



**STONE WINDROWER
&
LANDSCAPE RAKE
OPERATOR AND PARTS MANUAL**

MANUFACTURED BY:
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Introduction

Thank you for choosing a **Smyth Welding** Stone Windrower. Designed for residential and agricultural use to windrow stones and debris for easy pick up with minimum soil compaction. We are confident this equipment will meet your expectations in terms of quality, performance and reliability.

Please read this manual completely before operating your Stone Windrower and keep it for future reference. It contains important information and was made to assist you in the safe operation of your new Stone Windrower and to ensure it performs to its fullest capabilities.

Before using this Stone Windrower, any person who will be operating the Stone Windrower must be familiar with the safety recommendations and the operating instructions. Please read carefully and be sure to understand and follow all recommendations and procedures.

If you require additional information on your Stone Windrower, please contact your **Smyth Welding** Stone Windrower dealer.

Information needed for warranty and ordering parts:

Date of purchase: _____

Serial Number: _____

Model Number: _____

Special Options: _____

Warranty Information

Smyth Welding & Machine Shop Ltd. products are warranted for a period of 1 year from the date of original purchase, by the original purchaser, to be free from defects in material and workmanship under correct and normal use and proper applications.

Smyth Welding & Machine Shop Ltd. obligations under this warranty shall be limited to the repair or exchange at **Smyth Welding's** option, of any **Smyth Welding** product or part which proves to be defective as provided. The customer will return his unit to his dealer where it was purchased and if the dealer agrees with the warranty, they must then notify **Smyth Welding** to get authorization.

The equipment must be installed, operated and maintained in accordance with **Smyth Welding's** instructions.

This warranty does not extend to goods damaged or subject to accident, abuse or misuse after shipment from **Smyth Welding**, nor to goods altered or repaired by anyone other than an authorized **Smyth Welding** representative.

Smyth Welding shall in no event be responsible for any consequential damages of any nature whether special or general, direct or indirect.

Any warranty or claim which differs from that set out is unauthorized by **Smyth Welding & Machine Shop Ltd.** and is the warranty only of the party making it. **Smyth Welding & Machine Shop Ltd.** makes no other warranty, expressed or implied and the original user's sole remedy for breach thereof is as set forth.

To obtain warranty a copy of original bill of sale is required and all claims must be submitted within a 30 days from date of equipment failure.

Important Note:

The gearbox shafts are made with a special alloy steel. Moreover, they are case hardened to increase capacity to shock load. These shafts cannot be broken under normal loads. However, undesirable objects may enter the stone windrower and either bend or break the gearbox shaft. It is understood that the gearbox cannot be built to resist every possible overload, and consequently, gearbox shafts will not be replaced under warranty

Safety Information

This operator's manual should be regarded as part of the stone windrower. Suppliers of both new and secondhand stone windrowers are advised to keep documentation indicating that this manual was provided with the stone windrower.

Obey all safety instructions listed in this section and throughout this manual. Failure to do so could result in serious injury or death.

- Know all your controls and know how to quickly stop all power unit movement and the stone windrower movement.
- Know and follow good work practices when assembling, mounting, maintaining, repairing, removing and storing this product.
- All shields and guards are to be in place before operation of stone windrower.
- Wear appropriate personal protection equipment.
- Do not wear loose clothing, loose or uncovered hair, or any accessories that can catch in moving parts.
- Never allow anyone, except the operator, to be around the power unit on this product when it is in use.
- Do not start up unless others are clear of the work area.
- Do not allow riders on this product or the power unit.
- Do not stand or climb on this unit when operating.
- Do not place any part on your body under any part of this product unless the product is turned off and securely resting on adequate blocking or on the ground.
- Never leave equipment unattended with the power unit running.
- Ensure all safety warning decals are legible. Contact Smyth Welding & Machine Shop Ltd. for replacement of missing or damaged safety decals.



Maintenance

Stop the unit and disengage all power before doing any adjustments or service to your stone windrower. See your Smyth Welding dealer to replace any worn or damaged parts.

Chain:

Carefully check the teeth on the sprocket, if they are worn to a hooked shape, the sprockets should be replaced to assure full capacity performance and a satisfactory life from the new chain.

Tight chain causes an additional load which increases wear on chain joints, sprockets and shaft bearings.

Slack chain produces vibration, which may result in excessive chain wear, noise or shock loading.

Tighten chain allowing ¼" sag in the bottom span as the chain wears.

Sprocket:

Inspect sprockets for problems which lead to replacement.

-Wear on the sides, which is due to misalignment

-Tooth wear (indicated by hooking)

-Broken teeth

-Cracks that might lead to failure

-Wobbling of sprockets on shaft

Bearings:

-grease after every 8 hours of use

Shear Bolts:

-replace with grade 2 or 5 for PTO

Make sure this bolt is very tight in order to keep the efficiency of the shearing mechanism.

Gearbox:

-use 80W90 gear oil

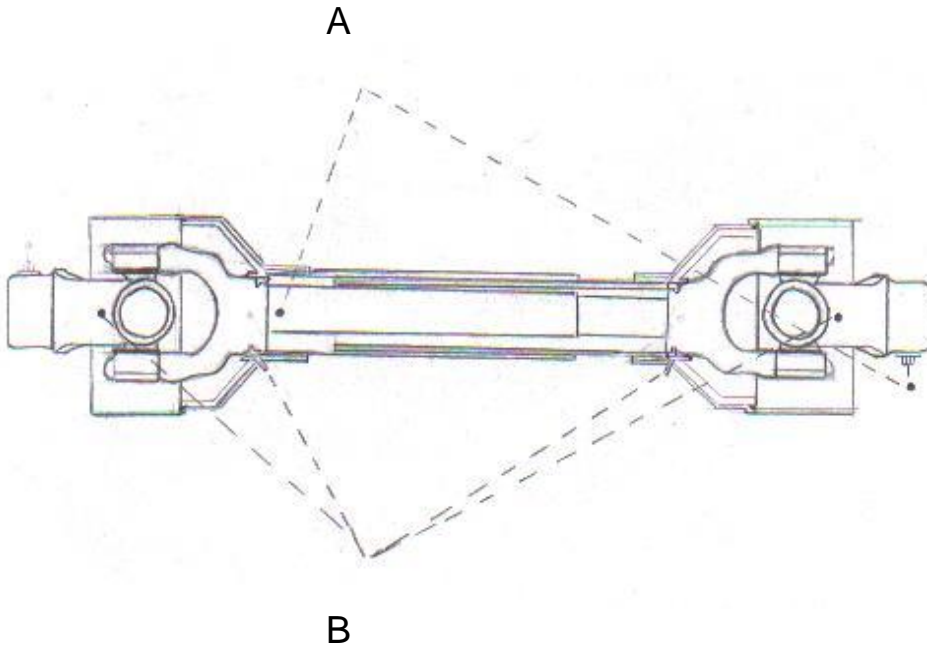
Tires:

- Check tire ratings to be sure they match the power unit load.

PTO:

Point A -grease after every 16 hours of use

Point B –grease after every 8 hours of use



Telescopic tubes of PTO should overlap a minimum length to meet ideal conditions for power transmission.

The following table could be used as a guide to find the maximum permissible length of PTO:

PTO size	Over-all length		Overlap
	Closed	Maximum	
T20	29¾"	41"	5"
T40	30½"	40½"	6"
T50	36½"	50"	7"
T60	37¾"	47¾"	7"
T80	36"	47¾"	7"

PTO shafts are made to transmit power with angles at universal joints; however, these angles should be kept to a minimum.

Determining PTO Angle

H.P.
60 @ 540 RPM

P.T.O. angles
5°
10°
15°
20°
25°

Estimated life in hours
450 hours
195 hours
90 hours
40 hours
20 hours

How to determine P.T.O. angle

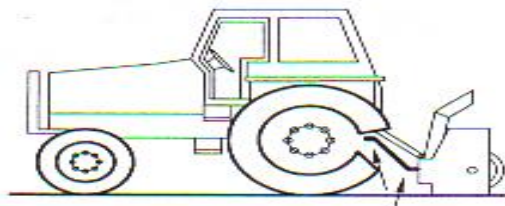


A = P.T.O. height at tractor
B = P.T.O. height at blower
C = A - B
L = Cross center distance in working position

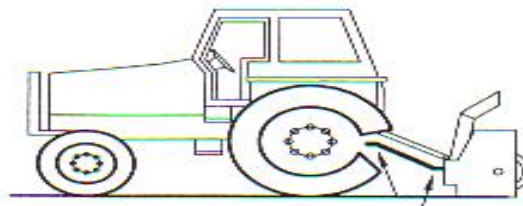
- 1) Lower blower on ground.
- 2) Take measures A, B & L
- 3) Subtract B of A ($A - B = C$)
- 4) Divide L by C ($L \div C = F$)
- 5) Compare F Factor in table below to find P.T.O. angle (interpolate, if necessary).

F FACTOR	ANGLE
6	10°
3.75	15°
2.75	20°
2.15	25°
1.75	30°

Previous examples clearly demonstrate that universal joint angle is directly related with life of P.T.O.. In order to reduce angle, it is necessary to increase the distance between snowblower and tractor.



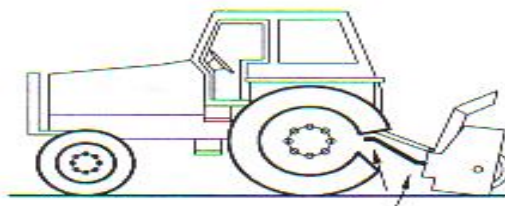
TOO LARGE ANGLES AT P.T.O. JOINTS TO AVOID



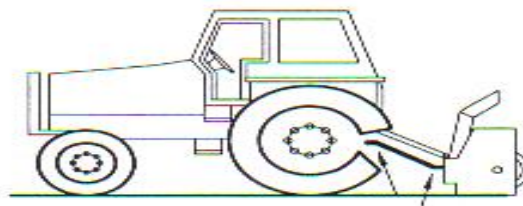
REASONABLE ANGLES AT P.T.O. JOINTS ACCEPTABLE

If it is impossible to increase the distance between snowblower and tractor, in order to maintain a reasonable angle at P.T.O., it is recommended to use a larger size of P.T.O., that is a greater capacity P.T.O. (please refer to your dealer for more details).

For snowblowers of 100 H.P., an additional gearbox is also available that can be mounted on existing snowblower gearbox, which increases the input shaft height, reducing angle of P.T.O. joints. This gearbox also has an input speed of 1000 R.P.M., which greatly increases P.T.O. capacity.



NON-EQUAL ANGLES AT P.T.O. JOINTS TO AVOID



EQUAL ANGLES AT P.T.O. JOINTS RECOMMENDED

Angles at each end of P.T.O.

A popular habit is to change snowblower angle in order to obtain a better scraping effect. This practice can become harmful to the P.T.O., angle at each end being unequal. There will be a fan speed variation as well as a drastic increase of load on cross and bearings. **To avoid**, it is recommended to keep tractor P.T.O. shaft and snowblower input shaft always parallel.

Chain Box Maintenance

The purpose of the chain box is to increase the PTO capacity from 540 rpm to 1000 rpm and to reduce angles at both ends of the PTO in working position by increasing the input shaft height.

After first 25 working hours, drain the oil out of the chain box and fill it in with 2.6 L of SAE 80W90 oil.

Drain and change the oil every working season.

PTO shear bolt

When the PTO is running at 1000 rpm instead of 540 rpm, the shear bolt value must be changed. On a PTO size 80, for 540 rpm the shear bolt is 12mm, grade 5. For 1000 RPM It has to be changed to a shear bolt 7/16" dia. Grade 2.

Adjusting the chain tension

After 10 working hours, the chain's adjustment must be checked. In order to do so, verify the backlash between the input and the output shaft by turning the input shaft in both directions while the output shaft remains still. If there is a play of .010 to .015, the chain must then be readjusted as follows:

- Remove PTO from the chain box.
- Unscrew the bolts from covers around the input shaft on both sides of the chain box
- With a hammer and screw-driver or a chisel, gently turn both covers in the same direction until the nest hole of the cover is in line with the threaded hole of the chain box.

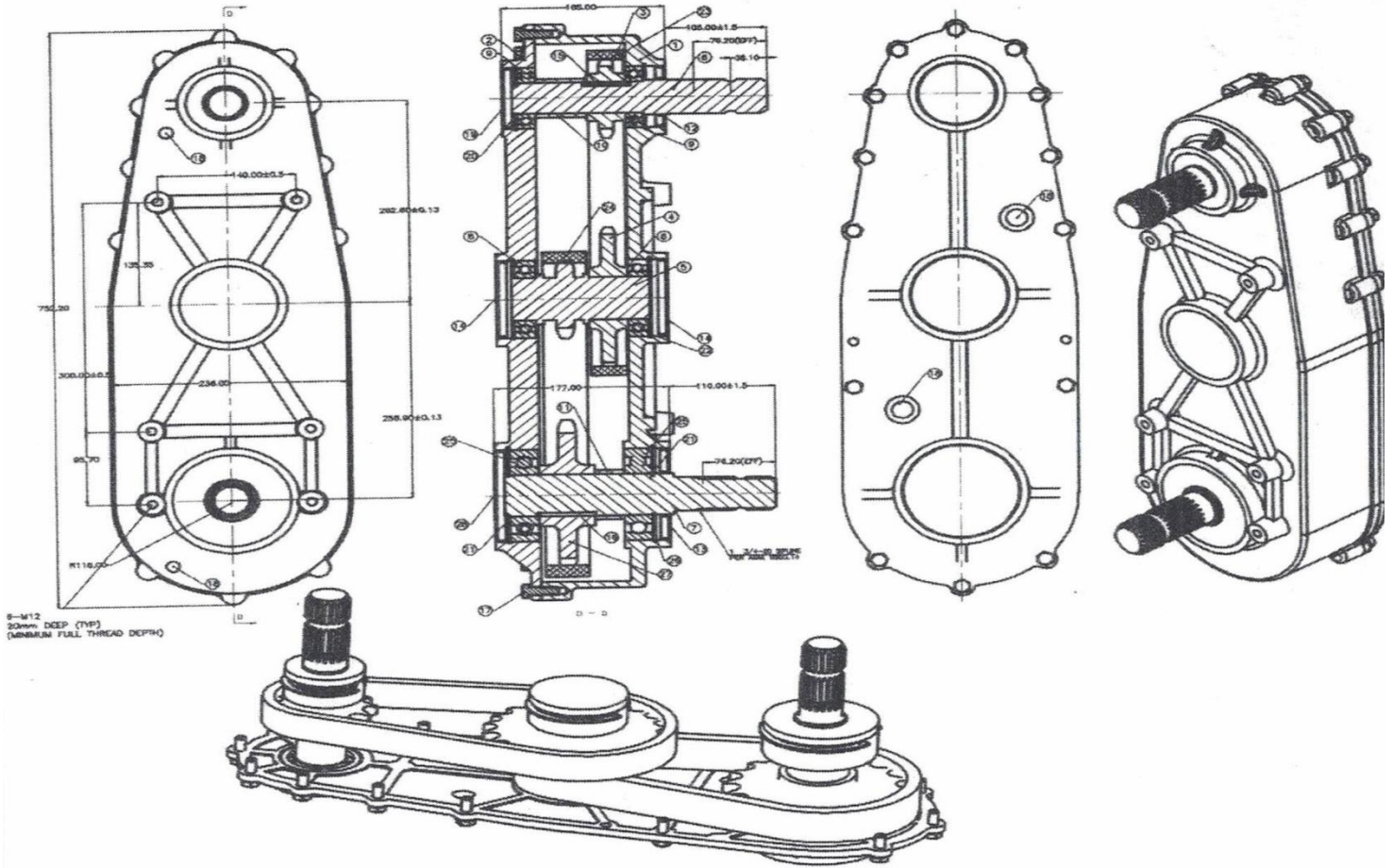
By turning input shaft cover, center to center, the distance of shafts will be changed adjusting the chains tension.

Make sure that the covers are turned in the same direction and by the same number of holes, otherwise, both shafts will not be parallel and serious damages might arise.

Verify the backlash between both shafts, if the difference is too high, repeat the operation. If the backlash is correct, reinstall the bolts and the PTO.

Verify the backlash every 100 working hours.

Chain Box Assembly EC065-007



- | | |
|----------------------|------------------------|
| 1. Housing | 15. Key |
| 2. Top Cap | 16. Key |
| 3. Chain Wheel | 17. Bolt |
| 4. Chain Wheel | 18. 3/8" NPT pipe plug |
| 5. Chain Wheel Shaft | 19. Seal |
| 6. Input Shaft | 20. Snap Ring |
| 7. Output Shaft | 21. Snap Ring |
| 8. Bearing | 22. Snap Ring |
| 9. Bearing | 23. Chain, |
| 10. Small Bushing | 24. Chain, |
| 11. Large Bushing | 25. Bearing |
| 12. Seal | 26. Snap Ring |
| 13. Seal | 27. Chain Wheel |
| 14. Seal | 28. Seal |

Operation Information

It is dangerous to use a tractor which is too big or too powerful, it may overload the stone windrower. If the tractor is too high, extreme angles at PTO shaft universal joints will result and the life of these U-joints will be shortened dramatically.

Place the stone windrower on a firm, level surface that is large enough to accommodate this product, your power unit and all works involved in the mounting process.

65 hp required for PTO driven stone windrower

25 gpm @ 2500 psi required for hydraulic driven

Check hose clearances for any interference.

Operate the controls from the operator's station only.

Never leave equipment unattended with the engine running.

Be aware of added weight and width of this product. Reduce travel speeds accordingly, especially when traveling on rough ground.

Use care on slopes and excessive incline areas.

Check all hardware holding the stone windrower to the power unit making sure all is tight.

Replace any damaged or fatigued hardware with properly rated fasteners.

Make sure all hydraulic hardware and hydraulic fittings are tight.

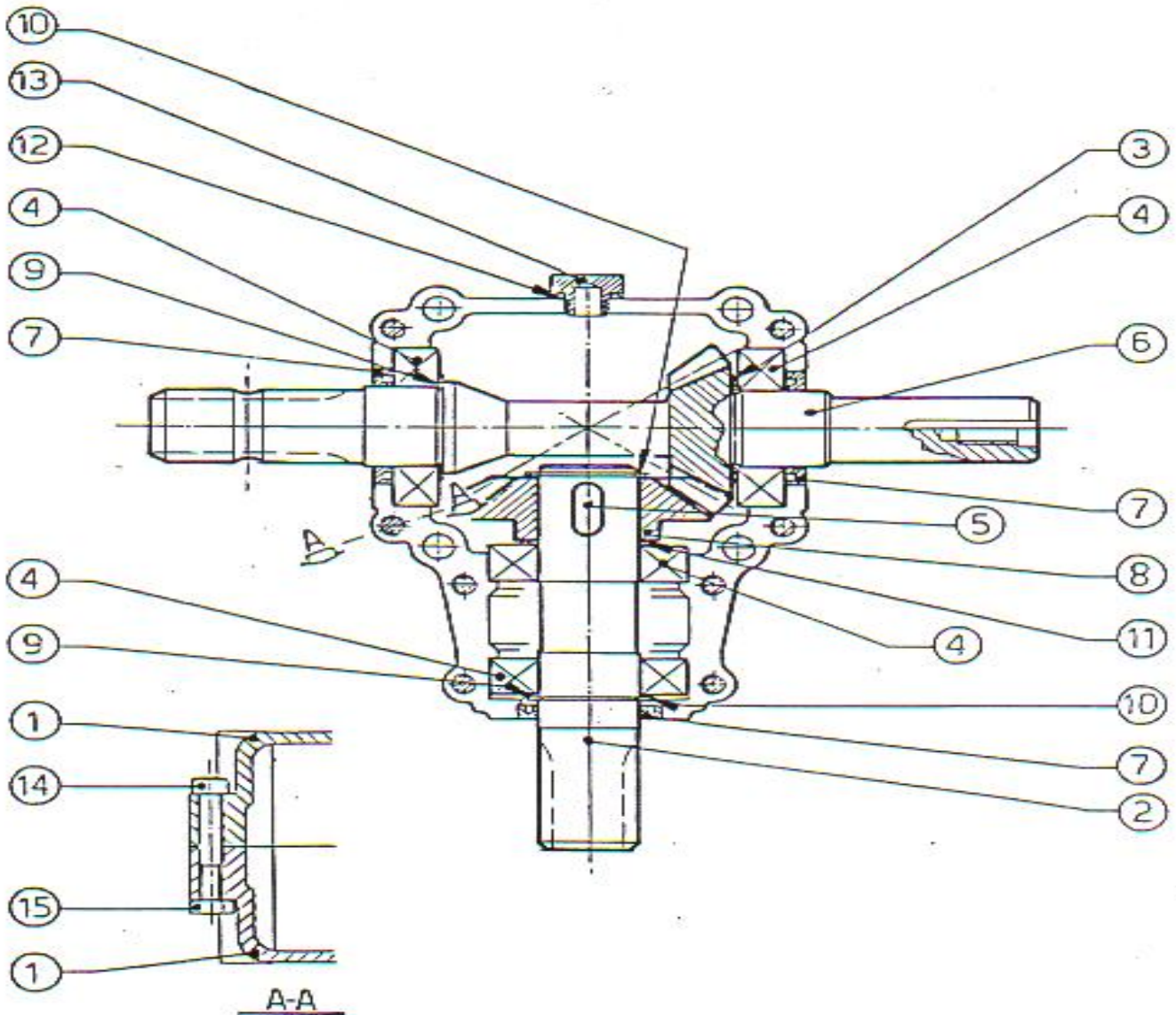
PTO Safety:

- Do not perform any adjustments, cleaning, maintenance or repairs with the engine running. The engine must be stopped and the PTO disengaged.
- Put the PTO control in the neutral position before starting the engine
- If undue vibrations are felt, disengage the PTO, stop the engine and look for causes of vibration. Vibration is usually the indicator of a problem.
- At the end of operation, disengage the PTO, lower the stone windrower, put the transmission in neutral, apply the parking brake, stop the engine and remove the key from the ignition

Hydraulic Safety:

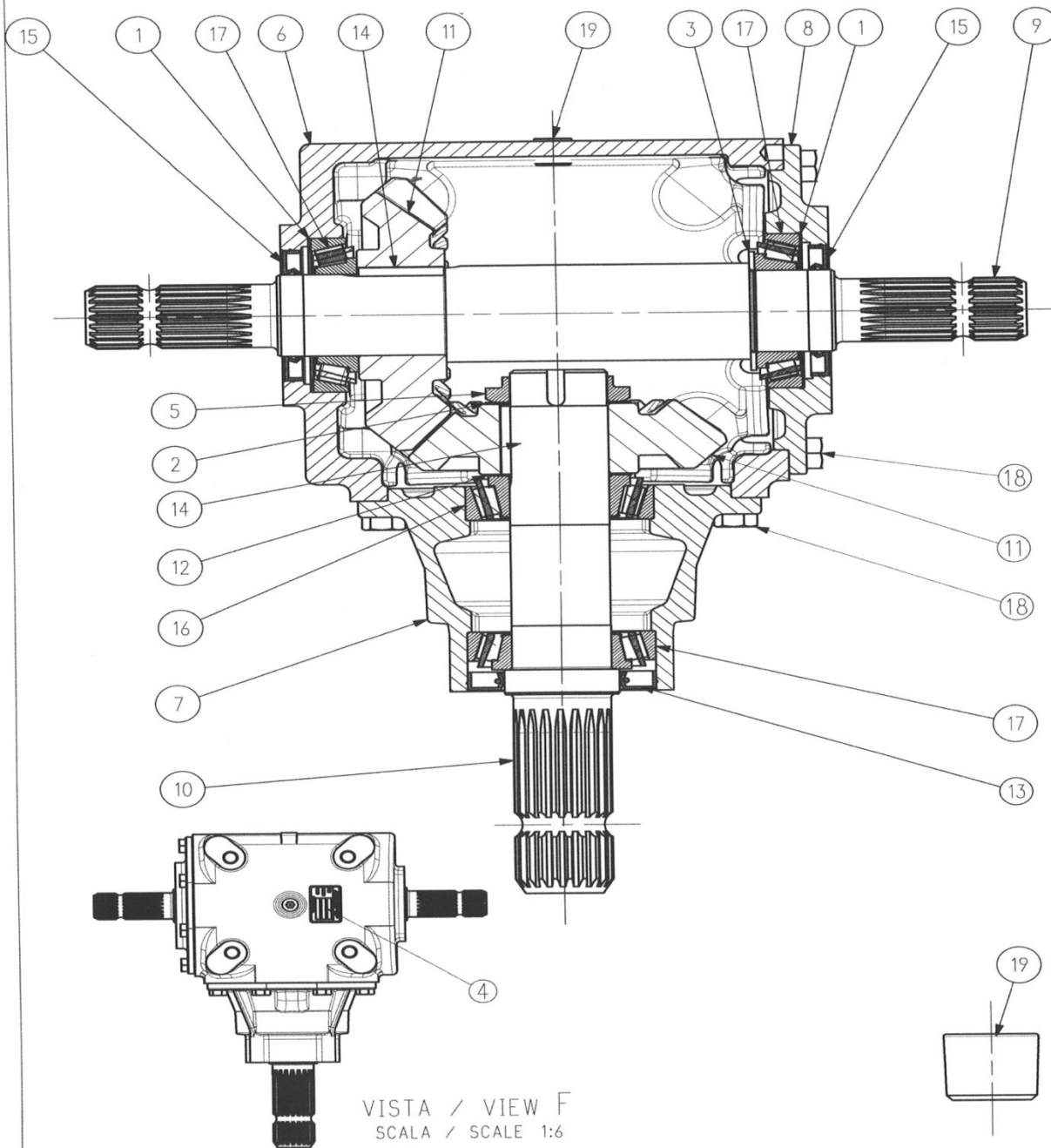
- Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death.
- Hydraulic leaks under pressure may not be visible, wear safety glasses, protective clothing, and use a sound piece of cardboard when searching for hydraulic leaks. **DO NOT USE YOUR HANDS.**
- Before connecting or disconnecting hydraulic hoses, read your power unit's operator's manual for detailed instructions on connecting and disconnecting hydraulic attachments.
- Make certain that all parts meet the specifications for this product when installing or replacing hydraulic hoses or fittings.
- Refer to your power unit's operator's manual and this manual for procedures and intervals, then inspect and maintain the entire hydraulic system to insure that the fluid remains clean, that all devices function properly, and that there is no fluid leaks

T-281A Gearbox



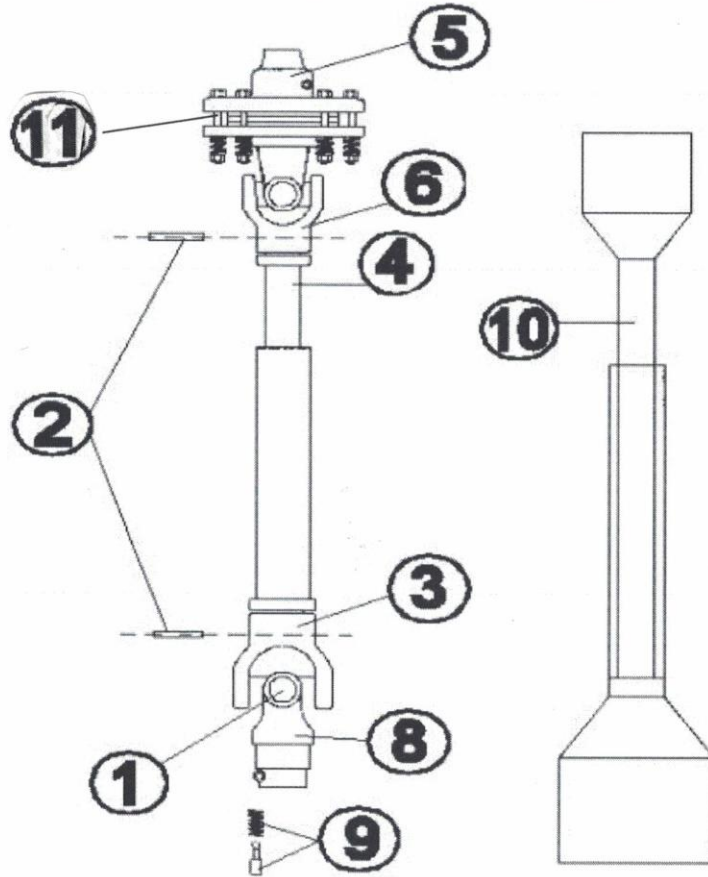
1. Casing
2. Shaft 1 1/4"
3. Shim
4. Bearing
5. Parallel Key A
6. Pinion shaft Z13 M5
7. Oil Seal
8. Crown wheel
9. Shim
10. Snap ring
11. Shim
12. O-Ring
13. Plug
14. Bolt
15. Hex

T-279J Gearbox



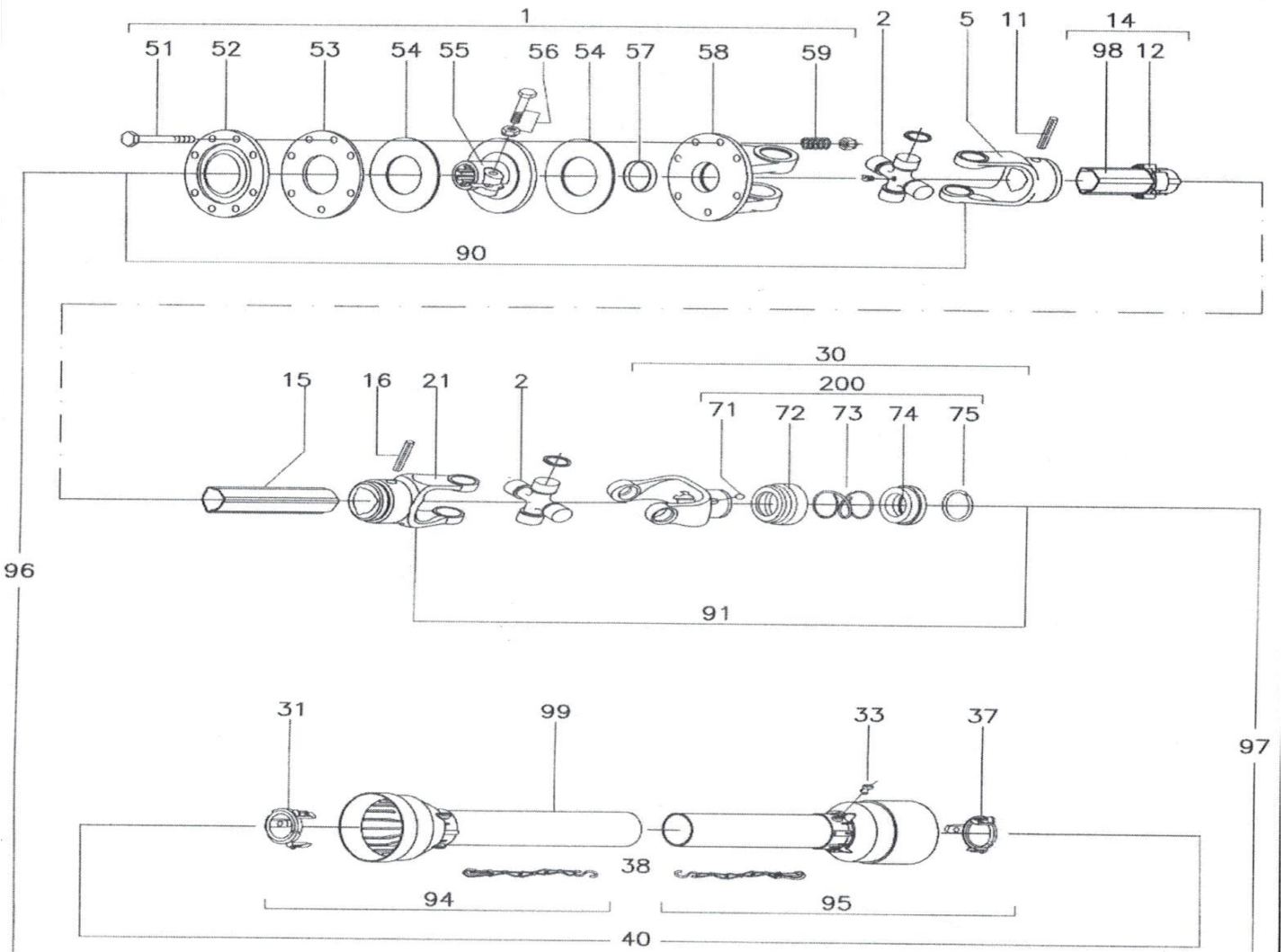
- | | |
|----------------------------|--------------------------------|
| 1 Shim Kit 70.3x84.7 | 11 Bevel Gear, Forged |
| 2 Shim 45.3x65.3x1.0 | 12 Shim Kit 45.3x65.3 |
| 3 Shim 45.3x65.3x2.5 | 13 Double Lip Seal 52x85x10 |
| 4 Name Plate | 14 Parallel Key 14x9x38.5 |
| 5 Locknut M45x1.5 | 15 Double Lip Oil Seal 45x72x8 |
| 6 Housing | 16 Bearing 32209 |
| 7 Extension AC | 17 Taper Roller Bearing 30209 |
| 8 Cover | 18 Hex Bolt M10x22 |
| 9 Shaft 1 $\frac{3}{8}$ " | 19 Plug $\frac{3}{8}$ " gas |
| 10 Shaft 1 $\frac{3}{4}$ " | |

SLIP CLUTCH PTO SHAFT

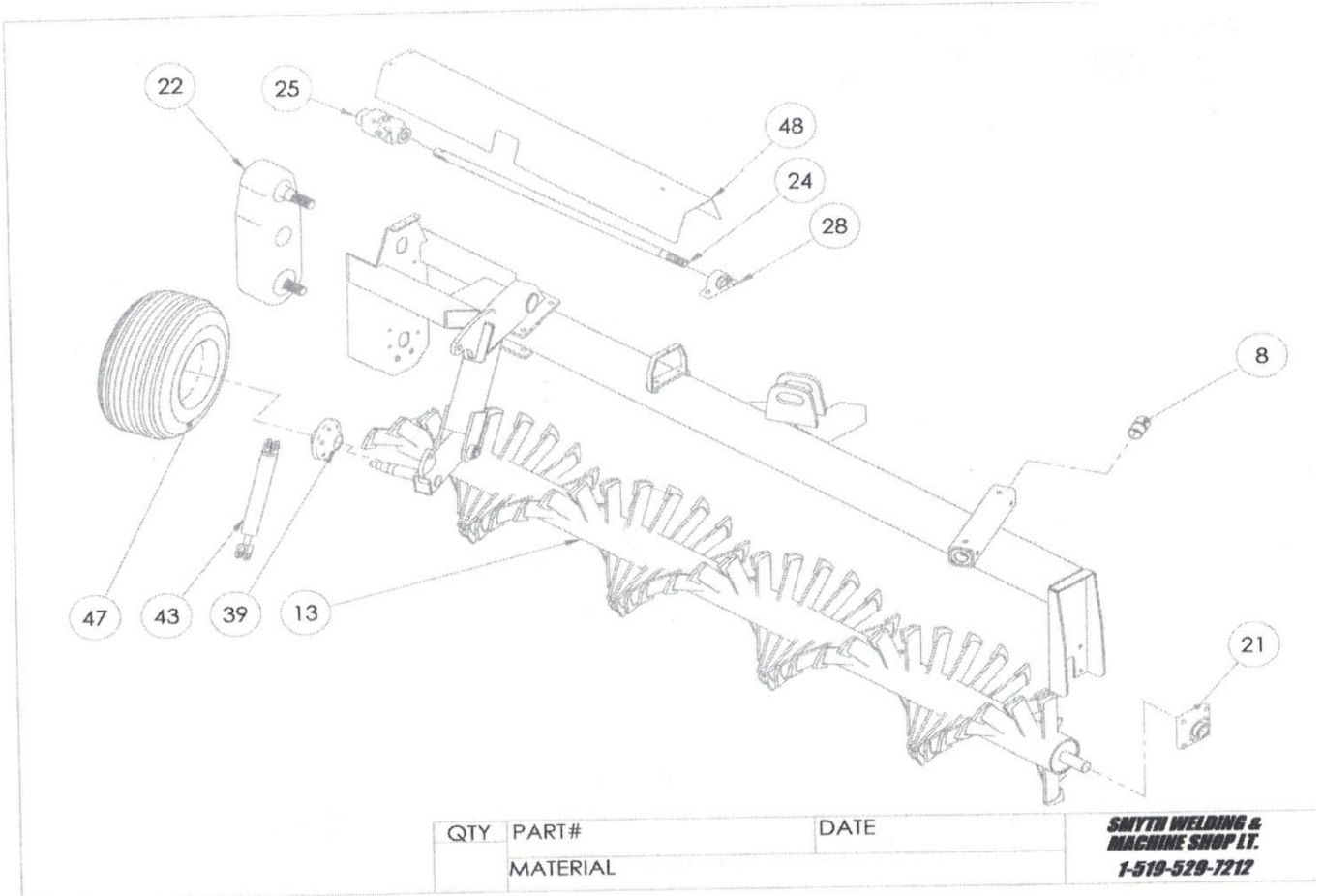


1. Cross Kit
2. Roll Pin
3. Female Tube End Yoke
4. Inner Tube
5. Slip Clutch Assembly
6. Male Tube End Yoke
7. Outer Tube
8. Tractor End Yoke
9. Quick Disconnect Pin
10. Safety Shield
11. Slip Clutch Plates

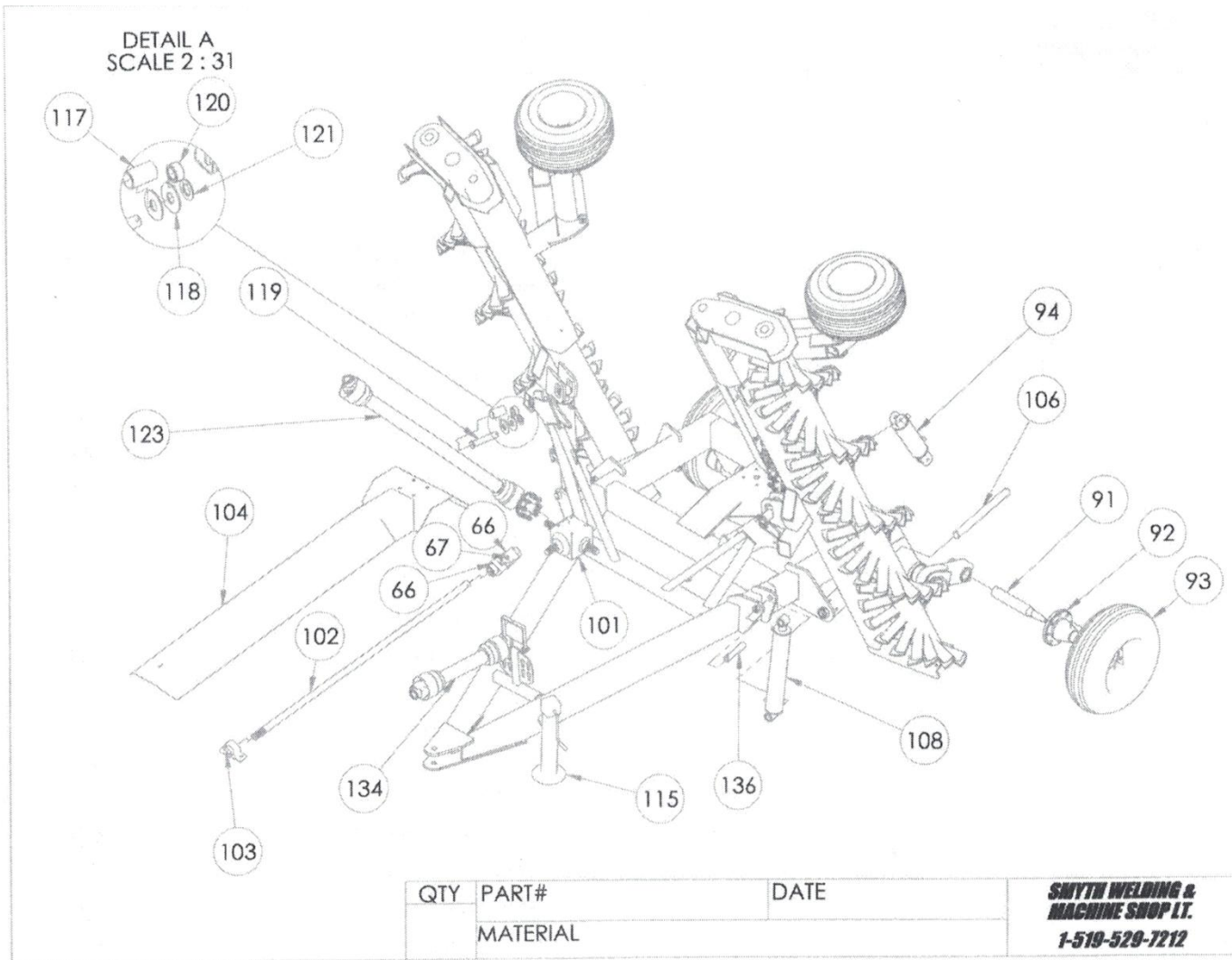
T60 PTO Breakdown



- | | |
|------------------------------------------|----------------------------------|
| 1.Complete Disc Clutch | 55.Clutch Support |
| 2.Cross Journal | 56.Bolt & Nut |
| 5.Outer Yoke | 57.Bushing |
| 11.Roll Pin for Outer Tube | 58.Flanged Yoke |
| 12.Bushing w/ G.F. | 59.Spring |
| 14.Complete Outer Tube | 71.Ball ½"ø |
| 15.Inner Tube | 72.Fixed Sleeve |
| 16.Roll Pin for Inner Tube | 73.Spring |
| 21.Inner Yoke | 74.Sliding Sleeve Collar |
| 30.Complete Collar Yoke | 75.Outer Circlip |
| 31.Guard Retaining Collar | 90.U Joint for Outer Tube |
| 33.Bolt | 91.U Joint for Inner Tube |
| 37.Guard Retaining Collar for Inner Tube | 94.Half Female Guard |
| 38.Safety Chains | 95.Half Male Guard |
| 40.Complete Guard | 96.Half Female Shaft w/Guard |
| 51.Bolt & Nut | 97.Half Male Shaft w/ Guard |
| 52.Pressure Plate | 98."Danger" Label for outer tube |
| 53.Inner Plate | 99."Danger" label for Inner Tube |
| 54.Lining Ring | 100.Instruction Manual |
| | 200.Kit Collar |



- 8.Brass Bushing
- 13.Rake/Drum
- 21.Rake/Drum Bearing
- 22.Chain Box
- 24.Cross Shaft
- 25.Universal Joint
- 28.Cross Shaft Bearing
- 39.Wheel Hub
- 43.Hydraulic Cylinder
- 47.Wheel
- 48.Cross Shaft



- | | |
|-----------------------|------------------------------|
| 66.U Joint | 108.Wing Cylinder |
| 67.Cross Kit | 115.Removable Jack |
| 91.Spindle | 117.Long Float Roller |
| 92.Wheel Hub | 118.Float Washer |
| 93.Wheel | 119.Float pin |
| 94.Rear Lift Cylinder | 120.Small Float Roller |
| 101.Main Gearbox | 121.Float Pin Machine Washer |
| 102.Main Drive Shaft | 123.Wing PTO |
| 103.Bearing | 134.T80 PTO |
| 104.Shield | 136.Cylinder Base Pin |
| 106.Wing Hinge Pin | |



1. Hydraulic Hose Kit

2. Jack for Hydraulic Model

3. Safety Chains



4. Stroke Control

5. Hydraulic Cylinder

6. Safety Shield



7. Cylinder Lock Up

8. Hydraulic Cylinder



9. Male Pioneer Ends

10. Light Plug

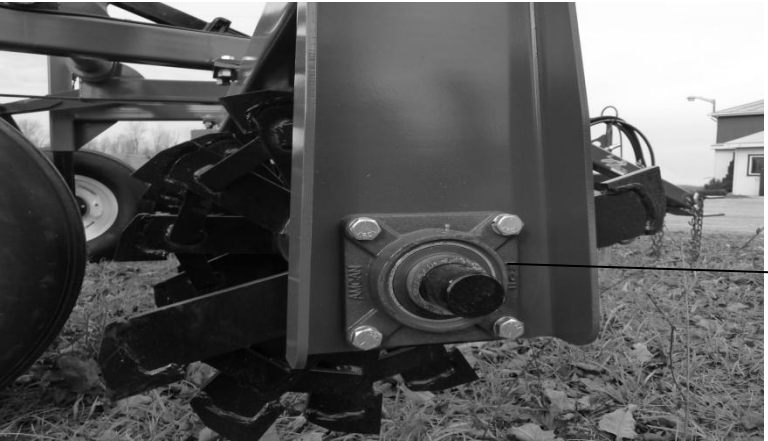
11. Hydraulic Motor with Chain Coupler



12. Chain Box Assembly



13. Bearing w/ 4 bolt flange



14. Gear Box

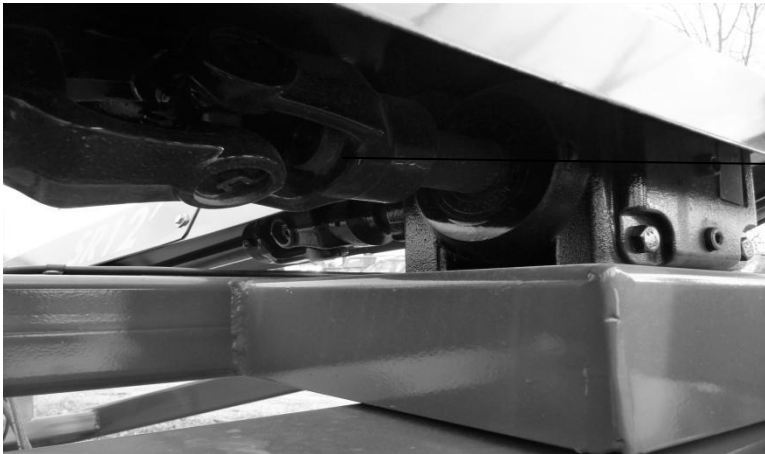




15. Safety Shield

16. Bearing w/ grease fitting

17. Input Shaft



18. Cross Shaft



19. Input Shaft Universal



20. Yoke & Cross Kit



21. PTO w/ slip clutch

22. Jack for PTO Model



23. Slip Clutch & Slip Clutch Discs



24. Ag Tire w/ 6 Bolt Hub



25. Turn Buckle



26. Single Ag Light

Trouble Shooting

<u>Quick Disconnect Yoke</u>		
Pin tight or seized	-quick-disconnect pin dirty (insufficient maintenance)	-clean, oil and follow service instructions
Pin damaged/broken	-quick-disconnect pin defective(forced engagement, incorrect handling)	-replace quick-disconnect pin
Pin damaged in locking portion	-excessive shaft length -axial loads too high	-shorten shaft length(cut both telescopic tubes as well as shields and remove burrs) -replace disconnect pin & -clean and grease telescopic tubes, and replace both tubes, if necessary
<u>Yoke</u>		
Distorted or worn	-excessive shaft length -axial loads too high -excessive working angle and torque	-shorten shaft length (cut both telescopic tubes as well as shields and remove burrs) -replace disconnect pin & -clean and grease telescopic tubes, and replace both tubes, if necessary -change PTO length -determine proper PTO angle (see page 7)

<u>Cross Kit</u>		
Cross arms broken	-extreme torque	-engage PTO carefully
Bearing caps turning in cross journal	-excessive torque or angle	-change PTO length -determine proper PTO angle
Overheating or Accelerate wear	-inadequate grease	-grease parts at proper intervals
<u>Telescopic Tube</u>		
Failure or twisting	-extreme torque -tube is too short	-engage PTO carefully -replace tube with correct length
Accelerated wear	-tube is too short -inadequate grease	-replace tube with correct length -grease parts at proper intervals
<u>PTO Shield</u>		
Excessive bearing wear	-inadequate grease	-grease parts at proper intervals
Safety chain failure	-incorrect safety chain mounting	-change safety chain mounting angularity
Damaged or worn	-contact with implement	-adjust to eliminate interference

<u>Hydraulic System</u>	-oil level low	-add oil until it reaches 2" from top
Over heating	-restriction in hoses -poppet is unseated	-remove bends in hoses and any other obstruction -reseat poppet or replace coupler
Quick coupler leaks	-tank is over filled	-drain oil until it reaches 2" from top
Oil flows from breather cap on tank	-exceeding maximum gpm and psi	-contact your dealer
Motor seals leak	-motor is failing	-contact your dealer



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