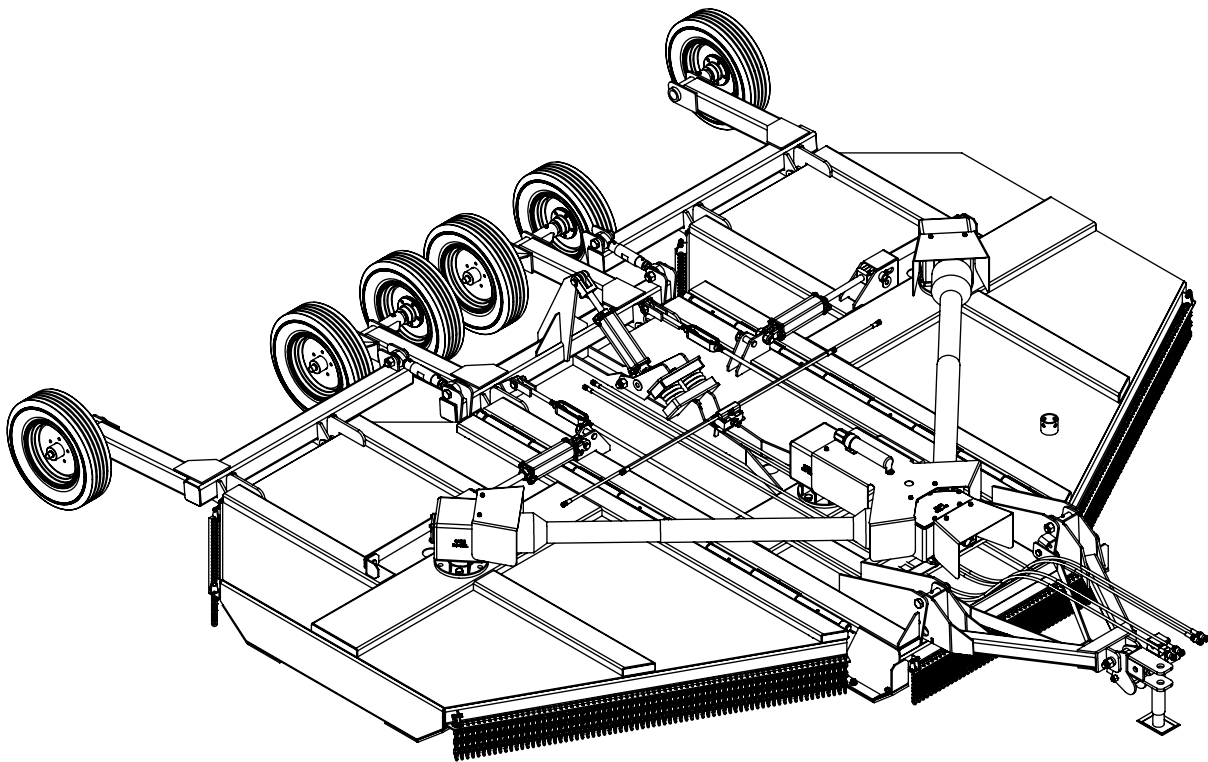


PULSAR WING PW180

Pulsar Wing Rotary Cutter Operator's / Parts Manual



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 **MK MARTIN**
ENTERPRISE Inc.

REV: 18-1

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Warranty

Effective on products retailed on or after November 1, 2017

Two Year Limited Consumer Warranty

Five Year Limited Consumer Warranty on Gearboxes

90 Day Limited Commercial Warranty including Gearboxes

Commercial includes rental and industrial applications.

Warranty begins at the time of customer delivery and is activated upon warranty registration receipt at MK Martin Enterprise Inc.

Warranty coverage is null and void unless the Warranty Registration form has been completed in full and is on file at MK Martin Enterprise Inc.

Keep your registration copy in a safe place, it is required as proof of warranty activation.

This new and unused product is warranted by MK Martin Enterprise Inc. to be free from defects in material and workmanship under normal use and regular service as described in the owner's manual, for a consumer period of 2 years and 5 years for gearboxes, from the date of delivery, and commercial period of 90 days, including gearboxes, from the date of delivery. Warranty is limited to the replacement of parts and / or repair of the product.

If issues develop within the warranty period with the product, contact the local dealer from which you purchased the unit. Only MK Martin authorized dealers may make repairs to the product or affect the replacement of defective parts, unless otherwise approved by MK Martin. Repairs / replacement will be done at no charge within a reasonable time after the receipt of the product.

This warranty does not cover the following items:

1. Normal replacement of service items.
2. Normal maintenance or adjustments.
3. Machines or parts lost or damaged during shipment,
4. Accessory items / parts not supplied by MK Martin
5. Damages resulting from:
 - misuse, negligence, accident, theft or fire
 - use of improper or insufficient fuel, fluids or lubricants
 - use of after market parts or accessories, unless approved by MK Martin
 - modifications, alteration, tampering or improper repair
 - any device or accessories installed by other than an authorized dealer.
6. Tires are covered by the manufacturer of the tire and the warranty period specified by that manufacturer. **Please contact the tire manufacturer for warranty on these items.**

MK Martin Enterprise Inc. shall not, in any event, be liable for any losses, damages or costs; to include profits, travel, transportation, pick up, delivery, towing cost, tow vehicle, loss of use, whether special, incidental, consequential or otherwise, in any way. Unit or parts are returned at the customer's expense.

Include a copy of your completed Warranty Registration form with any claim as proof of warranty activation.

There are no warranties, expressed or implied, other than those specified herein. No agent, employee or other person has any authority to vary any of the foregoing provisions.

Warranty coverage is null and void unless the Warranty Registration form has been completed in full and is on file at MK Martin Enterprise Inc. Warranty begins at the time of customer delivery and is activated upon Warranty Registration receipt at MK Martin Enterprise Inc.

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira ON CA N3B 2Z3

Purchaser's warranty protection is valid only when this completed form or a copy of this form is on file at M K Martin Enterprise Inc. By filling out this form the purchaser has acknowledged delivery of equipment and owner's / operator's manual and has accepted the condition of the equipment.

Date of delivery to purchaser -----

Type of Equipment -----

Model # ----- **Serial #** -----

Retailer's Signature Indicates

- *Equipment was properly assembled as directed by manufacturer*
- *Equipment was tested for functionality and operates properly*
- *Purchaser was instructed in safe and proper operating procedures*
- *Warranty was explained to purchaser*
- *Purchaser was given the operators manual*

Retailer

Signature -----

Company -----

Address -----

Purchaser's signature indicates

- *Acceptance of equipment fully assembled*
- *Received operator's manual*
- *Clearly understands conditions of warranty*
- *Received instructions of safe and proper operation of equipment*

Purchaser

Signature -----

Company -----

Mailing address -----

City ----- **Prov/State** ----- **Postal Code/Zip** -----

Available phone number -----

Warranty is valid only when it has been received by manufacturer at address above

Warranty Registration

Please Cut and Return to M K Martin Enterprise Inc

Fold And Tape here

Do not tape all edges or use staples

Fold Here

Postage
Stamp

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira ON CA N3B 2Z3

Safety

Take Note! This safety 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!**

Signal words are used in this manual.

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

Warning: Indicates a 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.

If you have any questions not answered in this manual please contact your dealer or

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Safety -- It's in your interest!

Before using this equipment!

Thoroughly read and understand the instructions given in this manual before operation. Refer to the safety decal section and read all instructions noted to them.

Do not allow anyone to operate this implement who has not fully read and comprehended this manual and who has not been properly trained in the safe operation of the implement. Review operator's manual annually.

Be sure that you know the dangers and safety concerns while operating this equipment!

Understand that your safety and the safety of other persons are measured by how you service and operate this machine.

The safety information given in this manual does not replace safety codes, federal, state or local laws. Make certain your machine has the proper equipment as designed by local laws and regulations.



Warning!



Operator should be a responsible adult. Do not allow persons to operate or assemble this unit until they have developed a thorough understanding of safety precautions and how it works.

- Do not use this machine while under the influence of drugs or alcohol.
- The operator should be familiar with all functions of the tractor and attached implement, and be able to handle emergencies quickly.
- **Keep hands, feet, and clothing away from power-driven parts.**
- **Do not wear loose-fitting clothing which may catch moving parts.**
- **Always wear protective clothing and substantial shoes.**
- **It is recommended that hearing and eye protection be worn.**
- Make sure all guards and shields are in place and secured before operating implement.
- **Keep all bystanders, especially small children away from equipment and work area before starting.**
- Place all controls in neutral, stop tractor engine, set park brake, remove ignition and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging the cutter.
- Place all tractor controls in neutral before starting.
- **Start tractor and operate controls from the driver's seat only. Never from the ground.**
- Do not operate the tractor inside a building unless there is adequate ventilation.
- **Never dismount from a moving tractor or leave tractor unattended with engine running.**
- Never adjust, service, clean, or lubricate implement until all power is shut off.



Safety -- It's in your interest!

- Do not allow anyone to stand between tractor and implement while backing up to implement.
- Stay clear of the machine when engaging the PTO. Keep others away.
- If equipment has been altered in any way from original design, manufacturer does not accept any liability for injury or warranty.
- Objects can be thrown out from the cutter with sufficient force to severely injure people or pets. Stay away from mower when it is running, keep others away.
- Watch out for fences, trees, rocks, wires, etc., while operating and transporting implement.
- Clean reflectors, SMV sign and lights if used, before transporting.
- When transporting use hazard flashing lights.
- Detach and store implement in an area where children normally do not play. Secure implement using blocks and supports.

WARNING ! Always block cutter securely before working on or under cutter.

Tractor Requirements

WARNING: Do not use too small a tractor. Tractors that are too small can be pushed around and/or flipped over by the weight of the cutter. Tractors that are too large can damage the cutter.

Fasten seat belt securely. If equipped with a fold-able Roll-Over Protective Structure (ROPS), only fasten seat belt when ROPS is up and locked. DO NOT wear seat belt if ROPS is down.

Tractor horsepower should be within the range noted below. Tractors outside the range must not be used.

Horsepower Rating 75 - 120 hp

PTO speed 540 rpm

Hydraulics - Two hydraulic remotes are required.

Hydraulic Leak Test



Warning! Do not check for high pressure leaks with your hands or fingers. Use a piece of cardboard or a thin piece of wood to detect the leak.

A high pressure stream of fluid from a pin hole can penetrate the skin and inject hydraulic fluid into your blood veins.

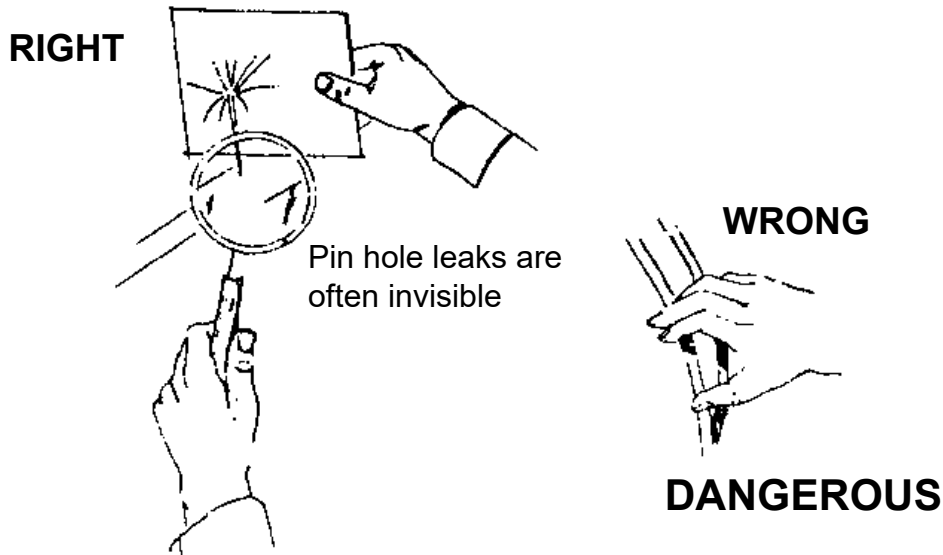


Figure 1. Detecting pinhole leaks in a hydraulic system.



IF THE SKIN HAS BEEN PENETRATED GET MEDICAL ATTENTION IMMEDIATELY!



Hydraulic lines may have high pressure fluid in the lines, even when the lines are disconnected.

Remember a small leak at high pressure may be invisible yet can penetrate the skin. If this happens get medical attention immediately, serious infection or toxic reaction can develop when hydraulic fluid pierces the skin.

Use caution when working with hydraulic components. Ensure there are no leaks, all fittings are tight and all components are in good repair.



Use a piece of wood or cardboard as a backstop when searching for leaks, **NEVER** your hand or fingers.



Always relieve pressure before disconnecting or working on hydraulic system.



Lighting and Marking



It is the responsibility of the customer to know lighting and marking requirements of local highway authorities and to install and maintain equipment to provide compliance with regulations. Add extra lights when transporting at night or during periods of limited visibility.

Inspect all the lights to ensure they are all working.

Inspect all the reflectors and SMV emblem to ensure that they are all visible and in the proper place.

Keep safety signs clean and legible at all times.



Transportation and Highway Operation



When traveling on public roads, use accessory lights, SMV sign, clean reflectors, and other adequate devices to warn operators in other vehicles of your presence. Always comply with all federal, state, and local laws.

Travel Speeds should be such that complete control and machine stability is maintained at all times. Where possible avoid operating near ditches, embankments and holes. **Reduce speed** when turning, crossing slopes and rough, slick or muddy surfaces.

When towing always have the draw-pin locked and secured, always have the safety chain fastened in the proper position.

IMPORTANT: Always disengage PTO before raising implement to transport position.

IMPORTANT: Determine at what angle the rear tractor tires come in contact with the deck and/or the hitch, avoid hitting cutter with tractor tires as damage may result.

Always raise wings and set transport locks before transporting from one work site to another and before traveling on public roadways. The wings can fall if not secured with transport locks causing a serious injury or death.

Do not exceed maximum transport speed of 32 km/h (20 mph) with implement attached. Travel below 32 km/h (20 mph) on rough terrain or when making turns.

When towing equipment without brakes.

Do Not travel at speeds over 32 km/h (20 mph); when fully loaded weighing more than 1.5t (3300 lbs) or more than 1 1/2 times the weight of the towing unit.

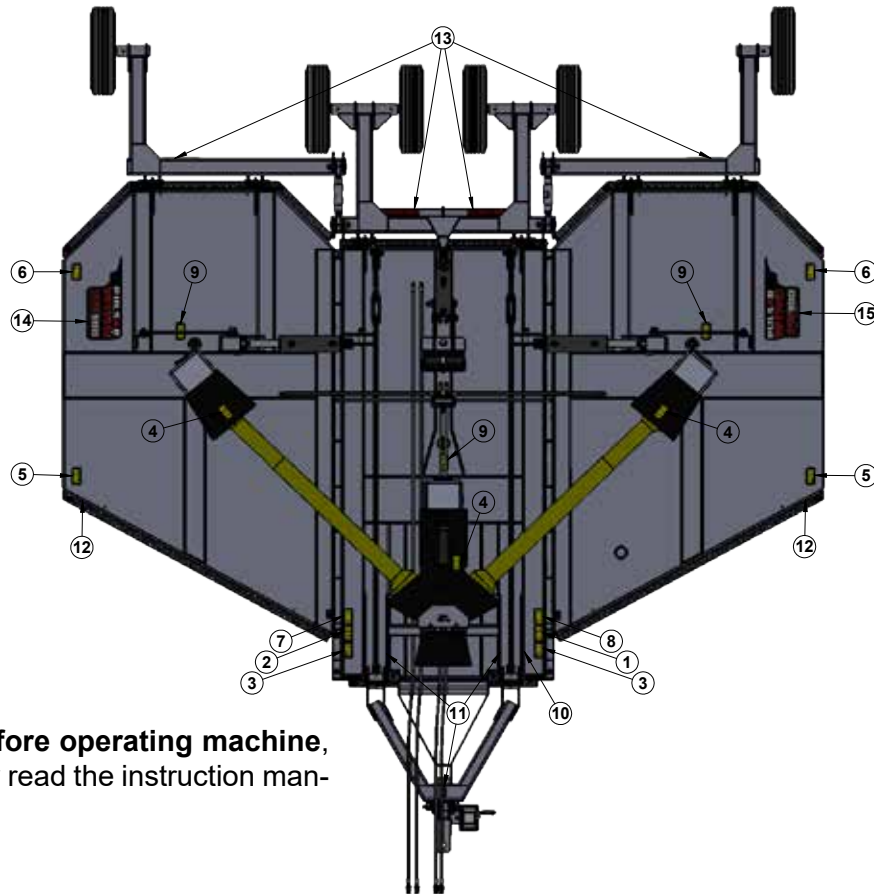
When towing equipment with brakes.

Do Not tow equipment with brakes over 40km/h (25 mph) when fully loaded, weighing more than 4 1/2 times the weight of the towing unit.

Be observant of bridge load ratings. Do not cross bridges rated lower than gross weight at which you are operating.

When traveling on roadways, transport in such a way that faster moving vehicles may pass you safely

Decal Location



Serial plate



#1 - Before operating machine, carefully read the instruction manual



#2 - Before any operation of maintenance a/or adjustment, stop, brake the tractor on level ground, lower the machine to the ground and read the instruction manual.



#3 - DANGER of being crushed. Stay away from cutter wing area, Do not get between the cutter wing and the ground.



#4 - DANGER of being caught by the PTO shaft. Do not go near the rotating members of the machine while in operation.



#5 - DANGER of possible shearing of limbs. Keep a safe distance from the machine while it is working.

Decal Location



#6 - DANGER. Sharp objects could be thrown. Keep safe distance from the machine



#7 - DANGER of possible crushing or shearing of limbs. Never reach into the crushing danger areas as long as parts may move.



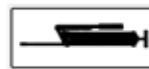
#8 - DANGER. Avoid fluid escaping under pressure, Consult manual for service procedures.



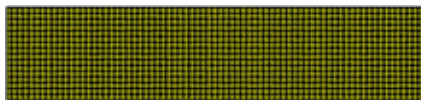
#9 - DANGER. Wait until machine components have completely stopped before touching them.



#10 - MK Martin Made in Canada



#11 - Grease



12 - Part# - 24350



13 - Part# - 24349



14 - Part# - Pulsar Wing PW180



15 - Part# - Pulsar Wing PW180

Assembly Information

Assembly of this cutter is the responsibility of the Dealer. It should be delivered to the owner completely assembled, lubricated and adjusted for normal cutting conditions.

The cutter is shipped partially assembled. Assembly will be easier if components are aligned and loosely assembled before tightening hardware.

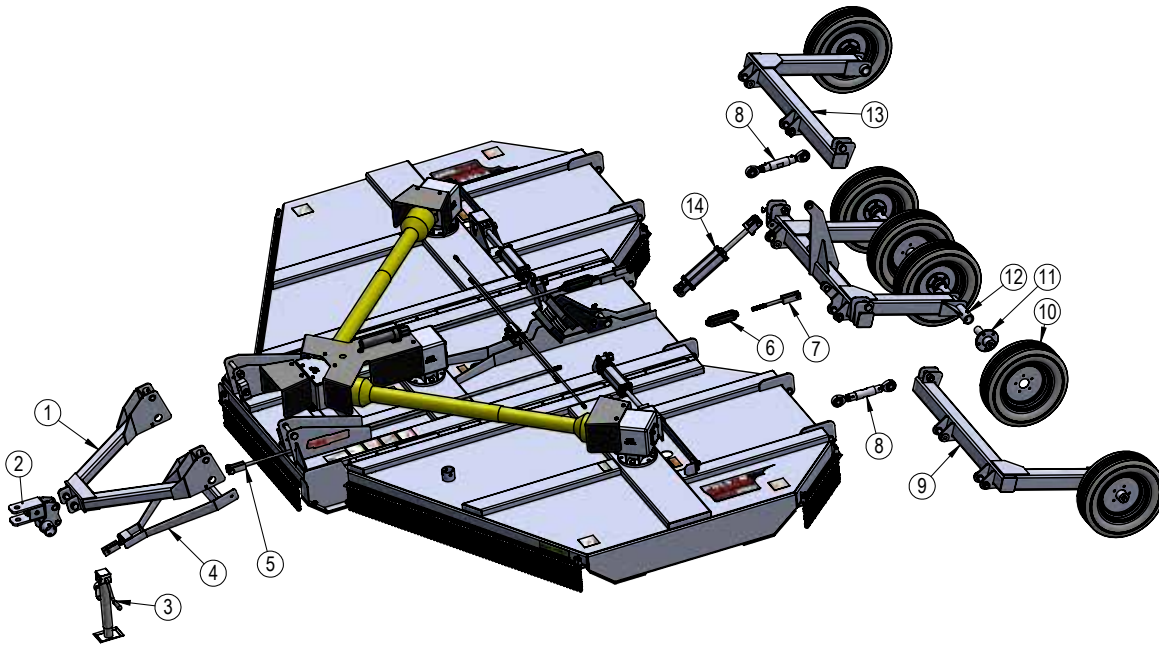
Select a suitable working area. A smooth hard surface, such as concrete, will make assembly much quicker. Open parts and lay out parts and hardware to make location easy. Refer to illustrations, accompanying text, parts lists and exploded view drawings.

INSTALLATION INSTRUCTIONS

- Attach main tongue (#1) to front of cutter with two 1 x 7" bolts and lock nuts.
- Install left and right tie rods (#5) to main tongue (#1) with 3/4 x 2 1/2 bolts and lock nuts.
- Attach hitch (#2) to main tongue (#1) with 1 x 8 bolt and locknut.
- Attach jack (#3) to mount and secure with pin.
- Place parallel link frame (#4) under main tough (#1) fasten rear to cutter with two 5/8 x 1 3/4 bolts and lock nuts. Attach front of frame (#4) to hitch (#2) with 5/8 x 4 bolt and locknut.
- Attach main wheel frame (#12) to back of cutter fasten with hinge pins provided.
- Attach short tie rods (#7) to wheel frame (#12) with 3/4 x 2 1/2 bolts and lock nuts. Fasten tie rods (#5) to short tie rods (#7) with coupler (#6)
- Attach wheel frame (#9) to cutter wing with hinge pins provided.
- Repeat for wheel frame (#13)
- Insert hub and spindle assemblies (#11) into spindle sleeves and fasten with 3/8 x 3 bolts and lock nuts mount wheels (#10) and tighten to specified torque (see bolt torque page).
- Connect turn buckles (#8) to wheel frames and to cutter with 1 x 4 bolts and lock nuts.
- Connect hydraulic cylinder (#14) to main wheel frame and to cutter with pins supplied.
- Hitch power unit to cutter and attach PTO **NOTE: Due to variations in distances between tractor PTO shafts and implement input shafts, drive-lines may need to be shortened or a longer shaft may be required. When fitting the implement to the tractor, the PTO drive-line, with telescoping sections, must be inspected.**

When the sections are at the most compressed operating position, the sections must not "bottom out". At its shortest length, there must be at least 2" (50.8 mm) of clearance between each section end and opposite section end at the most compressed operating position. When the sections are at the most extended position, there must be sufficient engagement between the sections. At its farthest operating extension, a minimum section engagement of 33% of shaft length must be maintained. (For direction on how to cut PTO turn to page 11)
- With cutter hooked to tractor go through the full range of motion lifting cutter up and letting it down turning tractor to the left and right as sharp as possible and, **Make sure the PTO does not bottom out or go past the 2" mark.**

Assembly Information



WARNING! Always block cutter securely before working on or under cutter.

Leveling center Deck and Wings

These adjustments should be made with your cutter hooked to the tractor operating the unit or to a tractor having the same drawbar height.

1. With cutter attached to a tractor, disengage PTO, and park on a level, hard surface. Place tractor gear selector in park or set park brake.
2. Wait for blades to come to a complete stop and then fold wings up to transport position.
3. Using hydraulic lift, adjust center deck height so that front skids are 2 to 3 inches above ground.
4. Shut tractor engine off and remove switch key before dismounting from tractor.
5. On both sides of the center deck are continuous hinges. Measure distance from bottom of hinges to ground at the front and back. They should be equal distance off the ground at the back and 1" closer to the ground at the front than they are at the back.

If continuous hinges are too high at the front:

Loosen Couplers (#6) an equal amount to lengthen both leveling rods until hinges are inclined from front to back by 1" with the front being closer to the ground than the back.

If continuous hinges are too low at the front:

Tighten Couplers (#6) an equal amount to shorten both leveling rods until hinges are inclined from front to back by 1" with the front being closer to the ground than the back.

6. Be sure both sides are equal distance from ground to continuous hinges and that left and right leveling rods have equal tension. Re-tighten jam nut.

Assembly Information

Wing Deck Leveling

Each wing section will need adjusting if wing top is not level with center deck top when wings are unfolded.

1. With tractor hydraulics, lower wings down. Pull cutter straight forward six to ten feet to allow outer wing wheels to properly align themselves.
2. Check wing tops to see if they are level with the top of the center deck. If the outer edge of either wing top is higher or lower than the center deck, then that wing should be leveled as follows:
 - **A.** If outer wing edge is higher than the center deck, loosen jam nut & rotate turnbuckle (#8) counterclockwise to lower outer wing edge until wing is level. Tighten jam nut to the correct torque when level.
 - **B.** If outer wing edge is lower than the center deck, loosen jam nut and rotate turnbuckle (#8) clockwise to raise outer wing edge until wing is level. Tighten jam nut to the correct torque when level.

Transport Locks

IMPORTANT: Always disengage tractor's PTO & wait for blades to come to a complete stop before raising cutter wings to transport position. Wing drivelines, wing gearboxes, and splitter gearbox can be damaged if driveline is turning.

Cutter wings will need to be raised before transporting on a roadway, through narrow gate openings and when servicing the deck underside.

- Disengage tractor PTO and wait for cutter blades to come to a complete stop before raising wings.
- Remove hairpin clip from storage pin, Rotate end of transport lock bar to transport pin. Secure with hairpin.
- Repeat for the other wing. Your cutter is now ready for transporting.



WARNING: Always raise wings and set transport locks before transporting from one work site to another and before traveling on public roadways. The wings can fall if not secured with transport locks causing a serious injury or death.

DANGER: Do not raise one or both wings up with PTO engaged or drivelines rotating. Objects can be thrown by rotating blades. Always keep people away from a cutter that is operating.

DANGER Do not operate cutter without both wings attached. Removing one wing will expose blades and increase risk of rollover. Removing both wings will expose blades on both sides. Exposed blades can result in serious injury and/or death.

Operating

Applications

The Pulsar Wing Cutter is designed and built by MK Martin to provide excellent cutting performance on gently sloping or slightly contoured right-of-ways, pastures, set-aside acres, or row crop fields. The 15' cutting width and ability to cut weeds and brush up to 1 1/2" in diameter make them well-suited for these applications, to cut long grass and scrub land with small trees or saplings. The cutter will work best on dry conditions. When cutting damp or longer grass, use slower travel speed and you may need to frequently clean the underside of the cutter deck. Power to the blades is provided by the tractor through a PTO Shaft and Gearbox. The Cutter is designed for a 540 RPM PTO speed and will give the best performance at this speed.

Many features in this cutter are the result of suggestions made by customers like you. By following the operating instructions in conjunction with a good maintenance program, your Pulsar Wing Cutter will provide you with many years of service.

Pre - Operation

It's now time to do a running operational safety check. It is important that at any time during this safety check you detect a malfunction in either the cutter or tractor that you immediately shut the tractor off, remove the key, and make necessary repairs and/or adjustments before continuing.

Before starting the tractor, make sure the park brake is engaged, PTO is disengaged, and cutter is resting on the ground with both wings down.

Start the tractor and set engine throttle speed at a low idle. Raise cutter with tractor's rear hydraulic lift control lever to transport position making sure that the PTO shaft does not bind and does not contact the cutter frame. Lower cutter to the ground and at a low engine speed engage PTO. If everything is running smoothly at a low idle, slowly raise the cutter to transport height checking for bind or chatter in the driveline. Lower cutter to the ground and increase tractor's engine rpm until the PTO reaches 540 rpm. If everything is still running smoothly, once more raise the cutter to transport height to check for driveline bind or chatter. Lower cutter to the ground, return engine to a low idle, and **disengage the PTO**.

Make a tight turn to ensure that the rear tractor tires are not coming in contact with the hitch or deck. Also, be sure tractor 3-point arms are raised and will not contact main driveline.

You should now be ready to transport to your cutting site at a safe ground speed. On roadways, transport in such a manner that faster moving vehicles can easily see you and pass you safely. Reduce your speed when traveling over rough and hilly terrain. Avoid quick or sharp steering corrections. Take extra care to ensure that the mower doesn't come into contact with obstacles such as trees, buildings, or fences. Use accessory lights and appropriate reflective devices to provide adequate warning to pedestrians and other vehicle operators when traveling on public roads and in the dark of night. Comply with all local, state and federal laws.

Operating

Cutter Operation

It is important that you inspect the area where you will be cutting and clear it of safety hazards and foreign objects either before or after you arrive at the cutting site. Cut only in areas which you are familiar with and are free of debris and unseen objects. Never assume the area is clear.



DANGER Keep others away from the cutter while it is operating. Rotary Cutters have the ability to discharge objects at high speeds causing serious injury or death. The use of front & rear safety guards is strongly recommended and should always be used when cutting along highways and in areas where bystanders are present. Stop blade rotation if bystanders are nearby.

When beginning operation of the cutter, make sure that all persons are in a safe location.

With the cutter slightly raised from the ground. Run the engine at a slow speed and slowly engage the PTO. Slowly bring the engine to 540 rpm PTO speed. Do not exceed rated speed. Lower the cutter to the ground and move slowly into material. Adjust tractor ground speed to provide a clean cut without lugging the tractor engine. Always operate tractor PTO at 540 RPM to maintain blade speed and to produce a clean cut. **Know how to stop the tractor and cutter quickly in an emergency.**

Operators of models with a conventional main driveline must plan ahead and choose a cutting pattern that allows for wider turns

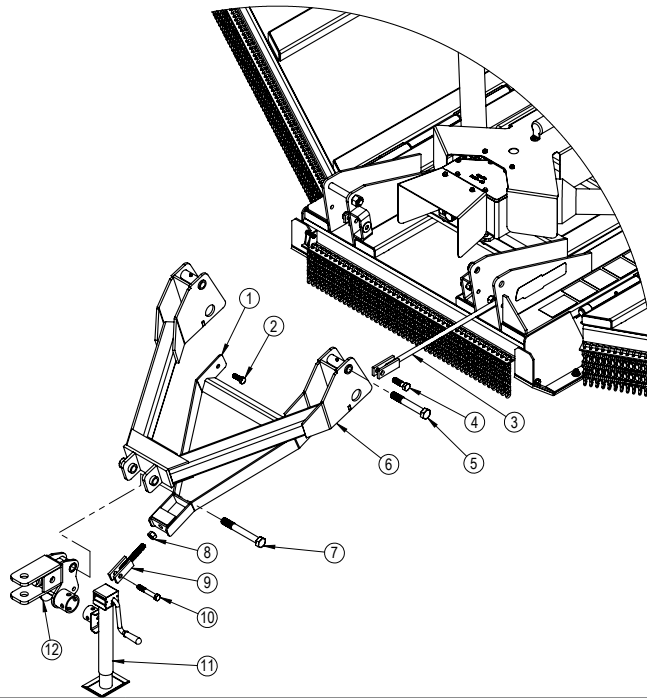
Ground Speed

You will need to maintain 540 rpm PTO speed and 2 to 5 mph (3 and 10km/h) ground speed to produce a clean cut. Select a tractor gear and range selection that will enable you to maintain these speed combinations. Generally the quality of cut is better at lower ground speeds. Dense ground cover will create the need to slow down even more. In certain conditions tractor tires will roll grass down resulting in an uneven cut when the grass fails to rebound. Should this happen you may try reversing the direction of cut and/or double cut to achieve the desired finish. Avoid very low cutting heights especially on extremely uneven terrain. Always cut downward on slopes and avoid crossing the face of steep slopes. Avoid sharp drops and cross diagonally through dips to prevent hanging up the tractor and cutter. Slow down in turns and avoid sharp turns if at all possible. Remember to look back often. It is the responsibility of the operator to note the conditions of the job being done and to set the speed to obtain a quality cutting job while maintaining control of the equipment. With a little practice you will be pleased with what your Pulsar Wing Cutter can do.

Transport on Road - Be Safe, Be Seen!

Caution: When traveling on public roads, use accessory lights, SMV sign, clean reflectors, and other adequate devices to warn operators in other vehicles of your presence. If cutter blocks visibility of SMV sign, relocate SMV sign so it is visible from the back at all times. Always comply with all federal, state, and local laws.

Pulsar Wing Cutter Hitch Parts

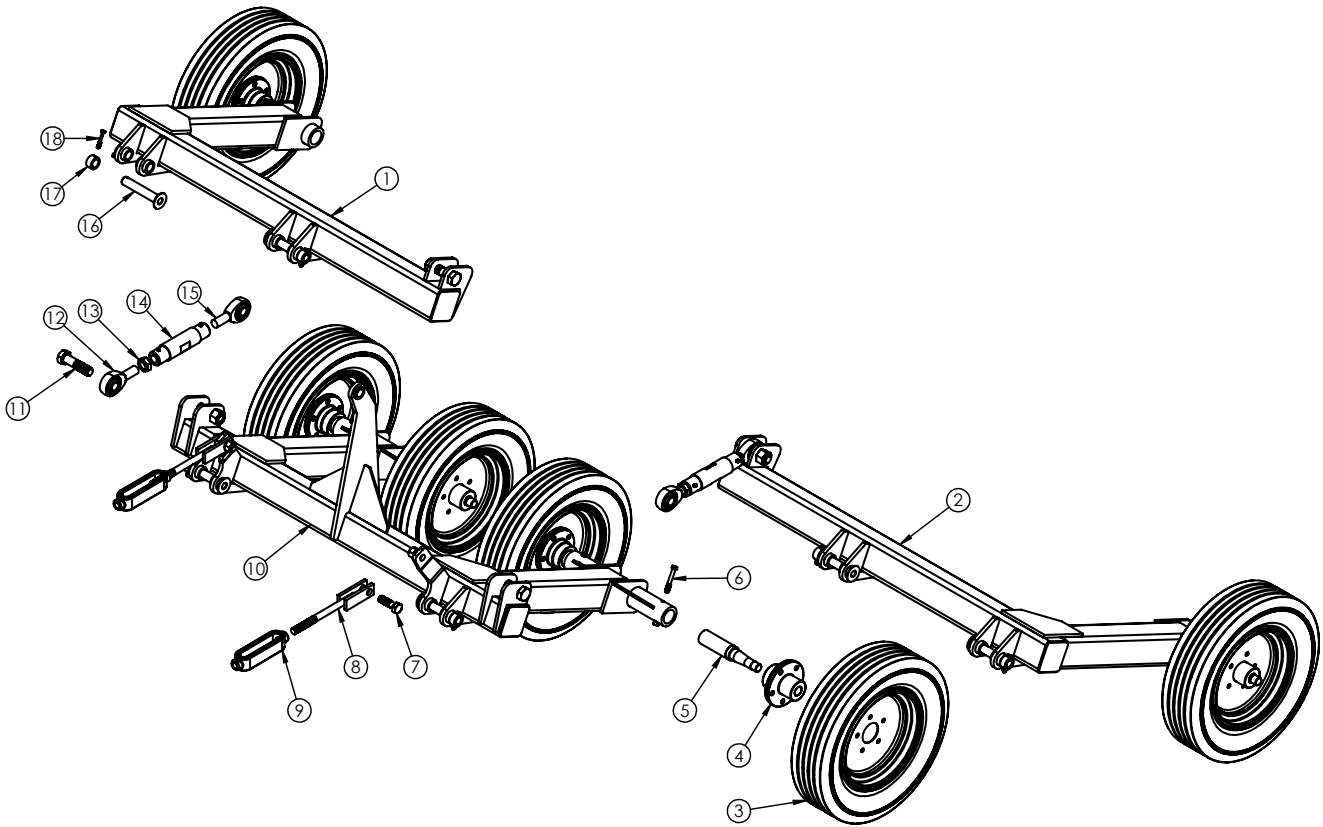


Item#	Part#	Description	Qty
1	35150	Parallel Link	1
2	xzhcs6217nc5	5/8 x 1 3/4 Gr5 Bolt c/w In	2
3	35128	Long Tie Rod	2
4	xzhcs7525nc5	3/4 x 12 1/2 Gr5 Bolt c/w In	2
5	xzhcs10070nc5	1 x 7 Gr5 Bolt c/w In	2
6	35121	Tongue	1
7	xzhcs10080nc5	1 x 8 Gr5 Bolt c/w In	1
8	xznut75nc	3/4 nut	2
9	36013	Parallel Link Adjuster	1
10	xzhcs6240nc5	5/8 x 4 Gr5 Bolt c/w In	1
11	53799	Jack Side wind	1
12	53886	Hitch	1

Note:

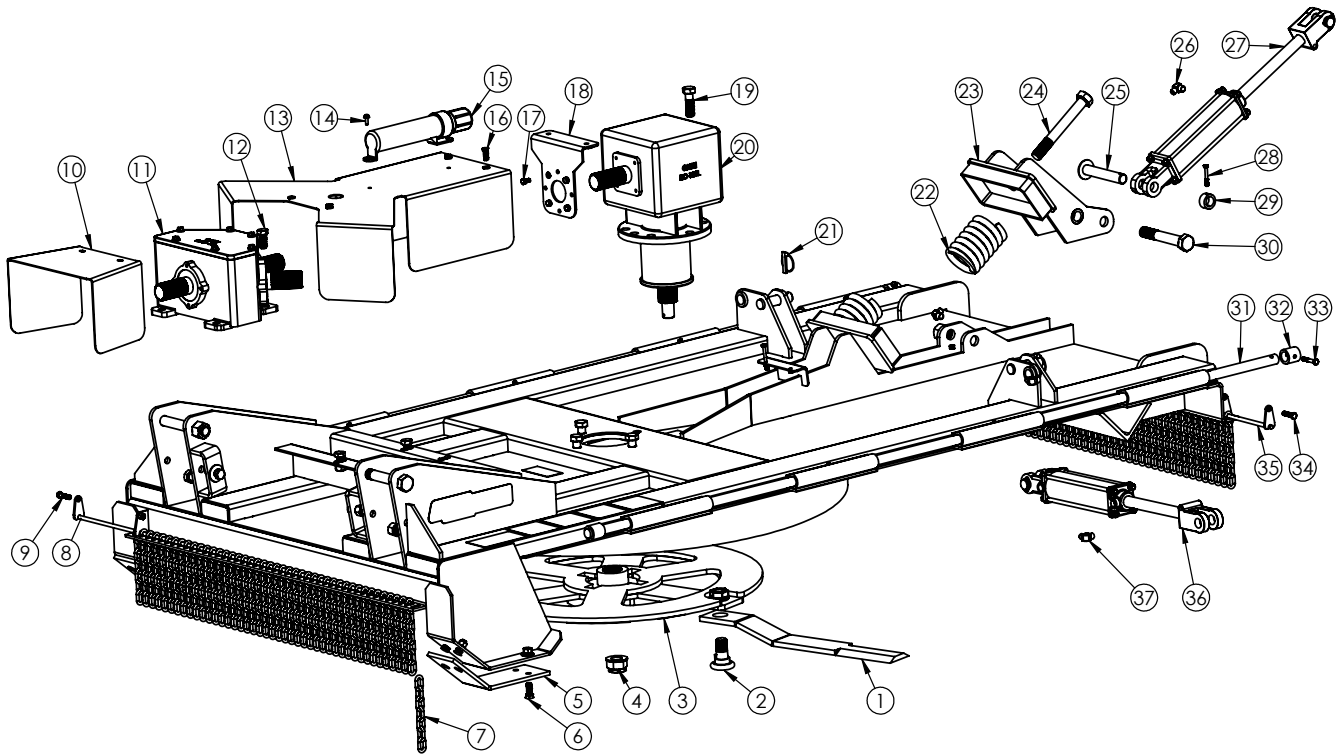
OL = Obtain Locally
c/w = complete with
fw - Flatwasher
lw = Lockwasher
ln = Locknut
n = Nut

Pulsar Wing Cutter Wheel Beam Parts



Item#	Part#	Description	Qty
1	35110	Right Axle	1
2	35109	Left Axle	1
3	ct555129	Tire	6
4	ct912949	Hub	6
5	ct913383	Spindle	6
6	xzhcs3730nc	3/8 x 1 1/2 Bolt c/w In	6
7	xzhcs7525nc	3/4 x 2 1/2 Bolt c/w In	2
8	35126	Short Tie Rod	2
9	53809	Turnbuckle	2
10	35106	Center Axle	1
11	xzhcs10040nc	1 x 4 Bolt c/w In	4
12	53810	Right hand ball joint	2
13	xbnut100nfjm	1" Jam Nut	2
14	35195	Link Block	2
15	53811	Left hand ball joint	2
16	35161	Wheel Beam Pin	6
17	35162	Pin Retainer	6
18	xzhcs2520nc	1/4 x 2 Bolt c/w In	6

Pulsar Wing Cutter Center Deck Parts



Item#	Part#	Description	Qty
1	53805	Double edge blade	3
2	53060	Blade Bolt c/w lw,n	3
3	35172	Mid Blade Disk	1
4	Nut	See Page	
5	35155	Center Section Skid Shoe	2
6	xbbp5015nc	1/2 x 1 1/2 plow bolt c/w lw,n	8
7	35173	5/16 Chain x 7 1/2	95
8	35039	Center Deck Chain Rod	1
9	xzhcs3715nc	3/8 x 1 1/2 Bolt c/w ln	1
10	35158	PTO Shield	1
11	251262	Splitter Box	
12	xzhcs6215nc	5/8 x 1 1/2 Bolt c/w lw, n	4
13	35159	Center PTO Shield	1
14	xzhfss2507nc	Flange bolt 1/4 x 3/4 c/w Flange nut	2
15	52649	Manual Tube	1
16	xzhcs3710nc	3/8 x 1 Bolt c/w lw	6
17	xzhcs3107nc	5/16 x 3/4 Bolt c/w lw	8
18	35157	Shield Mount	3
19	xzhcs7525nc	3/4 x 2 1/2 Bolt c/w lw, n	4
20	251265	Center Gearbox	
21	52656	7/16 Lynch Pins	2
22	53807	Spring 6" long	2

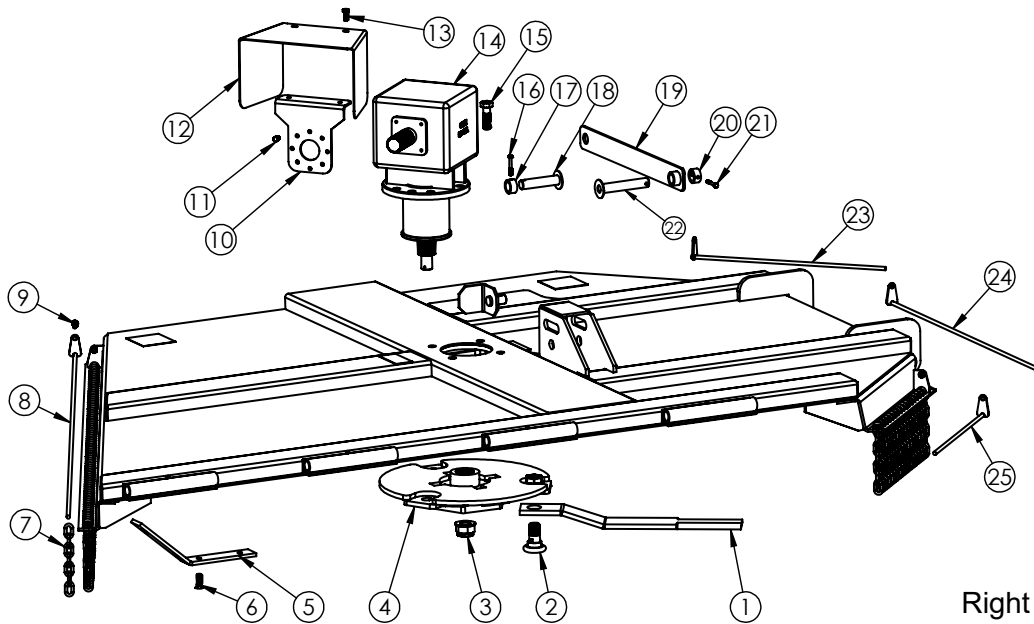
Pulsar Wing Cutter Center Deck Parts

Item#	Part#	Description	Qty
23	53887	Spring Top Pocket	1
24	xzhcs10080nc	1 x 8 Gr5 Bolt c/w In	1
25	35161	Hinge Pin	1
26	53806	Hyd. fitting	2
27	21916	3 x 8 cylinder	1
28	xzhcs2520nc	1/4 x 2 Gr5 Bolt c/w In	1
29	35162	Pin Retainer Collar	1
30	xzhcs10065nc5	1 x 6 1/2 Gr5 Bolt c/w In	1
31	35124	Wing Hinge Shaft	2
32	35153	Hinge Shaft Bolt Collar	2
33	xzhcs3120nc	5/16 x 2 Bolt c/w lw	2
34	xzhcs3715nc	3/8 x 1 1/2 Bolt c/w In	1
35	35037	Center Deck Chain Rod	1
36	21916	3 x 8 cylinder	2
37	53806	Hyd. fitting	4

Note:

OL = Obtain Locally
c/w = complete with
fw - Flatwasher
lw = Lockwasher
In = Locknut
n = Nut

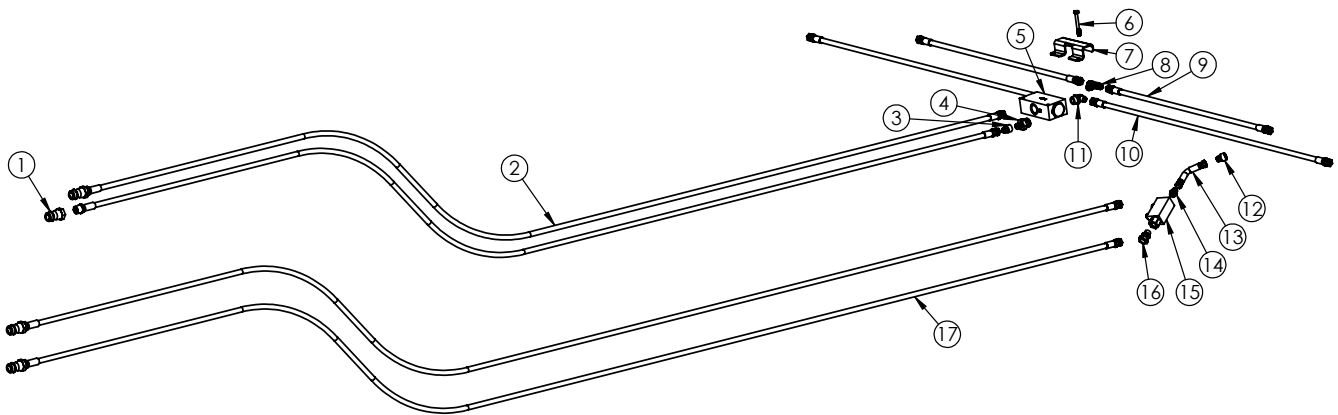
Pulsar Wing Cutter Wing Parts



Right Wing shown

Item#	Part#	Description	Right Wing Qty	Left Wing Qty
1	53805	Double edge blade	3	3
2	53060	Blade Bolt c/w lw,n	3	3
3	Nut	See Page		
4	35876	Wing Blade Disc	1	1
5	35154	Wing Skid Shoe	2	2
6	xbbp5015nc	1/2 x 1 1/2 plow bolt c/w lw,n	8	8
7	35173	5/16 Chain x 7 1/2	147	147
8	35079	Chain Rod Wing Front	1	1
9	xzhcs3715nc	3/8 x 1 1/2 Bolt c/w ln	4	4
10	35157	Shield Mount	1	1
11	xzm8x16	M8 x 16 Bolt c/w lw	4	4
12	53985	PTO Shield Wing	1	1
13	xzhcs3710nc	3/8 x 1 Bolt c/w lw	2	2
14	251264	Note: Right Wing Gearbox	1	
	251263	Note: Left Wing Gearbox		1
15	xzhcs7525nc	3/4 x 2 1/2 Bolt c/w lw, n	4	4
16	xzhcs2520nc	1/4 x 2 Bolt c/w ln	1	1
17	35162	Pin Retainer Collar	1	1
18	35169	Wing Cylinder Pin	1	1
19	36008	Transport Wing Lock	1	1
20	35162	Pin Retainer Collar	1	1
21	xzhcs2520nc	1/4 x 2 Bolt c/w ln	1	1
22	35161	Transport Bar Pin	1	1
23	35073	Chain Rod Wing Outside Rear	1	1
24	35075	Chain Rod Wing Center Rear	1	1
25	35077	Chain Rod Wing Inside Rear	1	1

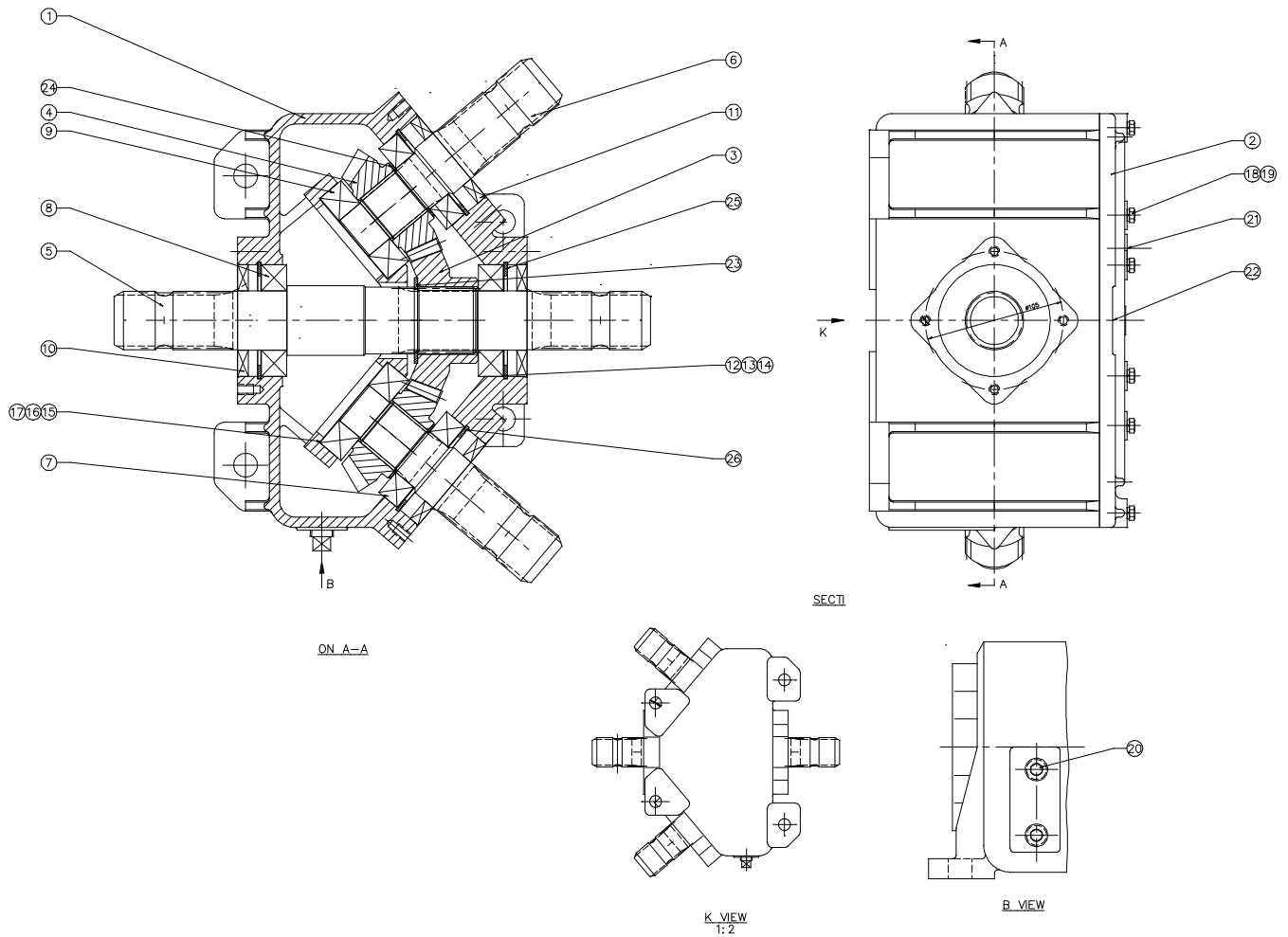
Pulsar Wing Cutter Hydraulic Parts



Item#	Part#	Description	Qty
1	53641	Agri-ball nipple	4
2	35878	Wing supply Hose	2
3	53801	Restrictor	1
4	53802	Hyd. fitting	1
5	53803	Flow divider	1
6	xzhcs2525nc	1/4 x 2 1/2 Gr5 Bolt c/w In	2
7	52490	Hose holder	1
8	53804	Hyd. fitting	1
9	35880	Wing short Hose	2
10	35879	Wing long Hose	2
11	53806	Hyd. fitting	2
12	53801	Restrictor	1
13	54055	Cylinder Hose	1
14	54051	Hyd. fitting	3
15	54058	Check valve	1
16	54057	Hyd. fitting	1
17	35877	Deck lift Hose	2

Note:
 OL = Obtain Locally
 c/w = complete with
 fw - Flatwasher
 lw = Lockwasher
 ln = Locknut
 n = Nut

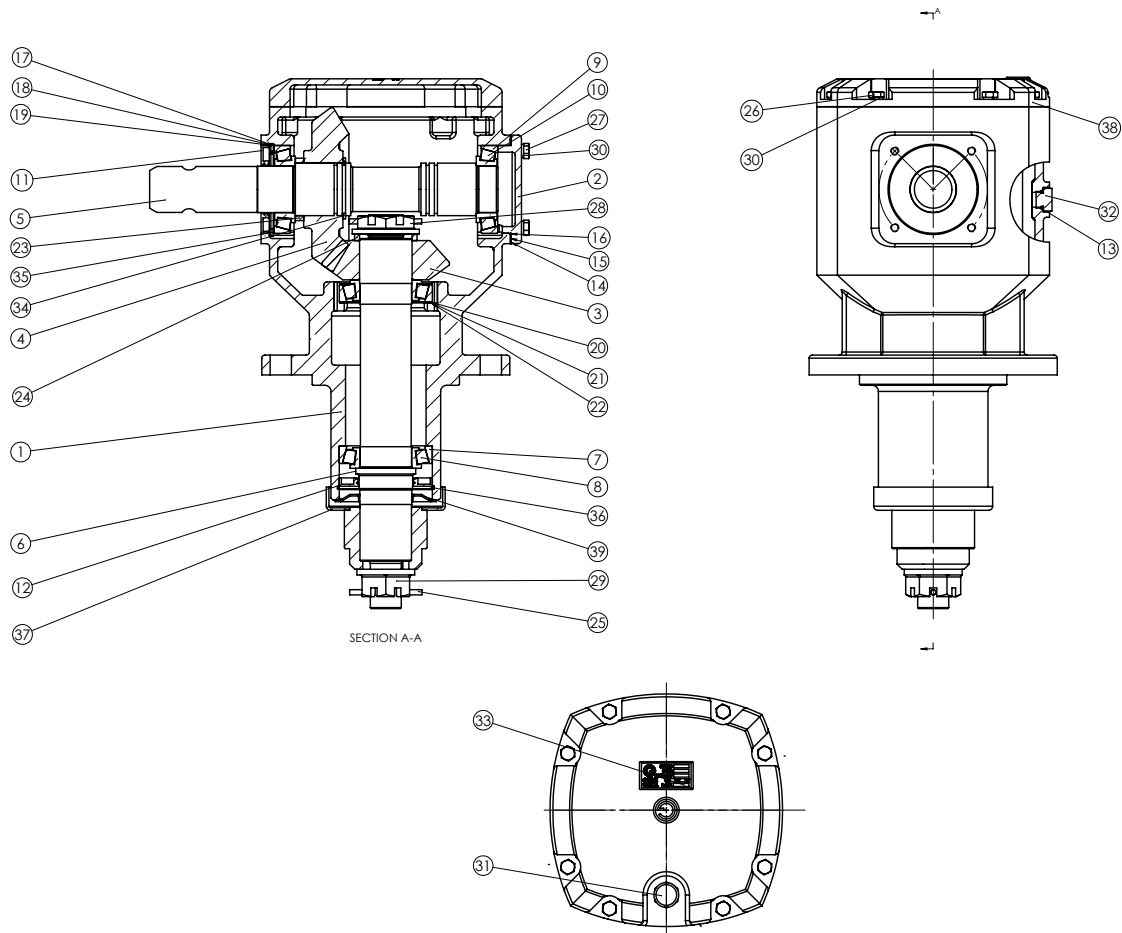
RCD-90 540 Rpm Parts



Item #	Part #	Description	Qty
1	010241	Housing	1
2	020301	Cover	1
3	031122	Gear	1
4	031121	Pinion	2
5	040462	Shaft - Input	1
6	040463	Shaft - Output	2
7	050007	Bearing Ball	2
8	050302	Bearing Ball	2
9	050303	Bearing Ball	2
10	060168	Seal, Input	2
11	060188	Seal, Output	2
12	090329	Shim, Input 0.1mm	2-a/r
13	090330	Shim, Input 0.2mm	2-a/r
14	090331	Shim, Input 0.5mm	2-a/r

Item #	Part #	Description	Qty
15	090332	Shim, Output 0.1mm	2-a/r
16	090333	Shim, Output 0.2mm	2-a/r
17	090334	Shim, Output 0.5mm	2-a/r
18	110148	Screw, M8x35	6
19	130058	Lockwasher 8M	6
20	140011	Plug	2
21	140033	Plug, Pressure Relief	1
22	190028	I.D. Tag	1
23	200003	Retaining Ring 50mm	1
24	200130	Retaining Ring 40mm	2
25	200159	Retaining Ring 85mm	2
26	200163	Retaining Ring 80mm	2

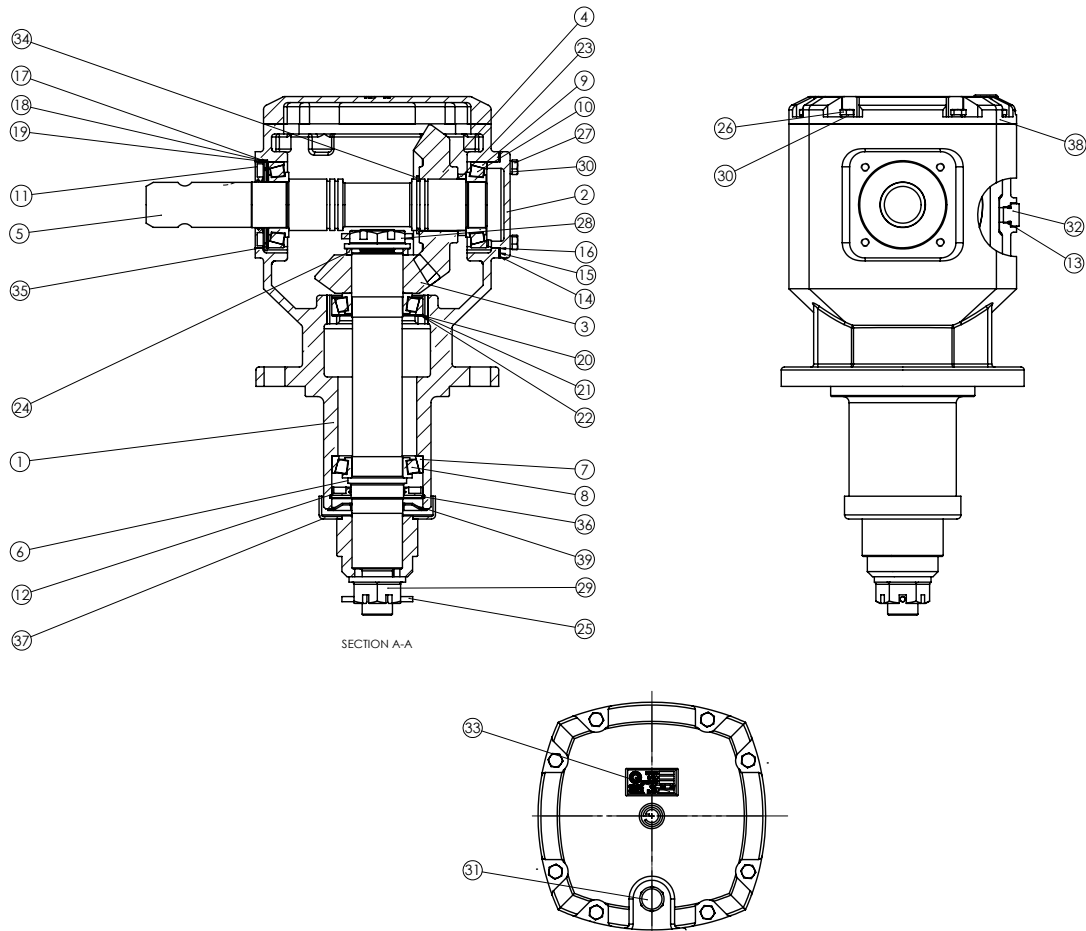
RC-100L (Left) 540 Rpm Parts



Item #	Part #	Description	Qty
1	010447	Housing	1
2	020371	Cap, Blank	1
3	031114	Pinion	1
4	031115	Gear	1
5	040833	Shaft - Input	1
6	040834	Shaft - Output	1
7	050200	Bearing, Cup	2
8	050201	Bearing, Cone	2
9	050239	Bearing, Cup	2
10	050240	Bearing, Cone	2
11	060168	Seal-Input	1
12	060243	Seal-Output	1
13	060251	O-Ring	1
14	070349	Gasket, Blank Cap 0.2Mm	var
15	070350	Gasket, Blank Cap 0.3Mm	var
16	070351	Gasket, Blank Cap 0.5Mm	var
17	090299	Shim - Input 0.1Mm	var
18	090300	Shim - Input 0.2Mm	var
19	090301	Shim - Input 0.5Mm	var
20	090145	Shim - Output 0.1Mm	var

Item #	Part #	Description	Qty
21	090146	Shim - Output 0.2Mm	var
22	090147	Shim - Output 0.3Mm	var
23	090417	Spacer	1
24	090418	Spacer	1
25	100118	Cotter Pin	2
26	110106	M8X1.25X25,	8
27	110222	M8X1.25X30,	4
28	120094	Nut, Hex 1 3/8"-18	1
29	120141	Nut, Hex M30x2-6H	1
30	130058	Lock Washer, M8	12
31	140033	Plug - Pressure Relief,	1
32	140097	Oil Sight Gage	1
33	190028	I.d. Tag	1
34	200003	Retaining Ring - External	1
35	200159	Retaining Ring - Internal	1
36	200151	Retaining Ring - Internal	1
37	210036	Blade Hub	1
38	240427	Cover, Inspection	1
39	240428	Protector, Seal	1

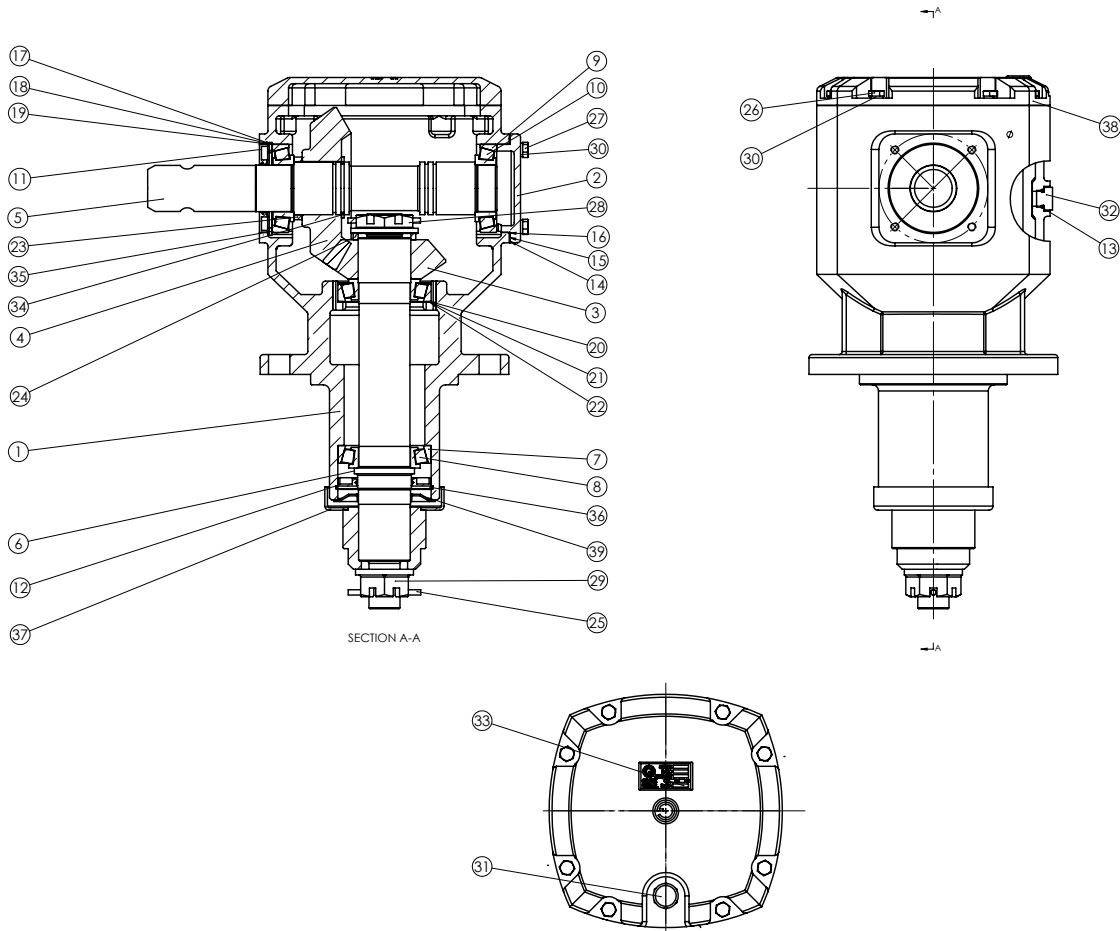
RC-100L (Right) 540 Rpm Parts



Item #	Part #	Description	Qty
1	010447	Housing	1
2	020371	Cap, Blank	1
3	031114	Pinion	1
4	031115	Gear	1
5	040833	Shaft - Input	1
6	040834	Shaft - Output	1
7	050200	Bearing, Cup	2
8	050201	Bearing, Cone	2
9	050239	Bearing, Cup	2
10	050240	Bearing, Cone	2
11	060168	Seal-Input	1
12	060243	Seal-Output	1
13	060251	O-Ring	1
14	070349	Gasket, Blank Cap 0.2Mm	var
15	070350	Gasket, Blank Cap 0.3Mm	var
16	070351	Gasket, Blank Cap 0.5Mm	var
17	090299	Shim - Input 0.1Mm	var
18	090300	Shim - Input 0.2Mm	var
19	090301	Shim - Input 0.5Mm	var
20	090145	Shim - Output 0.1Mm	var

Item #	Part #	Description	Qty
21	090146	Shim - Output 0.2Mm	var
22	090147	Shim - Output 0.3Mm	var
23	090417	Spacer	1
24	090418	Spacer	1
25	100118	Cotter Pin	2
26	110106	M8X1.25X25,	8
27	110222	M8X1.25X30,	4
28	120094	Nut, Hex 1 3/8"-18	1
29	120141	Nut, Hex M30x2-6H	1
30	130058	Lock Washer, M8	12
31	140033	Plug - Pressure Relief,	1
32	140097	Oil Sight Gage	1
33	190028	I.d. Tag	1
34	200003	Retaining Ring - External	1
35	200159	Retaining Ring - Internal	1
36	200151	Retaining Ring - Internal	1
37	210036	Blade Hub	1
38	240427	Cover, Inspection	1
39	240428	Protector, Seal	1

RC-100L (Center) 540 Rpm Parts



Item #	Part #	Description	Qty
1	010447	Housing	1
2	020371	Cap, Blank	1
3	030896	Pinion	1
4	030897	Gear	1
5	040833	Shaft - Input	1
6	040834	Shaft - Output	1
7	050200	Bearing, Cup	2
8	050201	Bearing, Cone	2
9	050239	Bearing, Cup	2
10	050240	Bearing, Cone	2
11	060168	Seal-Input	1
12	060243	Seal-Output	1
13	060251	O-Ring	1
14	070349	Gasket, Blank Cap 0.2Mm	var
15	070350	Gasket, Blank Cap 0.3Mm	var
16	070351	Gasket, Blank Cap 0.5Mm	var
17	090299	Shim - Input 0.1Mm	var
18	090300	Shim - Input 0.2Mm	var
19	090301	Shim - Input 0.5Mm	var
20	090145	Shim - Output 0.1Mm	var

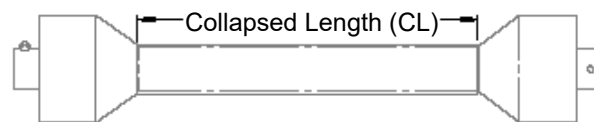
Item #	Part #	Description	Qty
21	090146	Shim - Output 0.2Mm	var
22	090147	Shim - Output 0.3Mm	var
23	090417	Spacer	1
24	090418	Spacer	1
25	100118	Cotter Pin	2
26	110106	M8X1.25X25,	8
27	110222	M8X1.25X30,	4
28	120094	Nut, Hex 1 3/8"-18	1
29	120141	Nut, Hex M30x2-6H	1
30	130058	Lock Washer, M8	12
31	140033	Plug - Pressure Relief,	1
32	140097	Oil Sight Gage	1
33	190028	I.d. Tag	1
34	200003	Retaining Ring - External	1
35	200159	Retaining Ring - Internal	1
36	200151	Retaining Ring - Internal	1
37	210036	Blade Hub	1
38	240427	Cover, Inspection	1
39	240428	Protector, Seal	1

PTO Drive-line Dimension

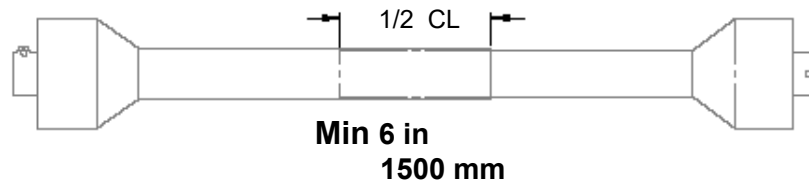
The PTO Drive-line as supplied with the machine will need to be checked for the proper length before being put into service.

To accommodate the various hitch and tractor configurations the supplied shaft may be too long, or in some cases too short. To determine shaft length, find the collapsed length, raise or lower the equipment until the PTO out of the tractor is horizontal with the input shaft on the machine. Measure lock-pin groove to lock-pin groove or bolt hole on the equipment. If this is on trailed equipment then turn tractor as sharp as possible.

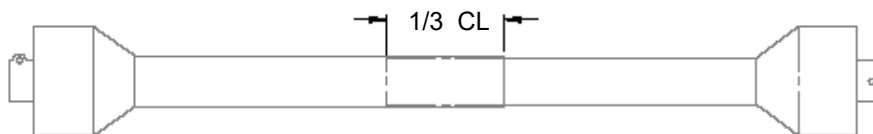
Measure collapsed PTO shaft from lock-pin to lock-pin or bolt hole and compare it with the measurement on the tractor. The difference of these measurements needs to be cut from Both Halves of the PTO shaft plus 1/2".



Working Length overlap is 1/2 of above collapsed length



Minimum Overlap in Transport Position 1/3 of collapsed length

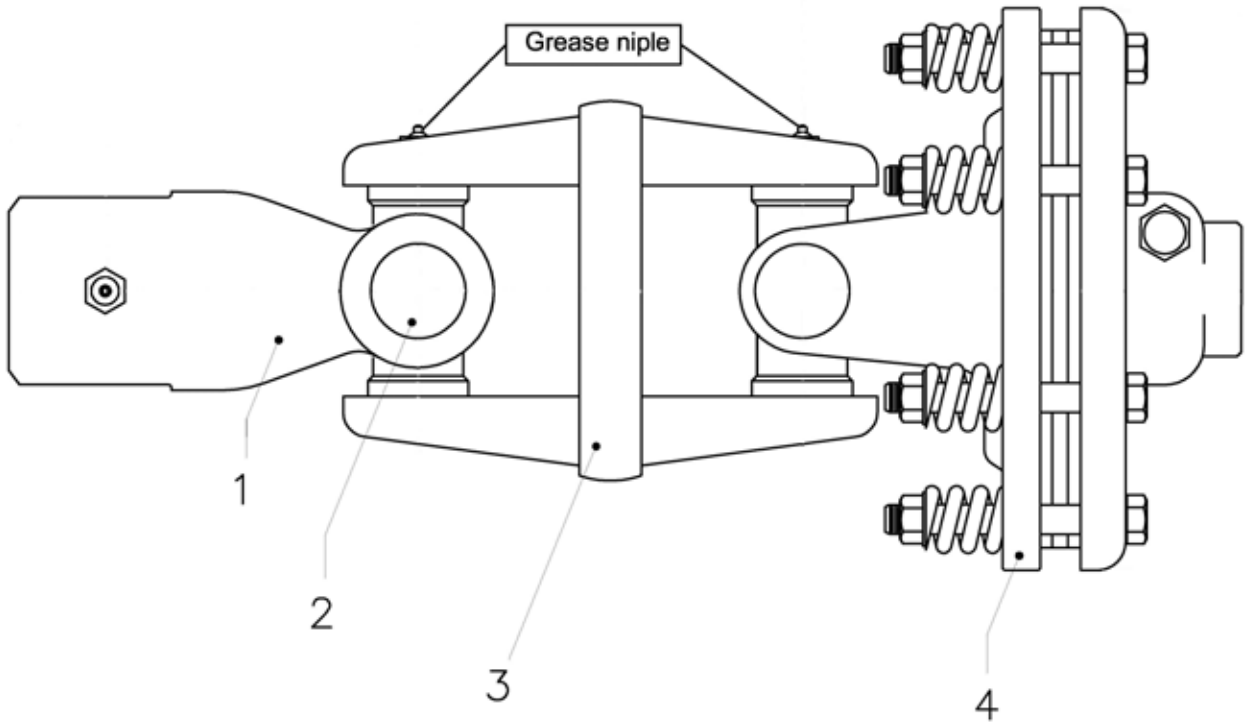


Following these guidelines will reduce the chances of damage to the equipment.

- Use a sharp hacksaw to cut the PTO tube
- Use a fine file to remove any sharp edges and burrs from sawing
- Clean off all dirt and filings from tube , carefully test for smooth fit.
- Apply a light coat of grease to the outside of the small tube
- Reinstall the shields
- Install on equipment and recheck

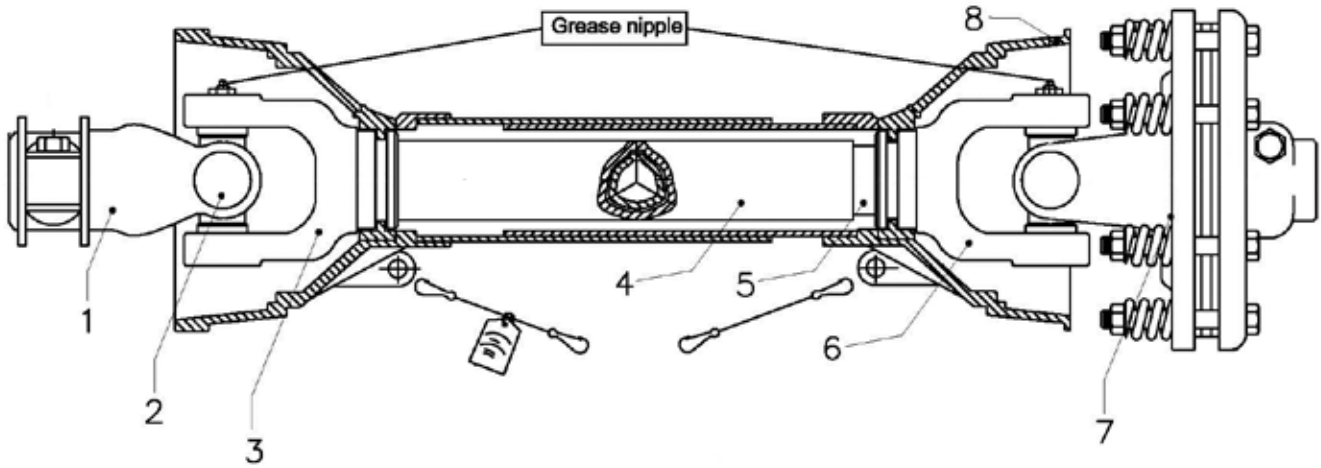
These procedures need to be done before first putting into operation and when attaching to a different tractor

Center PTO Parts



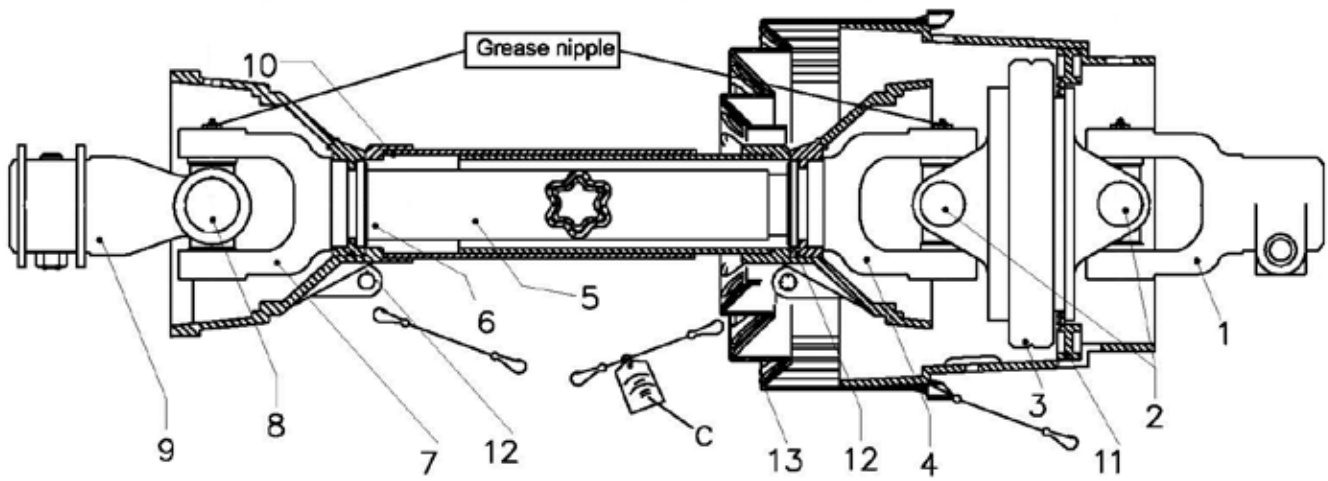
Item #	Part #	Description	Qty
1	73.60	Yoke	1
2	2200AE	Cross Kit	2
3	73HD	Connector Yoke	
4	52.2-07	Implement Yoke	1

Wing PTO Parts



Item #	Part #	Description	Qty
1	70.26	Yoke	1
2	2200AE	Cross Kit	2
3	75	Outer Tube Yoke	1
4	012	Outer Cardan Tube	1
5	009	Inner Cardan Tube	1
6	74	Inner Tube Yoke	1
7	52.2-07	Torque Limiter	1
8	KH3	Bell Cone Shield	2

Front PTO Parts



Item #	Part #	Description	Qty
1	666.4	Yoke	1
2	636E	Cross Kit	2
3	625	Torque Limiter	1
4	661E	Inner Tube Yoke	1
5	R5	Inner Cardan Tube	1
6	R4R	Outer Cardan Tube	1
7	X800	Outer Tube Yoke	1
8	2230E	Cross Kit	1
9	63.19	Yoke	1
10	KH3.4-60	Outer Bell Cone Shield	1
11	6506	Shield guide	1
12	9504	Inner Bell Cone Shield	1
13	6018	Outer Shield	1

Troubleshooting

Read and understand the Operator And Parts Manual and safety signs (decals) on equipment. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

Problem	Possible Cause	Solution
Does not cut	Dull blades	Sharpen blades.
	Worn or broken blades	Replace blades. (Replace in pairs only.)
	Incorrect PTO speed	Set at rated PTO speed.
	Drive not functioning (blades do not turn when PTO is running)	Check drive shaft connection. Check gearbox
	Gearbox malfunction	Repair gearbox.
	Excessive clutch slippage.	Adjust clutch.
Streaks or ragged cut	Broken or worn blades	Replace or sharpen blades.
	Attitude incorrect	Level machine.
	Ground speed too fast	Reduce ground speed.
	Excessive cutting height	Lower cutting height. (Note: Set height so blades do not frequently hit ground.)
	Excessive lush and tall vegetation	Re-cut at 90° to first pass.
Excessive side skid wear	Running with skids continuously on ground	Raise cutting height or adjust.
Excessive clutch slippage	Clutch out of adjustment	Adjust clutch.
	Clutch discs worn; wear stops contacting opposite plate	Replace discs.
	Blades hitting ground	Raise cutting height.
Vibration	Broken blade	Replace blades in pairs.
	Bearing failure	Check gearbox shafts for side play.
	Blades overlapped when wings raised to transport position.	Separate cutting blades before lowering wings.
Blades hitting deck	Bent blades or crossbar	Replace bent blades or crossbar.
Unit will not raise	Low oil	Add hydraulic oil.
Unit doesn't cut level	Wing section cuts lower than center	Lengthen turnbuckle connecting center yoke to wing wheel yoke.
	Wing section cuts higher than center	Shorten turnbuckle connecting center yoke to wing wheel yoke.

Maintenance

Proper servicing and adjustments are key to the long life of any implement. With careful inspection and routine maintenance, you can avoid costly downtime and repair.

Do not alter the cutter in a way which will adversely affect its performance.

Check all bolts and pins after using the cutter for several hours and on a regular basis thereafter to ensure they are tight and secured. Replace worn, damaged, or illegible safety labels by obtaining new labels from your MK martin dealer.

Warning: Keep all persons away from operator control area while performing adjustments, service, or maintenance.



WARNING!



Always block cutter securely before working on or under cutter.

Before working underneath, disconnect driveline from tractor, lower wings to ground, raise cutter, and pin transport bar in raised position. Attach parking jack and lower to ground. **Securely block all four corners of center section and each wing with jack stands.** Blocking up prevents the cutter from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.

Never perform service or maintenance with engine running.

Warning: Frequently check all hardware to make certain it is tight and not broken or missing. **Do not operate cutter** with loose pins, bolts, or nuts. Loose hardware can result in a serious breakdown causing bodily injury or death.

Tire Maintenance

Warning Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment. When removing and installing wheels, use wheel handling equipment adequate for the weight involved.

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

Warning Do not weld on or heat a rim. If a tire is mounted to the rim, air pressure inside the tire can increase enough to cause an explosion. High heat can also weaken and/or warp the rim, damage the tire, and destroy foam filling inside a tire.

Tractor Maintenance

One of the most important things you can do to prevent hydraulic system problems is to ensure your tractor's hydraulic reservoir remains free of dirt and other contaminations.

Use a clean cloth to wipe hose ends clean before attaching them to your tractor. Replace tractor hydraulic filter element at the prescribed intervals. These simple maintenances will go a long way to prevent occurrence of control valve and hydraulic cylinder problems.

Maintenance

Lubrication

Do not let excess grease collect on or around parts, particularly when operating in sandy areas. See below chart for lubrication points and frequency or lubrication based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication. Be sure to clean fittings thoroughly before attaching grease gun. One good pump of most guns is sufficient when the lubrication schedule is followed.

Daily Lubrication or 8 hours

- Grease - PTO Joint Bearings
- Grease - PTO Shield Bearings
- Check Oil Level in Gearbox add 80w90 Gear oil. Fill until oil reaches top mark on dipstick or begins to flow out side plug hole in gearbox.

Important: Do not overfill gearbox with oil! Oil will expand when hot! Make sure cutter is level and oil is cool before checking oil level.

Weekly Lubrication or 40 hours

- Grease - Wheel Bearing
- Grease - Wing hinges, Hitch pivot points, Wheel beam hinge points.
- Check for wear on Blade Bolts
- Check for wear and cracks around Blade Pivot Hole

Annually

- Wash and cleanup
- Touch up any paint scratches
- Store on blocks of wood in a dry place

Slip Clutch Adjustment

The slip clutch is designed to slip so that the gearbox and driveline are protected if the cutter strikes an obstruction.

A new slip clutch or one that has been in storage over the winter may seize. Before operating the cutter, make sure it will slip by performing the following operation:

- Remove driveline from tractor PTO.
- Loosen six 10 mm cap screws to remove all tension from Belleville spring plate.
- Hold clutch hub solid and turn shaft to make sure clutch slips.
- If clutch does not slip freely, disassemble and clean the thrust plate faces, flange yoke, and clutch hub.
- Reassemble clutch.
- Tighten Belleville spring until it is against the thrust plate of the clutch, and then back off each of the six nuts by 2 full revolutions. The gap between Belleville spring and thrust plate should be 1/8"
- If a clutch continues to slip when the spring is compressed to 1/8" gap, check friction discs for excessive wear. Discs are 1/8" when new. Replace discs after 1/16" wear. Minimum disc thickness is 1/16".

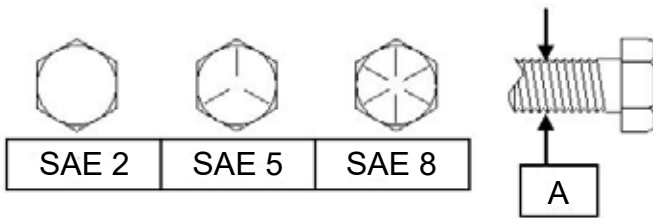
Bolt Torque

As used on this machine

- Bolt torque table shown below gives torque values for various bolts used.
- This chart is for non-lubricated threads.
- Replace with same strength bolt.

Torque Specifications. Torque values are identified by their head markings.

Diameter	SAE 2		SAE 5		SAE 8	
	<i>ft-lb</i>	<i>N.m</i>	<i>ft-lb</i>	<i>N.m</i>	<i>ft-lb</i>	<i>N.m</i>
"A"						
1/4	6	(8)	8	(11)	12	(16)
5/16	11	(15)	17	(24)	25	(33)
3/8	20	(27)	31	(42)	44	(59)
7/16	32	(43)	49	(67)	70	(95)
1/2	49	(66)	76	(105)	105	(145)
5/8	97	(130)	150	(205)	210	(285)
3/4	144	(195)	265	(360)	375	(510)
7/8	165	(225)	430	(585)	605	(820)
1	250	(340)	645	(875)	910	(1230)
1 1/8	355	(480)	795	(1080)	1290	(1750)
1 1/4	500	(680)	1120	(1520)	1820	(2460)
1 1/2	870	(1180)	1950	(2640)	3160	(4290)



Allen head cap screw are similar to SAE 8 quality

These torques are for reference only. Not all these sizes and grades are necessarily used in this machine. Bolts that are used as a pivot or hinge have to be used with a locknut, therefore only tighten enough to secure the bolt and still allowing the part to rotate freely.



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