

TUBE•LINE™

Tubeline Manufacturing Limited
6455 Reid Woods Drive RR #4
Elmira, Ontario, Canada N3B 2Z3

Email: sales@tubeline.ca

Fax: 519.669.5808

Tel: 519.669.9488

Toll-free (North America): 1.888.856.6613

www.tubeline.ca

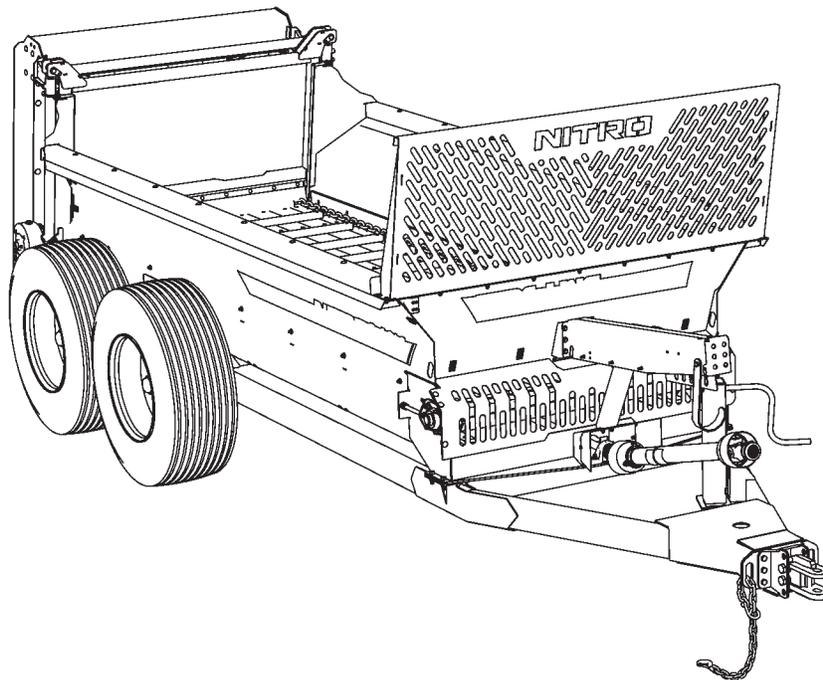
Operator's Manual

Keep this manual with the machine at all times.

NITRO LS

Manure Spreader

Nitro LS (Low Profile Series)



Do not attempt to operate this machine without thoroughly reviewing this manual for safe and proper operation.

Operator's Manual

Thank you for choosing a Tubeline Low Profile Manure Spreader. Our hope is that it will give you many years of productive service. This machine is designed to spread various types of manure evenly over a wide area.

Please read and understand this manual and the machine before operation. This manual covers models 300LS, 340LS, and 440LS.

Warranty and Limitation of Liability

All equipment is sold subject to mutual agreement that it is warranted by the company to be free from defects of materials and workmanship. But the company shall not be liable for special, indirect or consequential, damages of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacing or repairing without charge, at its factory or elsewhere, at its discretion.

Any material, or workmanship defects which become apparent within one year from the date on which the equipment was purchased, and the company shall have no liability for damages of any kind. The buyer by the acceptance of the equipment will assume all liability for any damages, which may result from the use or misuse by his employees or others.



Nitro Apron Chain Warranty

Tubeline Manufacturing Ltd offers a limited lifetime non-transferable warranty to the original purchaser of a Nitro manure spreader. This warranty applies to chain link breakage and covers parts only. Should a connecting link fail, only it will be replaced. However, if a standard link breaks the complete chain will be provided. Freight and labor to install is the responsibility of the purchaser and is not covered under the terms of the limited warranty.

Warranty coverage is null and void unless Warranty Registration form has been completely filled in and is on file at Tubeline Manufacturing Ltd.

Manuals

Manuals are printed and shipped with machines as they leave the manufacturer. Your machine may include parts or features not yet included in the initially shipped manual. The latest manual version can be found at www.tubeline.ca/support.php. Tubeline reserves the right to update and change manuals as seen fit. Dealers are informed of any pressing changes/ modifications. They can help you with any questions regarding replacement parts.

Serial Number

The implement serial number is located on the front left of the frame. This number helps us to track changes and improvements and must be mentioned when ordering parts or requesting service. For your convenience, a space has been provided inside the front cover of this manual to record the serial number, model number, purchase date, and dealer name.

Model No: _____

Serial No: _____

Date Purchased: _____

Dealer Name: _____

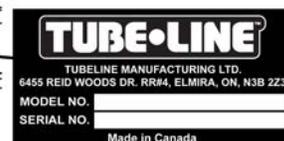
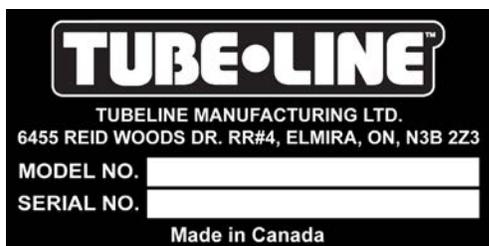
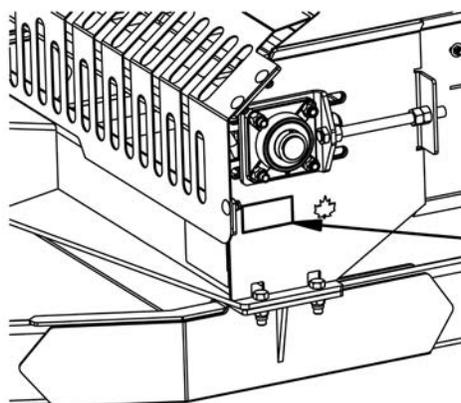


Table of Contents

Operator's Manual	I
Warranty and Limitation of Liability	I
Nitro Apron Chain Warranty	I
Manuals	I
Serial Number	I
Principals of Operation	IV
Intended Use	IV
Section 1 - Spreader Specifications	1-1
Hydraulic Requirements	1-2
Tractor Horsepower Requirements	1-2
Terminology	1-3
Section 2 - Tire Load Index Charts	2-1
16.5L-16.1 Implement	2-1
19L-16.1 Implement	2-1
425/22.5 TBR	2-1
550/45-22.5 Flotation	2-2
11R-22.5 TBR	2-2
Section 3 - Safety	3-1
Safety Symbol	3-1
Safety Words	3-1
General Safety	3-1
Personal Protection Equipment (PPE)	3-2
Operation Safety	3-2
Tire Safety	3-3
Hydraulic Safety	3-3
Maintenance Safety	3-4
Lighting & Clearance Marking	3-5
Safety Decals	3-5
Installing Decals	3-6
Safety Decal Locations	3-6
ISO Safety Decal Locations	3-7
ISO Safety Decal Illustrations	3-8
Section 4 - Operation	4-1
Tractor Preparation	4-1
Spreader Preparation	4-1
Hook-up / Unhooking	4-2
Loading	4-3
Spreading	4-3
Unplugging	4-3
Reversing Apron Chain	4-4
After operating for 2 hours:	4-4
After operating for 10 hours:	4-4
Optional Night Light Kit Operation	4-4

Section 5 - Transportation / Storage	5-1
Transport Safety	5-1
Storage Safety	5-1
Travel Speed	5-1
Storage and Cleaning	5-1
Section 6 - Service & Maintenance	6-1
Apron Chain Tension Adjustment	6-1
Apron Chain Shortening	6-2
Hub Installation	6-2
Wheel Nut Torque Specifications	6-3
Fluids & Lubricants	6-4
Greasing your Machine	6-4
Grease Points	6-5
Section 7 - Optional Flow Control	7-1
Flow Control Installation	7-1
Manual Flow Control Adjustment	7-2
Electric Flow Control Adjustment	7-2
Optional Flow Control Operation	7-2
Endgate Indicator Operation	7-3
Torque Values - Imperial	V
Torque Values - Metric	VI

Principals of Operation

The Nitro LS Manure Spreader is designed to be hitched behind a tractor. The Manure Spreader consists of a poly board floor trailer with an apron chain drag system, that pulls material to the rear of the trailer, through a set of vertical, spinning beaters and is then spread in an even pattern on the field. The rear beaters are connected to the tractor's PTO via gearboxes and PTO drivelines. The variable speed apron chain is operated from the tractor cab, and controls the speed of materials being fed through the beaters.

The apron chain and rear lift gate are operated using the tractor's hydraulic power outputs. The rear lift gate prevents material from jamming the beaters while loading, as well as preventing material from falling onto a roadway during transport.

We recommend that you carefully read this entire manual before operating the Manure Spreader. Please do not assume you know how to operate and maintain your machine before reading this manual carefully. Keep this manual available for reference.

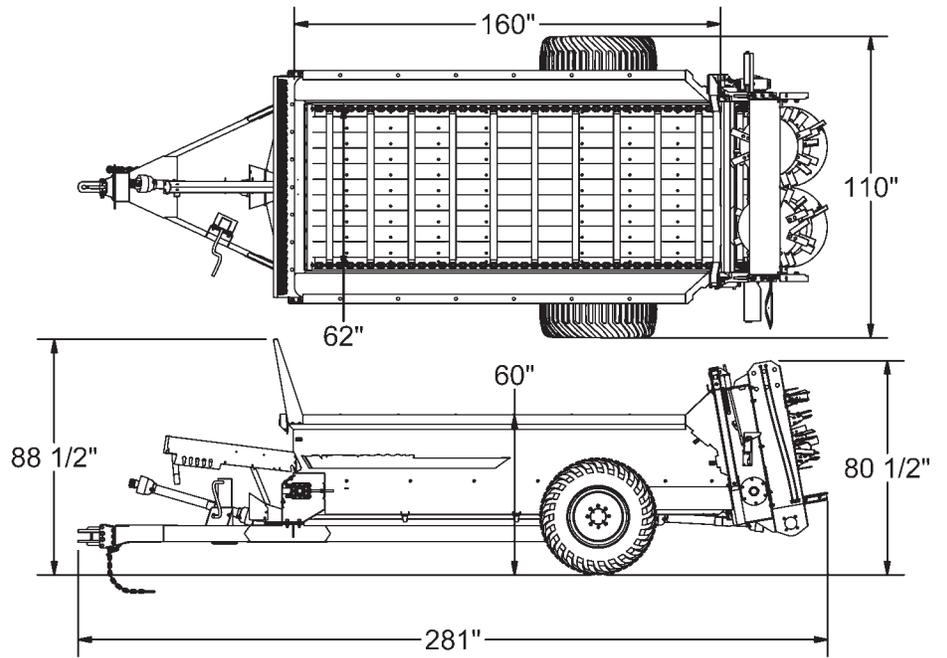
Call your authorized dealer if you need any assistance or more information.

Intended Use

The Nitro LS manure spreader is well suited to apply most forms of manure to fields as a fertilizing method. It is less commonly used to spread compost, lime, wood ash and seaweed fertilizer. The removal of the rear vertical beaters also allows the Nitro spreader to be used as a pit trailer for forage materials.

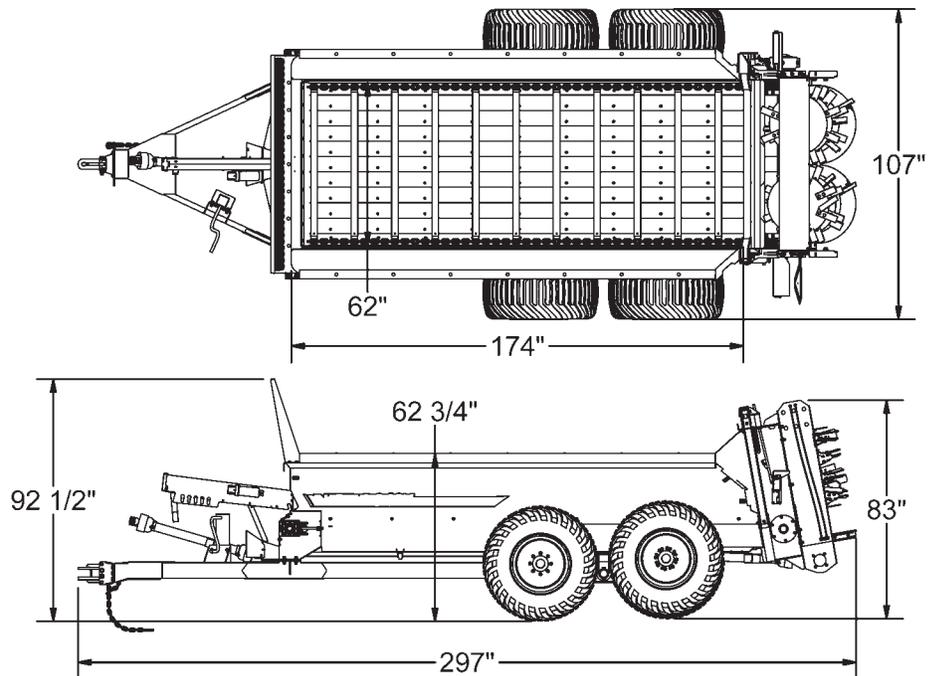
Section 1 - Spreader Specifications

NITRO 300LS	
Capacity	6ton (5443kg)
Heaped	300ft ³ (8.5m ³)
Struck level	171ft ³ (4.84m ³)
Inside Width	62" (1.58m)
Inside Depth	27" (0.7m)
Inside Length	160" (4.07m)
Loading Height	60" (1.52m)
Overall Length	23.5' (7.17m)
Overall Width	110" (2.8m)
Beater Diameter	32" (.813m)
Axle Type	Single
Hub Capacity	12,000 lbs
Beater Speed	540 RPM
PTO Speed	540 RPM
Apron Chain Dia.	5/8"
Shipping Weight	6250lb (2835kg)



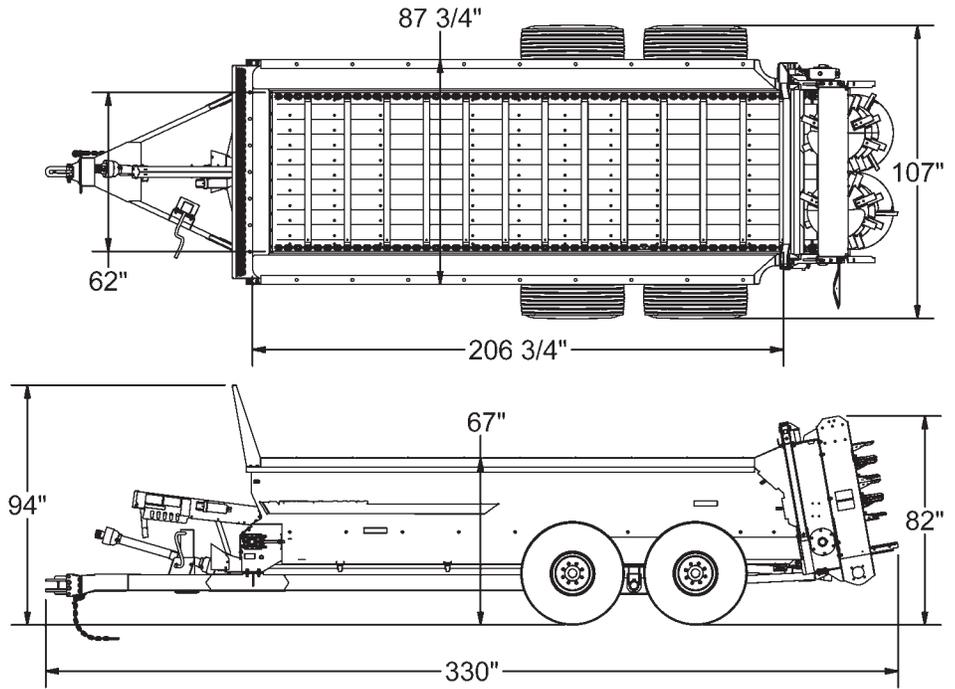
* Weight on tires will affect spreader height *

NITRO 340LS	
Capacity	8ton (7257kg)
Heaped	344ft ³ (9.74m ³)
Struck level	187ft ³ (5.3m ³)
Inside Width	62" (1.58m)
Inside Depth	27" (0.7m)
Inside Length	174" (4.42m)
Loading Height	62.75" (1.6m)
Overall Length	24.5' (7.47m)
Overall Width	110" (2.8m)
Beater Diameter	32" (.813m)
Axle Type	Tandem
Hub Capacity	8,000 lbs
Beater Speed	540 RPM
PTO Speed	540 RPM
Apron Chain Dia.	5/8"
Shipping Weight	7128lb (3234kg)



* Weight on tires will affect spreader height *

NITRO 440LS	
Capacity	10ton (9072kg)
Heaped	444ft ³ (12.5m ³)
Struck level	256ft ³ (7.25m ³)
Inside Width	62" (1.58m)
Inside Depth	27" (0.7m)
Inside Length	206.5" (5.25m)
Loading Height	67" (1.7m)
Overall Length	27.5' (8.38m)
Overall Width	107" (2.72m)
Beater Diameter	32" (.813m)
Axle Type	Tandem
Hub Capacity	8,000lbs
Beater Speed	540 RPM
PTO Speed	540 RPM
Apron Chain Dia.	5/8"
Shipping Weight	8050lbs (3652kg)



* Weight on tires will affect spreader height *

Hydraulic Requirements



NOTE: All Nitro LS manure spreaders have a maximum hydraulic flow rating of 16 GPM. Exceeding this rating can cause damage to gearboxes.

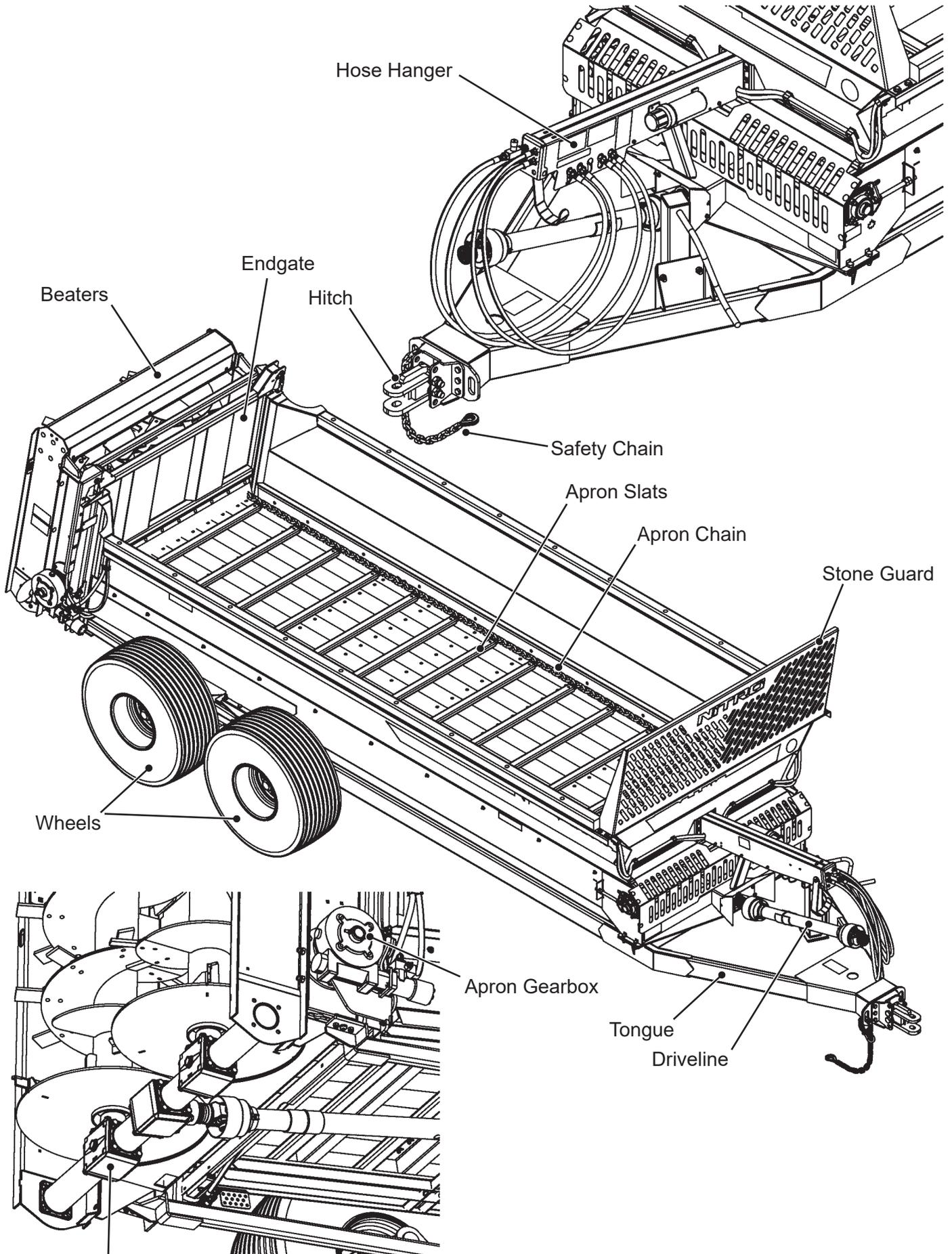
Tractor Horsepower Requirements



NOTE: Exceeding the maximum power input can cause damage to the driveshaft, gearbox, PTO and other drive systems components.

NITRO LS HORSEPOWER REQUIREMENTS		
Model	Tractor HP Requirement	Max. Power Input
300LS	50hp	100hp
340LS	60hp	100hp
440LS	100hp	100hp

Terminology



Section 2 - Tire Load Index Charts

Replacement tires must match or exceed the specifications in that size tire's chart.

16.5L-16.1 Implement

Tire Size	TT/TL	Rim	Ply Rating	Overall Width	Outer Diameter	Loaded Static Radius	Rolling Circumf	Tread Depth	Pressure psi (bar)	Load Index lbs (kg)				
										5 mph (8km/h)	10mph (16km/h)	15mph (24km/h)	20mph (32km/h)	30mph (48km/h)
16.5L-16.1	TL	W14C/W14CH	10	17.1"/434mm	41.6"/1057mm	18.4"/467mm	121"/3073mm	14/32"/11mm	12 (.8)	3695 (1676)	3090 (1402)	2785 (1263)	2620 (1188)	2340 (1061)
									16 (1.1)	4740 (2150)	3960 (1796)	3570 (1619)	3360 (1524)	3000 (1361)
									20 (1.38)	5560 (2522)	4645 (2107)	4190 (1901)	3940 (1787)	3520 (1597)
									24 (1.66)	6255 (2837)	5225 (2370)	4710 (2136)	4435 (2012)	3960 (1796)
									28 (1.93)	6950 (3152)	5810 (2635)	5235 (2375)	4930 (2236)	4400 (1996)
									32 (2.21)	7585 (3400)	6335 (2874)	5710 (2590)	5375 (2438)	4800 (2177)
									36 (2.5)	8215 (3726)	6865 (3114)	6190 (2808)	5825 (2642)	5200 (2359)

19L-16.1 Implement

Tire Size	TT/TL	Rim	Ply Rating	Overall Width	Outer Diameter	Loaded Static Radius	Rolling Circumf	Tread Depth	Pressure psi (bar)	Load Index lbs (kg)				
										5 mph (8km/h)	10mph (16km/h)	15mph (24km/h)	20mph (32km/h)	30mph (48km/h)
19L-16.1	TL	W16C/W16CH	10	19.4"/493mm	44"/1118mm	19.2"/488mm	127"/3226mm	17/32"/13.5mm	12 (.8)	4600 (2087)	3840 (1742)	3465 (1566)	3260 (1479)	2910 (1320)
									16 (1.1)	5910 (2681)	4935 (2238)	4450 (2020)	4190 (1901)	3740 (1696)
									20 (1.38)	6950 (3152)	5810 (2635)	5235 (2375)	4930 (2236)	4400 (1996)
									24 (1.66)	7805 (3540)	6520 (2957)	5880 (2660)	5535 (2511)	4940 (2241)
									28 (1.93)	8720 (3955)	7285 (3304)	6570 (2970)	6180 (2803)	5520 (2504)
									32 (2.21)	9480 (4300)	7920 (3592)	7140 (3230)	6720 (3048)	6000 (2722)

425/22.5 TBR

Tire Size	Load Range	Weight	Rim	Unloaded		Loaded	Static Loaded Radius	Revs per mile/ km	Max Pressure	Max Load	Max Speed
				OD	SW	Width					
425/65 R22.5	L	192 lbs/ 87 kg	12.25in	59.7 in/ 1140 mm	16.1 in/ 409 mm	17.8in/ 452 mm	20.8 in/ 528 mm	463 mile/ 288 km	120 psi/ 830 kPa	11400 lbs/ 5170 kg	65mph/ 104 kmh

550/45-22.5 Flotation

Tire Size	TT/TL	Rim	Unloaded		Loaded Static Radius	Rolling Circumf	Load / Speed Index (16 PR)		Pressure psi (bar)	Recommended Load lbs (kg)							
			SW	OD			DW	FR		Drive Wheel				Free Rolling			
										6 mph (10 km/h)	16mph (25 km/h)	25 mph (40 km/h)	31mph (50 km/h)	6 mph (10 km/h)	16mph (25 km/h)	25 mph (40 km/h)	31mph (50 km/h)
550/45-22.5	TL	16DC 18DC	27.6in/ 550 mm	52.5in/ 1070 mm	22.8in/ 470 mm	155.4in/ 3175 mm	147A8	159A8	12 (.8)	4560 (2070)	3880 (1760)	3260 (1480)	2940 (1332)	6500 (2950)	5530 (2510)	4650 (2110)	4190 (1900)
									17 (1.2)	5800 (2630)	4940 (2240)	4150 (1880)	3730 (1692)	8250 (3740)	7010 (3180)	5890 (2670)	5290 (2400)
									29 (2)	7800 (3540)	6640 (3010)	5580 (2530)	5020 (2277)	11110 (5040)	9440 (4280)	7940 (3600)	7140 (3240)
									35 (2.4)	8660 (3930)	7360 (3340)	6200 (2810)	5580 (2529)	12350 (5600)	10490 (4760)	8820 (4000)	7940 (3600)
									41 (2.8)	9500 (4310)	8070 (3660)	6780 (3075)	6100 (2768)	13510 (6130)	11490 (5210)	9650 (4375)	8690 (3940)

11R-22.5 TBR

Tire Size	Ply Rating	Tread Depth	Load Index	Speed Symbol	Overall Diameter	Section Width	Rim Width	Static Loaded Radius	Load Carrying Capacity	Max Pressure
11R-22.5	16	18/32	146/143	M	41.5"/ 1054mm	11"/ 280mm	8.25"/ 210mm	19.3"/ 490mm	6610lbs / 2998kg	120psi/ 830kPa

Section 3 - Safety

Safety Symbol



This safety alert symbol is found throughout this manual to call your attention to instructions involving yourself and others working around the machine. Failure to follow these instructions can result in injury or death. This symbol means: **Attention! Become Alert! Your Safety is involved!**

Safety Words

CAUTION: Indicates a potentially hazardous situation that may result in injury.

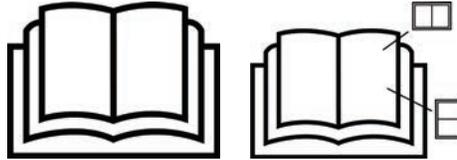
WARNING: Indicates a potentially hazardous situation that could result in serious injury or death.

DANGER: Indicates a hazardous situation that needs to be avoided. It is you the operator that needs to be aware of these dangers.

NOTE: Informative only, not hazard or safety related.

General Safety

Safety of the operator is a main concern. To avoid personal injury study the following precautions and insist those working with you or for you, follow them.



Study the features in this manual and make them a working part of your safety program. Keep in mind that this safety section is written only for the Nitro Manure Spreader.

Nitro LS Manure Spreader owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.

This equipment must not be operated by children, or those unfamiliar with operation of the machine.

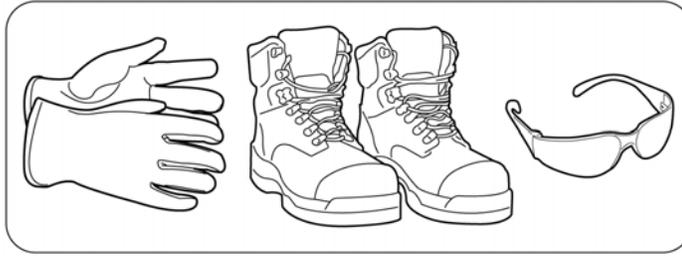
Review safety related items annually with all personnel who will operate or maintain the Nitro LS Manure Spreader.



WARNING: Pictures in this manual showing safety guards removed are for clarification only. Keep all shields and safety devices in place. If safety features become faulty, replace immediately. Do not operate equipment with them removed.

DANGER: Do not operate this machine while under the influence of drugs or alcohol. Consult your doctor about using this machine while taking prescription medications.

Personal Protection Equipment (PPE)



Wear appropriate protective gear. This list includes but is not limited to:

- Protective gloves.
- Protective shoes with slip-resistant soles.
- Protective glasses.
- Hearing protection.
- Respirator or filter mask.

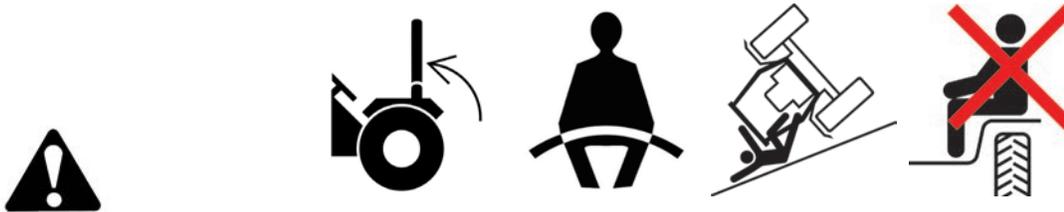
Secure long hair, loose fitting clothing or jewelry.

Have a first-aid kit available for use should the need arise and know how to use it.

Have a fire extinguisher available for use should the need arise and know how to use it.

Operation Safety

This safety section is intended to point out some of the basic safety situations that can be encountered during the normal operation and maintenance of the Nitro Manure Spreader, and to suggest possible ways of dealing with these situations. This section is **NOT** a replacement for other safety practices featured in other sections of this book.



WARNING: Only use a tractor with a ROPS cab and seat belt. Secure your seat belt before operating machine.

DANGER: Never allow riders on manure spreader. There is no safe place for any riders even for troubleshooting issues. Keep others away from your work area.

All equipment has a limit. Make sure you understand the speed, stability and load characteristics of the Nitro LS Manure Spreader.

Make sure the tractor is in proper operating condition as stated in the tractor Operator's Manual. The tractor must have enough weight and braking capacity, especially when operating on uneven terrain.

Know your tractor controls and how to stop the engine and machine quickly in an emergency.

Where possible avoid operating the Nitro Manure Spreader near roads, ditches, embankments or holes. Reduce speed when operating on rough, slippery, or muddy surfaces and when turning or crossing slopes, Stay off slopes too steep for proper operation.

Clear area of people, machines and obstacles before using this unit.

Close and secure all guards, deflectors and shields before starting and operating.

Never place any part of your body where it could be in danger if movement should occur during assembly, installation, operation, maintenance, repairing, unplugging or moving.

Turn machine off, stop and disable engine, remove ignition key and place in your pocket and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.

Beware of the machine size and have enough space to allow for operation.

Do NOT use attachments unless attachments are approved optional equipment.

Do not exceed a safe traveling speed when transporting.

Always use extra caution when turning around corners or in tight areas.

If elderly people assist with work, their physical limitations need to be recognized and accommodated.

Use only in daylight or good artificial light.



DANGER: The upright beaters on the Nitro can maim or kill. Always check for bystanders before engaging the PTO.

Tire Safety



DANGER: Failure to follow proper mounting procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

- Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Have a qualified tire dealer or repair service perform required tire maintenance.
- When replacing worn tires, make sure they meet the original tire specifications.

NOTE: Proper tire pressure and maximum load details can be found in [Section 2 - Tire Load Index Charts](#).

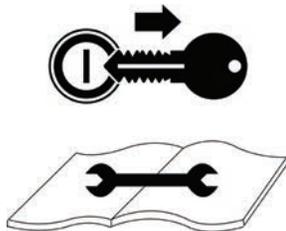
Hydraulic Safety



1. Make sure that all components in the hydraulic system are kept in good condition and are clean.
2. Before applying pressure to the system, make sure that all components are tight, and that lines, hoses and couplings are not damaged.
3. Do not attempt any makeshift repairs to the hydraulic lines, fittings, or hoses by using tapes, clamps or cements. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

4. Wear proper hand and eye protection when searching for a high pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
5. If injured by a concentrated high pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
6. Relieve pressure on the hydraulic system before maintaining or working on the system.

Maintenance Safety



Good maintenance is your responsibility. Poor maintenance leads to early part replacement, shortens machine lifespan, and limits machine operating abilities.

1. Follow good shop practices.
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
2. Never attempt to service hydraulic applications while pressurized or with engine running.
3. Never work under equipment unless it is blocked securely.
4. Always use personal protection devices such as hand, eye and hearing protectors, when performing any service or maintenance work.
5. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by the use of unapproved parts and/or accessories.
6. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
7. Periodically tighten all bolts, nuts, and screws and check that all electrical connections are properly secured to ensure unit is in a safe condition.
8. When completing maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.



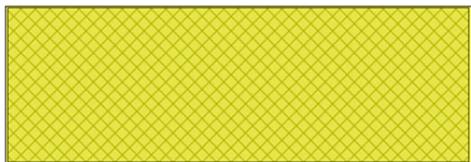
CAUTION: Avoid spraying gearbox seals with pressure washer when cleaning machine. Damaged seals will lead to fluid leaks!

NOTE: Before removing apron gearbox motor, tilt apron gearbox upwards to avoid oil draining.

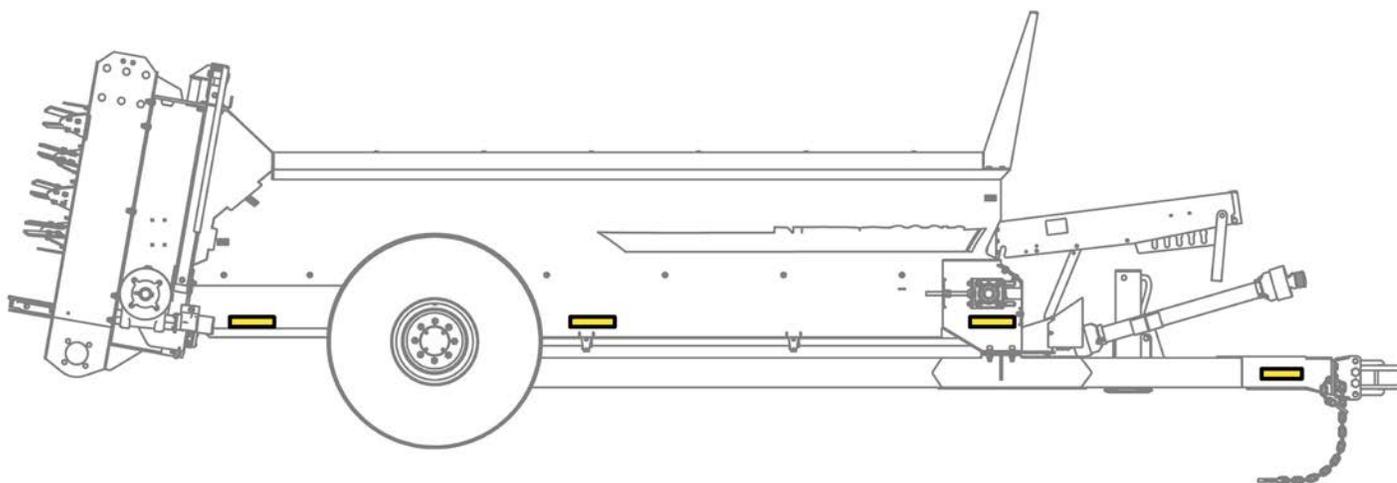
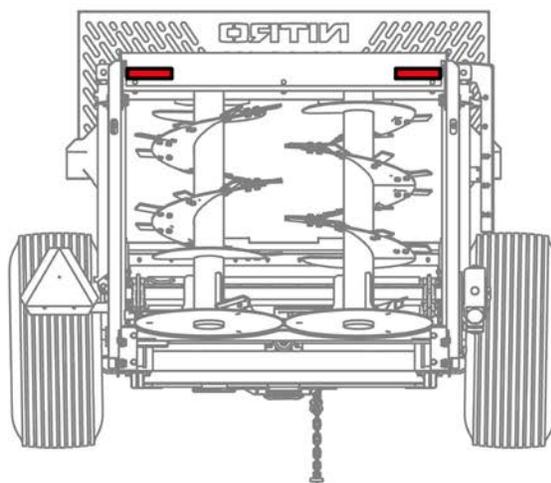
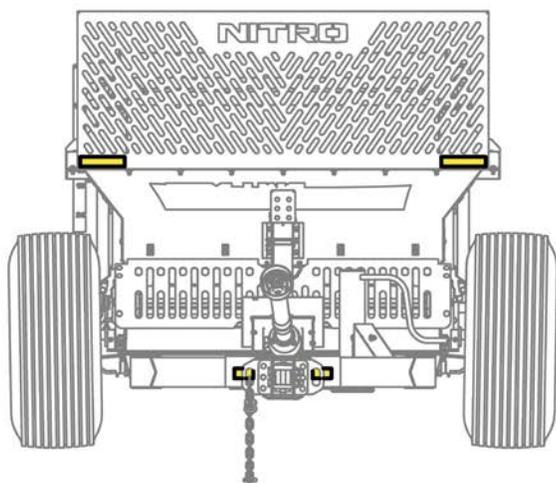
Lighting & Clearance Marking

This machine is equipped with lights and reflectors as required by the most stringent government and ASAE specifications. They should work with the tractor 7-pin connector.

Part No: DEAMBER



Part No: DERED



Safety Decals

1. Keep safety decals clean and legible at all times.
2. Replace safety decals that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety decals displayed in Safety Decal Locations each have a significant purpose and need to be cleaned or replaced when necessary.
5. Safety decals are available from your authorized distributor or dealer parts department or from the manufacturer.

Installing Decals

1. Ensure installation area is clean and dry.
2. Only apply in temperature is above 10°C (50°F).
3. Determine the exact position of the new safety decal before removing the paper backing.
4. Align the decal over the specific area, carefully press the sign on, slowly peeling away the backing paper while smoothing sign in place.
5. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.

Safety Decal Locations

The types of safety decals and locations on the equipment are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various safety decals, the types of warning, and the area, or proper function related to that area, that requires your safety awareness.

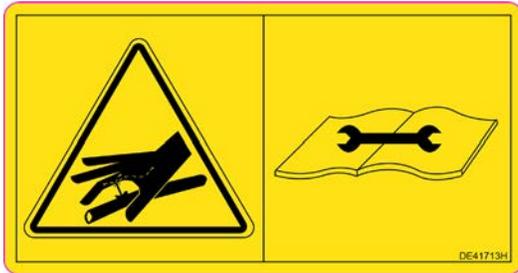
NOTE: Examples only - Actual decals may differ in text and graphic representation.

ISO Safety Decal Locations



ITEM	QTY	PART NUMBER	DESCRIPTION
1	6	DE41713H	ISO Decal - High Pressure Fluid Horizontal
2	2	DE41718H	ISO Decal - Thrown Object Horizontal
3	2	DE41902	ISO Decal - Chain Entanglement
4	1	DE42772	ISO Decal - Nitro Reverse Chain
5	1	DE42783	Nitro Reverse Chain Text Decal
6	1	DE42784	ISO Decal - Read OM Decals Section
7	1	DE42785	ISO Decal - PTO Entanglement
8	2	DE42787	ISO Decal - Nitro Beater Entanglement
9	1	DECANADA	Decal Made In Canada

ISO Safety Decal Illustrations



Item 1: DE41713H

Do not use hand to check for hydraulic leaks, alternatively use a piece of cardboard.



Item 7: DE42785

Do not use hand to check for hydraulic leaks, alternatively use a piece of cardboard.



Item 2: DE41718H

Keep clear of machine while operating. Serious injury may occur.

Item 8: DE42787

Stand clear of rotating beaters to avoid entanglement. Serious injury or death hazard.



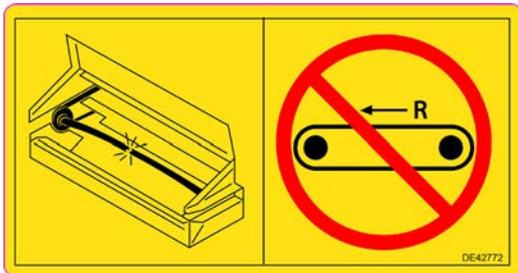
Item 3: DE41902

Keep hands clear of rotating parts while machine running. Do not operate without shielding in place. Do not wear loose clothing while operating.



Item 9: DECANADA

Manufacturer's country of origin.



Item 4: DE42772

Reversing apron chain while spreader is fully loaded will cause front apron shaft breakage.



Item 5: DE42783



Item 4: DE42784

Read Operator's manual decal section to understand safety decals.

Section 4 - Operation

Tractor Preparation

Follow this procedure when selecting and preparing a tractor for use with the machine:

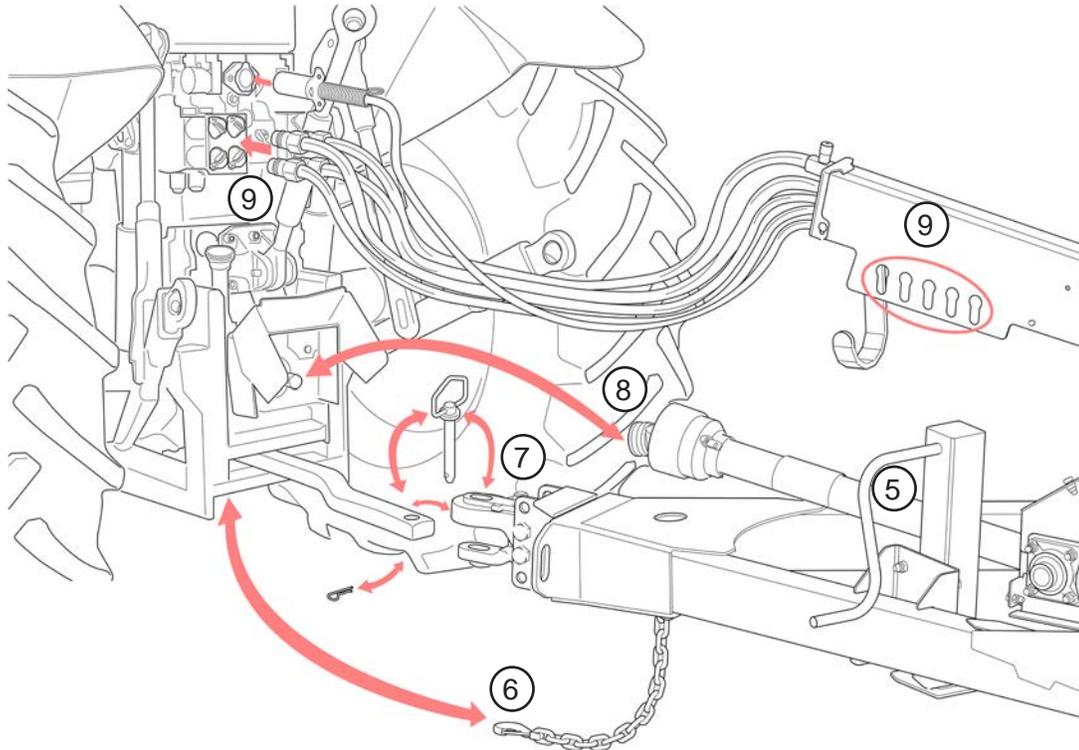
1. Use only a tractor of sufficient power and weight to adequately handle the machine. See [PTO / Horsepower Needed, pg.1-2](#).
2. Check oil level in the tractor hydraulic reservoir. Top up as required.
3. It is recommended to pin the drawbar in its centre draft position.
4. Use only a drawbar pin with provisions for a mechanical retainer. Always install the retainer.
5. Always attach a safety chain between the tractor and the machine to prevent unexpected separation.

Spreader Preparation

Your new Nitro LS spreader has a brief breaking-in period that you should follow for optimal operation, and for maximum lifetime of your product. When using the machine for the first time, it is extremely important to follow all of the procedures especially those listed below to avoid damage:

1. Read the Nitro LS Operator's Manual. Do not operate the spreader until the safety precautions in this manual and the decals on the spreader have been read and understood by the operator.
2. Check for proper assembly and tighten all bolts. All bolts were checked at the factory when assembled but may need to be re-torqued as vibrations in shipment may loosen them slightly.
3. Check tires and ensure that they are inflated to the pressure specified for the spreader's tires.
4. Lubricate the machine. Proper maintenance and lubrication is the user's responsibility and must begin before the first use. Refer to [Service & Maintenance, pg.6-1](#).
5. Operate the machine slowly for a period of time to run the chains in and confirm that all parts work freely.
6. Inspect all hydraulic lines, hoses, fittings and couplers for tightness. Tighten if there are leaks. Use a clean cloth to wipe any accumulated dirt from the couplers before connecting to the tractor's hydraulic system. See [Hydraulic Safety, pg.3-3](#).
7. Check the oil level in the gearboxes. Top up as required. See [Grease Points, pg.6-5](#).
8. Ensure that the PTO driveline is securely attached on both ends and can telescope easily. Check that the PTO driveline shield rotates freely. Remove any debris that has become entangled in the rear beaters or the PTO drive line.
9. Inspect all moving and rotating parts. Make sure that all guards and shields are installed and secured in position.

Hook-up / Unhooking



The Nitro LS Manure Spreader should always be parked on a level, dry area that is free of debris and foreign objects. Follow this procedure when attaching:

1. Clear area of bystanders and remove foreign objects from machine and working area.
 2. Make sure there is enough room to back the tractor up to spreader hitch.
 3. Start tractor and slowly back up to the hitch point.
 4. Stop tractor engine, place controls in neutral, set park brake and remove ignition key before dismounting.
 5. Use jack to raise or lower the hitch to align with the drawbar.
 6. Install safety chain between the tractor drawbar and hitch pin.
 7. Install drawbar pin with provisions for a mechanical retainer. Install the retainer.
 8. Connect PTO driveline to tractor. Pull back locking collar, slide yoke over tractor stub shaft until collar locks.
 9. Connect the hydraulics. To connect, proceed as follows:
 - Remove hoses from storage position. Uncap plastic plugs and clean couplers, also clean area around tractor ports.
 - Insert the male ends into rear tractor hydraulic ports.
- NOTE:** If the direction of motion is wrong, reverse the couplers.
10. Raise the jack.
 11. When unhooking from the tractor, reverse the above procedure.

NOTE: Occasionally air may become trapped in the hydraulic circuit, making it necessary to “bleed” the circuit. To perform this operation cycle the hydraulic several times or especially on older tractors, temporarily loosen an easily accessible hose fitting enough to allow any trapped air to escape while cycling the hydraulics. Retighten fitting.

Loading



CAUTION: When parking the spreader for loading, put the tractor in **PARK** or **NEUTRAL** and apply the parking brake.

NOTE: It is recommended to make sure the apron chain is operating properly before loading the spreader. Check the apron chain and slats to make sure they are not frozen or stuck to the bottom of the bed. Operating the spreader when the slats or chain are stuck to the bed may cause damage. Also make sure there are no lumps of manure dried to the floor boards.

1. Fully close rear endgate.
2. Load the spreader, starting at the front and continuing to load evenly to balance load.

The manure consistency will determine how full your spreader can be loaded. Solid manure can usually be loaded level to slightly heaped. Wet materials are heavier and may limit loading.

NOTE: It is unlawful to allow any manure spillage to occur on public roadways. Do not heap load such that manure is allowed to fall off spreader during transporting on roadways.

Spreading

Read [Operation Safety, pg.3-2](#) before operating spreader.

1. Engage the rear beaters with tractor PTO control.

NOTE: Before opening the endgate and starting the apron chain, get beaters up to full speed.

2. Extend the endgate cylinders until it is opened to the desired height.

Turn on the tractor hydraulics used to start the apron chain. The hydraulics adjust the speed at which material is being pulled towards the rear beaters. The slower the speed - the finer the spread as the rear beaters have more time to “process” the material.

See [Section 7 - Optional Flow Control](#), if applicable to your Nitro LS Manure Spreader.

Unplugging

The following is a recommended procedure if the manure spreader becomes plugged or the PTO disengages:

1. Disengage the hydraulics that run the apron chain.
2. Reverse the apron chain by flipping your tractor hydraulic lever.
3. Engage the hydraulics to reverse the apron chain in order to back material away from beaters. Stop apron chain after material is backed away from beaters or if pile doesn't move.



WARNING: Reversing chain under full load will cause front apron shaft to bend and/or break.

4. Engage the beaters. Bring beaters back up to regular speed.
5. Follow the instructions in the above [Spreading](#) section to start the apron chain in the standard operation direction.

If this procedure does not solve the situation, closer inspection and possible manual unplugging may be required. Make sure to stop tractor and wait for all moving parts to stop before servicing or unplugging:



WARNING: Stop tractor engine, place all controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

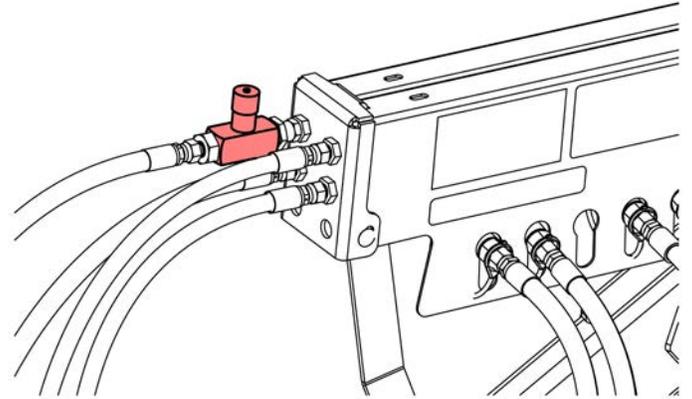
Reversing Apron Chain



CAUTION: Do NOT reverse apron chain if spreader is fully loaded, front apron shaft WILL bend and/or break.

To prevent accidental reversal of the apron chain and ensuing spreader damage, the apron chain safety valve must be opened manually to reverse the apron chain. The apron chain safety valve is located on the variable speed control valve at the front of the spreader. When this valve is opened (turned counter-clockwise), the direction of the apron chain can be reversed.

To return the apron chain direction to normal rearwards travel, close (turn clockwise rotation) the apron chain safety valve.



After operating for 2 hours:

1. Check wheel bolts torque.
2. Check all shields and guards. Tighten as required.
3. Visually inspect all hydraulic hoses and couplers. See [Hydraulic Safety, pg.3-3](#).
4. Check chain tightness. See [Adjust Chain Tension, pg.6-1](#).

After operating for 10 hours:

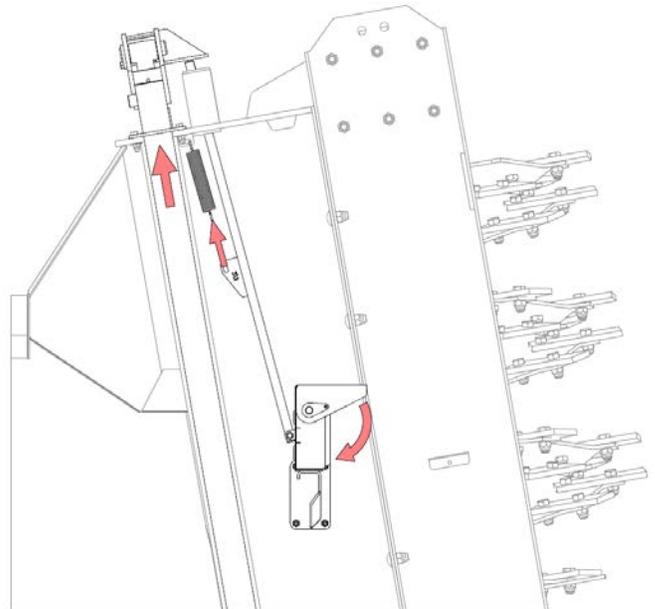
Repeat the 2 hour service list.

Optional Flow Control Operation

See [pg.7-2](#).

Optional Night Light Kit Operation

LS Spreaders equipped with a Mechanical Light Kit do not require any user input to operate. Light covers raise and lower in conjunction with the endgate.

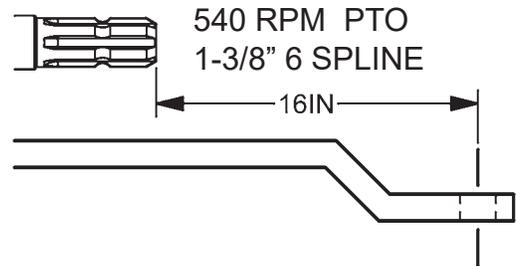


Section 5 - Transportation / Storage

Transport Safety

1. Comply with state and local laws governing safety and transporting of machinery on public roads.
2. Do not exceed a safe travel speed. Slow down on rough terrain and while cornering.
3. Never allow riders on the machine.
4. Keep tractor drawbar and Nitro hitch parallel. An uneven PTO may shear off a spline shaft.

Diagram to right shows standard tractor dimensions matching the front PTO on the Nitro spreaders.



Storage Safety

1. Store the Nitro Manure Spreader in an area away from human activity.
2. Do not allow children to play on or around the Nitro Manure Spreader.
3. Store the Nitro Manure Spreader in a dry, level area.

Travel Speed

A suggested starting speed is between 4-5 mph. This can be adjusted to operator preference. Maximum speed under load can be found in [Section 2 - Tire Load Index Charts](#).



WARNING: Normally, the load itself blocks manure and loose materials from being thrown towards the front. As the load/pile gets reduced, the rotation of the rear beaters can throw some material forward, therefore it is strongly recommended to lower the rear gate about 1/3 of the way down to prevent debris from being projected towards the front.

Storage and Cleaning

Disconnect PTO drive shaft and hydraulic hoses before cleaning, adjusting, lubricating, or servicing this machine.

1. The spreader must be thoroughly cleaned for extended storage. Manure is acidic and will damage paint and cause rusting of metal components.
2. Allow the spreader to completely unload.
3. To clean the spreader, raise the rear gate.



WARNING: Turn off all power during cleaning and inspection. Do not use power to move any components or to discharge material while cleaning or inspecting.

4. Hose off manure from the outside and inside of the spreader. Completely clean manure from moving mechanisms such as the beaters and rear gate. Remove accumulation in confined areas or pockets that trap manure.

CAUTION: Avoid directing high pressure spray on bearings, seals, flow control valve, and electrical devices.

5. Keep high pressure spray moving on painted surfaces. Sustained spray on cracks or scratches in paint can result in paint peeling.

6. Allow machine to dry.
7. Lower rear gate completely down before storing spreader.
8. Inspect the spreader for loose connections, damaged hydraulic hoses or connections and for other damaged components. Repair if necessary so the spreader is ready for future operation. See [Hydraulic Safety, pg.3-3](#).

Section 6 - Service & Maintenance

Apron Chain Tension Adjustment

Occasionally check the apron chain (A) for any bent or damaged slats. It is important to straighten or replace any damaged slats immediately. The apron chain tension should be checked and adjusted on occasion. If apron chain has slack, tightening is required:

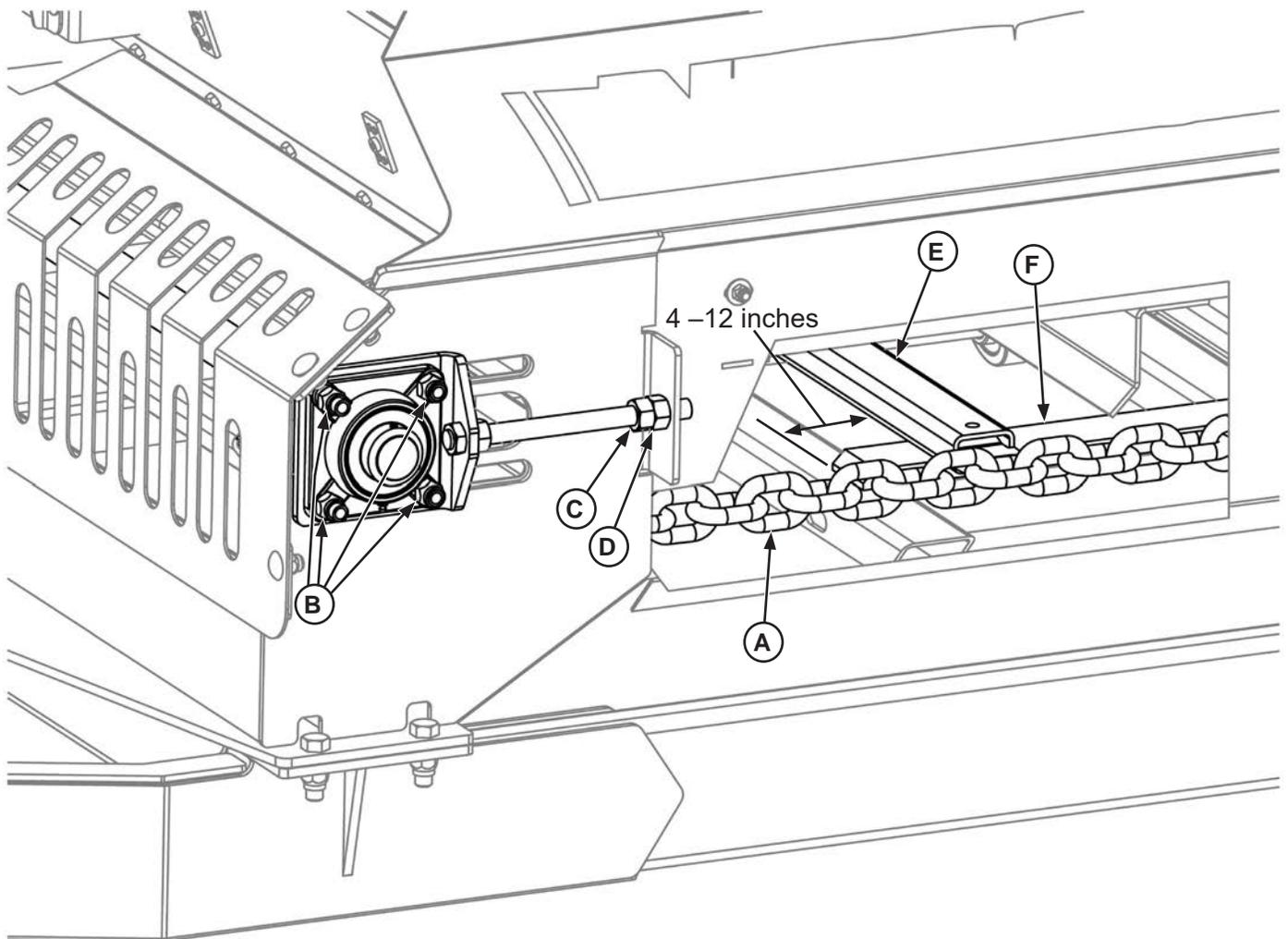
1. Loosen, but do not remove, the 4 bearing nuts (B) and front jam nut (C) on both chain sides.
2. To tighten the chain, turn the rear jam nuts (D) clockwise. Ensure both sides are adjusted equally.
3. To loosen the chain, turn the rear jam nuts (D) counter clockwise. Ensure both sides are adjusted equally.

Correct chain tension is achieved when a chain slat (E) first contacts the apron runner (F) 4 –12 inches from the apron runners' front edge. Ensure chain slat contacts apron runner equally on both sides.

4. Lock the chain in place by tightening the front jam nuts against rear jam nuts.



CAUTION: It is important to ensure the 4 bearing nuts are tightened after adjusting apron chain. In the event of the nuts not being tightened and the apron chain is reversed, equipment damage may occur.



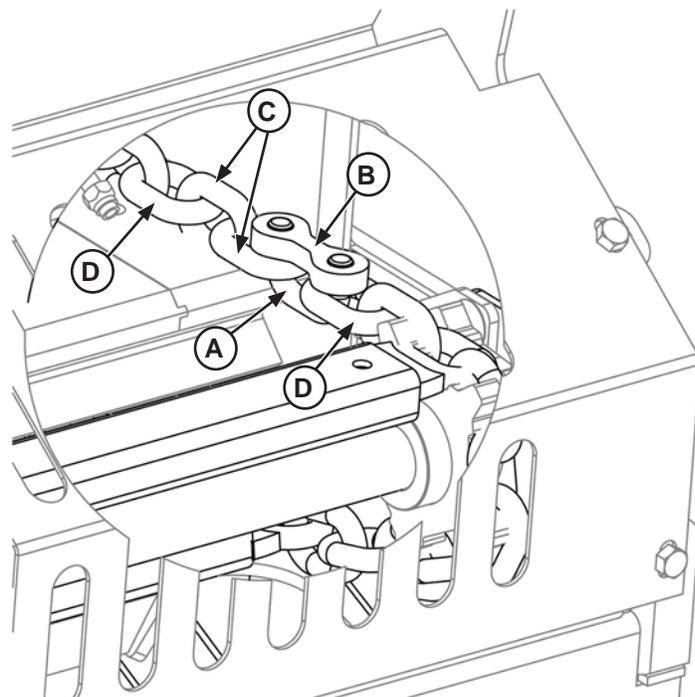
NOTE: If there is no more available space to tighten the apron chain, a link will need to be removed. Refer to [pg.6-2](#).

Apron Chain Shortening

To further tighten the apron chain when the front apron bearing adjustment has been maxed out you will need to remove chain links from each side. You will need an angle grinder with a cut off disk, a welder, and the following replacement parts.

CHAIN SIZE	MODELS	QTY	PART NUMBER	DESCRIPTION
5/8"	300LS, 340LS, 440LS	2	400-889	Connector Link (A)
		2	400-890	Connector Link Tab (B)

- Loosen front apron bearings as shown on [pg.6-1](#) to allow chain slack.
- Locate the existing welded chain links (B,C).
- Use angle grinder to remove the welded chain link and the two following chain links (C). The two end chain links (D) must be in the **HORIZONTAL** position.
- Connect the two end horizontal chain links with the connector link (C).
- Place the connector link tab (D) **ON TOP** of the connector link.
- With the connector link rod ends above the tab top face by at least 1/8", lay a weld bead **completely** around the rod ends. **DO NOT** tack weld only.

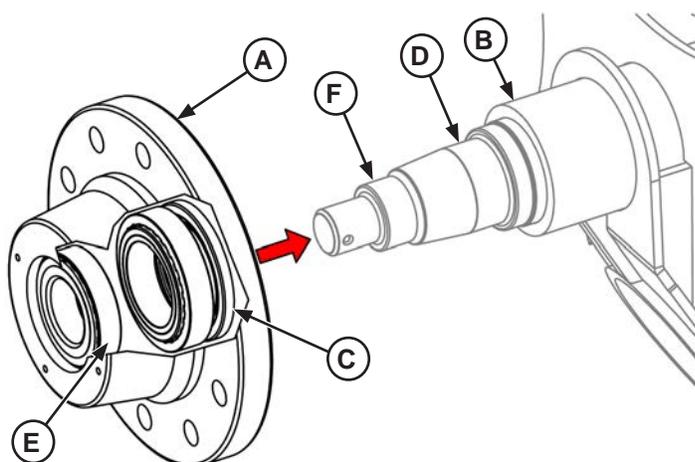


NOTE: Both chain sides must be shortened at the same time to ensure even chain movement.

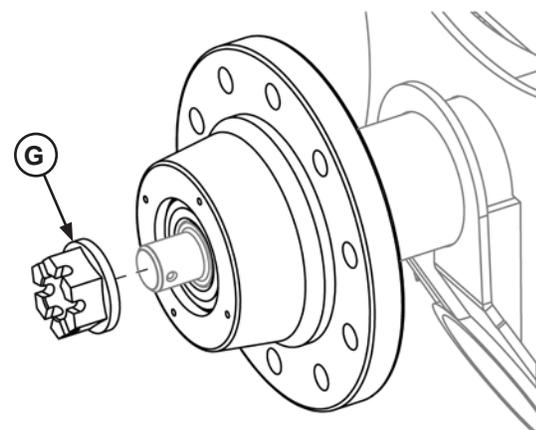
- Follow [Apron Chain Tension Adjustment](#) to properly set chain tension.

Hub Installation

- Push hub assembly (A) (without the dust cap), over the spindle (B) so that the inner cone (C) fits over the inner bearing journal (D).
NOTE: Do not allow the seal to contact the spindle until the outer bearing cone is piloted onto its journal. This will align the seal for final installation.
- Slide the greased outer cone (E) onto the outboard bearing journal (F). When the hub is nearly fitted there will be resistance when the seal bore meets the spindle. **NOTE:** Do not apply more force, the seal will be seated with nut installation.

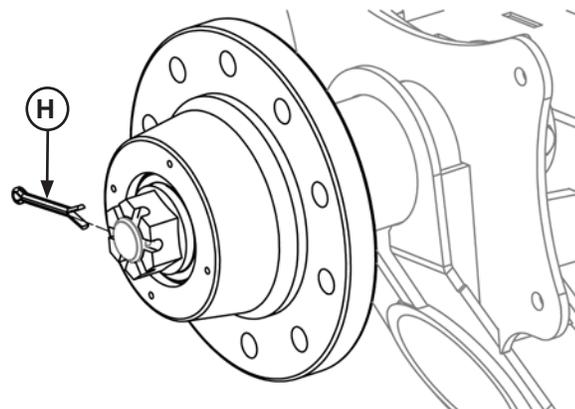


3. Depending on hub model, install and hand tighten washer and nut or flanged nut **(G)** against the outer cone.
4. Torque nut to 200 ft-lbs while rotating the hub assembly to seat the bearing seals.
5. Back the nut off one rotation, rotate hub several revolutions to ensure free movement.
6. Retorque the nut to 28 ft-lbs (up to 1 inch threaded spindle) or 45 ft-lbs (over 1 inch threaded spindle).



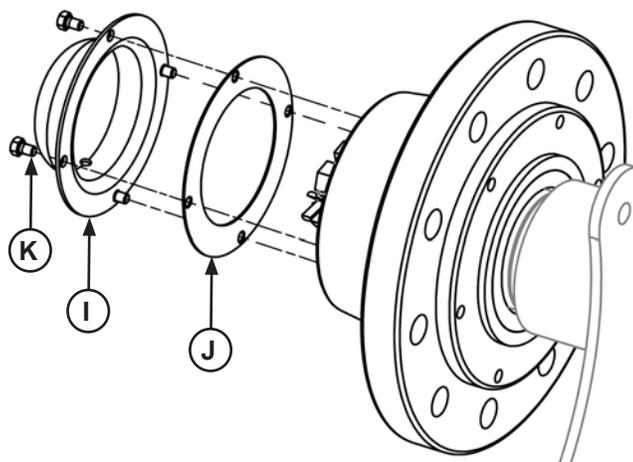
CAUTION: Do **NOT** use an impact wrench as torque is not controlled.

7. Reverse nut until nut slot allows cotter pin **(H)** to be inserted through spindle and nut.
8. Secure cotter pin by bending cotter pin ends against nut.
9. Apply NLGI Gr.2 bearing grease to nut and spindle thread to protect against corrosion.
10. Fit dust cap **(I)** onto hub and rotate to ensure clearance between spindle end and dust cap.
11. Coat dust cap interior with NLGI Gr.2 bearing grease.
12. Install gasket **(J)** and dust cap (with bolts **(K)** if applicable). Some models may be screw in type.



NOTE: Replace dust cap gasket every time dust cap is removed.

13. Use a torque wrench to tighten dust cap bolts to 13 ft-lbs.
14. Rotate the hub by hand, ensuring smooth rotation.
15. Wipe any excess grease from inner side of hub.



Wheel Nut Torque Specifications

NITRO MANURE SPREADER TORQUE SPECS				
HUB SIZE	BOLT PATTERN	WHEEL NUT PN	WHEEL STUD PN	TORQUE REQ. (LB-FT)
8,000lb	8 x 5/8-18 PIB	31532	31531	240 dry/ 180 lubed
12,000lb	8 x 5/8-18 PIB	31532	31531	240 dry/ 180 lubed

NOTE: Retorque wheel nuts after every operating day or after operating for 2 hours.

Fluids & Lubricants

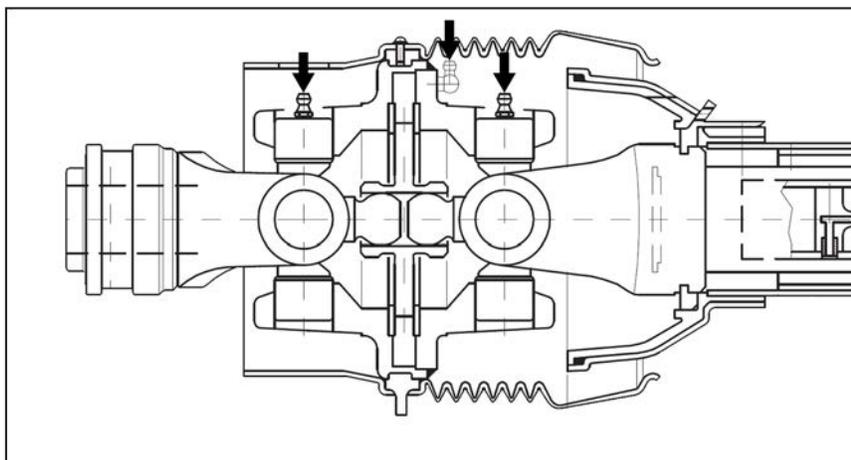
1. Grease: Use an SAE multi-purpose grease with extreme pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium base grease.
2. Beater Gearbox Oil: Use an SAE 80W90 gear oil for all operating conditions.
3. Storing Lubricants: Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

Greasing your Machine

- Use only a hand-held grease gun for all greasing.
- Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt.
- Replace and repair broken fittings immediately.
- If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway.
- Replace fitting if necessary.

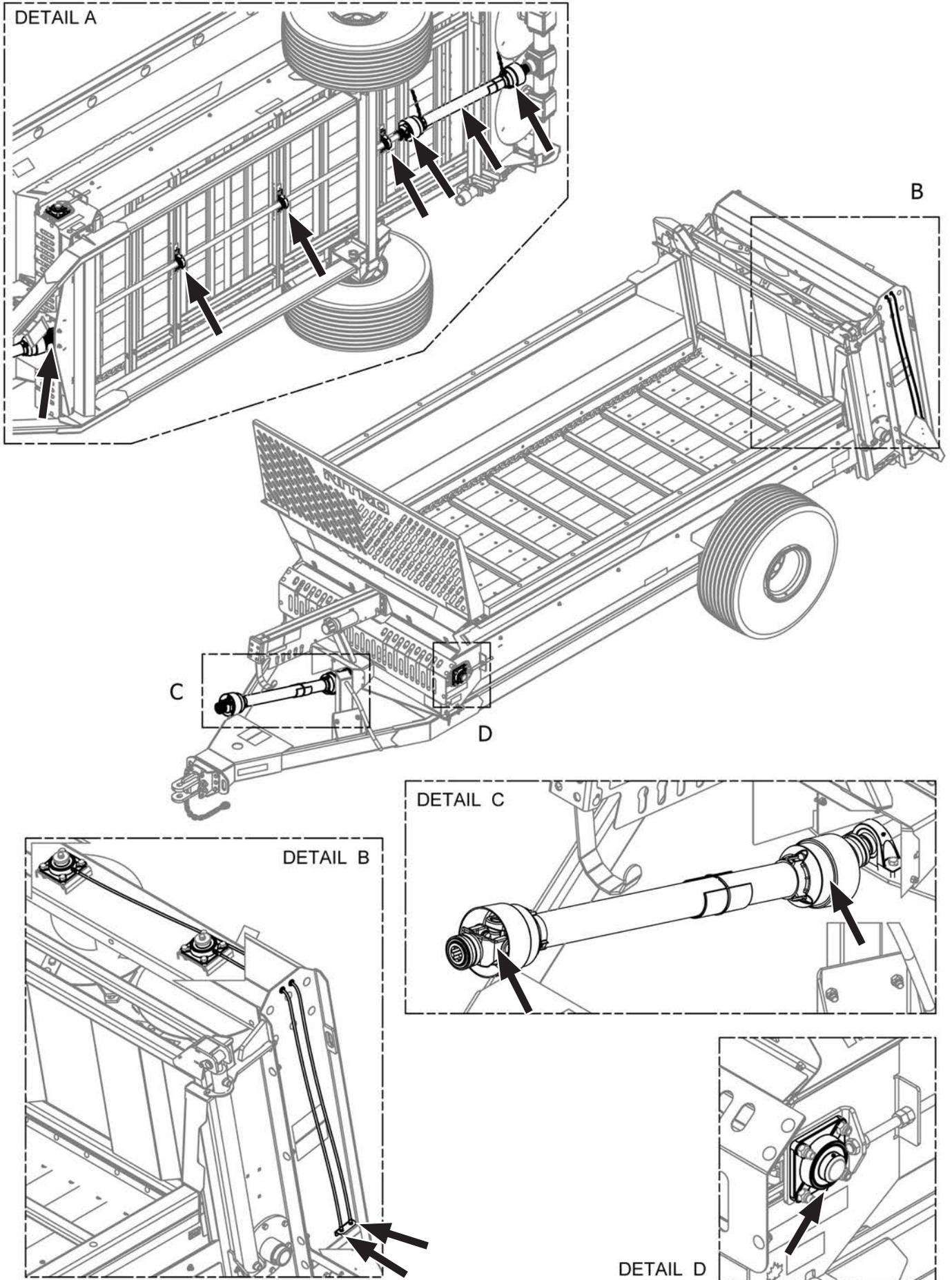
NITRO LS GREASE POINTS	SERVICE RECOMMENDATION
Detail A - Three Driveline Pillow Block Bearings	Every 10 hours of operation, 2-3 pumps w/ grease gun
Detail A - One Rear PTO Driveline: 2 crosses w/ zerks, zerk in inner sleeve	Every 25 hours of operation, 2-3 pumps w/ grease gun
Detail B - Two Top Beater Flange Bearings	Every 10 hours of operation, 2-3 pumps w/ grease gun
Detail C - One Front PTO Driveline: 2 crosses w/ zerks, zerk in inner sleeve	Every 16 hours of operation, 2-3 pumps w/ grease gun
Detail D - Two Front Apron Shaft Flange Bearings	Every 10 hours of operation, 2-3 pumps w/ grease gun
Detail E - One Apron Chain Gearbox	Change oil every 200 hours / Semi-Annually w/ 1.3L of M320 oil - Check level with sight glass, top up as needed
Detail F - Beater Gearboxes: Two double shaft (outer), One triple shaft (center)	Change oil every 200 hours / Semi-Annually w/ SAE 80W90 gear oil - Remove a cap to check level, top up as needed
Jack	Follow manufacturer recommendation

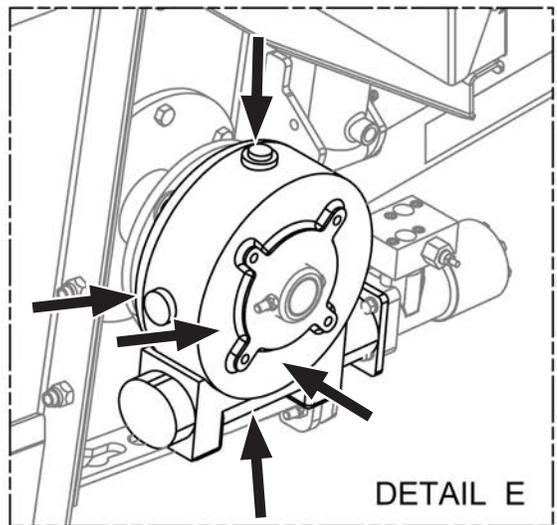
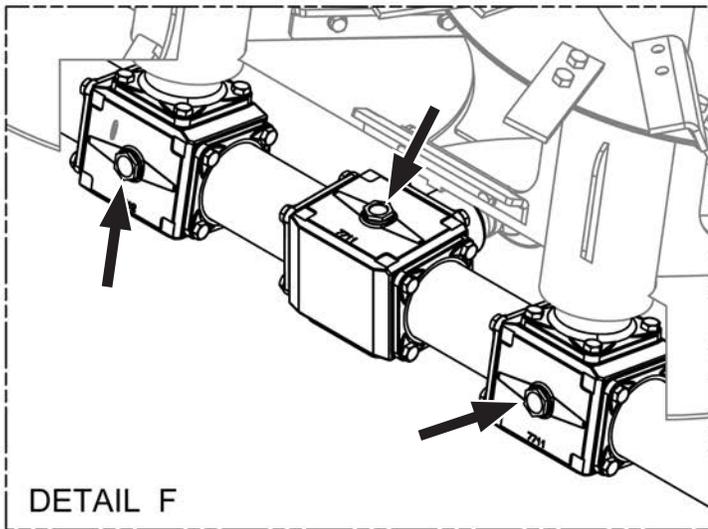
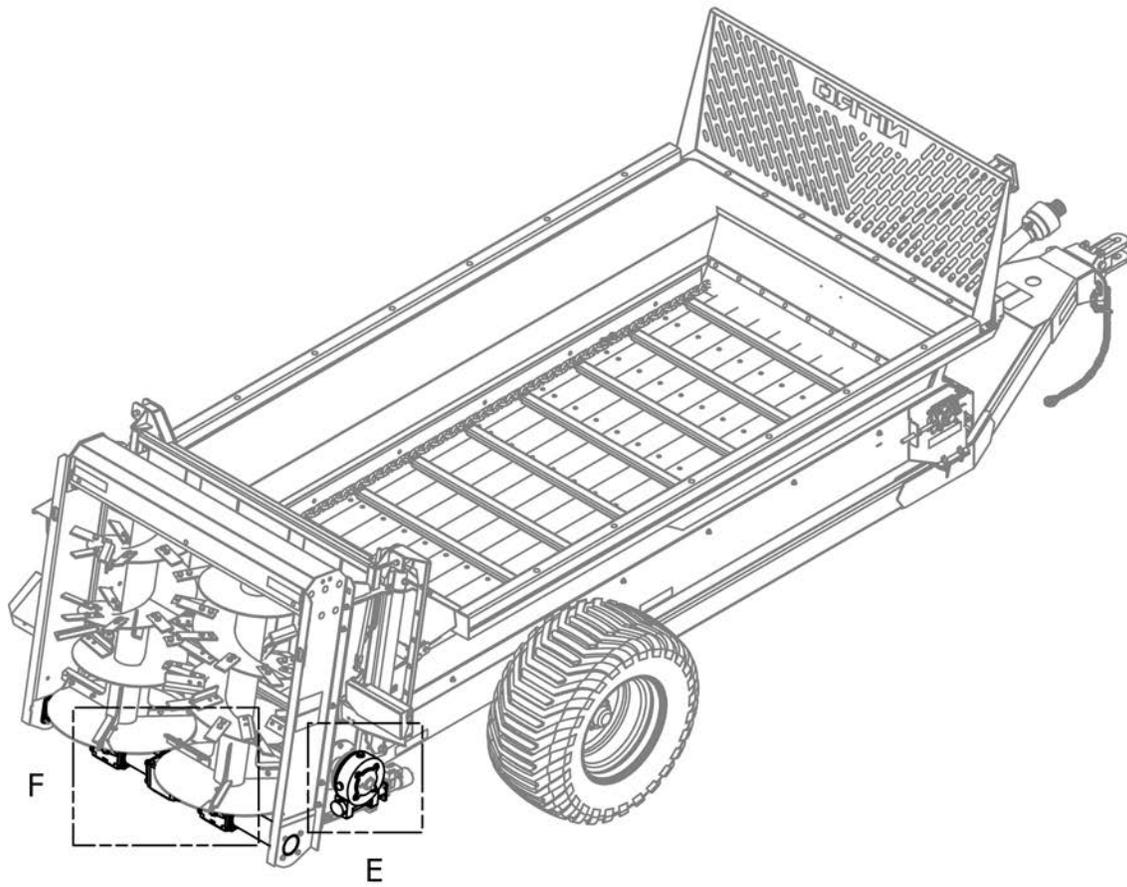
NOTE: Nitro LS spreaders equipped with grease lines still require separate greasing and/or oil changes on gearboxes, front driveline bearing, and PTOs.



Front PTO Driveline CV joint grease points.

Grease Points





Section 7 - Optional Flow Control

Flow Control Installation

To install a flow control option follow these instructions:

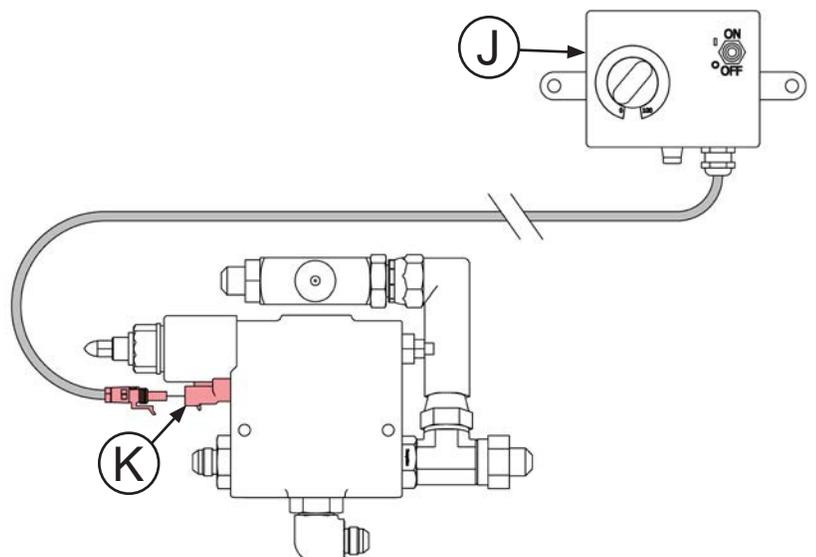
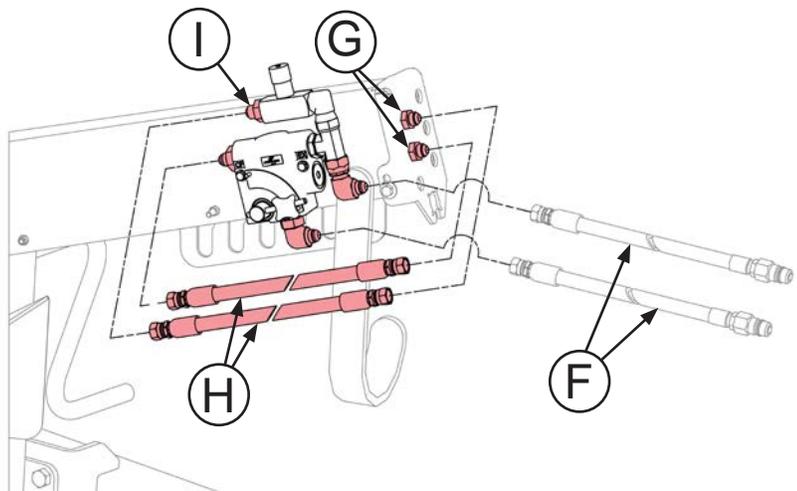
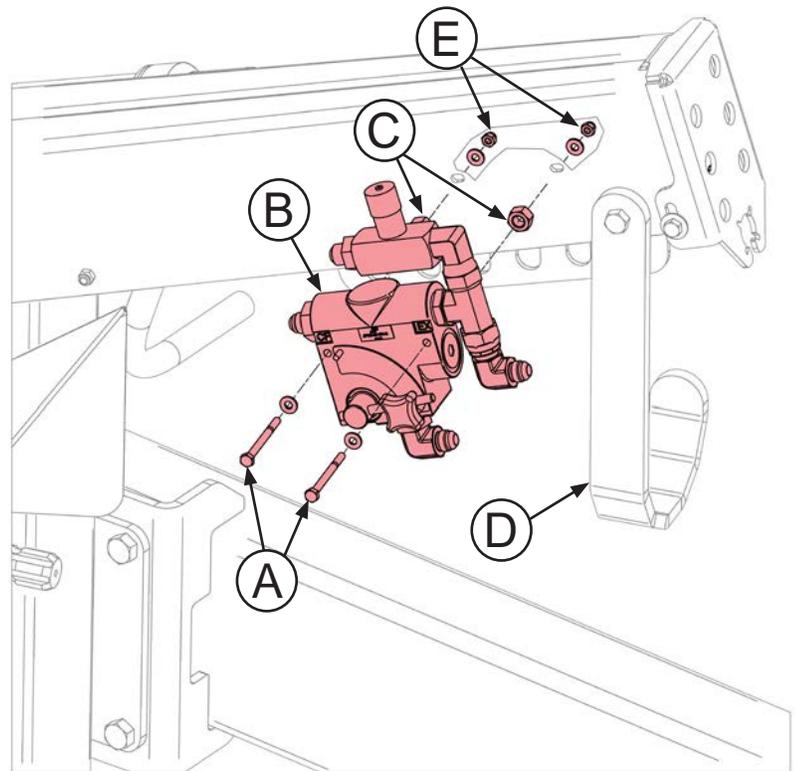
NOTE: Some older machines may require mounting holes to be drilled out. Place flow control in desired location on right side of hose hanger and center punch holes before drilling.

- Slide the 2 provided 1/4-20 x 3 hex bolts (A) through 1/4" washers and holes in flow control body (B).
- Place the 2 provided 1/2" hex nuts (C) over the bolt ends to act as spacers between the flow control and hose hanger.

NOTE: Disregarding the spacer nuts may cause interference between the flow control assembly and the PTO holder (D).

- Secure flow control with provided 1/4" flat washers and lock nuts (E).
- Remove 2 existing 30661 hoses (F) from upper right and middle right bulkhead fittings (G) on front of hose hanger.
- Connect 2 existing 30661 hoses to "EX" and "IN" port fittings of flow control.
- Connect 2 provided 37987 hoses (H) to flow control "CF" port fitting and bi-directional flow control hydraulic fitting (I).

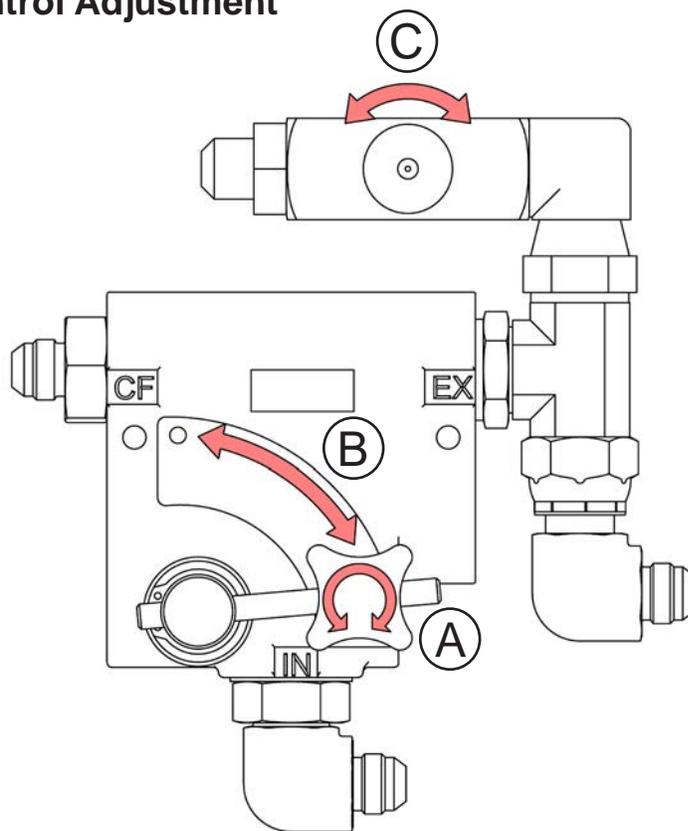
NOTE: The electric flow control option requires an electric controller (J) installed in power unit cab. Harness must be routed and connected into flow control solenoid plug (K). *Not applicable for manure spreaders with scale systems.*



Manual Flow Control Adjustment

The manual flow control option controls the hydraulic flow to the apron chain gearbox. To change the apron chain speed unscrew flow control lever (A), moving it down to increase speed or up to decrease speed (B).

The bi-directional flow control needle valve (C) stops the apron chain from traveling in reverse if the power unit hydraulic function is switched to reverse while under full load. See [Reversing the Apron Chain, pg.5-4](#) for further instructions.

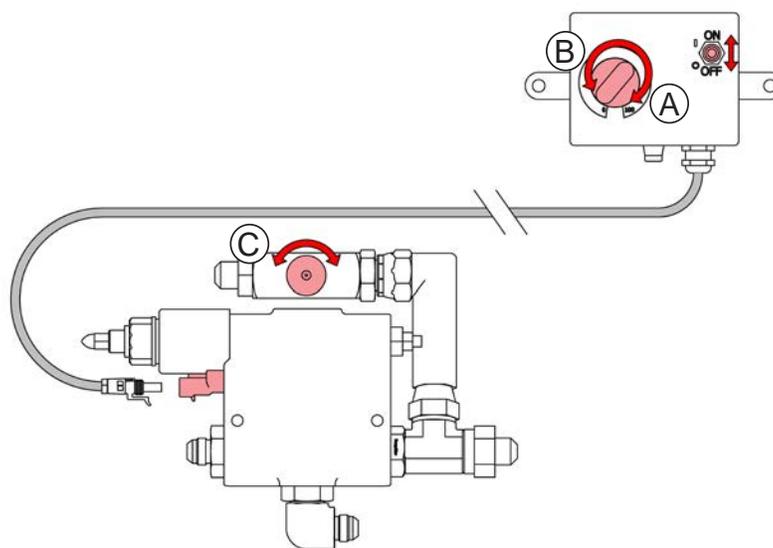


Electric Flow Control Adjustment

The electric flow control option controls the hydraulic flow to the apron chain gearbox. To change the apron chain speed simply use the dial on the flow controller (A), turn it to the right to increase speed or to the left to decrease speed (B).

The bi-directional flow control needle valve (C) has the same function as the manual flow control option.

NOTE: Nitro LS manure spreaders equipped with scale options do not require the electronic controller in the power unit cab. The electric flow control harness is instead wired into the scale monitor, which automatically controls the hydraulic flow and apron chain speed.

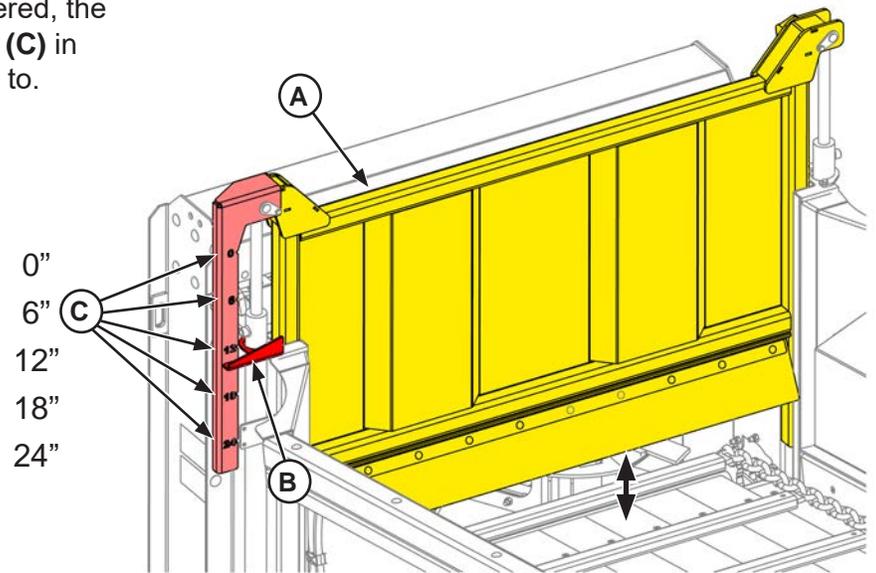


Optional Flow Control Operation

Tractors without variable hydraulic controls may have a Nitro LS manure spreader with a manual flow control or electric flow control. These options allow the operator to control the apron chain speed separate from the tractor. The manual flow control can only be controlled from the spreader, while the electric flow control can be controlled from the tractor cab if it's electric flow controller is mounted in the cab.

Endgate Indicator Operation

When the rear endgate (A) is raised or lowered, the indicator arrow (B) will move to the number (C) in inches that the endgate is currently opened to.



Torque Values - Imperial

SAE Grade and Head Markings	NO MARK	1 or 2 ^b 	5 	5.1 	5.2 	8 	8.2 
	NO MARK	2 	5 		8 		

Size	Grade 1				Grade 2 ^b				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated ^a		Dry ^a		Lubricated^{a}		Dry^{a}		Lubricated^{a}		Dry^{a}		Lubricated^{a}		Dry^{a}	
	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	240	175	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	400	300	510	375	400	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

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

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

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

^b 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.

Torque Values - Metric

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	

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a	
	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	190
M16	100	73	125	92	190	140	240	175	275	200	350	255	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

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

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

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

Index

11R-22.5 TBR . . . . .	.2-2
16.5L-16.1 Implement . . . . .	.2-1
19L-16.1 Implement . . . . .	.2-1
425/22.5 TBR . . . . .	.2-1
550/45-22.5 Flotation . . . . .	.2-2
After operating for 2 hours: . . . . .	.4-4
After operating for 10 hours: . . . . .	.4-4
Apron Chain Shortening. . . . .	.6-2
Apron Chain Tension Adjustment . . . . .	.6-1
Electric Flow Control Adjustment . . . . .	.7-2
Endgate Indicator Operation . . . . .	.7-3
Flow Control Installation. . . . .	.7-1
Fluids & Lubricants . . . . .	.6-4
General Safety . . . . .	.3-1
Grease Points . . . . .	.6-5
Greasing your Machine . . . . .	.6-4
Hook-up / Unhooking . . . . .	.4-2
Hub Installation . . . . .	.6-2
Hydraulic Requirements. . . . .	.1-2
Hydraulic Safety . . . . .	.3-3
Installing Decals . . . . .	.3-6
Intended Use	IV
ISO Safety Decal Illustrations . . . . .	.3-8
ISO Safety Decal Locations . . . . .	.3-7
Lighting & Clearance Marking . . . . .	.3-5
Loading . . . . .	.4-3
Maintenance Safety . . . . .	.3-4
Manual Flow Control Adjustment . . . . .	.7-2
Manuals	I
Nitro Apron Chain Warranty	I
Operation Safety . . . . .	.3-2
Operator's Manual	I
Optional Flow Control Operation . . . . .	.7-2
Optional Night Light Kit Operation . . . . .	.4-5
Personal Protection Equipment (PPE) . . . . .	.3-2
Principals of Operation	IV
Reversing Apron Chain . . . . .	.4-4
Safety Decal Locations . . . . .	.3-6
Safety Decals . . . . .	.3-5
Safety Symbol. . . . .	.3-1
Safety Words . . . . .	.3-1
Section 1 - Spreader Specifications . . . . .	.1-1
Section 2 - Tire Load Index Charts . . . . .	.2-1
Section 3 - Safety. . . . .	.3-1

Section 4 - Operation . . . . .	.4-1
Section 5 - Transportation / Storage . . . . .	.5-1
Section 6 - Service & Maintenance . . . . .	.6-1
Section 7 - Optional Flow Control . . . . .	.7-1
Serial Number	I
Spreader Preparation . . . . .	.4-1
Spreading . . . . .	.4-3
Storage and Cleaning . . . . .	.5-1
Storage Safety . . . . .	.5-1
Terminology . . . . .	.1-3
Tire Safety . . . . .	.3-3
Torque Values - Imperial	V
Torque Values - Metric	VI
Tractor Horsepower Requirements . . . . .	.1-2
Tractor Preparation . . . . .	.4-1
Transport Safety . . . . .	.5-1
Travel Speed . . . . .	.5-1
Unplugging . . . . .	.4-3
Warranty and Limitation of Liability	I
Wheel Nut Torque Specifications . . . . .	.6-3



Scan with smartphone to
download latest manual.

TUBE•LINE™