



# Operator's Manual

Model: IBEX E-Series Drum Mowers













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-  **IMPORTANT: NEVER ATTEMPT TO MOW WITH THE DRUMS HOVERED ABOVE THE GROUND. THE DRUMS ARE MEANT TO SIT COMPLETELY ON THE GROUND AT ALL TIMES WHILE MOWING.**
-  All references made in this manual to right, left, front, rear, top and bottom is as viewed facing the direction of forward travel with implement properly attached to tractor.
-  Make sure that everyone who operates this machine has read this manual completely. This manual is designed for qualified operators, who are appropriately trained and familiar with the controls and operation of the tractor to which the mower is attached.
-  This operator's manual is designed to help familiarize you with operation and maintenance of the machine. Performance and life of the machine depend upon proper maintenance and operating practices.
-  It is the user's responsibility to read the operator's manual and comply with all instructions pertaining to operation and maintenance. It is also the user's responsibility to inspect the machine at regular intervals and repair or replace worn or damaged parts when continued use would cause damage or excessive wear to other parts.
-  This mower has been designed and built for use in agriculture for mowing grass, pasture and permanent grasslands, alfalfa and other kinds of fodder crop. The machine is not designed for operation in other fields than agriculture.

# 1 Introduction

Congratulations on your purchase of your Ibex drum mower. Your machine, if properly operated and maintained, will provide many years of productive use. The purpose of this manual is to help you do this by describing proper safety, operation, and maintenance procedures. Do not attempt to use the machine without thoroughly understanding the information contained in this manual. Contact your Ibex Equipment dealer for assistance if any information described herein is not completely clear.

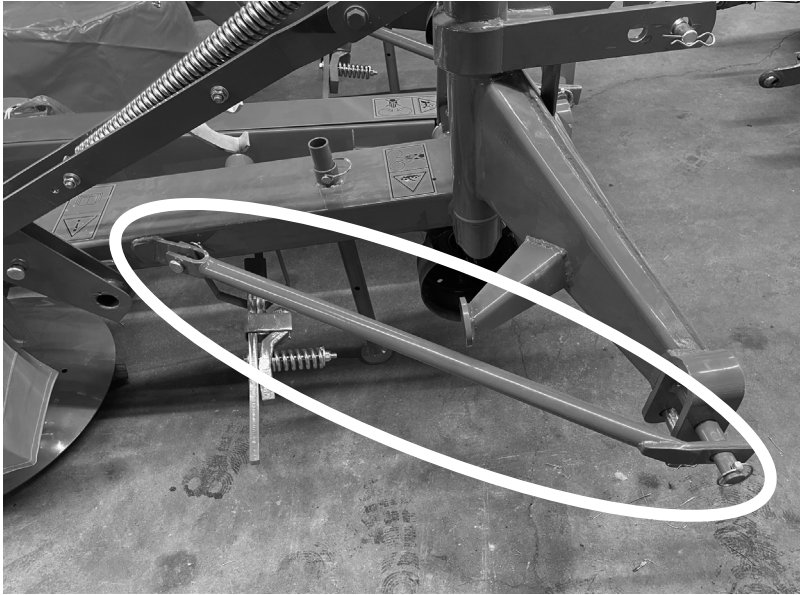
## 1.1 Technical Specifications

	<b>TX49E</b>	<b>TS53E</b>	<b>TM65E</b>
<b>Cutting Width</b>	49"	53"	65"
<b>Weight of Mower (lbs)</b>	675	690	835
<b>Minimum Tractor Engine HP</b>	18 HP	25 HP	40 HP
<b>Minimum Tractor Weight</b>	1400 LBS	2300 LBS	3500 LBS
<b>Minimum Tractor Width</b>	36"	52"	54"
<b>Maximum Tractor Width</b>	54"	72"	84"
<b>Tractor Hitch</b>	Category 1, 3-Point	Category 1, 3-Point	Category 1, 3-Point
<b>Drums</b>	2	2	2
<b>Blades Per Drum</b>	3	3	3
<b>Gearbox Grease</b>	NLGI 0 EP Grease	NLGI 0 EP Grease	NLGI 0 EP Grease
<b>Lubrication Grease</b>	NLGI 2 Grease	NLGI 2 Grease	NLGI 2 Grease

## 1.2 Key Components

### 1.2.1 Transport Sway Bar

The transport sway bar is locked in place to keep the mower secured in transport mode. It is detached when switching to mowing position.



*Figure 1 – Transport Sway Bar*

### 1.2.2 Transport Lock

The transport lock is secured in place during transport to enable lifting of the drum unit. It must be released while mowing.



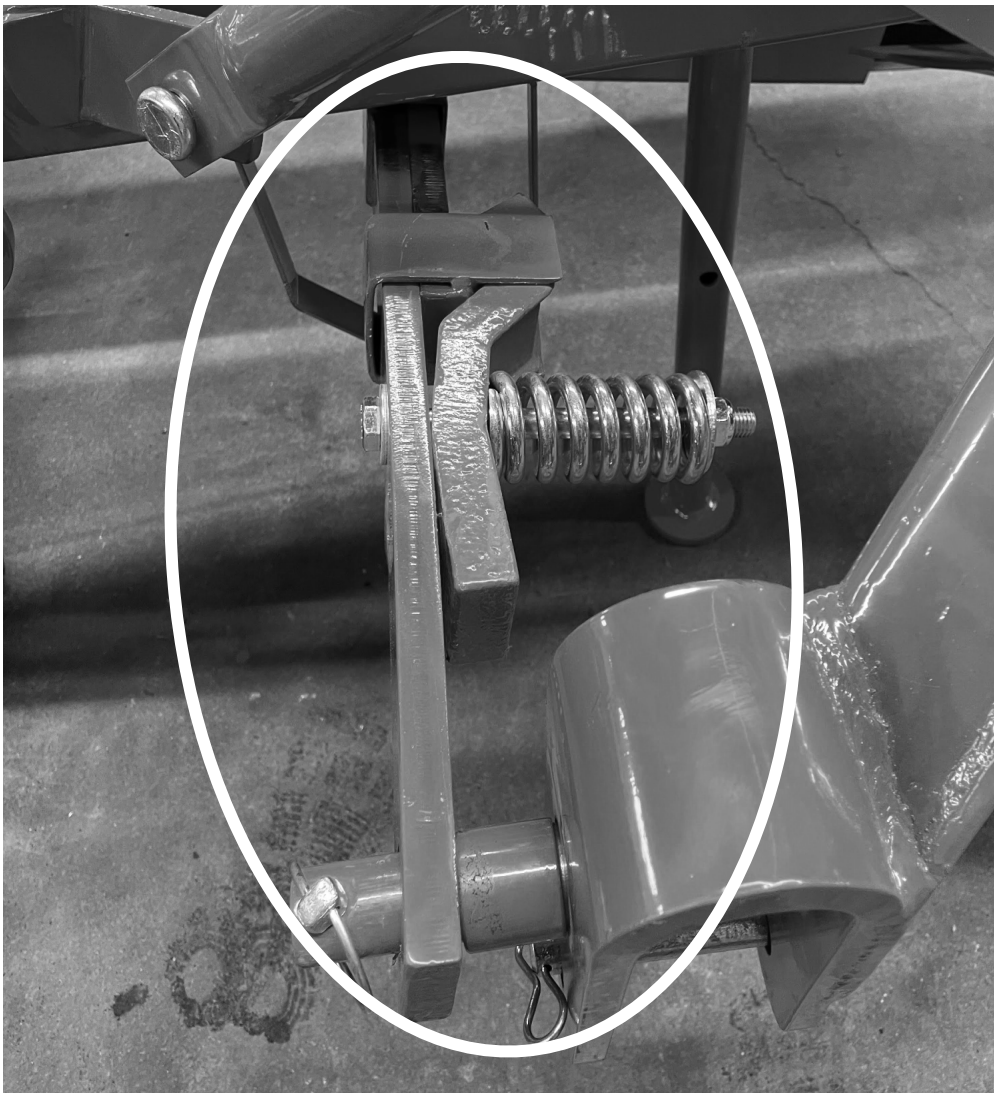
*Figure 2 – Transport lock, shown in the locked position*

### 1.2.3 Breakaway Bar

The breakaway bar is designed to separate when the drums hit an obstruction. If the breakaway bar separates, first turn the PTO off and wait for the drums to stop turning. Raise the 3-point hitch slightly to relieve some of the weight of the mower off of the ground.

For the next step you will need to push the drum unit forward to reset it, but first check the PTO shaft to see whether its inner and outer tubes have separated. If they have separated, reconnect them and ensure that they remain in place while pushing the drum unit forward. It is not a good idea to perform this maneuver by backing the tractor up, especially if the PTO shaft has separated. It is very easy to damage the PTO shaft and potentially your tractor when doing it this way.

Continue pushing the drum unit forward until the breakaway bar latches back into place. You can now lower the 3 point hitch to the appropriate height and continue to cut.



*Figure 3 – Breakaway Bar*

### 1.2.4 Blade Change Tool

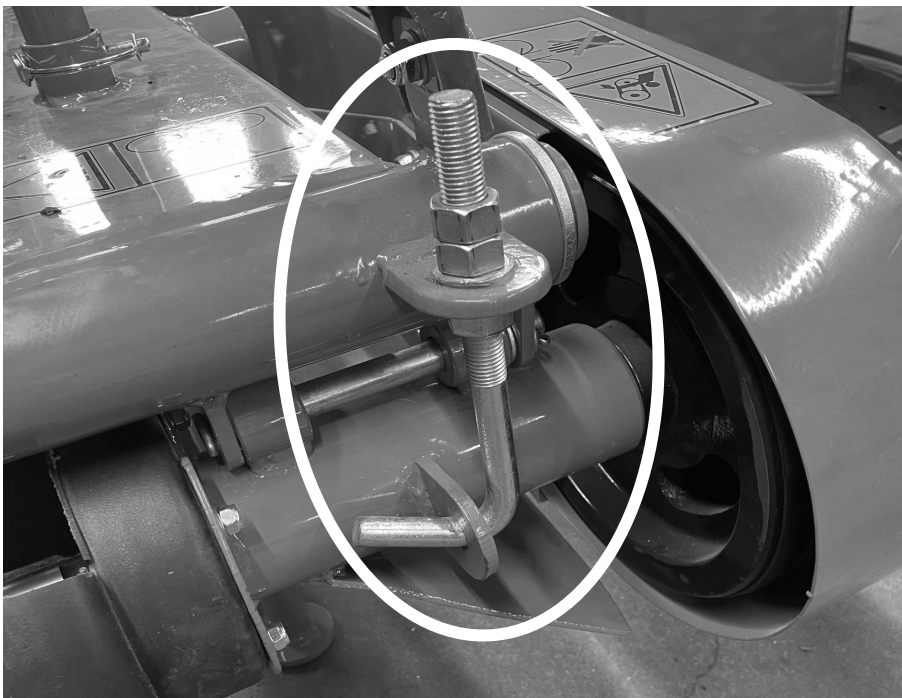
This tool is used to quickly and easily change the blades. Keep it stored with the mower as shown in Figure 4 for convenience.



*Figure 4 – Blade Change Tool*

### 1.2.5 Belt Adjuster

The belt adjuster keeps the belts in tension and allows for adjustment.



*Figure 5 – Belt Adjuster*



## 2 Operator Safety

Your safety is important to us. Please carefully read and follow the instructions given below and contained elsewhere in this manual before attempting to operate the machine. Most accidents can be avoided if you fully understand and implement the safety practices discussed in this section.



**WARNING:** *READ and UNDERSTAND all safety instructions in this section as well as warnings, cautions, and important notes throughout the manual. Serious injury or death may occur unless care is taken to follow these warnings.*

### 2.1 Tractor Operation Safety

- READ and UNDERSTAND all safety instructions and warnings in the operator's manual for your tractor.
- Understand how to stop forward motion, the engine, and the PTO of your tractor quickly in case of an emergency.
- Do not allow an inexperienced person to operate the tractor or any attachments without supervision.
- Wear proper safety gear at all times.
- Do not operate the tractor while under the influence of alcohol or drugs. Consult a medical professional regarding any prescription medications that you are currently taking and any side effects that could hinder your ability to operate the tractor safely.
- Only operate a tractor that has been properly maintained.
- Only operate the tractor in conditions of clear visibility. Never operate in dark or foggy conditions where visibility is restricted in front and to the sides of the tractor and implement. Ensure that all obstacles, steep slopes in the terrain, and overhead obstructions are visible.
- The tractor must be equipped with a rollover protection system (ROPS) and seatbelts to ensure operator safety in case of a rollover incident.
- Always set the parking brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, and wait for all moving parts to stop before leaving the tractor seat.
- Do not operate the tractor or implement while hydraulic oil or fuel is leaking. Oil and fuel are explosive, and their presence could present a hazard. Hydraulic lines are under extreme pressure and, if a break occurs, bursting oil could cause skin injury and/or tissue damage. Turn off the engine and relieve hydraulic pressure before checking for leaks.

### 2.2 Implement Operation Safety

- Before starting work ensure that the mower is in good condition, that all guards are in place and in good condition. Always replace damaged guards immediately.
- The guards, such as tarps, pipes, metal covers, are designed to avoid stones or objects being thrown up. They also guard from access to potentially dangerous parts of the machine and must therefore be in place and functioning correctly before the machine is used.



- Always maintain a safety zone of 150'. Never allow any bystanders or animals within the 150' safety zone while operating the mower.
- Never leave the operator's station with the machine running.
- The drums continue rotating after the tractor PTO has been shut off. Before proceeding with any work activities on the mower, it is crucial to ensure the drums have come to a complete stop.
- Before operating the machine check wear on cutting devices (blades and drums). Replace worn or damaged blades and blade holders with original Ibex brand parts. After replacing, make sure that all fasteners (bolts, screws and nuts) are of the type recommended by Ibex Equipment.
- When replacing blades, always check fasteners to ensure they are secure.
- Never mow along roadsides, in public places, or on very rocky ground to avoid the risk of accidents caused by materials or objects being thrown by the machine.
- Never operate the mower while driving in reverse.
- Make sure that forward speed is suited to the terrain. Never make sudden changes in direction. Be extremely careful when changing direction bearing in mind weight, length, and height of the machine.
- Never let anyone ride on the mower at any time.
- When driving on roadways the mower must always be in the transport position. Never drive on roadways with the mower in the working position.
- When driving on roadways, adhere to all applicable laws regarding roadway transport of agricultural machinery.
- Before operating the machine make sure that all guards and safety devices are properly secured and in good condition. Replace any damaged safety devices. Check wear on guards, curtain, and connecting devices before operating the machine.
- Make sure that there are no foreign objects in the machine (debris, tools, etc.) which could affect operation or cause injuries to the operator.
- Detach the machine on level ground, with the cutter drums lowered to the ground completely. With the aid of the stand, make sure that the machine is level.
- Before performing maintenance under raised parts of the machine, secure them using a suitable support.
- Be extremely careful when changing the position of the mower from transport to working position to avoid being pinched or crushed by the machine. Ensure there are no bystanders in the area.

## 3 Assembly

### 3.1 Uncrating

Remove the four (4) bolts from the top of the metal shipping frame. Remove the top of the crate frame and set it aside. Cut all binding wires from parts and set all parts out of the crate. Heavier components can be lifted out of the crate using a tractor loader, forklift, overhead hoist, or other means. Remove the bags and bundles of parts and sort them into like groupings. This makes finding the hardware much easier during assembly.

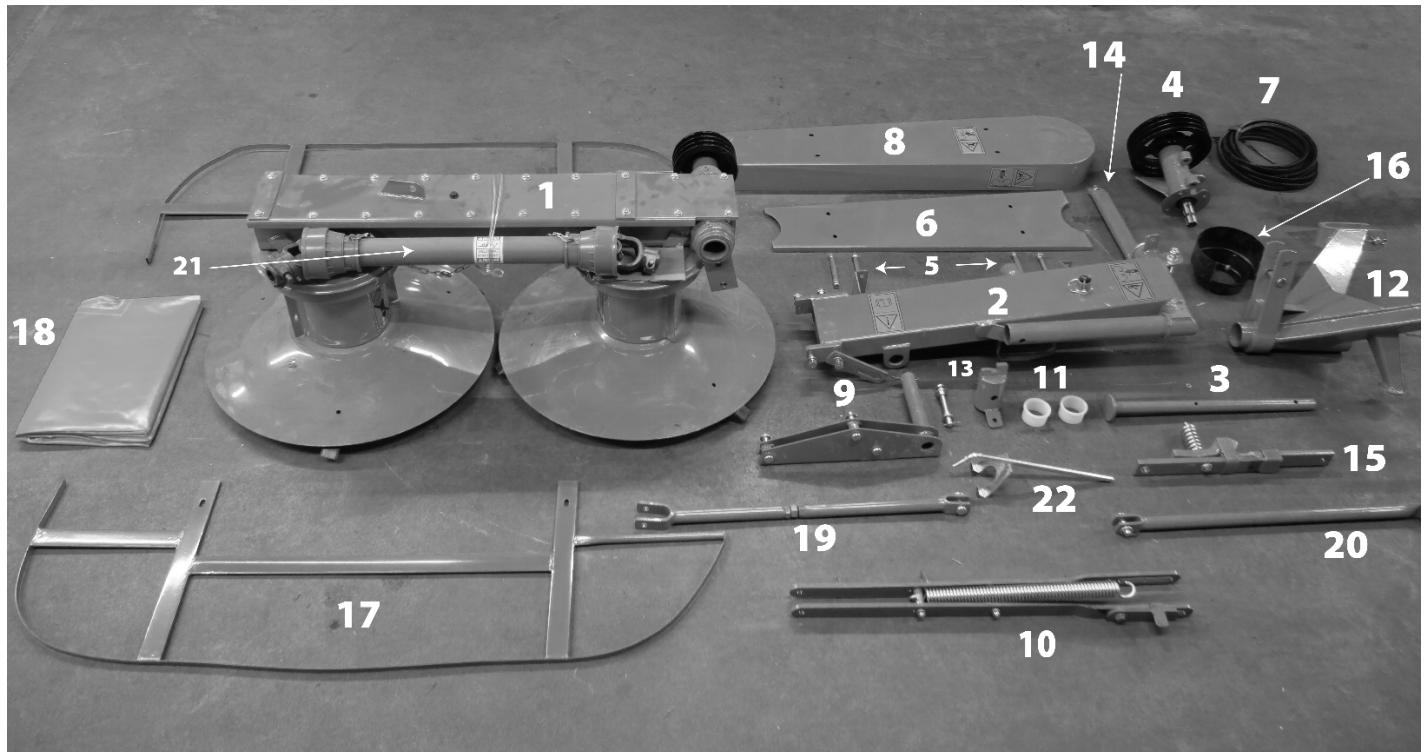


Figure 6 Part Reference

- |                             |                              |
|-----------------------------|------------------------------|
| 1. Drum Unit                | 12. Hitch Pivot Frame        |
| 2. Hitch Main Frame         | 13. Yoke Cap Pin and Spacers |
| 3. Jack Stand               | 14. Stabilizer Bracket       |
| 4. Belt Drive assembly      | 15. Breakaway Bar            |
| 5. 6" Double End Studs      | 16. PTO Shield               |
| 6. Belt Cover Backing Plate | 17. Curtain Frame            |
| 7. Belts (3)                | 18. Curtain                  |
| 8. Belt Cover               | 19. Adjustable Top Link      |
| 9. Triangular Pivot Frame   | 20. Transport Sway Bar       |
| 10. Suspension Assembly     | 21. PTO Shaft                |
| 11. Polymer Bushings        | 22. Blade Tool               |



*TIP: Reference this page during assembly to identify parts described in assembly instructions.*

## 3.2 Hitch Frame Assembly - TM65E ONLY



*NOTE: The TM65E ships more disassembled than the TX49E and TS53E models. Skip to Section 3.3 if you are assembling a TX49E or TS53E.*

- 3.2.1 Thoroughly coat the inside of the hinge brackets that are shipped in the hitch frame with grease. Attach the hitch main frame to the mower main frame using the four bolts and hinge brackets, as shown in Figure 7. Note the location of the slotted safety stop and be sure to reinstall in the same location.

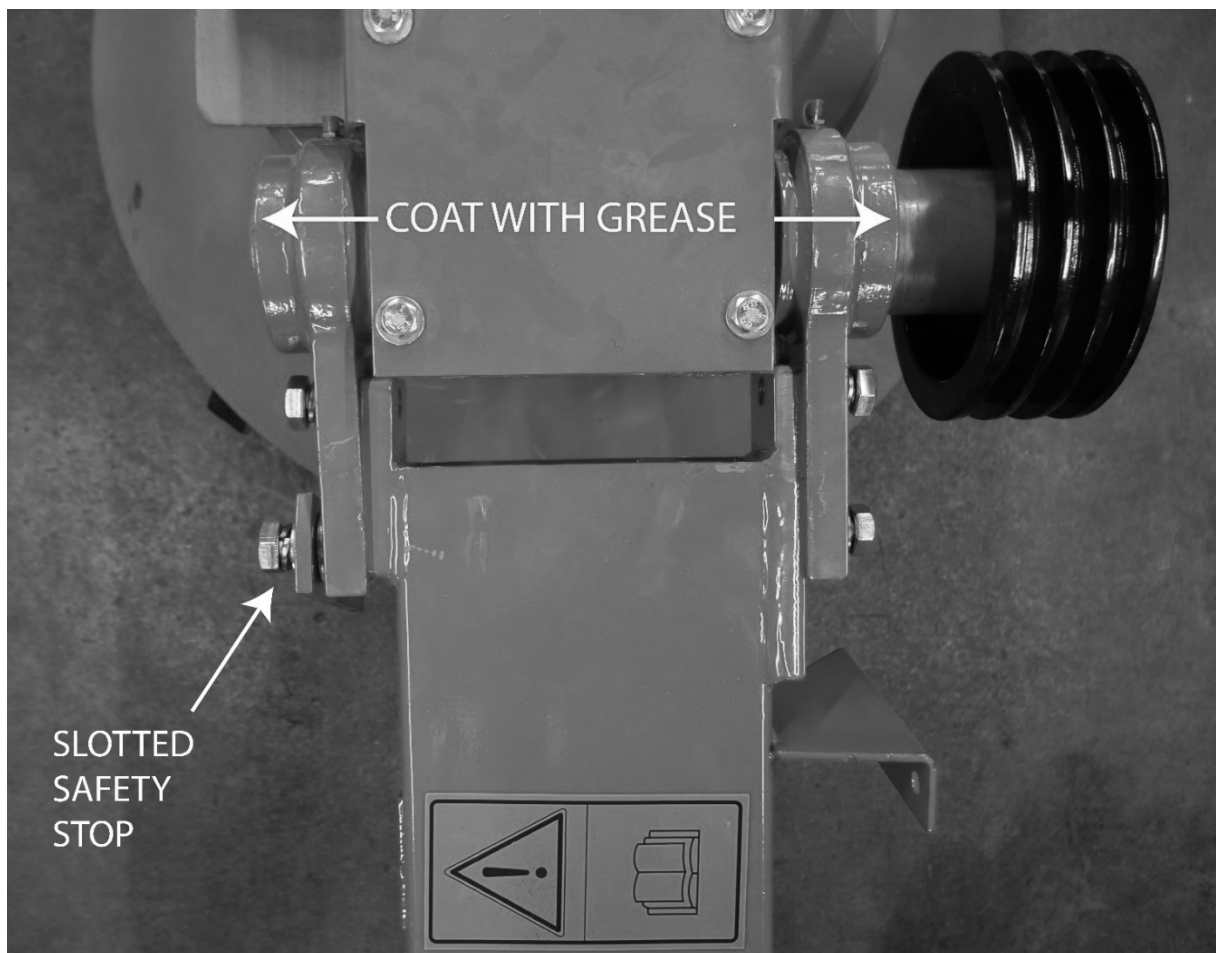


Figure 7

3.2.2 After attaching the main frame, install the jack stand in the mower hitch frame.



Figure 8



- 3.2.3 Install the belt cover backing plate by inserting the 6" double end studs through the holes in the backing plate and into the brackets on the hitch frame. Install and tighten the nuts in the brackets.



*Figure 9*

- 3.2.4 Install the belt drive assembly onto the hitch frame as shown in Figure 10.



*Figure 10*

Install the belts on the pulleys and lay a straight edge over the top of the pulleys. Use the belt adjuster on the belt drive assembly (Figure 12) to adjust the belts. To make adjustments, first loosen the top jam nut. Then loosen the other two nuts and thread the bottom nut far enough away from the frame to leave ample room for adjustment. Threading the top nut down against the frame will pull up on the link to tighten the belt.

Adjust the belt tensioner until there is 1¼" deflection when applying approximately 25 lbs. of pressure evenly across all three belts in the direction shown in Figure 11.

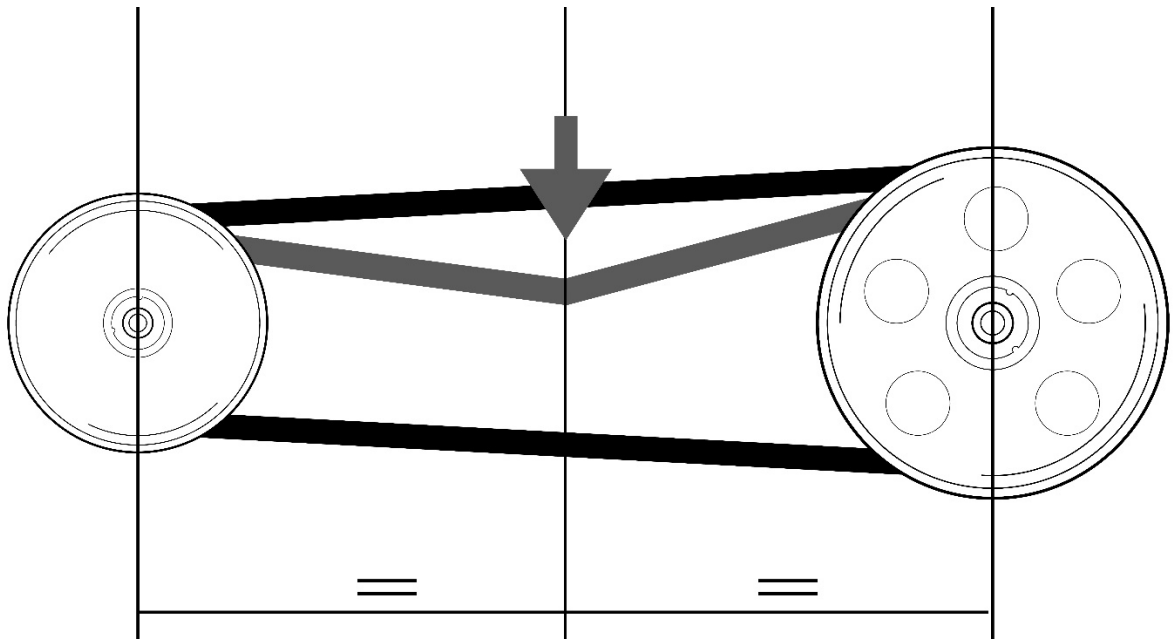


Figure 11

When adjustment is completed, tighten the top jam nut down against the adjusting nut.



**NOTE:** Belt tension should be rechecked after four (4) hours of operation.

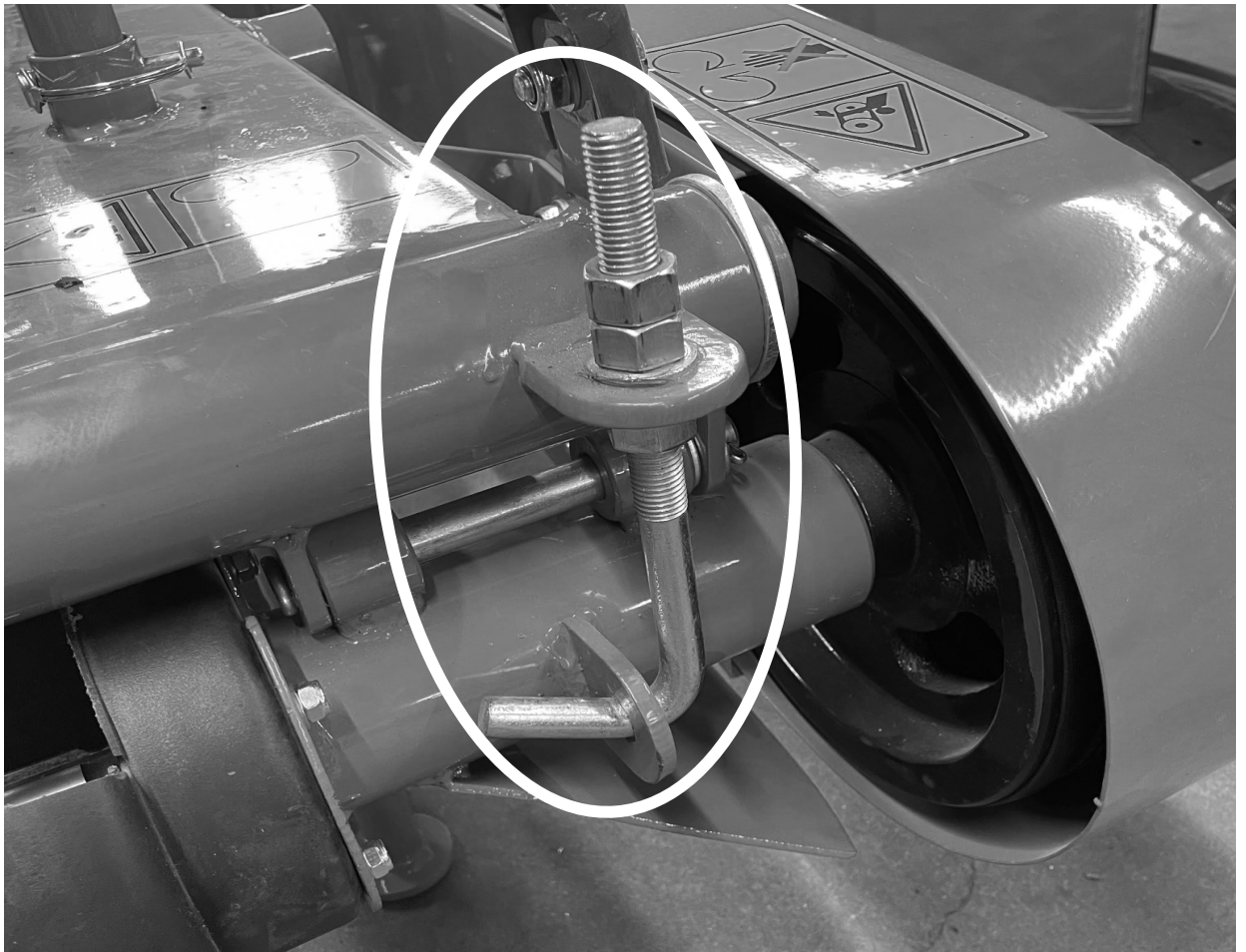


Figure 12

- 3.2.5 Install belt cover over belts and retain with nuts on the 6" double end studs. Install and tighten the nuts.

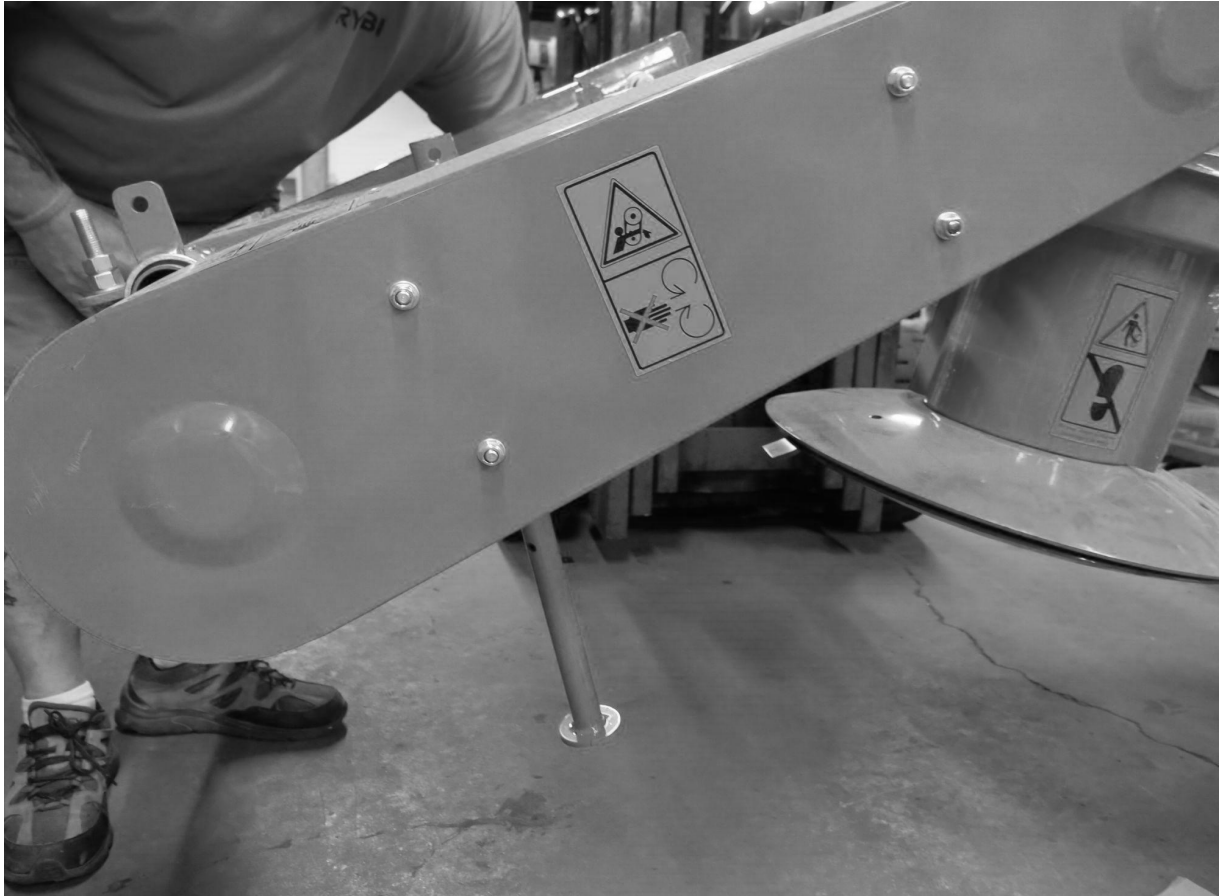


Figure 13



### 3.3 Main Frame Assembly – All Models

- 3.3.1 Remove the slotted safety stop as shown in Figure 14 and set it and its hardware aside.



Figure 14

- 3.3.2 Install the triangular pivot frame by sliding its hinge arm into the brackets on the bottom of the hitch main frame. Install the retaining pin and secure it with a cotter pin.



Figure 15

- 3.3.3 Insert the slotted end of the safety stop into the triangular pivot frame as shown in Figure 16 and insert the retaining pin through both the frame and the slot of the safety stop. Install the washer and cotter pin into the retaining pin. Reinstall the safety stop bolt and washers.



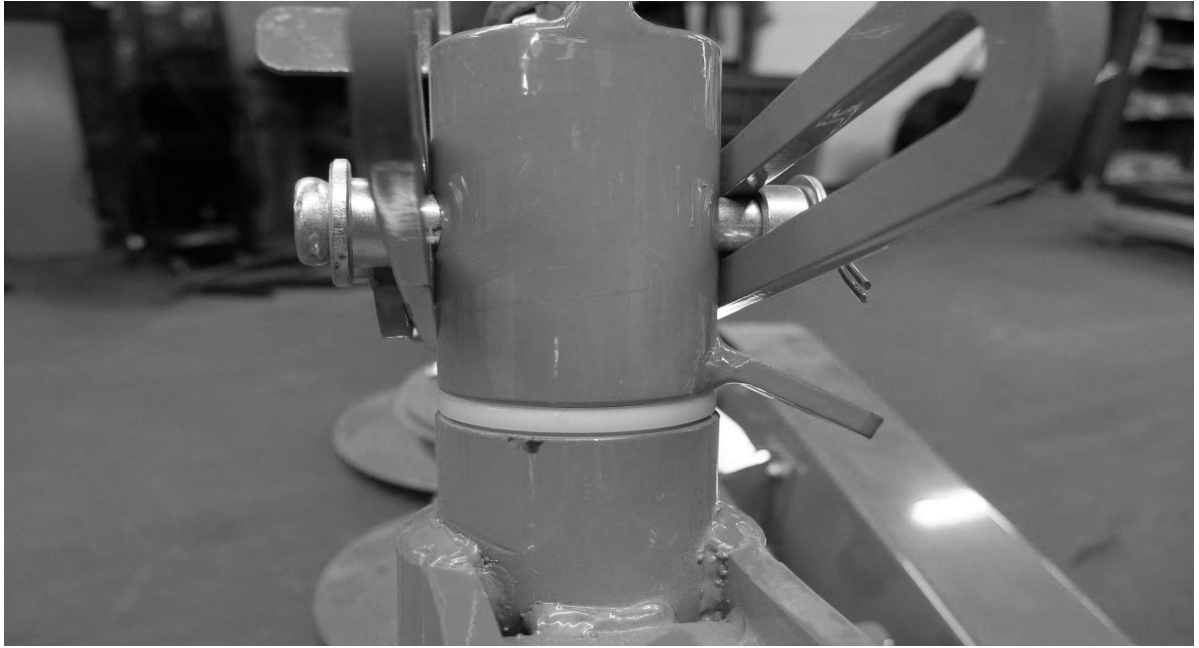
*Figure 16*

- 3.3.4 Remove the yoke cap and polymer bushings from the pivot post of the hitch main frame.



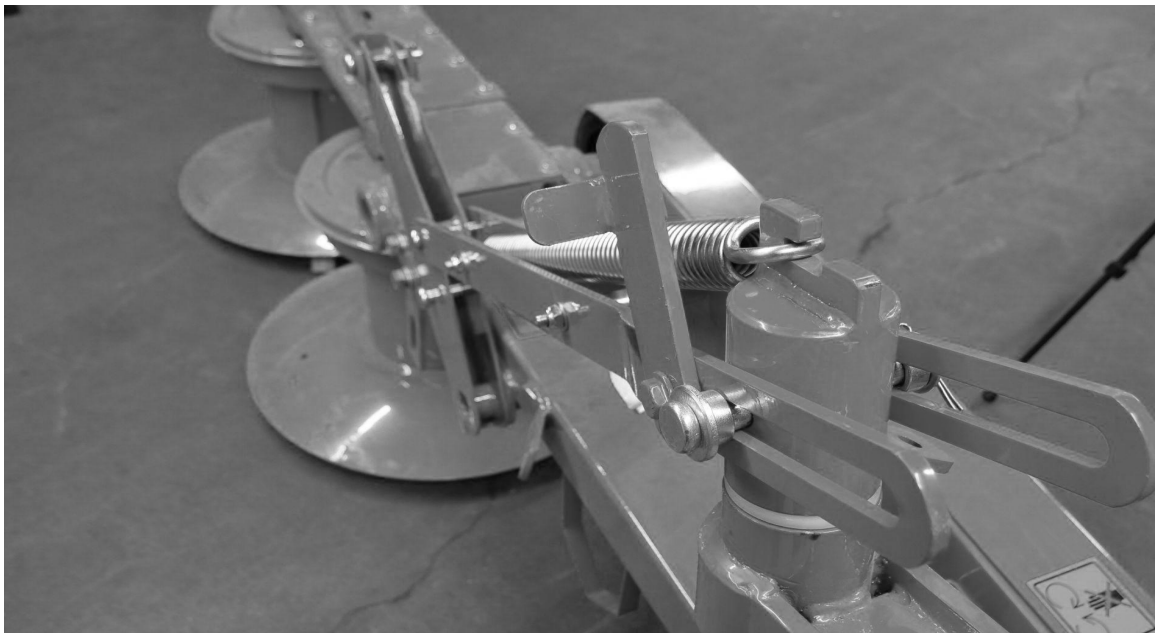
*Figure 17*

- 3.3.5 Install the polymer bushings into the 3-point pivot frame tube. Apply a thin coat of grease onto the inside of the polymer bushings and install the 3-point pivot frame onto the main frame pivot post. Ensure the polymer bushings are not damaged during installation. Reinstall the yoke adapter cap. Insert the pin through the slots in the suspension assembly and yoke adapter cap as shown in Figure 18.



*Figure 18*

- 3.3.6 Install the extension spring to the hook located on top of the yoke adapter cap.



*Figure 19*

### 3.3.7 Install the stabilizer bracket.

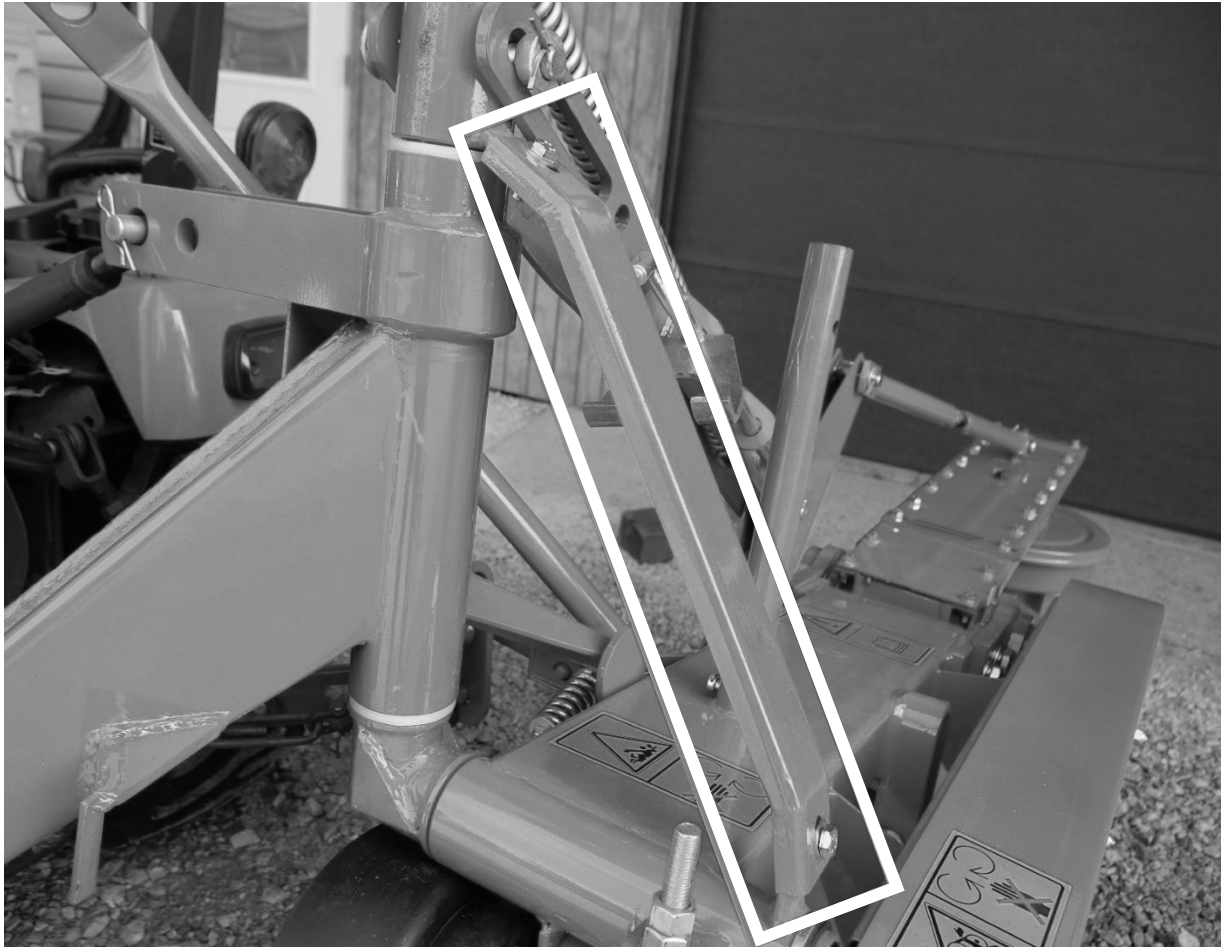


Figure 20



- 3.3.8 Install the breakaway bar by inserting the end that is opposite of the spring through the hanger bracket and into the U-shaped mounting bracket. Insert the retaining pin. The spring can face either direction, toward the left or right. Install the washer and cotter pin into the retaining pin as shown in Figure 22.



Figure 21

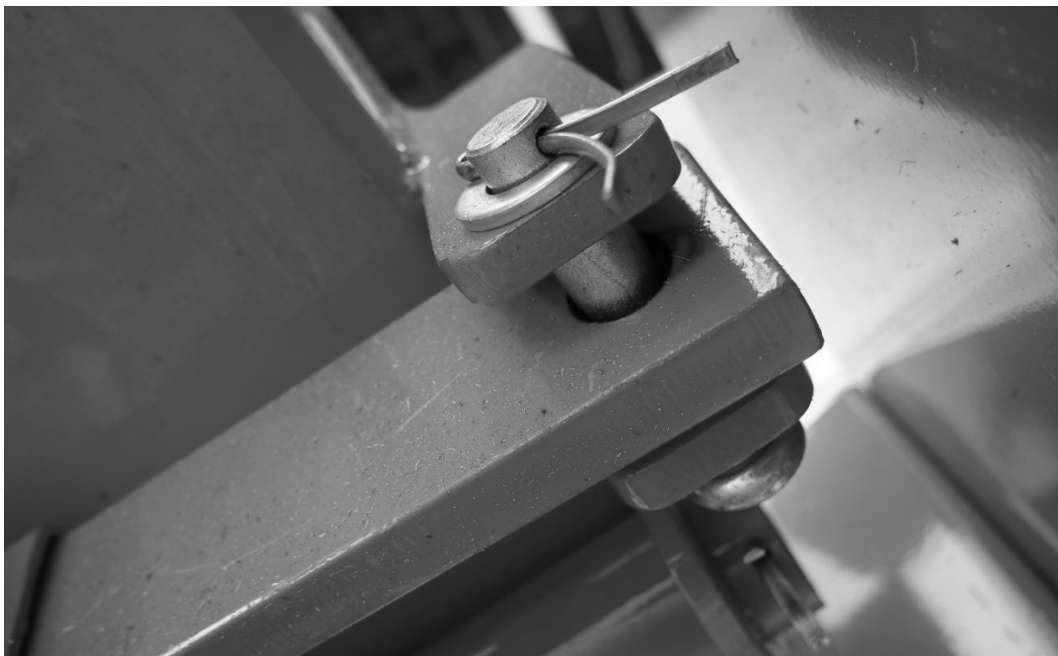


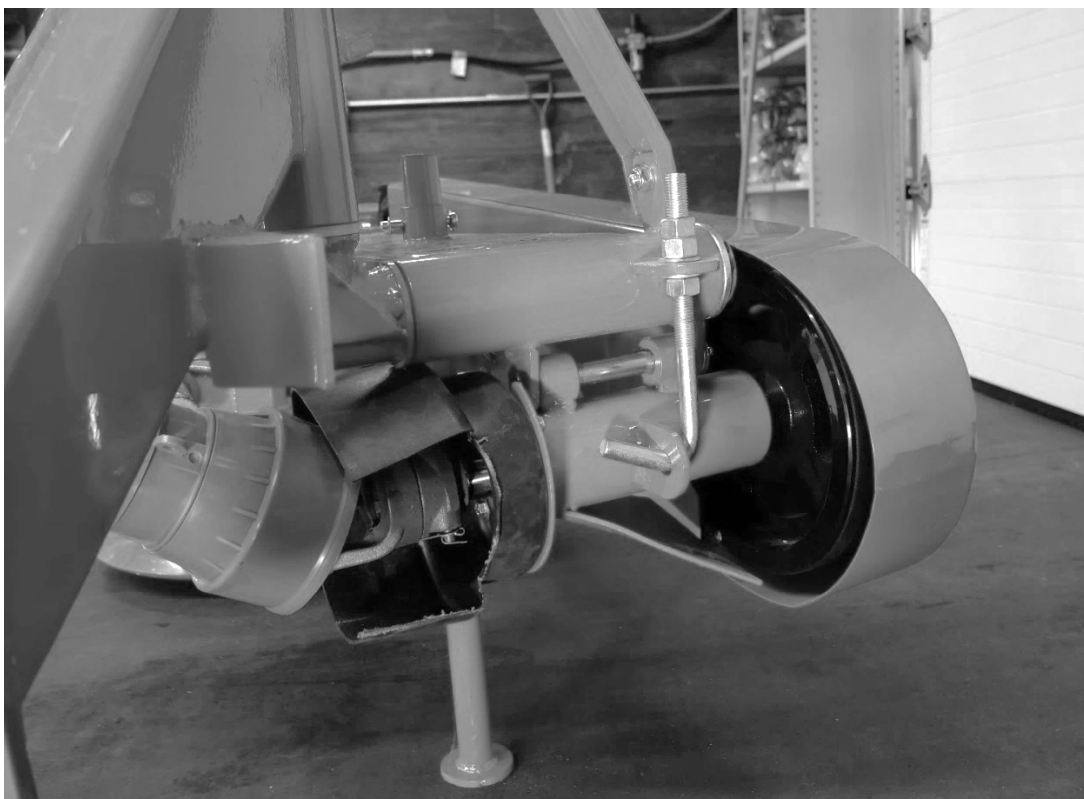
Figure 22

- 3.3.9 If necessary, rotate the pivot frame assembly so that it is in the transport position, as shown in Figure 23. Install the transport sway bar.



*Figure 23*

- 3.3.10 Install the PTO shield onto the front of the gearbox. Note the orientation of the cutout in the shield as shown in Figure 24.



*Figure 24*

## 3.4 Curtain Assembly – All Models

- 3.4.1 Remove the curtain frame retainer plates from the top of the main gear box assembly.

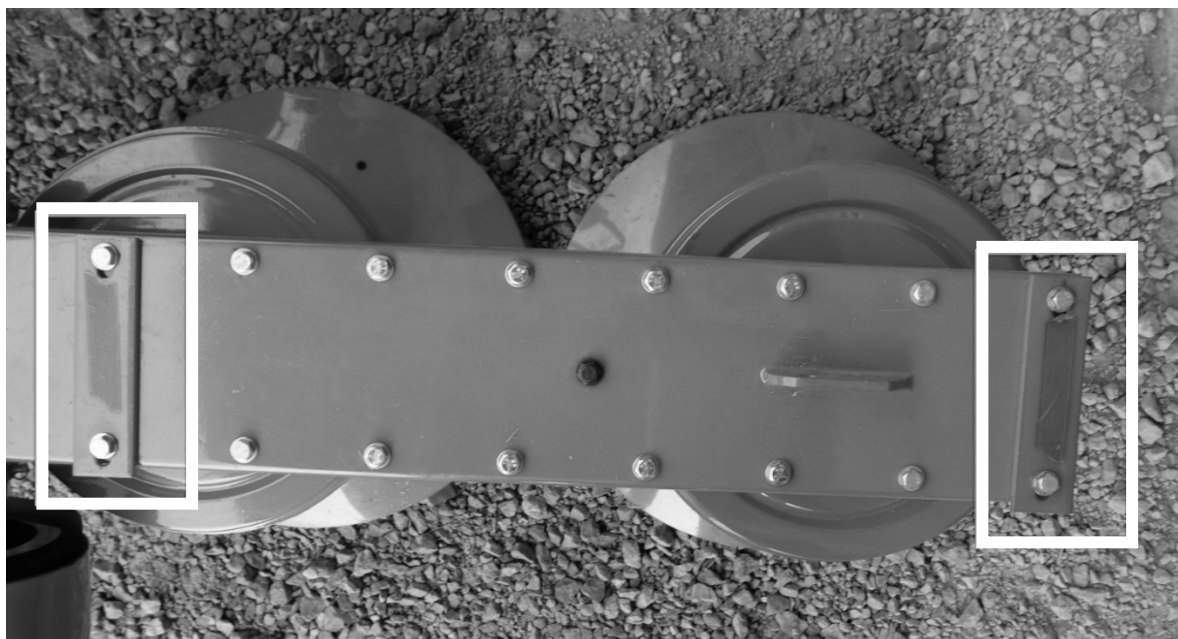


Figure 25

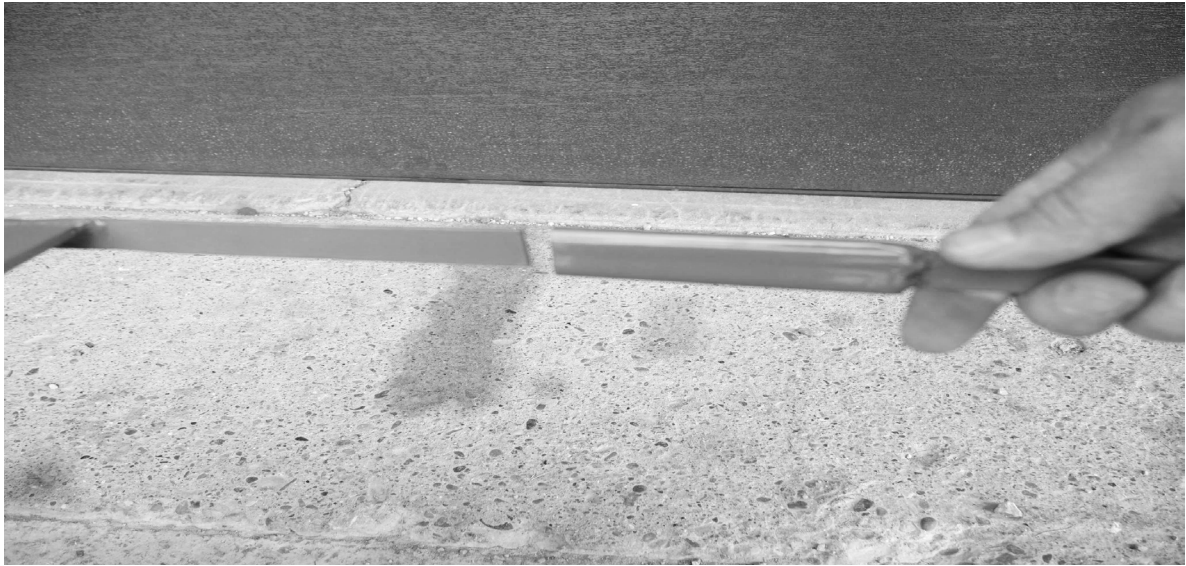
- 3.4.2 Begin with the front curtain frame. Insert bolts through the retainer plate and then through the mounting tabs on the curtain frame. Install the nuts onto bolts but only tighten finger tight.



Figure 26



- 3.4.3 Before setting the rear curtain frame in place, align it with the front frame and ensure that the ends of the outer rails are slipped together (see Figure 27). Set the curtain frame into place on the mower main frame with the mounting tabs of the curtain frame under the retainer plate.



*Figure 27*

Insert bolts through the retainer plate and then through the mounting tabs on the curtain frame. Install the nuts onto the bolts and tighten all bolts and nuts for final assembly.



- 3.4.4 Lay the yellow curtain over the curtain frame and move it into the correct position. The U-shaped cutout of the curtain goes around the main frame of the mower as shown in Figure 28. Insert the ties through the eyelets and tie them to secure the curtain over the curtain frame.



*Figure 28*

## 3.5 Final Steps – All Models

- 3.5.1 Ensure that the transport sway bar is installed and the transport lock is in the locked position, as shown in Figure 29. If the transport lock is difficult to move, back off the retaining bolt just slightly.

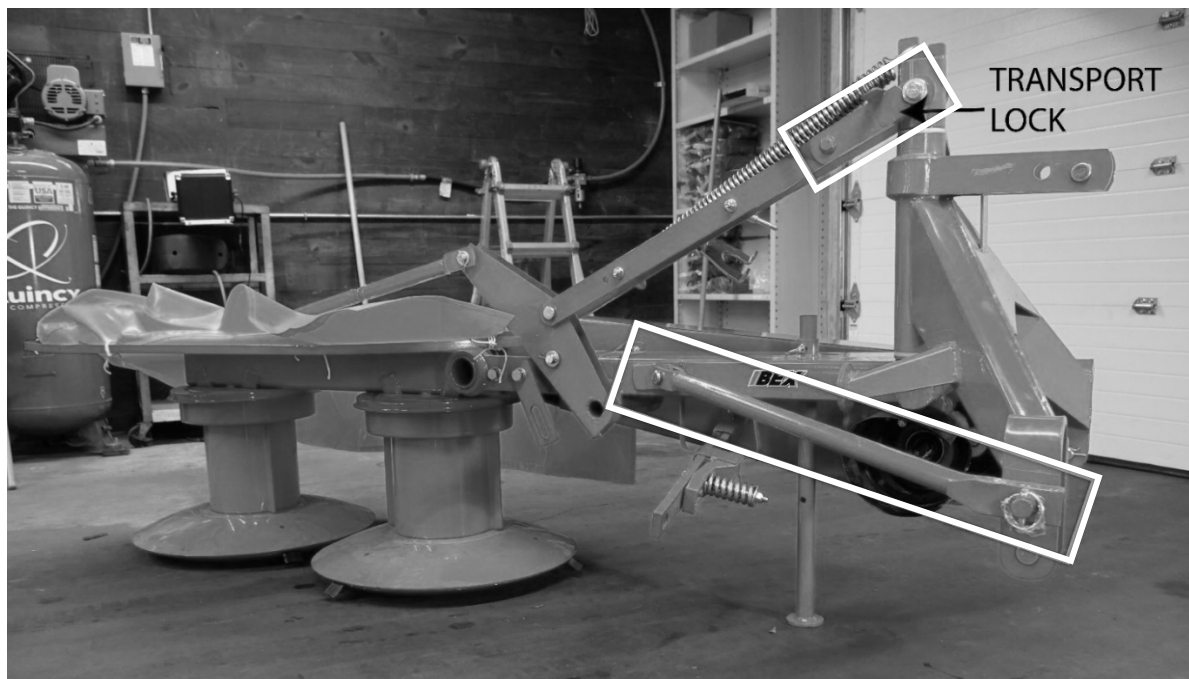


Figure 29

- 3.5.2 Reinstall the adjustable top link with connecting pin and retaining pin.



Figure 30

- 3.5.3 Adjust the length of the adjustable top link until the connecting pin for the slotted safety stop is in the center of the slot as shown in Figure 31. Note that the illustration is for reference only and the slotted safety stop is inserted inside of the triangular pivot frame.



Figure 31

- 3.5.4 Using a grease gun, lubricate the main frame hinge points.

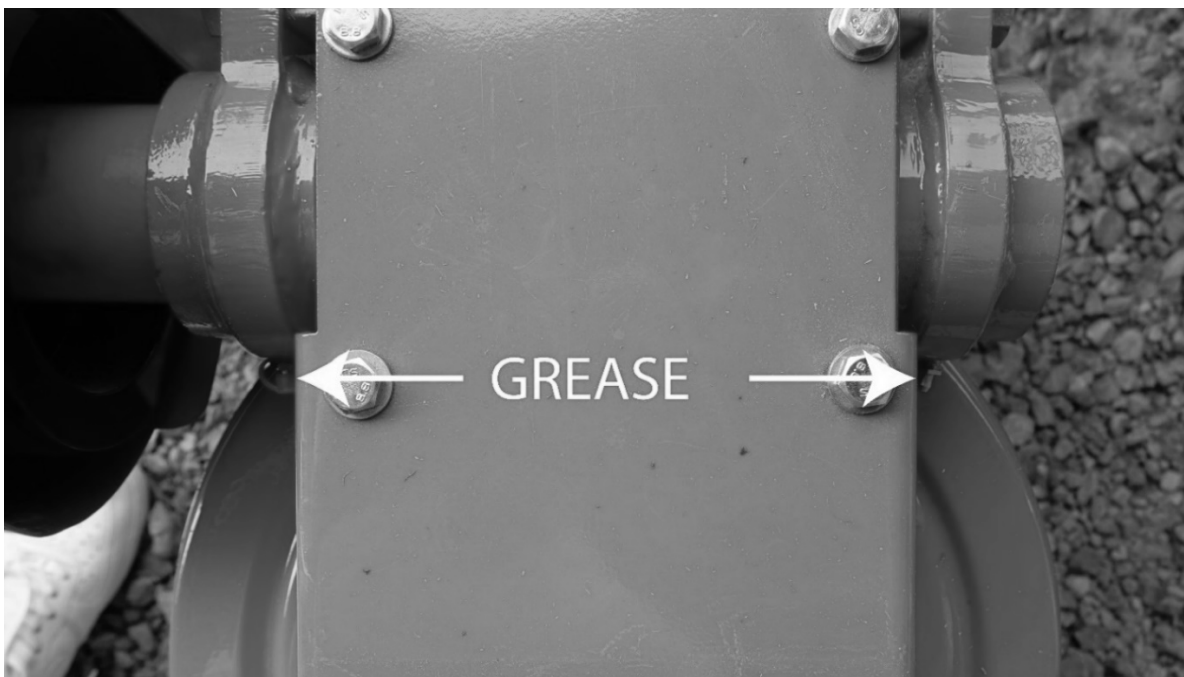


Figure 32



- 3.5.5 Insert the blade tool into the storage holes on the suspension assembly.



Figure 33

- 3.5.6 Hitch the mower up to the tractor. Move the mower into working/mowing position by first releasing the transport sway bar and the transport lock. Next, rotate the hitch pivot frame toward the breakaway bar and attach the bar to the frame as shown in Figure 34.



Figure 34

- 3.5.7 Connect the PTO shaft to the mower by pushing in the locking pin and sliding the yoke onto the PTO shaft of the mower. Push until the locking pin releases and settles into the groove. Attach the PTO shaft safety cover safety chain to a stationary part of the mower. Leave some slack in the chain to accommodate pivoting movements.

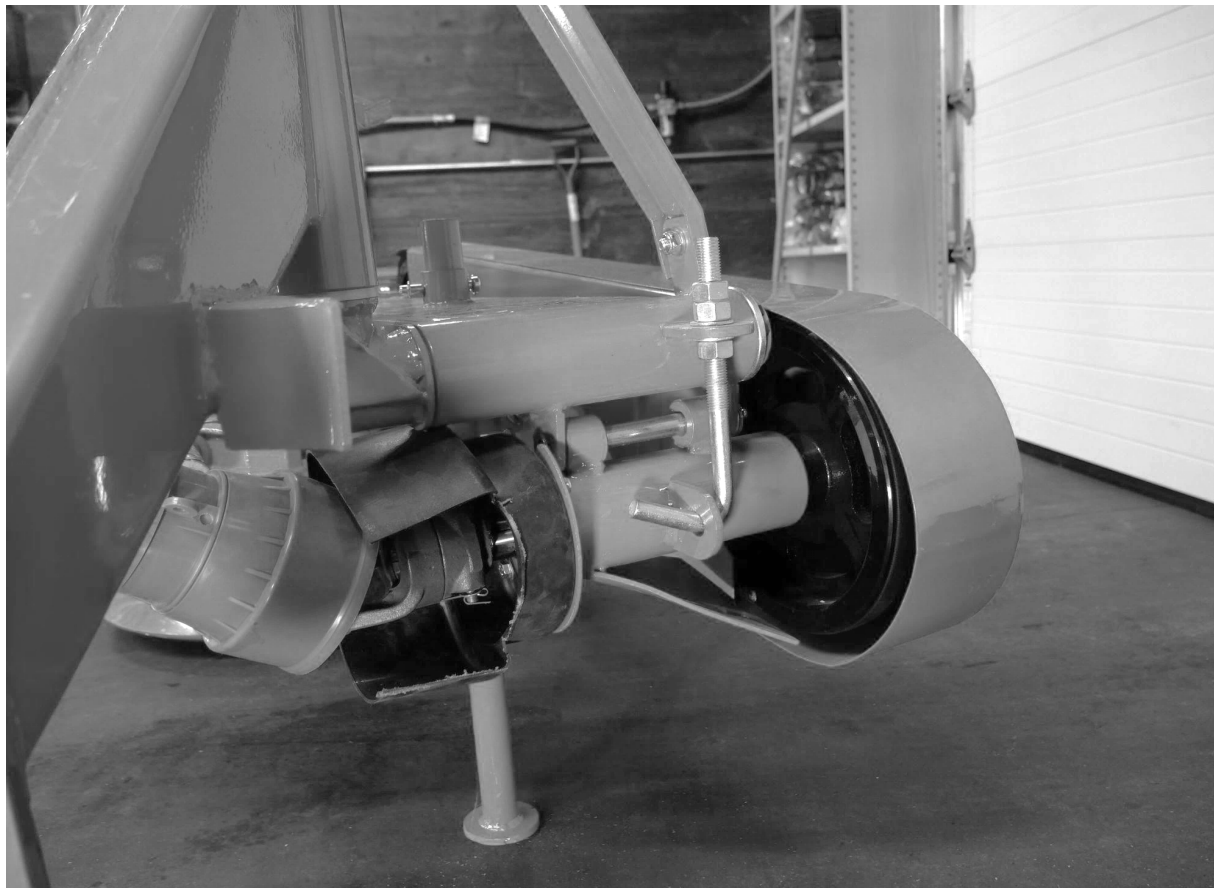


Figure 35



*Read and understand the included Ibex PTO Shaft Cutting Guide. If needed, cut the PTO shaft to the correct length to properly fit your tractor.*

## 4 Operation

The purpose of this section is to instruct you on the safe and optimal use of your new E-Series Mower. Pictures are included for illustrative purposes but may not match your machine exactly. Some pictures show protective covers removed for purposes of clarity. DO NOT attempt to operate the machine while the protective covers are removed.

Every operator of the implement, whether it is you or someone else, must be completely familiar with this section before attempting to use it.

### 4.1 Tractor Connection

- Attach the tractor's lower 3-point arms to the lower frame pins on the mower and attach the tractor's top link to the center pin on the mower. Ensure that the retaining pins are inserted and locked.
- Connect the PTO shaft to the tractor's PTO. Ensure the locking mechanism is fully engaged into the groove on the tractor's PTO.

### 4.2 Operation Procedure

#### 4.2.1 Switch from Transport to Mowing Position

- Lower the 3-point hitch so that the drums are just slightly above the ground.
- Release the transport lock bar and swing the drum unit around until it is perpendicular to the tractor.
- Attach the breakaway bar to the inner pin of the 3-point frame (the same pin that held the transport lock bar) as shown in Figure 36 and secure it with a linchpin.

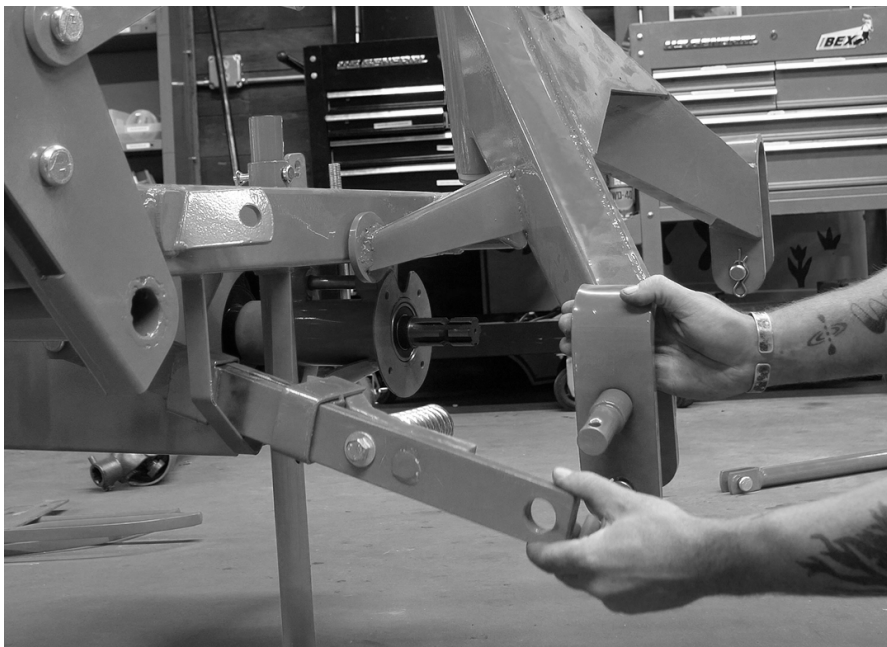


Figure 36

- Lower the 3-point hitch until the transport lock can be moved freely. Move the transport lock into the mowing (up) position.

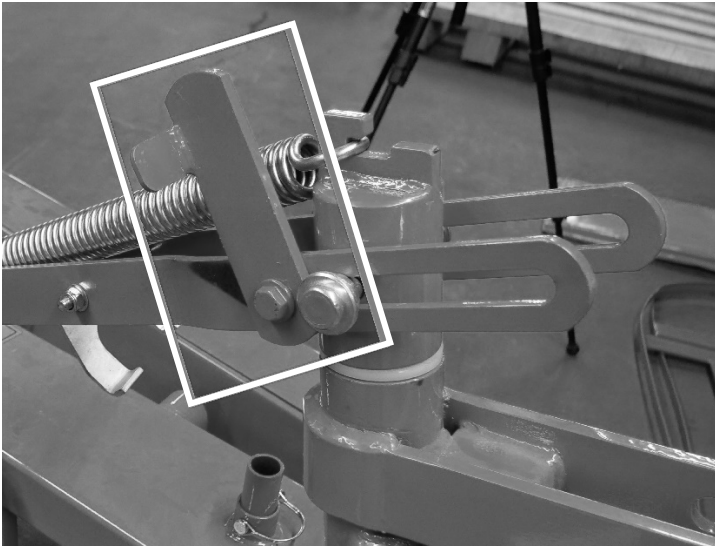


Figure 37 - Transport lock released and in mowing position

#### 4.2.2 Adjust the Mower for Optimal Cutting

- Raise the 3-point hitch to the point **just before** the drums release from the ground. The drums must be touching the ground during mowing.



**WARNING:** Do not attempt to hover the drums above the ground while mowing. Doing so will cause the machine to become unstable, causing damage to the machine and may shoot debris at high speeds, causing harm or damage.

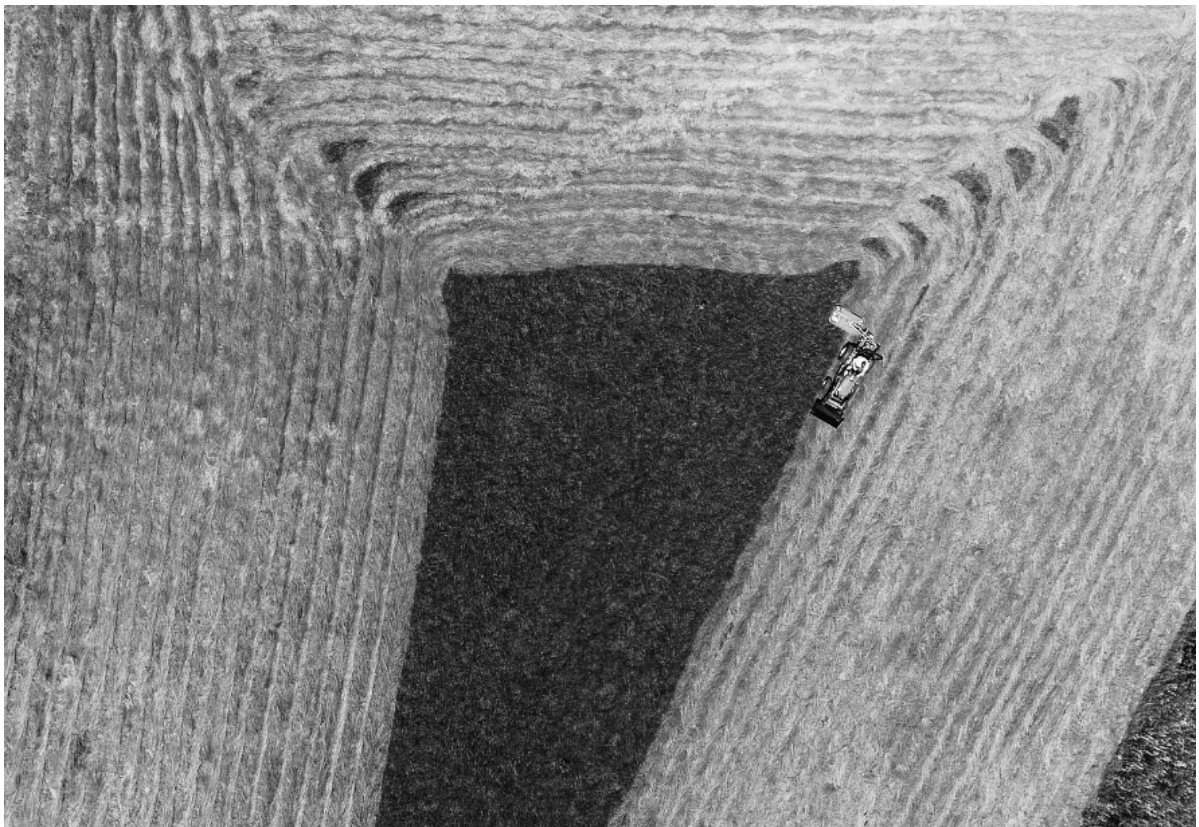
- Adjust the tractor's top link length so that the skid discs of the drums are raised slightly up in the front compared to the rear. This allows the discs to glide more smoothly along the ground. In most cases the front blades only need to be about ¼ inch higher than the rear blades. Mowing fields with lots of rocks, bumps, or other terrain abnormalities will require a steeper pitch to avoid hitting obstructions.
- Because there is a little bit of slack in the connection of the drum unit to the mower frame, the orientation of the skid discs may change slightly after driving forward. Check the drums after driving forward to ensure that the front blades are still at the desired angle and adjust the top link again if necessary.

#### 4.2.3 Cut the Crop

- Always start the tractor's PTO with the throttle at **idle speed**. This is especially important if you have an electric start/push button PTO. Starting the mower at too high of a throttle will apply extreme torque to the PTO shaft which can cause damage to the PTO shaft, the mower, and/or the tractor. Do not worry if the engine stalls when first turning on the PTO at low speed. This is expected and does not result in harm to the tractor. Immediately start the tractor back up and try again until the tractor no longer stalls.



- Slowly increase the throttle until the PTO is up to 540 RPM. Note that PTO RPM is not the same as engine RPM. Each tractor uses its own gear ratio to achieve 540 PTO RPM. Consult your tractor's manual if you don't know the engine RPM that achieves 540 PTO RPM.
- Do not attempt to run the mower at a PTO speed slower than 540 RPM. The machine is designed to run optimally at this speed. Running it slower will result in poor cutting performance and unnecessary strain on the tractor.
- In general, it's best to cut a field either in a back-and-forth row pattern, or in a spiral clockwise pattern from the outside of the field to the inside. Left turns should be avoided because they tend to place too much strain on the outer part of the drums. However, if you want to cut the outer edge of the field you will need to make left turns when cutting in a counterclockwise rotation. Be sure to slow down when making left turns to avoid tripping the breakaway bar, or consider flail mowing or brush hogging the outer swath of the field.



*Figure 38 – Clockwise mowing pattern*

- The clockwise spiral mowing pattern tends to leave uncut sections at turning points (this is visible in Figure 38 at the corners). These sections can be cut after reaching the center of the spiral. It is not necessary to switch the mower to transport mode while moving to those areas, since drum mowers tend to cut low to the ground. The previously cut hay will just be funneled through the drums as you pass through it.

#### 4.2.4 Switch from Mowing to Transport Position

- Release the breakaway bar from the 3-point hitch frame.



- Swing the transport lock over and raise the 3-point hitch until it falls into lock position. If it doesn't fall easily, slightly loosen the lock's mounting bolt to allow it to pivot freely.
- Raise the 3-point hitch until the mower is lifted slightly off of the ground and swing the drum unit to the rear.
- Attach the transport lock bar to the 3-point hitch frame and secure it with a linchpin.
- Raise the 3-point hitch to a suitable height for transport.

#### 4.2.5 Storage

If the mower was used for the last time for the season, see Section 6, End of Season Storage, for tips on storing the mower long-term. If not, inspect the mower for any damage or maintenance needs before storing it away. Brush or blow off any debris from the machine. Avoid the use of water to clean the machine as it can become trapped in its crevices and create rust.

### 4.3 Recommendations for Best Results

- Do not attempt to mow at lower PTO speeds. For safe and efficient operation, the tractor's PTO speed must be at 540 RPM.
- Faster forward speeds tend to result in better flow of the crop through the machine and more even discharge. However, speed should be adjusted to suit the terrain and speeds exceeding 8 MPH are not recommended. Rough field conditions will require a slower speed.
- Reduce forward speed when turning corners. Avoid left turns whenever possible and be particularly cautious whenever making left turns.
- Avoid maneuvers that will cause the breakaway bar to release. Each separation of the breakaway bar results in wear, which can in turn make it easier for it to separate again.

Examples of best practices:

- Improve the condition of the field as much as possible so that the ground has as few rough patches, bumps, and debris as possible.
- Always adjust the mower for optimal mowing as discussed in section 4.2.2.
- Avoid left turns whenever possible. If a left turn must be made, raise the 3-point hitch just slightly (not so much that the drum unit lifts off the ground) and drive at a slow forward speed.
- Keep the cutting blades as sharp as possible. Replace blades with damage that cannot be smoothed and sharpened by grinding.



**WARNING: DO NOT ATTEMPT TO HOVER THE DRUMS ABOVE THE GROUND WHILE MOWING. THE DRUMS ARE TO BE COMPLETELY ON THE GROUND EXCEPT WHILE TRANSPORTING.**



**WARNING: SPEEDS HIGHER THAN THE RECOMMENDED MAXIMUM GROUND SPEED CAN COMPROMISE THE CONDITION OF THE MACHINE, THE QUALITY OF WORK AND THE SAFETY OF THE OPERATOR.**

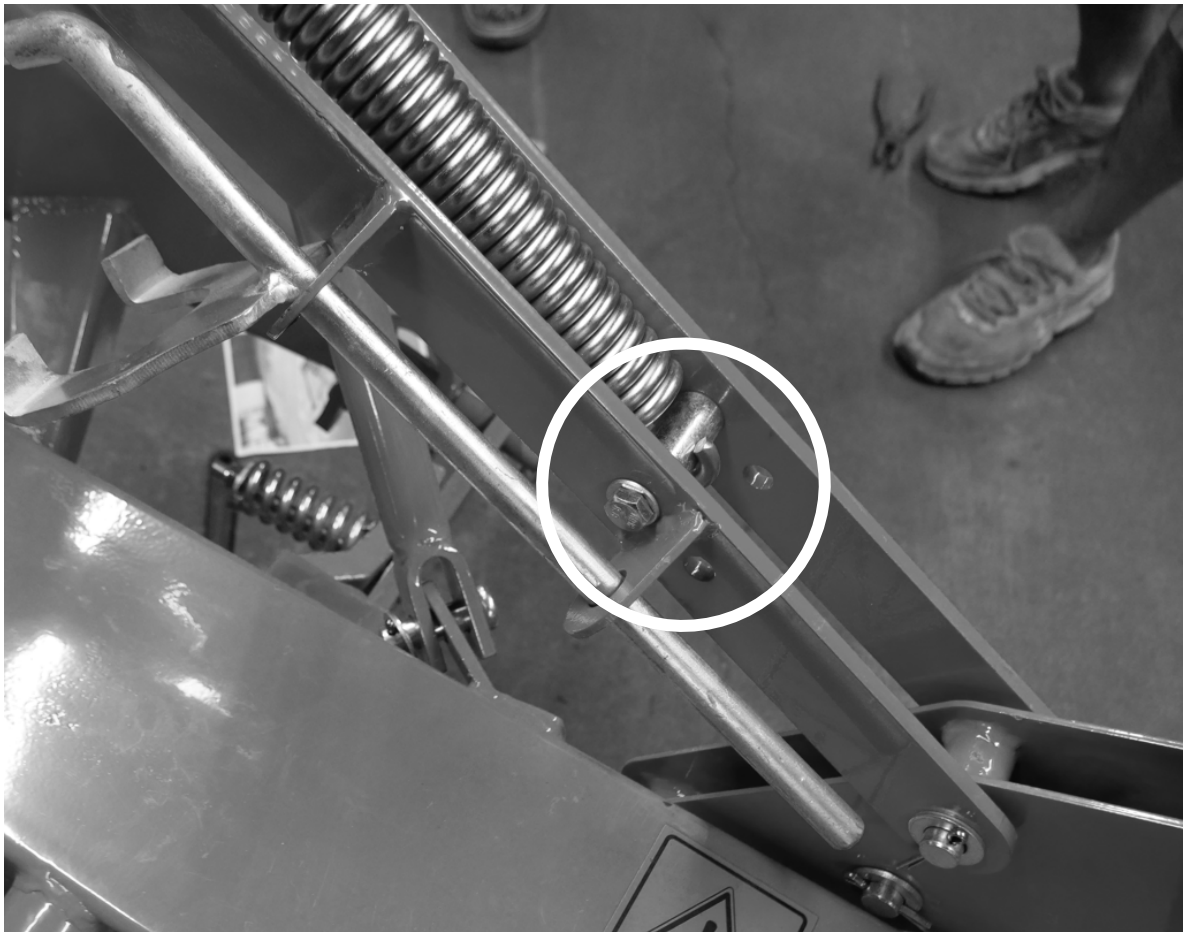


**WARNING: DO NOT DRIVE THE TRACTOR IN REVERSE DIRECTION WITH THE MOWER ON THE GROUND. DO NOT ATTEMPT TO MOW IN REVERSE. DAMAGE WILL RESULT.**

## 4.4 Operational Adjustments

### 4.4.1 Suspension

The suspension spring relieves some of the weight of the drum mower to ease forward movement and lessen the blow if the drums contact any obstructions. The spring can be attached at two different points, as shown in Figure 39 below. It comes installed in the top-most hole. This setting is sufficient to provide enough suspension under normal use. If you will be working in a field that is in rough condition, with bumps, hills, or undulations in the terrain, it may be desirable to increase the spring suspension.



*Figure 39*

To do this, you will first need to ensure that the mower is in working/mowing position (see section 4.2.1 for instructions). Relieve the spring tension by adjusting the 3-point hitch frame so that it is positioned as in Figure 40, with the top of the frame as close to the rear as possible.

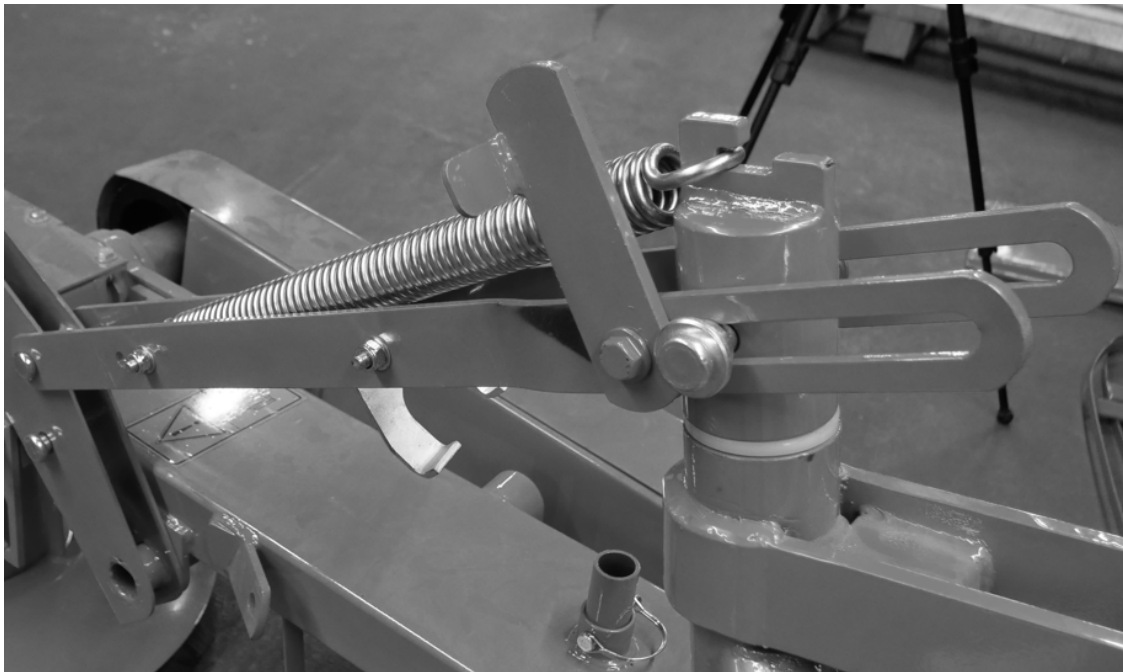


Figure 40

Remove the spring attachment pin and re-install the pin and spring at the other attachment point. It may be necessary to stretch the suspension spring to achieve this.

#### 4.4.2 Belt Tension

Use the belt adjuster on the belt drive assembly (Figure 41) to adjust the belts when necessary. First loosen the top jam nut, then loosen the other two nuts and thread the bottom nut far enough away from the frame to leave ample room for adjustment. Threading the top nut down against the frame will pull up on the link to tighten the belt.

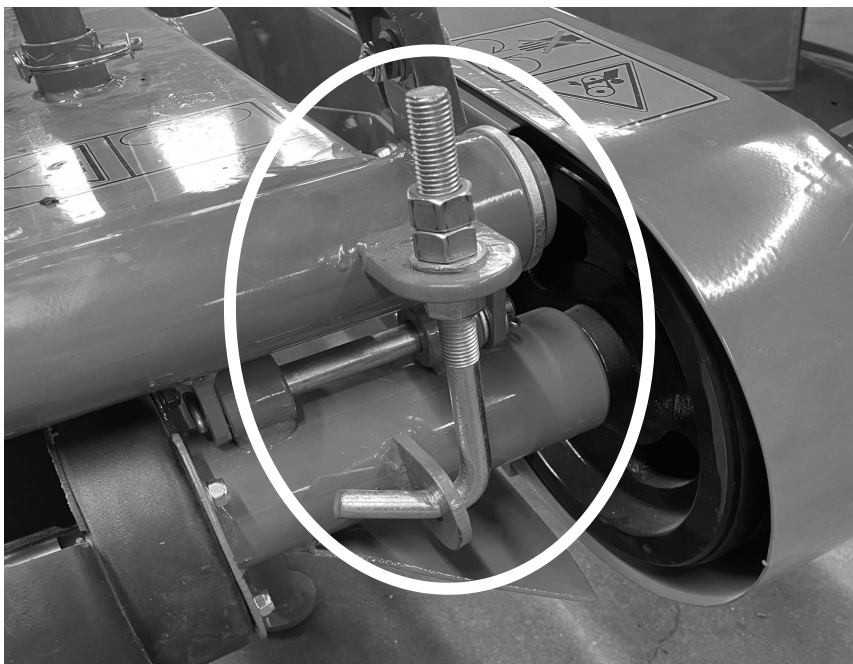


Figure 41

Adjust the belt tensioner until there is 1¼" deflection when applying approximately 25 lbs. of pressure evenly across all three belts in the direction shown in Figure 42.

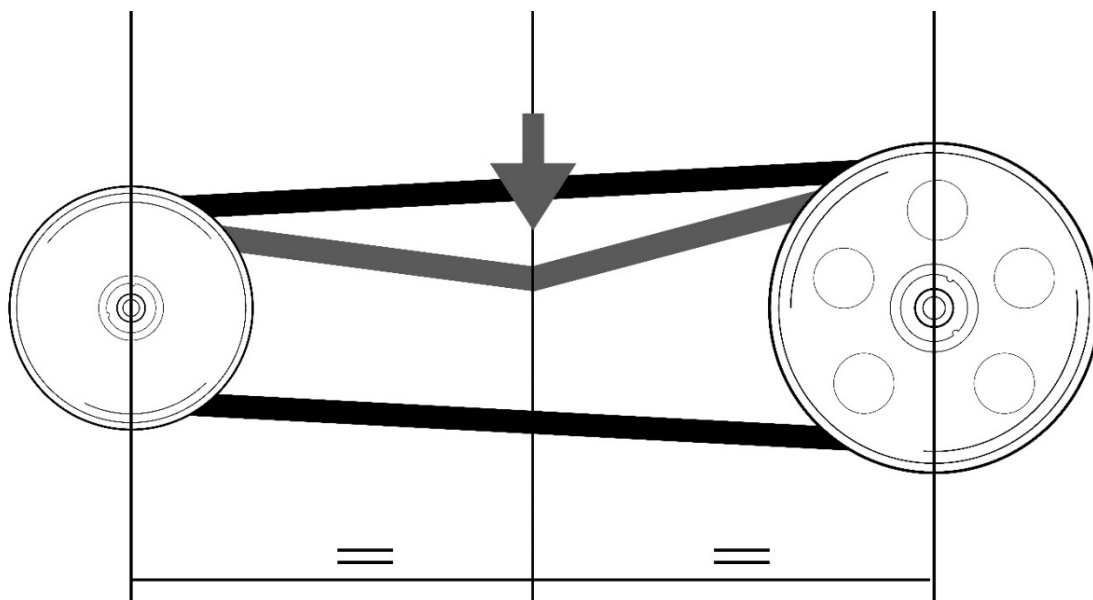


Figure 42

When adjustment is completed, tighten the top jam nut down against the adjusting nut.

## 5 Maintenance

### 5.1 Maintenance Schedule

Action	Interval			Specifications
	As Needed	Each Day of Use	100 Hrs. or Each Season	
LUBRICATION				
Change gearbox grease – only after repair	X			NLGI 0 EP Grease
Main frame hinge point – add grease at grease fittings	X	X		NLGI 2 Grease
PTO shaft – add grease at grease fittings and grease internal shafts	X	X		NLGI 2 Grease
Linkage pivot points without bearings or grease fittings	X	X		Add spray lubricant
GENERAL MAINTENANCE				
Check belt tension (also re-check 4 hours after first installation)			X	1 ¼” of deflection with 25 lbs of pressure across all 3 belts
Check nuts/bolts and tighten any that are loose	X	X		
Clean machine	X	X		Remove dirt and debris (do not use water)
In case of paint wear with bare metal, apply paint, oil, or grease to prevent rust	X			

### 5.2 Gearbox Lubrication

The main gearbox for the drums runs along the length of the drum unit, with one chamber that services both drums. The chamber takes NLGI 0 EP grease. It comes filled to the proper level at the factory. The chamber should have enough grease so that it reaches the height of the central shaft. The grease does not need to be changed unless it needs to be drained to perform repair on the gearbox.



## 6 End of Season Storage

- Before storing the mower for a long period of time, it is good practice to clean the machine and lubricate all mechanical components to prevent rust.
- Clean the machine thoroughly. Avoid using water as it will encourage formation of rust. Use compressed air or a handheld brush instead.
- Inspect the machine for damaged parts and scratched paint. Cover any bare metal with paint, oil, or grease to prevent rust.
- Inspect the curtain and replace if damaged or excessively worn.
- Store the machine in a barn or other enclosed shelter out of the weather.

## 7 Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
<b>Not cutting properly</b>	Worn, bent, or broken blades	Replace worn blades
	Forward speed is too fast or too slow	Adjust forward speed
	Belts are slipping	Check & correct belt tension Check for excessive belt wear Check for debris that is preventing drum rotation
<b>Scalping the ground</b>	Mower pitched too far forward or back	Ensure tractor top link is adjusted as outlined in section 4.2.2
	Bent blade(s)	Install new blades
	Bent upper or lower disc	Replace as necessary
<b>Cut material clogging machine or clumping behind machine</b>	Wet plant material	Allow additional drying time prior to mowing
	Dull or worn blades	Install new blades
	Forward speed is too fast or too slow	Adjust forward speed
<b>Breakaway bar keeps separating</b>	Mower has not been adjusted for optimal cutting	Adjust the mower according to section 4.2.2
	Breakaway bar is worn from repeated separation	Tighten spring tension as a temporary fix, then replace breakaway bar as soon as possible
	Field is too rough	Improve field conditions before mowing
<b>Excessive vibration</b>	Worn, bent, broken or missing blades	Check and replace blades as needed
	Bent PTO shaft	Replace PTO shaft
	Worn bearings in PTO shaft U-joints	Replace PTO shaft
	Bent upper or lower disc	Replace as necessary
	Bent drum drive shaft	Replace drive shaft