# 4200, 4300 and 4400 Compact Utility Tractors

# TECHNICAL MANUAL

John Deere Lawn & Grounds Care Division TM1677 (Apr01) Replaces TM1677 (Jul99)



**4200 Tractor** 



4300 Tractor



4400 Tractor

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.

# Specifications and Information

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
- Component Location
- System Schematic
- · Theory of Operation
- · Troubleshooting Chart
- Diagnostics
- Tests & Adjustments
- Repair

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

Each section will be identified with a symbol rather than a number. The groups and pages within a section will be consecutively numbered.

We appreciate your input on this manual. To help, there are postage paid post cards included at the back. If you find any errors or want to comment on the layout of the manual please fill out one of the cards and mail it back to us.

Final Drive Power Train

Steering

Brakes

Hydraulics

**Diesel Engine** 

**Gear Power Train** 

**Hydrostatic Power Train** 

SyncReverser™ Power Train

**Electrical** 

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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Consumer Equipment Division
Horicon, WI
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Previous Versions 1998

Miscellaneous

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#### **SAFETY**

## RECOGNIZE SAFETY INFORMATION



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.

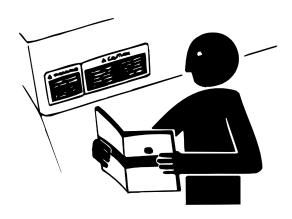
Follow recommended precautions and safe servicing practices.

# **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**

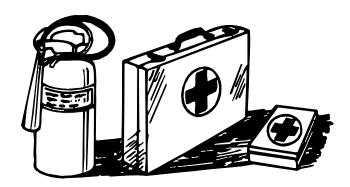


Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

# HANDLE FLUIDS SAFELY-AVOID FIRES

## **Be Prepared For Emergencies**





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.

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# USE CARE IN HANDLING AND SERVICING BATTERIES





# **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 volt-meter 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.
- Avoiding breathing fumes when electrolyte is added.
- 4. Avoiding spilling or dripping electrolyte.
- 5. Use proper jump start procedure.

#### • If you spill acid on yourself:

- 1. Flush your skin with water.
- 2. Apply baking soda or lime to help neutralize the acid.
- 3. Flush your eyes with water for 10 15 minutes.
- 4. Get medical attention immediately.

#### · If acid is swallowed:

- 1. Drink large amounts of water or milk.
- 2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
- 3. Get medical attention immediately.

### USE CARE AROUND HIGH-PRESSURE FLUID LINES

# **Avoid High-pressure Fluids**





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**



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.

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### **USE SAFE SERVICE PROCEDURES**

## **Wear Protective Clothing**



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**



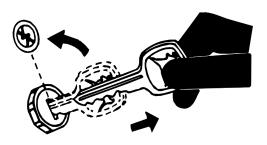
Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

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**



#### 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**



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.
- 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.

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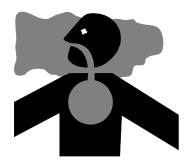
## **Using High Pressure Washers**

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**



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.

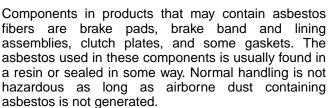
Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

# 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.



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



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.

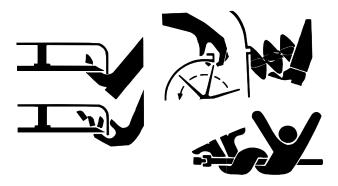
Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

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# AVOID INJURY FROM ROTATING BLADES, AUGERS AND PTO SHAFTS



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

# SERVICE COOLING SYSTEM SAFELY



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 cap to first stop to relieve pressure before removing completely.

# HANDLE CHEMICAL PRODUCTS SAFELY





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 include 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.

#### LIVE WITH SAFETY



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

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# **GENERAL VEHICLE SPECIFICATIONS\* – 4200**

4200 CS1 4200 HS1	4200 CST	4200 HST
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#### **ENGINE**

Make John Deere/Yanmar John Deere/Yanmar

Model 3TNE78A 3TNE78A

Type 4-cycle Diesel 4-cycle Diesel

Bore and Stroke 78x84 mm (3.07x3.31 in.) 78x84 mm (3.07x3.31 in.)

Cylinders 3

Valves Overhead Valves Overhead Valves

Displacement 1204 cm<sup>3</sup> (73.5 cu in.) 1204 cm<sup>3</sup> (73.5 cu in.)

Compression Ratio 18.0:1 18.0:1

 Gross Engine Power
 19.6 kW (26.3 hp)
 19.6 kW (26.3 hp)

 Torque (at rated speed)
 63.2 N•m (46.6 lb-ft)
 63.2 N•m (46.6 lb-ft)

 Torque (max. @ 1600 rpm)
 78.5 N•m (57.9 lb-ft)
 78.5 N•m (57.9 lb-ft)

Lubrication Full pressure Full pressure

Oil filter Standard Single Element Standard Single Element

Oil Capacity (w/filter) 3.8 L (4.0 qt) 3.8 L (4.0 qt) Engine Rated Speed 2700 rpm 2700 rpm Engine Slow Idle Speed 950  $\pm$  50 rpm 1000  $\pm$  50 rpm

Engine Fast Idle Speed  $2920 \pm 25 \text{ rpm}$   $2920 \pm 25 \text{ rpm}$ 

Cooling system Liquid w/Pump & Radiator Liquid w/Pump & Radiator

Air cleaner Dry-Type w/Safety Element Dry-Type w/Safety Element

#### **ELECTRICAL**

Volts 12 VDC 12 VDC

Battery Size - 12V (CCA) 500 Cold Cranking Amps 500 Cold Cranking Amps

Alternator 40 amp 40 amp

Regulator Internal, Current Limiting Internal, Current Limiting

Starting Motor 1.2 kW (1.61 hp) 1.2 kW (1.61 hp)
Headlights 37.5 W Halogen Bulb 37.5 W Halogen Bulb

Tail Lights 5 W Bayonet Base 5 W Bayonet Base

Hazard Lights Type 1156 Type 1156

Instrument Panel Lamps 1.7 W Bayonet Base 1.7 W Bayonet Base



<sup>\*</sup>Specifications and design subject to change without notice.

#### **FUEL SYSTEM**



System Type **Direct Fuel Injection Direct Fuel Injection** 

Injection Pump In-Line w/Solenoid Shutoff In-Line w/Solenoid Shutoff

Fuel type Diesel Diesel

**Fuel Tank Capacity** 37.9 L (10.0 gal) 37.9 L (10.0 gal) Fuel Filter Clear Bowl Water Clear Bowl Water

Separator with Disposable Separator with Disposable

Paper Element, Paper Element,

Water Floating Red Ring Water Floating Red Ring

#### **DRIVE TRAIN**

9 x 3 Collar Shift HST and Gear Type

Mechanical Front Wheel

Drive (4-WD)

Yes (Option)

Yes (Option)

3.8 L (1.0 gal) Front Axle Fluid Capacity 3.8 L (1.0 gal)

Differential Lock Standard; Foot Operated Standard; Foot Operated

Number of Speeds 9 Forward, 3 Reverse Infinite / 3 Range

Final Drive Spur Gear Spur Gear **Brakes** Wet Disk Wet Disk

Hydraulic Power Assist Hydraulic Power Assist Steering

**Drawbar Tongue Weight** Vertical Capacity Rating

500 kg (1102 lb) 500 kg (1102 lb)

## PTO (PTO Shaft Speed Measured at 2700 Engine rpm)

Type Independent Idenpendent **Rotation Direction** Clockwise Clockwise

Multiple Wet Disk Clutch Multiple Wet Disk

Brake Wet Disk Wet Disk Rear Shaft Speed 540 rpm 540 rpm Mid Shaft Speed 2100 rpm 2100 rpm

2 - Speed Shaft Speeds 540 rpm and 750 rpm 540 rpm and 750 rpm **PTO Output Power** 16.0 kW (21.5 hp) 14.9 kW (20.0 hp)

#### 3-POINT HITCH

Type Category One Category One Lift Capacity at 61.0 cm 771 kg (1700 lb) 771 kg (1700 lb) (24 in.) Behind Link Arms

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At

	4200 CST	4200 HST		
CLUTCH				
Type Disk	Wet Multiple	None		
HYDRAULIC SYST	EM			
	(Measurements Taken At 2700 Engine rpm)	(Measurements Taken 2700 Engine rpm)		
Туре	Open Center System	Open Center System		
Tran/Hydr Fill Capacity	24 L (6.3 gal)	26 L (6.8 gal)		
Working Pressure	14652 kPa (2125 psi)	14652 kPa (2125 psi)		
Pump	Open Ctr/Gear	Open Ctr/Gear		
Front Pump Capacity	19.3 L/min (5.1 gpm)	19.3 L/min (5.1 gpm)		
Rear Pump Capacity	27.6 L/min (7.3 gpm)	27.6 L/min (7.3 gpm)		
Total Fluid Capacity	46.9 L/min (12.4 gpm)	46.9 L/min (12.4 gpm)		
GROUND SPEEDS	3			
Range A, Gear 1	1.3 km/h (0.8 mph)	6.0 km/h (3.7 mph)		
Range A, Gear 2	2.0 km/h (1.3 mph)			
Range A, Gear 3	2.7 km/h (1.7 mph)			
Range B, Gear 1	3.7 km/h (2.3 mph)	10.5 km/h (6.5 mph)		
Range B, Gear 2	5.6 km/h (3.5 mph)			
Range B, Gear 3	7.5 km/h (4.7 mph)			
Range C, Gear 1	10.5 km/h (6.5 mph)	21.1 km/h (13.1 mph)		
Range C, Gear 2	15.9 km/h (9.9 mph)			
Range C, Gear 3	21.2 km/h (13.2 mph)			
Range A, Reverse 1	1.3 km/h (0.8 mph)	6.0 km/h (3.7 mph)		
Range B, Reverse 1	3.7 km/h (2.3 mph)	10.5 km/h (6.5 mph)		
Range C, Reverse 1	10.1 km/h (6.3 mph)	21.1 km/h (13.1 mph)		
WEIGHT				
w/ROPS, 3PT	1213 kg (2675 lbs)	1304 kg (2875 lbs)		
TIRES				
Front (Standard)	7.00 - 12 R1	7.00 - 12 R1		
Rear (Standard)	12.4 - 16 R1	12.4 - 16 R1		

4300 HST

# **GENERAL VEHICLE SPECIFICATIONS** - 4300

4300 CST

ENGINE			
Make	John Deere/Yanmar	John Deere/Yanmar	John Deere/Yanmar
Model	3TNE84	3TNE84	3TNE84
Туре	4-cycle Diesel	4-cycle Diesel	4-cycle Diesel
Bore and Stroke	84x90 mm (3.31x3.54 in.)	84x90 mm (3.31x3.54 in.)	84x90 mm (3.31x3.54 in.)
Cylinders	3	3	3
Valves	Overhead Valves	Overhead Valves	Overhead Valves
Displacement	1496 cm <sup>3</sup> (91.3 cu in.)	1496 cm <sup>3</sup> (91.3 cu in.)	1496 cm <sup>3</sup> (91.3 cu in.)
Compression Ratio	18.0:1	18.0:1	18.0:1
Gross Engine Power	24.0 kW (32.2 hp)	24.0 kW (32.2 hp)	24.0 kW (32.2 hp)
Torque (at rated speed)	78.5 N•m (57.9 lb-ft)	78.5 N•m (57.9 lb-ft)	78.5 N•m (57.9 lb-ft)
Torque (max. @ 1700 rpm)	99.1 N•m (73.1 lb-ft)	99.1 N•m (73.1 lb-ft)	99.1 N•m (73.1 lb-ft)
Lubrication	Full pressure	Full pressure	Full pressure
Oil filter	Standard Single Element	Standard Single Element	Standard Single Element
Oil Capacity (w/filter)	4.3 L (4.6 qt)	4.3 L (4.6 qt)	4.3 L (4.6 qt)
Engine Rated Speed	2700 rpm	2700 rpm	2700 rpm
Engine Slow Idle Speed	950 ± 50 rpm	950 ± 50 rpm	1000 ± 50 rpm
Engine Fast Idle Speed	2920 ± 25 rpm	2920 ± 25 rpm	2920 ± 25 rpm

4300 SRT

#### **ELECTRICAL**

Cooling system

Air cleaner

Volts	12 VDC	12 VDC	12 VDC
Battery Rating	45 amp-hr	45 amp-hr	45 amp-hr
Battery Size - 12V (CCA)	500 Cold Cranking Amps	500 Cold Cranking Amps	500 Cold Cranking Amps
Alternator	40 amp	40 amp	40 amp
Regulator	Internal, Current Limiting	Internal, Current Limiting	Internal, Current Limiting
Starting Motor	1.4 kW (1.88 hp)	1.4 kW (1.88 hp)	1.4 kW (1.88 hp)
Headlights	37.5 W Halogen Bulb	37.5 W Halogen Bulb	37.5 W Halogen Bulb
Tail Lights	5 W Bayonet Base	5 W Bayonet Base	5 W Bayonet Base
Hazard Lights	Type 1156	Type 1156	Type 1156
Instrument Panel Lamps	1.7 W Bayonet Base	1.7 W Bayonet Base	1.7 W Bayonet Base

Liquid w/Pump & Radiator Liquid w/Pump & Radiator Liquid w/Pump & Radiator Dry-Type w/Safety Element Dry-Type w/Safety Ele

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<sup>\*</sup>Specifications and design subject to change without notice.

	4300 CST	4300 SRT	4300 HST	
FUEL SYSTEM	1000 001		1000 1101	
	Direct Fuel Injection	Direct Fuel Injection	Direct Fuel Injection	
System Type	Direct Fuel Injection	Direct Fuel Injection	Direct Fuel Injection	
Injection Pump	In-Line w/Solenoid Shutoff	In-Line w/Solenoid Shutoff	In-Line w/Solenoid Shutoff	
Fuel type	Diesel	Diesel	Diesel	
Fuel Tank Capacity	37.9 L (10.0 gal)	37.9 L (10.0 gal)	37.9 L (10.0 gal)	
Fuel Filter	Clear Bowl Water Separator with Disposable Paper Element, Water Floating Red Ring	Clear Bowl Water Separator with Disposable Paper Element, Water Floating Red Ring	Clear Bowl Water Separator with Disposable Paper Element, Water Floating Red Ring	
DRIVE TRAIN				
Туре	Collar Shift	SyncReverser™	Hydrostatic	
Mechanical Front Wheel Drive (4-WD)	Yes (Option)	Yes (Option)	Yes (Option)	
Front Axle Fluid Capacity	3.8 L (1.0 gal)	3.8 L (1.0 gal)	3.8 L (1.0 gal)	
Differential Lock	Standard; Foot Operated	Standard; Foot Operated	Standard; Foot Operated	
Number of Speeds	9 Forward, 3 Reverse	12 Forward-12 Reverse	Infinite / 3 Range	
Final Drive	Spur Gear	Spur Gear	Spur Gear	
Brakes	Wet Disk	Wet Disk	Wet Disk	
Steering	Hydraulic Power Assist	Hydraulic Power Assist	Hydraulic Power Assist	
Drawbar Tongue Weight Vertical Capacity Rating	500 kg (1102 lb)	500 kg (1102 lb)	500 kg (1102 lb)	
PTO (PTO Shaft Speed Measured at 2700 Engine rpm)				
Туре	Independent	Independent	Independent	
Rotation Direction	Clockwise	Clockwise	Clockwise	
Clutch	Multiple Wet Disk	Multiple Wet Disk	Multiple Wet Disk	
Brake	Wet Disk	Wet Disk	Wet Disk	
Rear Shaft Speed	540 rpm	540 rpm	540 rpm	
Mid Shaft Speed	2100 rpm	2100 rpm	2100 rpm	
2 - Speed Shaft Speeds	540 rpm and 750 rpm	540 rpm and 750 rpm	540 rpm and 750 rpm	
PTO Output Power	20.0 kW (26.8 hp)	20.0 kW (26.8 hp)	18.9 kW (25.3 hp)	
3-POINT HITCH				
Туре	Category One	Category One	Category One	
Lift Capacity at 61.0 cm (24 in.) Behind Link Arms	999 kg (2200 lb)	999 kg (2200 lb)	999 kg (2200 lb)	

<sup>\*</sup>Specifications and design subject to change without notice.