

Operator's Manual



Power-Link Installation and Operation



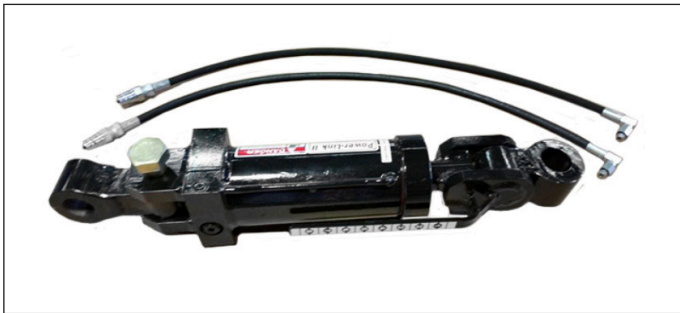
*Read, Understand, and Follow
the instructions and procedures provided in this manual
to safely install, operate, and maintain the Power-Link Cylinder.*

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1. Introduction

1.1 Welcome



Gnuse Mfg. Power-Link Cylinder Kits

The Power-Link Hydraulic Cylinder Kit allows positioning of an implement on a Cat 1, 2, 3, or 4 three-point hitch to be adjusted directly from the tractor's operator seat. Some models of the Power-Link Cylinder cylinder include a double, pilot-operated, check valve to help lock the cylinder rod and prevent drift of the implement.

The Power-Link Cylinder replaces the existing top link on the tractor's three-point hitch. When installed it allows adjustments to the top link without leaving the tractor's seat. When used with a quick hitch, mounting and dismounting of three-point hitch implements is simplified.

1.2 Safe Operation

Safe, efficient, and trouble-free operation of the Power-Link Cylinder requires the operator or anyone else who will be using or maintaining this product to read, understand, and follow the information contained within this manual.

Store this manual in a convenient location for future reference.

1.3 Intended Usage

WARNING



To prevent personal injury or even death, be sure you read, understand, and follow all of the instructions in this manual! Any top link assembly, including the Power-Link Cylinder, if not used and maintained properly, can be dangerous to users unfamiliar with its operation. Do not install, use, adjust, or maintain the Power-Link Cylinder until the user has developed a thorough understanding of the safety precautions and functions of this device.

The Power-Link Cylinders are designed for the specific purpose of hydraulically adjusting an implement attached to a 3-point hitch. **DO NOT modify or use this product for any application other than that for which it was designed.**

If the cylinder and its related parts are used or altered in any way from their original design, Gnuse Mfg. will not accept any liability for injury or product damage (warranty claim).

1.4 Important Lubrication Requirements

Lubricate the ball and socket ends of the cylinder daily with light machine oil or periodically add grease, if equipped with grease Zerks.

NOTICE

Bushings that are not properly lubricated will not function properly which may lead to damage of other related parts or the connected implement.

1.5 Hydraulic Requirements

WARNING

This unit operates with a maximum hydraulic pressure of 3,000 psi. Do not exceed this maximum pressure.

1.6 Product Improvements

Because Gnuse Mfg. maintains an ongoing program of product improvement, we reserve the right to make improvements in design or changes in specifications without incurring any obligation to install them on units previously sold.

The information, specifications, and illustrations in this manual are based on the information that was available at the time this material was written and can change at any time.

1.7 Disposal of Equipment at End of Useful Life

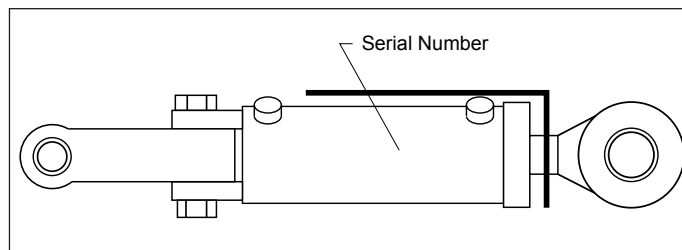
The Gnuse Power-Link Cylinder Kit has been designed for the specific purpose of positioning an implement attached to a 3-point hitch. When this product or its components are no longer capable of performing their designed purpose, they should be removed and scrapped. Do not use any materials or components from this unit for any other purpose.

1.8 Serial Number Location and Model

A serial number is stamped on the barrel of the cylinder. Please use this number when requesting service, seeking information, or ordering parts. Also, include the model with any requested information; for example [3-1/2" (with check valve)].

IMPORTANT:

Make sure the serial number is recorded on this page in case the serial number is damaged or unreadable and for easy reference when contacting Gnuse Mfg. with questions.



Serial Number _____

Model _____

Purchase Date _____

Dealer _____

Address _____

Phone Number _____

1.9 Operator Manual Storage

Store this Installation and Operation manual and other operating materials in a safe and easily accessible location.

1.10 Contact Information

If you have any questions not answered in this manual, need assistance, or require additional copies of the manual, contact:

GNUSE Manufacturing Corporation
P.O. Box 189 or 98 E. Elkhorn Street
Arlington NE 68002

Phone (402) 478-4433

Fax (402) 478-4436

Website: gnusemfg.com

2. Safety

2.1 General

Most work-related accidents are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you install, operate, and maintain the Power-Link Cylinder you must be alert to potential hazards. You should also have the necessary training and skills to operate the tractor and its attached implement.

Improper installation, operation, or maintenance of this product could cause a dangerous situation that results in injury or even death. Even though the cylinder may not be hazardous to use, the implement it is attached to can be the cause of the injury.

Do not use this product until you read and understand the information contained in this manual and other related equipment manuals. Do not use the Power-Link Cylinder for anything other than its intended purpose.



Do not use Power-Link Cylinder until you read and understand the information contained in this

manual.

Safety precautions and warnings are provided in this manual and also attached to the cylinder. If these precautions are not followed, bodily injury or death could occur to you or other bystanders.

Gnuse Mfg. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the product are, therefore, not all-inclusive. If a method of operation or maintenance not specifically recommended by Gnuse Mfg. is used, you must satisfy yourself that it is safe for you and others. You should also ensure that the product will not be damaged or be made unsafe by the methods that you choose.

2.2 Safety Alert Symbol



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This manual contains WARNINGS, CAUTIONS, IMPORTANT NOTICES, and NOTES which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury, or death. The following keywords call the reader's attention to potential hazards.

Hazards are identified by the "Safety Alert Symbol" and followed by a signal word such as "WARNING" or "CAUTION".

 **WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates that equipment or property damage can result if instructions are not followed.

**SAFETY
INSTRUCTIONS**

Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

Note: Contains additional information important to a procedure.






2.3 Safety Icons Nomenclature

This manual has numerous safety symbols. These safety symbols may indicate important information about personal injury hazards from the cylinder, the tractor, or the implement.
















2.3.1 Personal Protection/Important Information

-  Read the manual
-  Safety Signs
-  Protection (eye, hand, foot, ear)
-  Remove key
-  Stop engine
-  Set parking brake
-  Fire extinguisher
-  First aid kit
-  Use only authorized parts
-  Safety first
-  Roll over protection
-  Use proper tools

2.3.2 Prohibited Actions

-  Do not operate (drugs)
-  Do not operate (alcohol)
-  No children
-  No riders
-  No unauthorized welding or modifications

2.3.3 Hazard Avoidance

-  Safety alert symbol
-  Contact hazard (hand)
-  Contact hazard (foot)
-  Crushing hazard
-  Fire hazard
-  Hot surface
-  High-pressure fluid hazard
-  Pressure (zero)
-  Pressure (high)
-  Defective or broken part
-  Defective or worn hoses
-  Trapped pressure hazard
-  Slipping hazard
-  Tripping hazard
-  Rollover hazard (chock wheeled machines)
-  Overturn hazard

2.4 General Safety Instruction

The owner/operator is responsible for the SAFE use and maintenance of the Power-Link Cylinder and its attached implements. Make sure anyone who is operating, maintaining, or working around the cylinder, the tractor, or the implement is familiar with the operating and maintenance procedures and related SAFETY information contained in this manual and other related equipment manuals. This manual will alert you to good safety practices that should be used while using the Power-Link Cylinder connected to a 3-point hitch.

These general safety instructions apply to the overall use and maintenance of the Power-Link Cylinder when it is attached to the tractor and the implement. If you do not understand any information in this manual, see your dealer or contact Gnuse Mfg. before proceeding.

WARNING Failure to comply with the following safety instructions could result in serious injury and possibly even death if they are not understood and followed.



Owner's Manual

Read, Understand, and Follow the instructions in this manual before installing, operating, or performing maintenance on the Power-Link Cylinder or its connected components. Review the contents of this manual and any other appropriate equipment manuals at least annually thereafter.

Be sure that only experienced personnel operate the equipment. Do not operate any equipment without all guards and shields in place.



Crush Hazard

Hydraulic / mechanical components could cause serious injury if not properly used. Never work on, around, or under an implement being held up by the Power-Link Cylinder or any top link. To prevent injury, lower implements to the ground or support them with adequate support stands.



Impaired User Hazard

Do not attempt to operate or maintain any equipment under the influence of drugs or alcohol. Consult your doctor before using any equipment while taking prescription medications.

WARNING



Fall or Crush Hazard

Do not allow anyone to ride on the tractor or implement.

Falling or crushing hazards could result in severe injuries or death.



No Unauthorized Modifications

Do not modify the Power-Link Cylinder or its components. Do not weld on the product. Unauthorized modifications may affect the product's function, or create safety hazards.



Damaged Parts Hazard

Do not use the Power-Link Cylinder if it is damaged. If the Power-Link Cylinder or its connected components are believed to have a defect which could cause it to work improperly, immediately stop using it and remedy the problem before continuing.



High-Pressure Fluid Hazard

Fluid under pressure can cause serious injury. It can be almost invisible when escaping from a pinhole-sized leak, and it can pierce the skin. Do not touch or get near a pressurized hydraulic hose assembly with any part of your body. If fluid punctures the skin, even if no pain is felt, a serious emergency exists. Obtain medical assistance immediately.



Fire Hazard

Most hydraulic fluids are flammable when exposed to the proper conditions. Leaking pressurized hydraulic fluids may develop a mist or fine spray that can flash or explode upon contact with a source of ignition. These explosions can be very severe and could result in serious injury or death.

CAUTION

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

Personal Protection Equipment

When using any implement, wear appropriate personal protective equipment. This list may include, but is not limited to:



- Protective shoes with slip-resistant soles
- Protective eyewear
- Protective clothing and gloves
- Hearing protection

CAUTION



Hearing Loss Prolonged Exposure To Loud Noise May Cause Permanent Hearing Loss!

Working environments with noise-producing implements may cause partial to permanent hearing loss. Use hearing protection any time noise levels exceed 80 decibels (dB). Noise levels over 85 dB, on a long-term basis, may cause severe hearing loss. Noise levels over 90 dB over a period of time could cause permanent and even total hearing loss. Hearing loss from loud noise is cumulative over a lifetime without hope of natural recovery.



Crush Hazard

Tractors must be equipped with a RollOver Protective Structure (ROPS) and a seat belt. A crushing hazard may occur if the driver is ejected from the seat while the tractor is in motion. Fasten the seat belt whenever the tractor is moving.



Slip Hazard

Leaking hydraulic fluid is not only unsightly it may make working areas slippery and dangerous.



Hot Oil / Burn Hazard

High fluid temperatures may cause severe burns. Most hydraulic systems typically operate between 150 to 300 degrees Fahrenheit. Oil at these temperatures may burn the skin.

Metal parts (such as fittings and adapters) are also hot and may cause burns. Hoses can also become hot.

SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.



Safety Signs

Replace any missing or hard-to-read safety signs or instructional labels. Use care when washing or cleaning the Power-Link Cylinder.



First Aid Kit

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

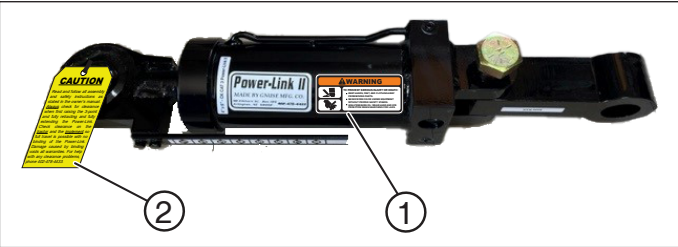


Fire Extinguisher

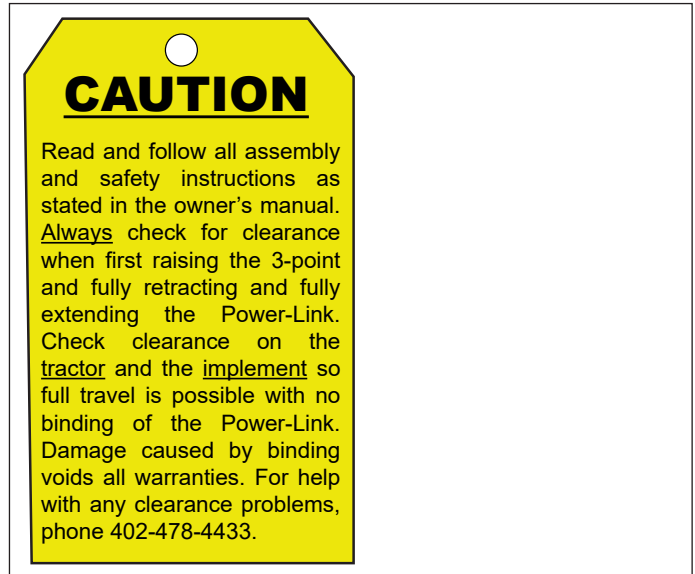
Have a fire extinguisher available should the need arise and know how to use it.

3. SAFETY SIGNS AND LABELS

3.1 Safety Sign Locations



Item	Description
1	Warning - Personal Protection
2	Caution - Follow Instructions



4. Specifications

Description	2-1/2"	3"	3-1/2"	3-1/2" with check valve	4"	4" with check valve	4-1/2" with check valve
Bore and Stroke	2-1/2 x 6"	3 x 7"	3-1/2 x 7"	3-1/2 x 6"	4 x 7"	4 x 6"	4-1/2 x 6"
Pressure Rating	3500 psi	3500 psi	3500 psi	3500 psi	3500 psi	3500 psi	3500 psi
Hitch Size	Cat 1 & 2	Cat 2 & 3	Cat 2 & 3	Cat 2 & 3	Cat 3*	Cat 3*	Cat 4*
Check Valves	No	No	No	Yes	No	Yes	Yes
Push Capacity	17,100 lbs.	21,200 lbs.	33,600 lbs.	33,600 lbs.	43,900 lbs.	43,900 lbs.	55,000 lbs.
Pull Capacity	12,800 lbs.	16,700 lbs.	27,400 lbs.	27,400 lbs.	35,500 lbs.	35,500 lbs.	47,200 lbs.
Tractor Horsepower	up to 60	60 to 110	110 to 175	110 to 175	175 and up	175 and up	175 and up

5. Installation



1. Park the tractor on a flat, level surface. Place the transmission in park and set the parking brake. Turn off the engine, and remove the ignition key to prevent unauthorized starting.

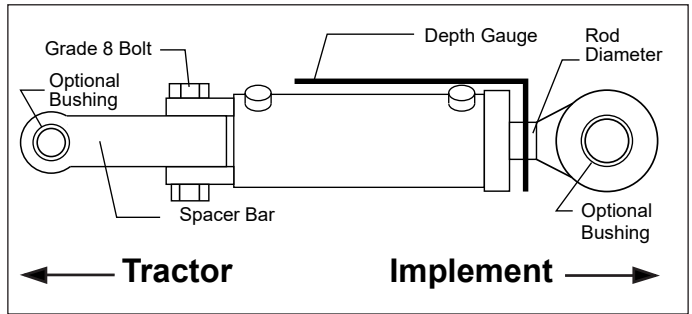
WARNING



Crush Hazard
Before leaving the tractor's operator seat

for any reason:

- a. Lower the implement to the ground.
 - b. Relieve hydraulic fluid pressure.
 - c. Place the tractor in park, shut off the engine, and remove ignition key.
 - d. Set the parking brake.
2.  Relieve all hydraulic pressures in the auxiliary hydraulic lines attached to the cylinder.
 3.  Place chocks in front and back of the tractor's rear tires.
 4. If necessary, remove the current top link. The clevis pins and keeper pins may be reused, if not damaged or worn. Use only OEM manufactured pins to install the Power-Link Cylinder.
 5. Using the removed clevis pin and keeper pin install the Power-Link Cylinder with the spacer bar towards the tractor and the ball and socket towards the implement, guidance system, or quick hitch.



6. If necessary, install the hoses to the cylinder and tighten to the proper torque.
7. Connect the hoses to a duplex outlet on the tractor.

Note: If the Power-Link Cylinder operates opposite of the desired direction, reverse the hoses.

8. Make sure hydraulic hoses are routed to prevent them from being stretched, pinched, or kinked.

NOTICE

Avoid positioning hoses next to metal edges or too close to another hose. The hose cover and reinforcement may be damaged by abrasion, creating an unsafe working condition.

SAFETY INSTRUCTIONS




Make sure the hoses are adequately supported and will not pinch or be stretched during operation.

9. Proceed to the Startup and Operation section of this manual.



6. Startup and Operation



6.1 User Safety

WARNING Failure to follow the following safety instructions could result in serious injury and possibly even death if they are not understood and followed.

WARNING	
Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, causing serious injury or possible death. If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.	
	<ul style="list-style-type: none">• Check or tighten all connections BEFORE applying pressure.
	<ul style="list-style-type: none">• Release all pressure before removing a hose, fitting, or valve by:<ul style="list-style-type: none">a. Stopping the engine.b. Moving all hydraulic control levers into a float position.
	<ul style="list-style-type: none">• DO NOT use your bare hand to check for potential leaks. Always use a board or cardboard when checking for a leak.

Qualified Users Only
Before using the implement with the Power-Link Cylinder, be familiar with the tractor's controls. Read and understand this manual and the one provided with your tractor before operating the implement. Do not allow an untrained person to operate the tractor.

  **Train Unfamiliar Users**
It is the tractor owner's responsibility to make sure any person using the tractor with its attached implement has been thoroughly trained on its proper and safe use.

  **Impaired User Hazard**
Do not attempt to operate or maintain the tractor under the influence of drugs or alcohol. Consult your doctor before using the tractor while taking prescription medications.


 **No Children**
Never allow children to operate the tractor.

WARNING

 **Hydraulic Pressure**
This equipment may operate with hydraulic pressures up to 3,000 psi.

  **High-Pressure Hydraulic Oil**
Use proper tools to check or tighten all connections **BEFORE** pressurizing the system.

CAUTION

 **Trapped Air**
Trapped air in the hydraulic hoses or the cylinder can cause unexpected movement of the implement. Never enter the work area around or under the implement when it is in the raised position.

6.2 Startup

1. Start the tractor. Do not attach an implement to the 3-point hitch at this time.
2. Slowly raise the 3-point hitch. Make sure the travel is in the desired direction.
3. Attach the implement and verify the clearance between the cylinder and the tractor as well as the cylinder and the implement. Check for clearance with the cylinder completely extended and retracted. The cylinder must pivot freely at all times without binding to prevent damage to the cylinder, implement, and/or tractor.
4. Check the hydraulic hoses for operating room to prevent damage or excessive wear. If there is a problem with clearance or travel it may need to be corrected with a different length spacer bar.
5. Check for oil leakage.
6. Raise and lower the Power-Link Cylinder several times to fill the hoses and cylinder with hydraulic fluid removing any trapped air.
7. Check the tractor's hydraulic fluid level and add the recommended hydraulic fluid as needed.

6.3 Operating the Power-Link


⚠ WARNING Keep all persons and objects clear while any part of the tractor or implement is in motion.

1. Use the tractor's controls to raise and lower the Power-Link Cylinder.


2. When traveling any distance or on any roads with an attached implement, a safety chain is recommended between the implement and the rear of the tractor.

NOTICE *Inadequate support of the implement can cause Power-Link Cylinder, tractor, or implement damage.*

7. Maintenance


⚠ WARNING  Replace parts only with genuine OEM parts. Do not alter equipment or replace parts with other brands which may not fit properly or meet OEM (Original Equipment Manufacturer) specifications. They can weaken the integrity and impair the safety, function, performance, and life of the equipment.

1. Lubricate the ball and socket ends of the cylinder daily with light machine oil or periodically add grease if equipped with grease Zerk.
2. Inspect the cylinder and hoses daily for signs of damage or wear.

 **Zero Pressure**
Make sure all hydraulic pressure is released before inspecting or disconnecting Power-Link Cylinder hydraulic hoses.

Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, causing serious injury and possible death. If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

3. Check all hydraulic hoses and hydraulic fittings after several hours of use to ensure they are tight.
4. Replace any worn, damaged, or illegible safety labels by obtaining new labels.
5. Replace any damaged or worn hydraulic hoses or fittings.

 **⚠ WARNING** DO NOT attempt to repair any broken or damaged parts by welding. Poorly done repairs or modifications to any part can result in serious injury or death should these repairs fail.


8. Troubleshooting


Problem	Cause	Solution
Cylinder will not hold position.	Seals are worn or damaged.	Replace seals with Seal Kit. Refer to Section 9. Replacement Parts for part number.
Ball joint is worn or loose.	Normal wear and use.	Replace ball joint.
Cylinder rod will not extend or retract.	Faulty hydraulic tip.	Replace tip.
	Crimped hose.	Replace hose.

9. Replacement Parts

For any additional information concerning the proper adjustment, repair or replacement of parts, consult the factory service department for further information.

⚠ WARNING  **Replace parts only with genuine OEM parts. Do not alter equipment or replace parts with other brands which may not fit properly or meet OEM (Original Equipment Manufacturer) specifications. They can weaken the integrity and impair the safety, function, performance, and life of the equipment.**

 **Do not use worn, defective, or broken parts.**

 **Do not use worn, defective, or under-rated hoses.**

Part Number	Description
4" and 4.5" Power Link Parts	
BAR - 4.5 - 8530	8530 Bar, 6.5" Center-to-Center
BAR - 4.5 - TRAC	RowTrac Bar, 4.5" Center-to-Center
Shaft Ends	
SHF - 3.5 - BALL	3.5" Ball, Shaft End
SHF - 4.0 - BALL	4" Ball, Shaft End
SHF - 0.0 - CAT4	Cat. 4 Clevis End

Part Number	Description
Seal Kits	
2.5 - 0080	Seal Kit for 2.5" Power-Link
3.0 - 0042	Seal Kit for 3" Power-Link
3.5 - 0066	Seal Kit for 3.5" Power-Link, Years: Pre 2/1993
3.5 - 0020	Seal Kit for 3.5" Power-Link, Years: 2/1993 to 12/1998
3.5 - 0045	Seal Kit for 3.5" Power-Link, Years: 1/1999 to 9/1999
3.5 - 0080	Seal Kit for 3.5" Power-Link, Years: 10/1999 on
4.0 - 0083	Seal Kit for 4" Power-Link
4.5 - 1005	Seal Kit for 4.5" Power-Link
Bolts	
0.875 - 91516	7/8" Bolt for 2.5" Power-Link
1.0 - 97580	1" Bolt for 3" and 3.5" Power-Link
1.25 - GNU001	1.25" Bolt for 4" and 4.5" Power-Link
2.5" Power Link Parts	
BAR - 3.5 - AVGE	3.5" Bar, 3.5" Center-to-Center
3, 3.5, and 4" Power Link Parts	
BAR - 4.0 - AVGE	4" Bar, 4" Center-to-Center
BAR - 5.0 - SHLT	Short Light Bar, 5" Center-to-Center
BAR - 5.0 - SHRT	Short Bar, 5" Center-to-Center
BAR - 6.5 - AVGE	6.5" Bar, 6.5" Center-to-Center
BAR - 8.0 - LONG	Long Bar, 8" Center-to-Center
4" Power Link Parts	
BAR - 6.5 - 8000	8000 Bar, 6.5" Center-to-Center
BAR - 6.5 - 8030	8030 Bar, 6.5" Center-to-Center
BAR - 7.0 - LARM	Long Arm Bar, 7" Center-to-Center
BAR - 9.0 - AVGE	9" Bar, 9" Center-to-Center

10. Limited Warranty

Gnuse Mfg. warrants its cylinders to work in a general agricultural working environment, free from defects for a period of one (1) year. All claims under this warranty, by the Purchaser, are limited only to the repair or replacement of the cylinder should a manufacturing defect be identified.

A defective cylinder must have authorization from Gnuse Mfg before being returned.

The Purchaser understands that Gnuse Mfg. will not be held liable for any costs or related damages including, but not limited to, any charges for removal or installation in connection with the replacement or repair of the cylinders.

This warranty is non-transferrable and shall be void in the event of abuse, neglect, improper maintenance, or unauthorized customer repair. Gnuse Mfg. makes no other warranties, express or implied, and disclaims all warranties of quality, merchantability, or fitness for a particular purpose.

Warranty Exclusions:

- Improper installation, misapplication, or excessive side loading.
- Non-compatible hydraulic fluid.
- Lack of regularly scheduled maintenance.
- Failure to maintain fluid cleanliness in the hydraulic system.
- Damage due to corrosive chemicals.
- Disassembly of the cylinder, without written permission, prior to the date of warranty expiration.

Warranty Registration Card

Please complete and send the included registration card to the address listed on the card.



GNUSE Manufacturing Corporation
P.O. Box 189
98 E. Elkhorn Street
Arlington, NE 68002
www.gnusemfg.com
402-478-4433

Making one-person implement control easier and faster.

Warranty Registration Card

The registration card must include:

- the buyer's complete name and postal address,
 - the model (refer to Section 1.8),
- the serial number (refer to Section 1.8), and
 - the date of delivery.

Please complete and send this registration card to:

GNUSE Manufacturing Corporation
P.O. Box 189
Arlington, NE 68002

or email to trevor@gnusemfg.com

Warranty Card

Please Print Clearly

Purchased Date _____

Name _____

Address (street) _____

Address (city, state, zip code) _____

Serial Number _____

Model _____

Dealer Name _____

Address (street) _____

Address (city, state, zip code) _____