parts as if they were moving whenever the engine is running or has the potential to start.

AVOID BURNS...

Do not touch the engine, muffler, or other components which may increase in temperature during operation, while the unit is running or shortly after it has been running.

AVOID FIRES AND EXPLOSIONS...

Avoid spilling fuel and never smoke while working with any type of fuel or lubricant. Wipe up any spilled fuel or oil immediately. Never remove the fuel cap or add fuel when the engine is running. Always use approved, labeled containers for storing or transporting fuel and lubricants.

AVOID ASPHYXIATION...

Never operate an engine in a confined area without proper ventilation.

AVOID INJURY FROM BATTERIES...

Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes, and clothing. Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.

AVOID INJURY DUE TO INFERIOR PARTS...

Use only original equipment parts to ensure that important safety criteria are met.

AVOID INJURY TO BYSTANDERS...

Always clear the area of bystanders before starting or testing powered equipment.

AVOID INJURY DUE TO PROJECTILES...

Always clear the area of sticks, rocks, or any other debris that could be picked up and thrown by the powered equipment.

AVOID MODIFICATIONS...

Never alter or modify any part unless it is a factory approved procedure.

AVOID UNSAFE OPERATION...

Always test the safety interlock system after making adjustments or repairs on the machine. Refer to the Electrical section in this manual for more information.

SECTION 1 - GENERAL INFORMATION

GENERAL SPECIFICATIONS

	MZ14H	MZ16H	MZ18H
ENGINE			
Type.....	Briggs & Stratton	Briggs & Stratton	Briggs & Stratton
Model.....	280H070	286H770	31H777
Horsepower	10.8 kw (14.5)@3600 RPM	11.9 kw (16.0)@3600 RPM	13.4 kw (18.0)@3600 RPM
Cylinders.....	Single	Single	Single
Displacement.....	465CC	465CC	500CC
Low Idle Speed.....	N/A	N/A	N/A
Maximum Speed:			
High Idle	3300 ±100 RPM	3300 ±100 RPM	3300 ±100 RPM
Oil Capacity	1.75 qt. (1.7 L)	1.75 qt. (1.7 L)	1.75 qt. (1.7 L)
Serial Number.....	0166E1	0165E1	0168E1
Fuel Unleaded Gasoline	87 octane min.	87 octane min.	87 octane min.
Vertical Shaft	1 in. (2.54 cm) Dia	1 in. (2.54 cm) Dia	1 in. (2.54 cm) Dia
Charge Coil.....	12v - 9 amp	12v - 9 amp	12v - 16 amp
Other.....	Air cooled, Dual ele- ment air cleaner, Over- head valve, Four cycle, Solid state ignition	Air cooled, Dual ele- ment air cleaner, Over- head valve, Four cycle, Solid state ignition, Pressure lubricated with oil filter	Air cooled, Dual ele- ment air cleaner, Over- head valve, Four cycle, Solid state ignition, Full pressure lubricated with oil filter
CONSTRUCTION			
Frame	Drawn 10 ga. steel	Drawn 10 ga. steel	Drawn 10 ga. steel
FUEL SYSTEM			
Capacity.....	2 Gallon (7.6 L)	2 gallons (7.6 L)	2 Gallon (7.6 L)
Type.....	Single	Single	Single
Other.....	Fuel tank shut-off, Fuel filter (replaceable in-line type), Large diameter vented fuel cap	Fuel tank shut-off, Fuel filter (replaceable in- line type), Large diame- ter vented fuel cap	Fuel tank shut-off, Fuel filter (replaceable in-line type), Large diameter vented fuel cap
TRACTION SYSTEM			
Transaxles	Twin Hydro-Gear EZT Hydrostatic Transaxles	Twin Hydro-Gear EZT Hydrostatic Transaxles	Twin Hydro-Gear EZT Hydrostatic Transaxles
Transaxle Drive	Belt Drive with self-ten- sioning system	Belt Drive with self-ten- sioning system	Belt Drive with self-ten- sioning system
Ground Speed	Infinite, 0 to 6.0-MPH (9.7-km/hr) forward, 0 to 3-MPH (5.0-km/hr) reverse	Infinite, 0 to 6.0-MPH (9.7-km/hr) forward, 0 to 3-MPH (5.0-km/hr) reverse	Infinite, 0 to 6.0-MPH (9.7-km/hr) forward, 0 to 3-MPH (5.0-km/hr) reverse

SECTION 1 - GENERAL INFORMATION

	MZ14H	MZ16H	MZ18H
Transport Levers	Allow unit to be moved without engine running	Allow unit to be moved without engine running	Allow unit to be moved without engine running

ATTACHMENT DRIVE

Clutch	Electric Clutch	Electric Clutch	Electric Clutch
Type.....	Vertical drive with single deep B-groove pulley	Vertical drive with single deep B-groove pulley	Vertical drive with single deep B-groove pulley

TIRES

Rear Drive Tires	18 x 6.5-8 4 ply	18 x 7.5-8 4 ply	18 x 8.5-8 4 ply
Front Castor Tires.....	410/350 x 4 with "saw-tooth" tread	410/350 x 4 with "saw-tooth" tread	410/350 x 4 with "saw-tooth" tread
Tire Pressure	13 psi (90 kPa) rear, 35 psi (241 kPa) front	13 psi (90 kPa) rear, 35 psi (241 kPa) front	13 psi (90 kPa) rear, 35 psi (241 kPa) front

OPERATORS SEAT

Type.....	High back foam padded	High back foam padded	High back foam padded with arm rests
Mounting.....	Hinged mounting for easy access to battery and controls; spring suspension	Hinged mounting for easy access to battery and controls; spring suspension	Hinged mounting for easy access to battery and controls; spring suspension
Adjustment.....	Fore and aft 2 in. (51 mm) by loosening 2 knobs and sliding seat	Fore and aft 2 in. (51 mm) by loosening 2 knobs and sliding seat	Fore and aft 2 in.(51 mm) by loosening 2 knobs and sliding seat

STEERING

Levers.....	Dual wrap-around levers control hydraulic pumps	Dual wrap-around levers control hydraulic pumps	Dual wrap-around levers control hydraulic pumps
Dampening	Dual hydraulic dampers	Dual hydraulic dampers	Dual hydraulic dampers
Turning Radius	Zero radius turn (ZRT)	Zero radius turn (ZRT)	Zero radius turn (ZRT)

CONTROLS

Steering Lever	Dual wrap-around with cushioned grips	Dual wrap-around with cushioned grips	Dual wrap-around with cushioned grips
Parking Brake	Automatic with steering lever lock out	Automatic with steering lever lock out	Automatic with steering lever lock out
Attachment Lift.....	Right hand operated lever with cushioned grip	Right hand operated lever with cushioned grip	Right hand operated lever with cushioned grip
Cutting Height.....	Rightside incorporated with attachment lift	Rightside incorporated with attachment lift	Rightside incorporated with attachment lift

SECTION 1 - GENERAL INFORMATION

	MZ14H	MZ16H	MZ18H
Engine Throttle	Rightside console mounted lever	Rightside console mounted lever	Rightside console mounted lever
Ignition Switch	Rightside console mounted electric with key	Rightside console mounted electric with key	Rightside console mounted electric with key
Power Take Off	Rightside console mounted electric	Rightside console mounted electric	Rightside console mounted electric

INTERLOCKS

Seat	Operator presence switch	Operator presence switch	Operator presence switch
Control Lever/Brake.....	Dual position switch	Dual position switch	Dual position switch
Power Take Off.....	Position switch	Position switch	Position switch

ELECTRICAL SYSTEM

Battery Voltage	12 volt negative ground	12 volt negative ground	12 volt negative ground
Battery Type	BCI Group U1	BCI Group U1	BCI Group U1
Fused.....	(1) 30 amp blade type, main (1) 25 amp blade type, charge system	(1) 30 amp blade type, main (1) 25 amp blade type, charge system	(1) 30 amp blade type, main (1) 25 amp blade type, charge system (1) 10 amp included with optional light kit

LUBRICATION FITTINGS

Front Castor Pivots.....	2 Fittings	2 Fittings	2 Fittings
Front Castor Wheels.....	2 Fittings	2 Fittings	2 Fittings

DIMENSIONS

Wheel Base	47.6 in. (120.9 cm) center of front tire to center of drive tires	47.6 in. (120.9 cm) center of front tire to center of drive tires	47.6 in. (120.9 cm) center of front tire to center of drive tires
Width	39.6 in. (100.6 cm) outside rear tires	40.5 in. (102.9 cm) outside rear tires	43.2 in. (109.7 cm) outside rear tires
Overall Width	45.4 in. (115.3 cm) with deck deflector down, 42.4 in. (107.7 cm) gate width with deflector up	50.7 in. (128.8 cm) with deck deflector down, 46.0 in. (116.8 cm) gate width with deflector up	55.0 in. (139.7 cm) with deck deflector down, 46.6 in. (118.4 cm) gate width with deflector up
Overall Length	72.6 in. (184.4 cm)	72.6 in. (184.4 cm)	72.6 in. (184.4 cm)
Overall Height.....	39 in. (99.1 cm)	39 in. (99.1 cm)	39 in. (99.1 cm)

SECTION 1 - GENERAL INFORMATION

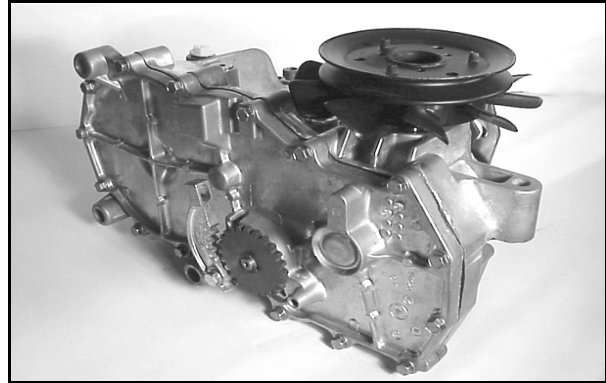
	MZ14H	MZ16H	MZ18H
Track Width	32.9 in. (83.6 cm) center to center of rear tires 31.6 in. (80.3 cm) center to center of castor tires	32.9 in. (83.6 cm) center to center of rear tires 31.6 in. (80.3 cm) center to center of castor tires	34.6 in. (87.9 cm) center to center of rear tires 31.6 in. (80.3 cm) center to center of castor tires
Deck Width	45.4 in. (115.3 cm) w/ deflector down	50.7 in. (128.8 cm) w/ deflector down	55 in. (139.7 cm) w/ deflector down
WEIGHT			
Net Weight.....	505 lbs. (229 kg.) (estimated)	516 lbs. (234 kg.) (estimated)	535 lbs. (243 kg.) (estimated)
DECK	Right side discharge, 38 in cut, two blade mid-mounted rotary. Drawn 13 gauge steel deck with welded mounting brackets. Frame supported.	Right side discharge, 42 in cut, two blade mid-mounted rotary. Drawn 13 gauge steel deck with welded mounting brackets. Frame supported.	Right side discharge, 44 in cut, two blade mid-mounted rotary. Drawn 13 gauge steel deck with welded mounting brackets. Frame supported.
DEFLECTOR	Pivoting deflector (spring loaded) (H.D.P.E.).	Pivoting deflector (spring loaded) (H.D.P.E.).	12 gauge formed, held down by torsion springs at pivot bracket.
ANTI-SCALP ROLLERS	Optional kit	Optional kit	Two Front - left and right
HEIGHT OF CUT	Adjusts from 1.5" to 4.5" (38 mm to 114 mm) (7 positions)	Adjusts from 1.5" to 4.5" (38 mm to 114 mm) (7 positions)	Adjusts from 1.5" to 4.5" (38 mm to 114 mm) (7 positions)
UNCUT CIRCLE	0" uncut circle	0" uncut circle	0" uncut circle
ENGINE TO DECK DRIVE	HA-section Kevlar cord "V" belt from engine clutch sheave to deck spindle sheaves. Spring loaded idler for belt tension and take-up	HA-section Kevlar cord "V" belt from engine clutch sheave to deck spindle sheaves. Spring loaded idler for belt tension and take-up	HA-section Kevlar cord "V" belt from engine clutch sheave to deck spindle sheaves. Spring loaded idler for belt tension and take-up
SPINDLE ASSEMBLIES	Two 17-mm diameter spindles turning in permanently lubed ball bearings. Die cast aluminum spindle housings.	Two 17-mm diameter spindles turning in permanently lubed ball bearings. Die cast aluminum spindle housings.	Two 17-mm diameter spindles turning in permanently lubed ball bearings. Die cast aluminum spindle housings.

SECTION 1 - GENERAL INFORMATION

	MZ14H	MZ16H	MZ18H
BLADES	Two 19.32" x 2.5" x .187" heat treated steel blades.	Two 21.60" x 2.25" x .164" heat treated steel blades.	Three 15.5" x 2.5" x .187" heat treated steel blades.
TIP SPEED	16,760 ft/min @ 3300 RPM nominal 17,270 ft/min @ 3400 RPM max	17,290 ft/min @ 3300 RPM nominal 17,810 ft/min @ 3400 RPM max	16,740 ft/min @ 3300 RPM nominal 17,310 ft/min @ 3400 RPM max
DECK MOUNTING	Deck suspended from front frame by four trunion rods and attached to lift mechanism by two multi-position link ("pork chops")	Deck suspended from front frame by four trunion rods and attached to lift mechanism by two multi-position link ("pork chops")	Deck suspended from front frame by four trunion rods and attached to lift mechanism by two multi-position link ("pork chops")
OPTIONAL EQUIPMENT			
Recycler Kit			
Twin Bagger			
Vac Bagger			
Arm Rest Kit			
Snow Plow Attachment			
Tire Chains			
Smooth Castor Wheel Kit			
Decal Kit - Canada			
Anit-Scalp Kit			
Light Kit			
CERTIFICATION	Conforms to California CARB and EPA Certification. Conforms to ANSI B71.1-2001.	Conforms to California CARB and EPA Certification. Conforms to ANSI B71.1-2001.	Conforms to California CARB and EPA Certification. Conforms to ANSI B71.1-2001.

SECTION 1 - GENERAL INFORMATION

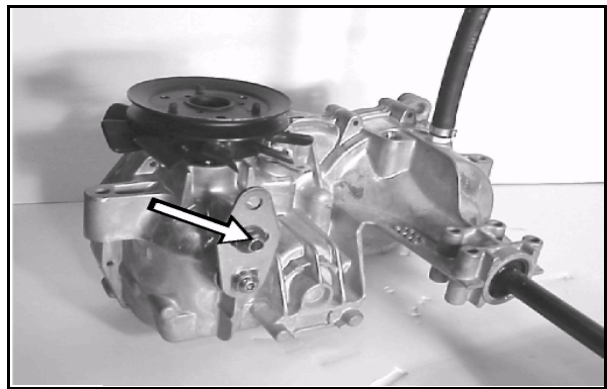
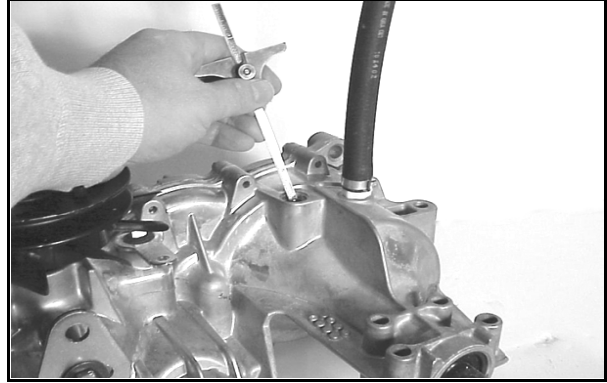
HYDROSTATIC TRANSAXLES



GENERAL SPECIFICATIONS		
Lubrication	SAE 20W-50 API Classification SH/CD	
Oil Capacity	1.6 to 1.7 qt. (1.5 to 1.6 liters)	
Oil Level	The transaxle is a sealed system and does not require periodic checking. Check oil at the oil fill plug location only. Do not check the oil at the vent tube. Checking oil at the vent tube will only give you a false reading or no reading at all, since this is the oil expansion area. If the oil needs to be checked, the transaxle must be removed to check oil level and IT CAN BE ONLY CHECKED COLD. There is a fill plug located at the top of the transaxle. To check the level of the oil, remove the fill plug. Oil level should be 3/4" (1.9 cm) from the top of the oil fill plug.	
Fluid Change	The transaxle is factory filled and does not require regular oil changes.	
Ground Speed	Forward	0-6.0 MPH (9.7 km/h)
	Reverse	0-3.0 MPH (0-5.0 km/h)

SECTION 1 - GENERAL INFORMATION

NOTE: If you are replacing the transaxle, after you have installed the hydro rods, remove the nut and washer located on the cam plate. Also, check the oil prior to installation.



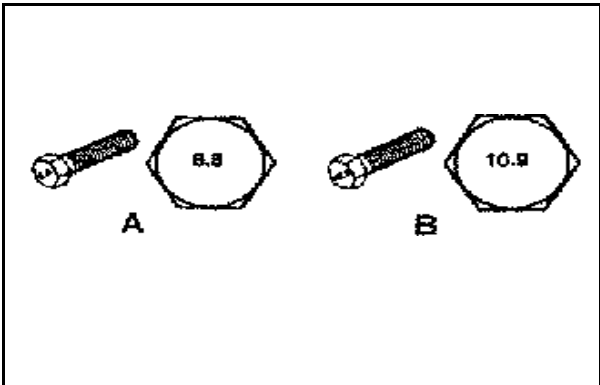
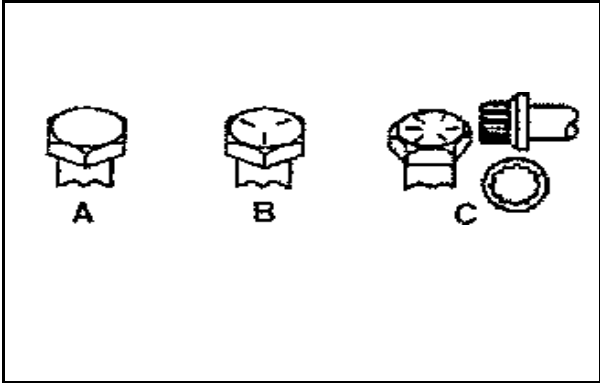
SECTION 1 - GENERAL INFORMATION

TORQUE SPECIFICATIONS

Recommended fastener torque values are listed in the following tables. For critical applications, as determined by New Holland, either the recommended torque or a torque that is unique to the application is clearly identified and specified in the service manual.

These torque specifications for the installation and tightening of fasteners shall apply to all fasteners which do not have a specific requirement identified in the service manual. The following factors shall be considered when applying torque: cleanliness of the fasteners, use of a thread sealant (Loctite), degree of lubrication on the fastener, presence of a prevailing torque feature, hardness of the surface underneath of the fastener's head, or similar condition which affects the installation.

As noted in the following tables, torque values should be reduced by 25% for lubricated fasteners to achieve the similar stress as a dry fasteners. Torque values may also have to be reduced when the fastener is threaded into aluminum or brass. The specific torque value should be determined based on the aluminum or brass material strength, fastener size, length of thread engagement, etc.



INCH SERIES BOLTS AND SCREWS	
(A) Grade 1	(C) Grade 8
(B) Grade 5	

METRIC BOLTS AND SCREWS	
(A) Class 8.8	(B) Class 10.9

The standard method of verifying torque shall be performed by marking a line on the fastener (head or nut) and mating part, then back off fastener 1/4 of a turn. Measure the torque required to tighten the fastener until the lines match up.

SECTION 1 - GENERAL INFORMATION

STANDARD TORQUE FOR DRY, ZINC PLATED, AND STEEL FASTENERS (INCH SERIES)

THREAD SIZE	GRADE 1, 5, & 8 WITH THIN HEIGHT NUTS	SAE GRADE 1 BOLTS, SCREWS, STUDS, & SEMS WITH REGULAR HEIGHT NUTS (SAE J995 GRADE 2 OR STRONGER NUTS)		SAE GRADE 5 BOLTS, SCREWS, STUDS, & SEMS WITH REGULAR HEIGHT NUTS (SAE J995 GRADE 2 OR STRONGER NUTS)		SAE GRADE 8 BOLTS, SCREWS, STUDS, & SEMS WITH REGULAR HEIGHT NUTS (SAE J995 GRADE 2 OR STRONGER NUTS)	
		In-lb	N-cm	In-lb	N-cm	In-lb	N-cm
# 6 - 32 UNC	10 ± 2	13 ± 2	147 ± 23	15 ± 2	170 ± 20	23 ± 2	260 ± 20
# 6 - 40 UNF				17 ± 2	190 ± 20	25 ± 2	280 ± 20
# 8 - 32 UNC	13 ± 2	25 ± 2	282 ± 30	29 ± 3	330 ± 30	41 ± 4	460 ± 45
# 8 - 36 UNF				31 ± 3	350 ± 30	43 ± 4	31 ± 3
# 10 - 24 UNC	18 ± 2	30 ± 5	339 ± 56	42 ± 4	475 ± 45	60 ± 6	674 ± 70
# 10 - 32 UNF				48 ± 4	540 ± 45	68 ± 6	765 ± 70
1/4 - 20 UNC	48 ± 7	53 ± 7	599 ± 79	100 ± 10	1125 ± 100	140 ± 15	1580 ± 170
1/4 - 28 UNF	53 ± 7	65 ± 10	734 ± 113	115 ± 10	1300 ± 100	160 ± 15	1800 ± 170
5/16 - 18 UNC	115 ± 15	105 ± 17	1186 ± 169	200 ± 25	2250 ± 280	300 ± 30	3390 ± 340
5/16 - 24 UNF	138 ± 17	128 ± 17	1446 ± 192	225 ± 25	2540 ± 280	325 ± 30	3670 ± 340
	ft-lb	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m
3/8 - 16 UNC	16 ± 2	16 ± 2	22 ± 3	30 ± 3	41 ± 4	43 ± 4	58 ± 5
3/8 - 24 UNF	17 ± 2	18 ± 2	24 ± 3	35 ± 3	47 ± 4	50 ± 4	68 ± 5
7/16 - 14 UNC	27 ± 3	27 ± 3	37 ± 4	50 ± 5	68 ± 7	70 ± 7	68 ± 9
7/16 - 20 UNF	29 ± 3	29 ± 3	39 ± 4	55 ± 5	75 ± 7	77 ± 7	104 ± 9
1/2 - 13 UNC	30 ± 3	48 ± 7	65 ± 9	75 ± 8	102 ± 11	105 ± 10	142 ± 14
1/2 - 20 UNF	32 ± 3	53 ± 7	72 ± 9	85 ± 8	115 ± 11	120 ± 10	163 ± 14
5/8 - 11 UNC	65 ± 10	88 ± 12	119 ± 16	150 ± 15	203 ± 20	210 ± 20	285 ± 27
5/8 - 18 UNF	75 ± 10	95 ± 15	129 ± 20	170 ± 15	230 ± 20	240 ± 20	325 ± 27
3/4 - 10 UNC	93 ± 12	140 ± 20	190 ± 27	265 ± 25	359 ± 34	374 ± 35	508 ± 47
3/4 - 16 UNF	115 ± 15	165 ± 25	224 ± 34	300 ± 25	407 ± 34	420 ± 35	569 ± 47
7/8 - 9 UNC	140 ± 20	225 ± 25	305 ± 34	430 ± 45	583 ± 61	600 ± 60	813 ± 81
7/8 - 14 UNF	155 ± 25	260 ± 30	353 ± 41	475 ± 45	644 ± 61	660 ± 60	895 ± 81

NOTE: Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

NOTE: Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be

determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

NOTE: The nominal torque values listed above for Grade 5 and 8 fasteners are based on 75% of the minimum proof load specified in SAE J429. The tolerance is approximately ± 10% of the nominal torque value. Thin height nuts include jam nuts.

SECTION 1 - GENERAL INFORMATION

STANDARD TORQUE FOR DRY, ZINC PLATED, AND STEEL FASTENERS (METRIC FASTENERS)

THREAD SIZE	CLASS 8.8 BOLTS, SCREWS, AND STUDS WITH REGULAR HEIGHT NUTS (CLASS 8 OR STRONG NUTS)		CLASS 10.9 BOLTS, SCREWS, AND STUDS WITH REGULAR HEIGHT NUTS (CLASS 10 OR STRONG NUTS)	
M5 x 0.8	57 ± 5 in-lb	640 ± 60 N-cm	78 ± 7 in-lb	885 ± 80 N-cm
M6 x 1.0	96 ± 9 in-lb	1018 ± 100 N-cm	133 ± 13 in-lb	1500 ± 150 N-cm
M8 x 1.25	19 ± 2 ft-lb	26 ± 3 N-m	27 ± 2 ft-lb	36 ± 3 N-m
M10 x 1.5	38 ± 4 ft-lb	52 ± 5 N-m	53 ± 5 ft-lb	72 ± 7 N-m
M12 x 1.75	66 ± 7 ft-lb	90 ± 10 N-m	92 ± 9 ft-lb	125 ± 12 N-m
M16 x 2.0	166 ± 15 ft-lb	225 ± 20 N-m	229 ± 22 ft-lb	310 ± 30 N-m
M20 x 2.5	325 ± 33 ft-lb	440 ± 45 N-m	450 ± 37 ft-lb	610 ± 50 N-m

NOTE: Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

NOTE: The nominal torque values listed above are based on 75% of the minimum proof load specified in SAE J1199. The tolerance is approximately ± 10% of the nominal torque value. Thin height nuts include jam nuts.

NOTE: Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

SECTION 1 - GENERAL INFORMATION

OTHER TORQUE SPECIFICATIONS

SAE GRADE 8 STEEL SET SCREWS

THREAD SIZE	RECOMMENDED TORQUE	
	SQUARE HEAD	HEX SOCKET
1/4 - 20 UNC	140 ± 20 in-lb	73 ± 12 in-lb
5/16 - 18 UNC	215 ± 35 in-lb	145 ± 20 in-lb
3/8 - 16 UNC	35 ± 10 ft-lb	18 ± 3 ft-lb
1/2 - 13 UNC	75 ± 15 ft-lb	50 ± 10 ft-lb

WHEEL BOLTS AND LUG NUTS

THREAD SIZE	RECOMMENDED TORQUE**	
7/16 - 20 UNF Grade 5	65 ± 10 ft-lb	88 ± 14 N-m
1/2 - 20 UNF Grade 5	80 ± 10 ft-lb	108 ± 14 N-m
M12 x 1.25 Class 8.8	80 ± 10 ft-lb	108 ± 14 N-m
M12 x 1.5 Class 8.8	80 ± 10 ft-lb	108 ± 14 N-m

** For steel wheels and non-lubricated fasteners.

**THREAD CUTTING SCREWS
(ZINC PLATED STEEL)**

TYPE 1, TYPE 23, OR TYPE F	
THREAD SIZE	BASELINE TORQUE*
No. 6 - 32 UNC	20 ± 5 in-lb
No. 8 - 32 UNC	30 ± 5 in-lb
No. 10 - 24 UNC	38 ± 7 in-lb
1/4 - 20 UNC	85 ± 15 in-lb
5/16 - 18 UNC	110 ± 20 in-lb
3/8 - 16 UNC	200 ± 100 in-lb

**THREAD CUTTING SCREWS
(ZINC PLATED STEEL)**

THREAD SIZE	THREADS PER INCH		BASELINE TORQUE*
	TYPE A	TYPE B	
No. 6	18	20	20 ± 5 in-lb
No. 8	15	18	30 ± 5 in-lb
No. 10	12	16	38 ± 7 in-lb
No.12	11	14	85 ± 15 in-lb

* Hole size, material strength, material thickness and finish must be considered when determining specific torque values. All torque values are based on non-lubricated fasteners.

Conversion Factors

in-lb x 11.2985 = N-cm

ft-lb x 1.3558 = N-m

N-cm x 0.08851 = in-lb

N-cm x 0.73776 = ft-lb

SECTION 1 - GENERAL INFORMATION

EQUIVALENTS AND CONVERSIONS

DECIMAL AND MILLIMETER EQUIVALENTS

FRACTIONS	DECIMALS	MM	FRACTIONS	DECIMALS	MM
1/64	0.015625	0.397	33/64	0.515625	13.097
1/32	0.03125	0.794	16/32	0.53125	13.484
3/64	0.046875	1.191	35/64	0.546875	13.891
1/16	0.0625	1.588	9/16	0.5625	14.288
5/64	0.078125	1.984	37/64	0.578125	14.684
3/32	0.9375	2.381	19/32	0.59375	15.081
1/8	0.1250	3.175	5/8	0.6250	15.875
9/64	0.140625	3.572	41/64	0.640625	16.272
5/32	0.15625	3.969	21/32	0.65625	16.669
11/64	0.171875	4.366	43/64	0.671875	17.066
3/16	0.1875	4.762	11/16	0.6875	17.462
13/64	0.203125	5.159	45/64	0.703125	17.859
7/32	0.21875	5.556	23/32	0.71875	18.256
15/64	0.234375	5.953	47/64	0.734375	18.653
1/4	0.2500	6.350	3/4	0.7500	19.050
17/64	0.265625	6.747	49/64	0.765625	19.447
9/32	0.28125	7.144	25/32	0.78125	19.844
19/64	0.296875	7.541	51/64	0.796875	20.241
5/16	0.3125	7.541	13/16	0.8125	20.638
21/64	0.328125	8.334	53/64	0.828125	21.034
11/32	0.34375	8.731	27/32	0.84375	21.431
23/64	0.359375	9.128	55/64	0.859375	21.828
3/8	0.3750	9.525	7/8	0.8750	22.225
25/64	0.390625	9.922	57/64	0.890625	22.622
13/32	0.40625	10.319	29/32	0.90625	23.019
27/64	0.421875	10.716	59/64	0.921875	23.416
7/16	0.4375	11.112	15/16	0.9375	23.812
29/64	0.453125	11.509	61/64	0.953125	24.209
15/32	0.46875	11.906	31/32	0.96875	24.606
31/64	0.484375	12.303	63/64	0.984375	25.003
1/2	0.5000	12.700	1	1.000	25.400
1 mm = 0.03937 in.			0.001 in. = 0.0254 mm		



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SECTION 1 - GENERAL INFORMATION

U.S. METRIC CONVERSIONS

	TO CONVERT	INTO	MULTIPLY BY
Linear Measurement	Miles	Kilometers	1.609
	Yards	Meters	0.9144
	Feet	Meters	0.3048
	Feet	Centimeters	30.48
	Inches	Meters	0.0254
	Inches	Centimeters	2.54
	Inches	Millimeters	25.4
Area	Square Miles	Square Kilometers	2.59
	Square Feet	Square Meters	0.0929
	Square Inches	Square Centimeters	6.452
	Acre	Hectare	0.4047
Volume	Cubic Yards	Cubic Meters	0.7646
	Cubic Feet	Cubic Meters	0.02832
	Cubic Inches	Cubic Centimeters	28.3495
Weight	Tons (Short)	Metric Tons	0.9078
	Pounds	Kilograms	0.4536
	Ounces	Grams	28.3495
Pressure	Pounds/Sq.In.	Kilopascal	6.895
Work	Foot-pounds	Newton-Meters	1.356
	Foot-pounds	Kiogram-Meters	0.1383
	Inch-pounds	Kilogram-Centimeters	1.152144
Liquid Volume	Quarts	Liters	0.9463
	Gallons	Liters	3.785
Liquid Flows	Gallons/Minute	Liters/Minute	3.785
Temperature	Fahrenheit	Celsius	1. Subtract 32° 2. Multiply by 5/9

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