

JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER
EQUIPMENT DIVISION

Lightweight Fairway Mower
7500, 7700, 8500, 8700, 8800 (SN 020001-)
7500E-Cut Hybrid and 8500E-Cut Hybrid
(SN 010001-)

TM107919 DECEMBER 2008

TECHNICAL MANUAL



JOHN DEERE

North American Version
Litho In U.s.a.

INTRODUCTION

Manual Description

This technical manual is written for an experienced technician and contains sections that are specifically for this product. It is a part of a total product support program.

The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- Specifications and Information
- Identification Numbers
- Tools and Materials
- Component Location
- Schematics and Harnesses
- Theory of Operation
- Operation and Diagnostics
- Diagnostics
- Tests and Adjustments
- Repair
- Other

Note: Depending on the particular section or system being covered, not all of the above groups may be used.

The bleed tabs for the pages of each section will align with the sections listed on this page. Page numbering is consecutive from the beginning of the Safety section through the last section.

We appreciate your input on this manual. If you find any errors or want to comment on the layout of the manual please contact us.

Safety

Specifications and Information

Engine

Electrical

Power Train

Hydraulics

Steering

Brakes

Attachments

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Previous Editions

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INTRODUCTION

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

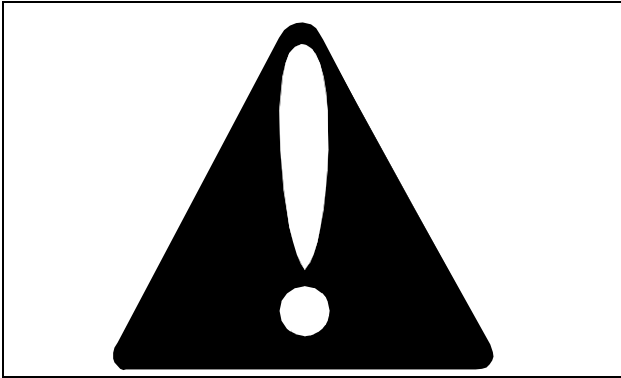
NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

**Have any questions please write to me:
admin@servicemanualperfect.com**

SAFETY

Recognize Safety Information



MIF

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

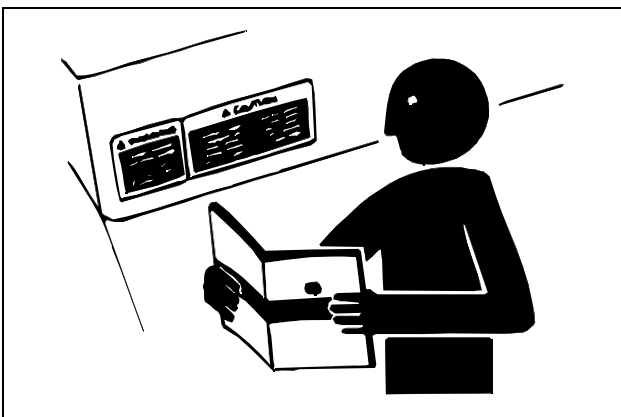
Follow recommended precautions and safe servicing practices.

Understand Signal Words

A signal word - DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Replace Safety Signs

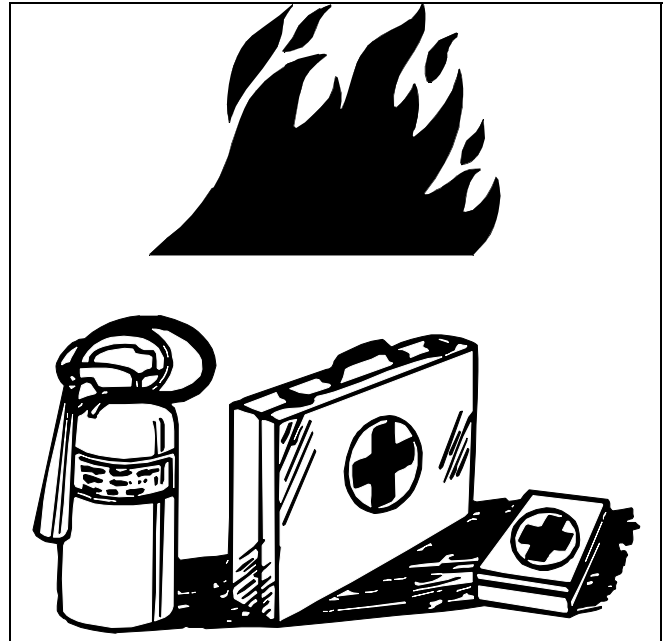


MIF

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

Handle Fluids Safely - Avoid Fires

Be Prepared For Emergencies



MIF

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.

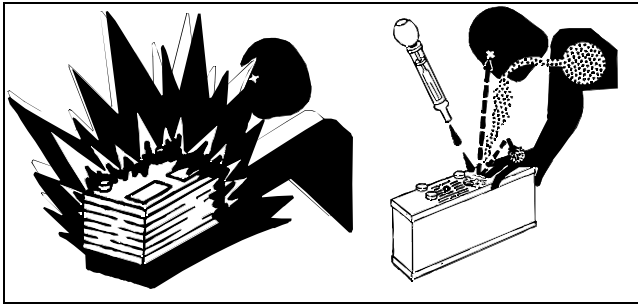
Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

SAFETY

Use Care in Handling and Servicing Batteries



MIF

Prevent Battery Explosions

- Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.
- Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.
- Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

Prevent Acid Burns

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid acid burns by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper jump start procedure.

If you spill acid on yourself:

6. Flush your skin with water.
7. Apply baking soda or lime to help neutralize the acid.
8. Flush your eyes with water for 10-15 minutes.
9. Get medical attention immediately.

If acid is swallowed:

10. Drink large amounts of water or milk.
11. Then drink milk of magnesia, beaten eggs, or vegetable oil.
12. Get medical attention immediately.

Use Care Around High-Pressure Fluid Lines

Avoid High-Pressure Fluids



MIF

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid injury from escaping fluid under pressure by stopping the engine and relieving pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Avoid Heating Near Pressurized Fluid Lines



MIF

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

SAFETY

Use Safe Service Procedures

Wear Protective Clothing



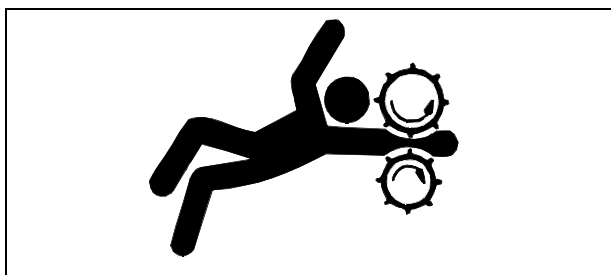
MIF

Wear close-fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

Service Machines Safely



MIF

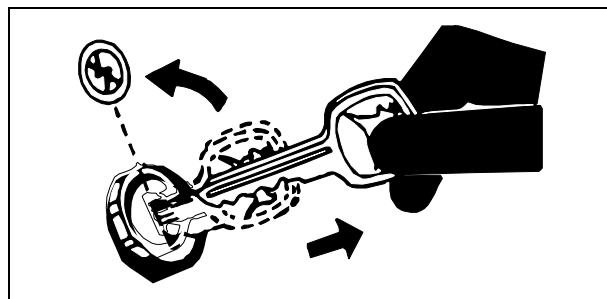
Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. Use power tools only to loosen threaded parts and fasteners. For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches. Use only service parts meeting John Deere specifications.

Park Machine Safely

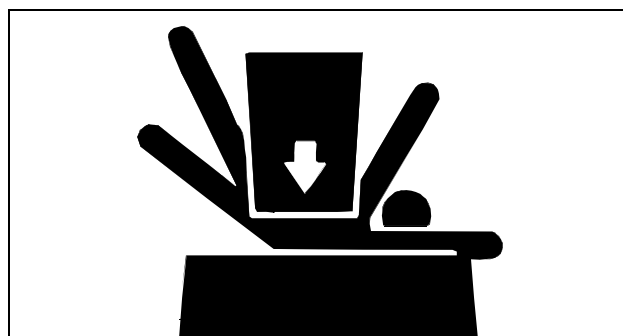


MIF

Before working on the machine:

1. Lower all equipment to the ground.
2. Stop the engine and remove the key.
3. Disconnect the battery ground strap.
4. Hang a "DO NOT OPERATE" tag in operator station.

Support Machine Properly and Use Proper Lifting Equipment



MIF

If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

Lifting heavy components incorrectly can cause severe injury or machine damage. Follow recommended procedure for removal and installation of components in the manual.

Work in Clean Area

Before starting a job:

1. Clean work area and machine.
2. Make sure you have all necessary tools to do your job.
3. Have the right parts on hand.
4. Read all instructions thoroughly; do not attempt shortcuts.

SAFETY

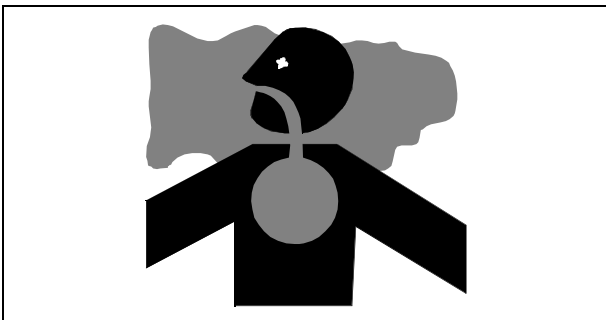
Using High-Pressure Washers

Directing pressurized water at electronic/electrical components or connectors, bearings, hydraulic seals, fuel injection pumps or other sensitive parts and components may cause product malfunctions. Reduce pressure and spray at a 45 to 90 degree angle.

Illuminate Work Area Safely

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

Work in Ventilated Area



MIF

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

WARNING: California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. Do all work outside or in a well ventilated area. Dispose of paint and solvent properly. Remove paint before welding or heating: If you sand or grind paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Avoid Harmful Asbestos Dust

Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding material containing asbestos. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, apply a mist of oil or water on the material containing asbestos. Keep bystanders away from the area.

Service Tires Safely



MIF

Explosive separation of a tire and rim parts can cause serious injury or death.

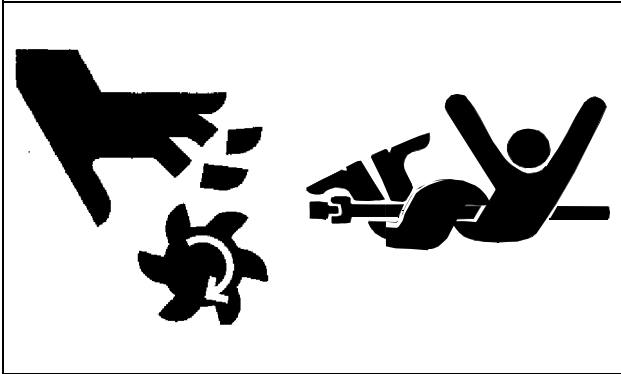
Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

SAFETY

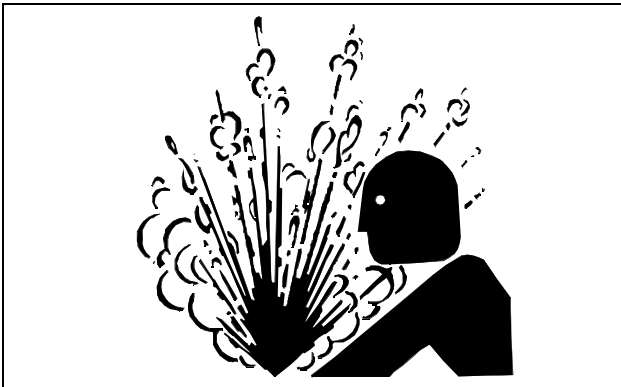
Avoid Injury from Rotating Blades and Drive Shafts



TS283 MIF

Keep hands and feet away while machine is running. Shut off power to service, lubricate or remove mower blades or drive shafts.

Service Cooling System Safely

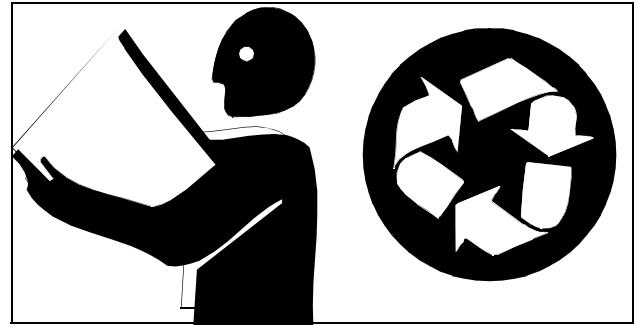


MIF

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off machine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen the cap to first stop to relieve the pressure before removing completely.

Handle Chemical Products Safely



MIF

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

Dispose of Waste Properly

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment includes such items as oil, fuel, coolant, brake fluid, filters, and batteries. Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

SAFETY

LIVE WITH SAFETY



MIF

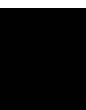
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

SPECIFICATIONS AND INFORMATION TABLE OF CONTENTS

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SPECIFICATIONS AND INFORMATION TABLE OF CONTENTS



SPECIFICATIONS AND INFORMATION SPECIFICATIONS

Specifications

General Specifications

Engine Diesel

Machine Models Used On	7500, 7700
Make	Yanmar
Model	3TNV84T
Output Power	27.7 kW (37.1 hp)
Machine Models Used On	8500, 8700, 8800
Make	Yanmar
Model	3TNV84HT
Output Power	30.2 kW (40.5 hp)
Type	4-cycle diesel
Cylinders	3
Bore	84 mm (3.31 in.)
Stroke	90 mm (3.54 in.)
Displacement	1.496 L (91.3 cu. in.)
Firing Order	1-3-2
Direction of Rotation	Counterclockwise (viewed from flywheel)
Combustion System	Direct injection type
Compression Ratio	18:1
Cooling	Liquid
Governor	Centrifugal
RPM at Slow Idle	1400 ± 50
RPM at Fast Idle (No-Load)	2800 ± 50
Rated RPM	2600
Torque Rise	20 percent minimum

Electrical Specifications

Battery Voltage	12
Starter Type	Solenoid shift
Alternator	Iskra

Hydraulic Power Train

Triple Charge Pump (Front Gear Set)

Make	Hema
Flow	19.6 L/min (5.2 gpm)
Required Pressure at Hydro Input	414-1103 kPa (60-160 psi)

Filter

Type	Spin on
Clogged Filter Bypasses Fluid to Tank At	345 kPa (50 psi)
Filter Bypass Light Comes On At	276 kPa (40 psi)

SPECIFICATIONS AND INFORMATION SPECIFICATIONS

Hydrostatic Transmission (7000 Series)

Make..... Eaton
Model..... 72400 Series
Displacement..... 40.6 cm³/rev (2.48 in³/rev)
Type..... Servo Controlled Variable Displacement Piston Pump
Main Relief Valve Setting..... 31 026 ± 1379 kPa (4500 ± 200 psi)
Charge Relief Valve Setting..... 1241 - 1517 kPa (180 - 220 psi)

Hydrostatic Transmission (8000 Series)

Make..... Eaton
Model..... 72400 Series
Displacement..... 49.2 cm³/rev (3.00 in³/rev)
Type..... Servo Controlled Variable Displacement Piston Pump
Main Relief Valve Setting..... 31 026± 1379 kPa (4500 ± 200 psi)
Charge Relief Valve Setting..... 1241 - 1517 kPa (180 - 220 psi)

Front Wheel Motors (7000 Series)

Make..... Parker Hannifin
Left Model..... TH Series
Right Model..... TH Series
Displacement..... 280 cc³/rev (17.1 in³/rev)

Front Wheel Motors (8000 Series)

Make..... Parker Hannifin
Left Model..... TH Series
Right Model..... TH Series
Displacement..... 310 cc³/rev (19.0 in³/rev)

Rear Wheel Motors (8700 and 8800)

Make..... Parker Hannifin
Model..... TF Series
Displacement..... 240 cc³/rev (14.5 in³/rev)

Hydraulic

Triple Pump (Front Gear Set)

Make..... Hema
Flow..... 20.8 L/min (5.5 gpm)
Relief Valve Setting - 7500, 7700, 8500, and 8700 (In Hydrostatic Pump)..... 1241-1517 kPa (180-220 psi)
Relief Valve Setting - 8800 (In Hydrostatic Pump)..... 1241-1517 kPa (180-220 psi)

Reel Pumps

Make..... Hema
Flow..... 32.6 L/min (8.6 gpm)
Type..... Gear, positive displacement

Rotary Mower Pumps

Make..... Hema
Flow..... 36 L/min (9.5 gpm)
Type..... Gear, positive displacement

SPECIFICATIONS AND INFORMATION SPECIFICATIONS

Reel Motors

Make.....	Danfoss
Displacement (Standard Reels).....	13.9 cm ³ (0.85 cu in.)
Displacement (Heavy Duty Reels).....	19 cm ³ (1.16 cu in.)
Type.....	Gear, with case drain flow

Rotary Mower Motors

Make.....	Danfoss
Displacement.....	12.6 cm ³ (0.77 cu in.)
Type.....	Gear, with case drain flow

Reel Speeds @ 2800 Engine RPM (Engine Not Loaded)

7000 Reels (Standard).....	2250 ± 150 rpm
8000 Reels (Heavy Duty).....	1650 ± 150 rpm

Rotary Mower Speeds @ 2800 Engine RPM (Engine Not Loaded)

8800 Mowers.....	2800 ± 150 rpm
------------------	----------------

Front Inboard and Rear Lift Cylinders

Stroke.....	152 mm (6 in.)
Compressed Length.....	289 mm (6 in.)

Front Outer Lift Cylinder

Stroke.....	203 mm (8 in.)
Compressed Length 7500, 7700, 8500, 8700.....	975 mm (38-3/8 in.)
Compressed Length 8800.....	1032 mm (40-5/8 in.)

Hydraulic Filter

Type.....	10 micron spin-on
Clogged Filter Bypasses Fluid to Tank At.....	344.74 kPa (50 psi)
Filter Bypass Light Comes On At.....	275.79 kPa (40 psi)

Brakes

Brake Type.....	Mechanical
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Attachments - Cutting Units

Make.....	John Deere
Size.....	55.9 cm (22 in.)
Backlapping.....	On machine, variable speed
Clip Ratio.....	See Theory of Operation (Performance Variables)
Front Rollers.....	Choice of smooth, grooved, or spiral
Reel Diameter.....	12.7 cm (5 in.)
Bed Knife Adjustment.....	Reel-to-bed knife
Height-of-Cut.....	2.38 to 19 mm (3/32 to 3/4 in.)
Number of Blades (Standard).....	9 (greens)
Number of Blades (Optional).....	5 (fairways)
Cutting Unit Drive.....	Hydraulic
Bed Knife Standard.....	3 mm (1/8 in.)
Bed Knife Tournament.....	2.38 mm (3/32 in.)
Bed Knife Fairway.....	6.5 mm (1/4 in.)

SPECIFICATIONS AND INFORMATION GENERAL INFORMATION

General Information

Metric Fastener Torque Values

Property Class and Head Markings	4.8		8.8		9.8		10.9		12.9	
										
Property Class and Nut Markings	5		10		10		10		12	
										

MIF (TS1163)

	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ¹		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	109
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

1. "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication.

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a $\pm 10\%$ variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same class. Make sure fastener threads are clean and that you properly start

thread engagement. This will prevent them from failing when tightening.












When bolt and nut combination fasteners are used, torque values should be applied to the NUT instead of the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

Reference: JDS-G200.

SPECIFICATIONS AND INFORMATION GENERAL INFORMATION

Inch Fastener Torque Values

SAE Grade and Head Markings	1 or 2 ¹ No Marks 	5 5.1 5.2   	8 8.2  
SAE Grade and Nut Markings	2 No Marks 	5  	8  

MIF (TS1162)

	Grade 1				Grade 2 ¹				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	Lubricated ²		Dry ²		Lubricated ²		Dry ²		Lubricated ²		Dry ²		Lubricated ²		Dry ²	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

1. "Grade 2" applies for hex cap screws (not hex bolts) up to 152 mm (6 in.) long. "Grade 1" applies for hex cap screws over 152 mm (6 in.) long, and for all other types of bolts and screws of any length.

2. "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication.

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a $\pm 10\%$ variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same grade. Make sure fastener threads are clean and that you properly start

thread engagement. This will prevent them from failing when tightening.

When bolt and nut combination fasteners are used, torque values should be applied to the NUT instead of the bolt head.

Tighten toothed or serrated-type locknuts to the full torque value.

Reference: JDS-G200.