

# Pequea Rotary Rake Models HR1140 and HR939

# **Operator's Manual**



THIS MANUAL MUST BE READ AND UNDERSTOOD BEFORE ANYONE OPERATES THIS MACHINE!

Manual# 990005 Revised 04/2017

# YOU MUST FILL OUT YOUR WARRANTY REGISTRATION TO ACTIVATE YOUR WARRANTY AND TO QUALIFY FOR PARTS AND SERVICE!!

To the Owner;

Thank-You for choosing a quality rotary rake from Pequea Machine, Inc. We strive to give you the best equipment and the best level of service of any company. With a little care and maintenance this machine will do your work for you for many years. In this manual, we make an effort to get you better acquainted with the rake so you can achieve maximum performance. We design and build all of our equipment with the end user in mind so we welcome any suggestions or ideas for improvement.

Please take a few minutes to fill out the area below. This information will be valuable to you when ordering parts or requesting service from your dealer.

Dealer Name:
Dealer Phone Number:
Service Manager/Technician:
Model# and Description:
Serial Number:
Date of Purchase:

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#### INTRODUCTION

Thank-You for choosing the Pequea Rotary Rake. Your rake is the result of years of research and development work. This Operator's Manual will familiarize the operator with the safety and operation of the machine. Included are complete instructions for assembly, operation, lubrication, and maintenance procedures. Understanding and following these procedures will result in years of maximum performance from your Pequea Rake.

Read entire manual before operating. Failure to follow the instructions outlined in this manual may result in personal injury and/or damaged equipment, and could void the warranty.

#### **Rake Serial Number**

The rake's serial number can be found near the front of the main frame of the machine. Please use this number when requesting service, seeking information, or ordering parts. For the operator's convenience, space to record the serial number, model number, purchase date, and dealer has been provided inside the front cover of this manual.

All pictures and instructions in this manual assume that the right and left side of the machine are that of someone standing behind the rake facing forward.

#### **Specifications**

Specifications	HR1140	HR939	
Working Width	13'	10' 8"	
Raking Width	11'	9'	
Transport Width	59"	9' 4"	
Gear Box	Enclosed Oil Bath		
Gear Reduction	9.7 to 1		
Tine Arms	11	9	
Double Tines per Arm	4	3	
PTO/HP Required	40 HP - 540 RPM	30 HP - 540 RPM	
Direction of Raking Action	Left		
Hydraulic Requirement	1200 psi		
Weight	1550 lbs. 1050 lbs.		
Tandem Axle Beam	Standard		
Tires	18.5 x 8 Flotation Tires on 4-Bolt Galvanized Wheels		

# SAFETY



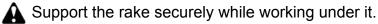
This symbol precedes specific safety instructions throughout this manual. When reading the manual pay close attention to the information that follows this symbol.

FAILURE TO FOLLOW INSTRUCTIONS IN THIS MANUAL COULD RESULT IN PERSONAL INJURY OR DEATH. READ ENTIRE MANUAL BEFORE OPERATING ROTARY RAKE.

Keep hands, feet and clothing away from the machine's input power take-off (PTO) and any 📥 other moving parts until the machine has been shut down and the power source has been locked out. (Refer to Power Source Safety)

Do not adjust, unclog, lubricate, or service the machine until it has been shut down and the power source has been locked out. (Refer to Power Source Safety)

Do not lubricate or adjust the machine while it is in motion.



Do not stand between the tractor and the rake while attaching or detaching the rake unless the tractor engine is shut off and the parking brake has been set.

Be certain all bystanders and animals are a safe distance away from the rake before raising or lowering it. Never allow anyone to ride on the rake or the tractor.

When transporting, never exceed a speed of 20 MPH and avoid sudden turns which may compromise the operator's control of the tractor.

A Be constantly aware of the location of the ends of the rake to avoid collision with other objects.

When moving the machine on public roads use the proper reflectors, lights, and slow moving A vehicle signs required by local government agencies.

#### **Power Source Safety**

Do not use a rake power take-off (PTO) shaft without a rotating shield in good working order. Make sure drive system safety shields are in place for both the power source and the rake.

A The rake input PTO must be securely attached to both the power source and the input shaft.



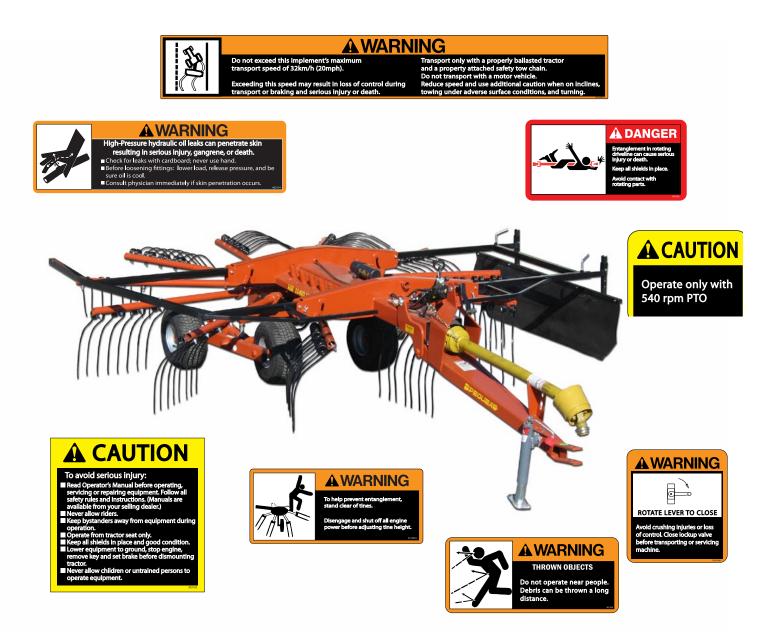
A Make sure PTO is disengaged before starting power source.

A PTO shield chains must be attached to the tractor and the rake to keep the shield from rotating.

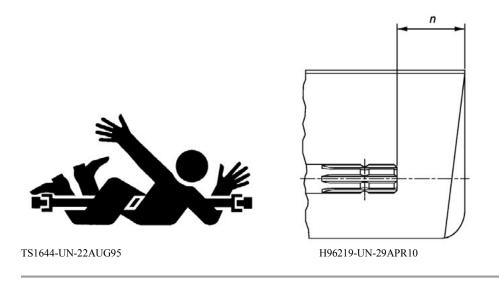
# SAFETY CONT'D

#### **Safety Decals and Reflectors**

Decals and reflectors are for the protection of yourself and others. If they are missing, faded, or not readable, get replacements from your dealer immediately.



#### **Stay Clear of Rotating Drivelines**



Entanglement in rotating driveline can cause serious injury or death.

Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Wear close fitting clothing. Stop the engine and be sure that PTO driveline is stopped before making adjustments, connections, or cleaning out PTO driven equipment.

Do not install any adapter device between the tractor and the primary implement PTO drive shaft that will allow a 1000 rpm tractor shaft to power a 540 rpm implement at speeds higher than 540 rpm.

Do not install any adapter device that results in a portion of the rotating implement shaft, tractor shaft, or the adapter to be unguarded. The tractor master shield shall overlap the end of the splined shaft and the added adaptor device as outlined in the table.

РТО Туре	Diameter	Splines	$n \pm 5 mm (0.20 in.)$
1	35 mm (1.378 in.)	6	85 mm (3.35 in.)
2	35 mm (1.378 in.)	21	85 mm (3.35 in.)
3	45 mm (1.772 in.)	20	100 mm (4.00 in.)

#### SET-UP (HR1140)

A When working under the rake, make sure it is properly and securely supported.

#### **Tine Arms**



Remove rubber caps from gearbox stub shaft. Remove tine arms from storage position and slide onto gearbox stub shaft. Insert tab on tine arm into slot and insert locking pin. Rotate gearbox installing tine arms until complete. Do not operate without all arms installed correctly. The stub shafts are greased at the factory with an anti-rust lubricant. You may need to regrease periodically to keep the surface from getting rusty. Surface rust will make it nearly impossible to remove the arms. *Always store the rake with arms in transport position!!* 

#### Guards



To lower the guards, simply pull the locking pin and slowly lower the guard to the raking position and reinsert pin to lock in place. Guards should also be stored in transport position.

#### **Hay Curtain**



Slide curtain assembly into receivers on guard and insert locking pins at desired height. The locking bolts on the guard allow for quick horizontal adjustment in the field to adjust the width of the windrow.

# SET-UP (HR939)

#### **Tine Arms**

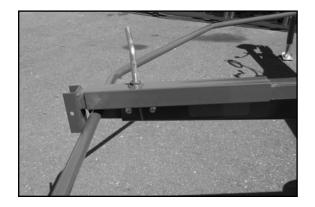
Remove the rubber cap from the gearbox shaft. Slide the tine arm onto the shaft. Line up the hole and insert the M12 x 70 metric socket head bolts (002566). Secure an M12 nylon lock (002824)nut onto each of the bolts. Repeat for all 9 arms.



#### **Guard Support Arms**

Attach the guard support arms to both sides of the rake using the 1/2" bolts. NOTE: The guard arm with the curtain mount tube is for the left side of the rake.





#### Guards

Attach the guard to the guard arm and to the front of the main frame. Use the 5/16" bolts where it attaches to the guard arm. Use the 1/4" bolts where it attaches to the front of the main frame of the rake. Tighten all fasteners.

**Note to customer:** This setup for the HR939 is usually done by the dealer, however, the arms and guards can easily be removed for winter storage if you prefer.

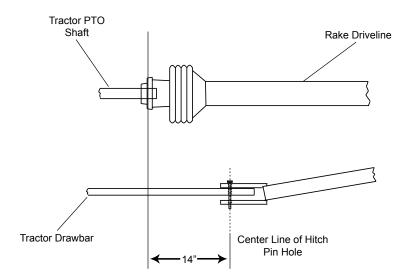


# HITCHING

#### **Tractor Requirements**

The Pequea Rotary Rake is designed to be used with a tractor having a 540 RPM PTO. The hitch pin hole on the tractor should be 14" from the rear of the groove in the PTO output shaft. (See illustration below)

NOTE: If the hitch pin hole is located well behind the tractor tires there is the potential of making a sharp enough turn to damage the rake PTO shaft.



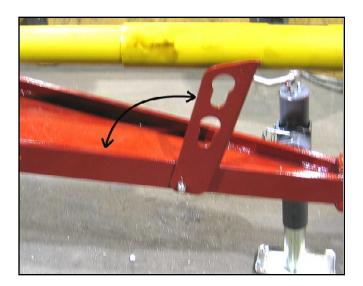
#### Hitching

Align the hole in the tractor draw bar with the hole in the rake tongue and insert an approved hitch pin. Lock hitch pin with a safety clip to insure that it cannot work its way out.



#### HITCHING, CONT'D

With PTO shaft connected to the rake, slide shaft safety collar back and slide the tractor side of the PTO shaft onto the tractor drive shaft. Release the shaft safety collar. Insure that the PTO shaft is securely locked onto the tractor drive shaft. Fold the PTO stand down onto the frame to avoid damaging the PTO shaft shielding. (See illustration below)



Connect the rake hydraulic line to the tractor implement hydraulic output.

Crank the rake jack off of the ground and remove the locking pin. Pull the jack off of the mount, place in storage position on the main frame, and reinsert locking pin. (See illustrations below) Jack can also be stored on the hitch beam by simply giving it a quarter turn. This position is not recommended in the field though as it increases the risk of damaging the jack with the tractor wheel when turning.



HR939 Shown



HR1140 Shown

# TRANSPORTING

#### **Field Transport**

Make sure that the rake is raised into the transport position.

Never allow anyone to ride on the rake or the tractor other than the operator.

Avoid tight turns to reduce the possibility of loss of control or PTO shaft damage.

Remain fully aware of the width of the rake in relation to the objects you are passing, either stationary or moving.

Never travel at speeds over 10 MPH in the field.

#### **Road Transport**

Adhere to all suggestions for transport in the field listed above.

Remove the arms and raise the guards to reduce the overall width of the rake. (HR1140 only)

Follow all local regulations for moving agricultural equipment on public roads, especially those related to reflectors, SMV (slow moving vehicle) symbols and safety markers.

Never travel on the road at night. Your rake is not equipped with lights.

Never travel at speeds over 20 MPH on the road.

# **HEIGHT AND LEVEL ADJUSTMENT, HR1140**



Never attempt to make any adjustments with the rake or the tractor running. All power sources must be completely shut off and parking brakes applied.





**Operating Position** 

Transport Position

#### **Height Adjustment**

The adjustment bolts are set at the factory with 5" between the head of the bolt and the jam nut. (See illustration on right). This setting will set the tips of the tines at 1" from the ground and will be correct under most field and crop conditions. However, in uneven or rocky field conditions we recommend setting the tines up higher off the ground to reduce tine wear and stress. There is no advantage to having the tines actually hit the ground. Hitting the ground will cause unnecessary wear on the tines, and will cause the hay to become contaminated with dust, resulting in premature wear of other processing equipment. An occasional adjustment will also be necessary to account for normal tine wear. To adjust, simply loosen the jam nut and thread the bolt up or down to reach the desired height. One complete turn will adjust the height of the rake 1/8". Be sure to retighten the jam nut after adjustment.

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#### Leveling the Rake

Your rake is also equipped with a leveling cylinder. This is on the front of the main frame and can be adjusted quickly at any time to accommodate different draw bar heights. Simply turn the handle clockwise to raise or counter-clockwise to lower the front of the rake. NOTE: You will get the best performance with the front of the rake slightly lower than the rear.



# **HEIGHT AND LEVEL ADJUSTMENT, HR939**

#### **Height Adjustment**

The HR939 has an adjustment screw for the rear height adjustment. (See illustration below) Turn clockwise to raise or counterclockwise to lower the rake. With the rake setting on level ground, set the height so that the tips of the tines are 1" from the ground. This setting will offer the best performance in most field and crop conditions, however, in uneven or rocky areas we recommend setting the tines higher off the ground to reduce tine wear and stress. There is no advantage to having the tines actually hit the ground. Hitting the ground will cause unnecessary wear on the tines, and will cause the hay to become contaminated with dust, resulting in premature wear of other processing equipment. An occasional adjustment will also be necessary to account for normal tine wear.



#### Leveling the Rake

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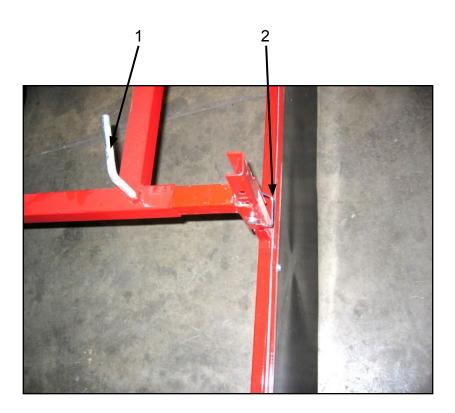
# HAY CURTAIN ADJUSTMENTS

Whenever desired, the hay curtain on your Pequea hay rake can easily be adjusted to accommodate your requirements. The hay curtain adjustment determines the width of the windrow, and is used when turning a windrow or removed when combining windrows.

The working width of your swath is adjusted by positioning the hay curtain. To change the curtain position, turn the L-shaped rod (1) on the curtain mounting tube. Loosen by turning counter clockwise and tighten by turning clockwise until tight. (Do not overtighten)

The height of the hay curtain is adjusted by removing the stop pins (2) on the curtain frame and raising or lowering the curtain to the desired height. We recommend setting it so the bottom of the curtain just touches the cut plant.

When combining windrows the curtain may be turned upside down or eliminated completely. Never simply raise the guard into it's transport position. Doing so exposes humans and animals to the danger of being struck by moving tines and the tines or arms can be damaged by striking another object.



# OPERATING

Having made adjustments (where necessary) described in the previous sections, drive the tractor to where you will begin raking. With the tractor standing still, lower the rake to it's operating position. Engage the tractor's PTO at a low RPM, (this is especially important on a tractor with an electric clutch) and without getting off the tractor seat, visually determine that the rake is properly adjusted. If further adjustments are required, disengage the PTO and stop the tractor's engine and adjust where needed.

When ready, increase PTO speed to the desired RPM and engage the tractor's forward gear. Remember, ground speed and PTO speed, along with the proper adjustment for height and level, will play a large role in making a clean sweep and a nice even windrow. 6 MPH ground speed and 350 PTO RPMs is the ideal combination for fluffy windrows. Adhere to all safety requirements as listed previously for field operation.

Always operate the rake at the lowest RPM possible that allows you to rake cleanly at your chosen ground speed. Higher speeds result in more leaf loss and lower quality hay, especially if you are raking dry hay. Higher speeds will also cause more wear on the rake.

When finished, reduce PTO speed before disengaging. Disengage PTO and raise rake into transport position before leaving field.

Requirements will change according to field and crop conditions.

#### **Field Dangers**

While operating the rake you must constantly be aware of all your surroundings. The folddown guards are designed for human safety and will not withstand a collision with a stationary object such as a fence post or an electric pole. If such a collision does occur and you cannot stop before the tine arms hit the obstacle, the safety slip clutch on the PTO shaft will automatically engage and protect the gearbox from any serious damage. The slip clutch will not engage fast enough to protect the tine arms.

The rake is also equipped with an anti rollover system for the axle tandem walking beams. This is a safety feature that will keep the axle tandems from going over center and flipping up into the tine arms when accidently driving over a washout, sink hole, or animal den. However, this is no excuse for careless driving, as other damage can occur when the wheels hit a rut or a hole.

# LUBRICATION

It is extremely important to keep your rake properly lubricated at all times. Failure to do so will greatly decrease the performance and the life of the machine.

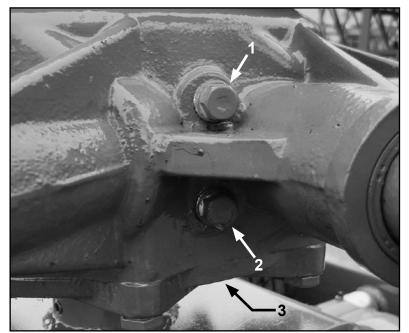
Never lubricate or perform any maintenance, adjustments or repairs with the machine running. The PTO must be disengaged and the tractor's engine must be shut off.

With a clean cloth wipe off both the grease fitting and the tip of the grease gun. This will eliminate any chance of dirt or dust particles getting inside and damaging the bearings.

Do not overgrease the flange bearings. Overgreasing could rupture the seals exposing the bearing to a lot of dust particles. Roller bearings are sealed and are generally maintenance free. The friction bearing points cannot be overgreased.

#### **Gearbox Lubrication**

The oil level in the gearbox can be checked by removing the check plug on the side of the gearbox (2) and using a straw to insure that the oil level is near the bottom of the plug hole. If oil needs to be added, use 80W-90 Gear Oil and fill using the plug located near the top of the gear box (1).



We recommend changing the oil after every 200 hours of use and/or once per year. To do this, remove the plug at the bottom of the gear box (3) and drain the oil into a container for proper disposal. Fill the gearbox with 3.1 litres of 80W-90 Gear Oil. Always follow local guidelines for disposal of waste oil in an environmentally appropriate manner. Never drain waste oil directly onto the ground.

# LUBRICATION

#### **PTO Lubrication**

There are grease fittings on both the tractor end and the rake end of the PTO shaft. Grease these after every 8 hours of operation. Use a high quality lithium grease.



#### **General Lubrication**

All other grease fittings should be lubricated after every 50 hours of operation. Use a high quality gear grease for the grease fittings on top of the gearbox. For all other bearings, joints, and pivot points, use either a lithium or a gear grease. In dry, dusty conditions it may be necessary to grease more than every 50 hours.

#### Tine Arms (HR1140 Only)

The inside surface of the tine arm must be greased periodically to avoid surface rust which will make it difficult or nearly impossible to remove the arms for storage. A generous dab of heavy weight anti-sieze grease once a year should be sufficient for a rake that is stored indoors. If the rake is stored outside you will need to regrease more frequently.

#### MAINTENANCE

Check and replace any safety decals that are damaged or missing.

After first use of the rake, we recommend a thorough inspection of all bolts and nuts. Retighten any loose hardware and check periodically thereafter. We have tried to minimize the amount of vibration, but the inspection is still a good practice.

Check the air pressure of the tires. They should be inflated to approx. 20 psi.

Inspect the tines and replace any broken, missing, or bent tines.

Visually inspect condition of the hay curtain. Replace if necessary.

Periodically pressure wash your equipment and touch up any scratches with high quality rust resistant paint.

Apply a light weight oil to all moving parts not specified in other lubrication instructions in this manual.

# STORING YOUR PEQUEA RAKE

Before winter storage, perform all lubrication and other maintenance procedures as previously described.

Remove tine arms and put them in their proper storage position (same as over the road transport). Raise guards and lock in place.

Store in a dry, covered place with the rake lowered into the raking position. Storing in the raised (transport) position exposes the cylinder rod to dust and other elements that could cause it to rust

# **TORQUE SPECIFICATIONS**

	GRADE	5 BOLTS	GRADE 8 BOLTS		
BOLT SIZE	TORQUE (DRY) FT.LBS.	LUBRICATED FT.LBS.	TORQUE (DRY) FT.LBS.	LUBRICATED FT.LBS.	
1/4 20	8	6	12	9	
1/4 28	10	7	14	10	
5/16 20	17	13	24	18	
5/16 24	19	14	27	20	
3/8 16	30	23	45	35	
3/8 24	35	25	50	35	
7/16 14	50	35	70	50	
7/16 20	55	40	80	60	
1/2/2 13	75	55	110	80	
1/2/2 20	85	65	120	90	
9/16 12	110	80	150	110	
9/16 18	120	90	170	130	
5/8 11	150	110	210	160	
5/8 18	170	130	240	180	
3/4 10	260	200	380	280	
3/4 16	300	220	420	310	
7/8 9	430	320	600	450	
7/8 14	470	350	670	500	
1-8	640	480	910	680	
1-14	720	540	1,020	760	

# **Standard Torque Chart**

# **TORQUE SPECIFICATIONS**

	NEWTON METERS (NM) FOOT POUNDS (FT. LBS.)		NEWTON METERS (NM)		IDS (FT. LBS.)
BOLT SIZE & PITCH	CLASS	PLATED	UNPLATED	PLATED	UNPLATED
M4 x .70	8.8	3.10	2.20	2.30	1.65
M5 x .80	8.8	6.10	5.50	4.58	4.13
M6 x 1.00	8.8	10.40	9.50	7.80	7.13
M7 x 1.00	8.8	17.00	15.50	12.75	11.63
M8 x 1.25	8.8	25.00	23.00	18.75	17.25
M8 x 1.00	8.8	27.00	24.50	20.25	18.38
M10 x 1.50	8.8	51.00	46.00	38.25	34.50
M10 x 1.25	8.8	54.00	49.00	40.50	36.75
M10 x 1.00	8.8	57.00	52.00	42.75	39.00
M12 x 1.75	8.8	87.00	79.00	65.25	59.25
M12 x 1.50	8.8	92.00	83.00	69.00	62.25
M12 x 1.25	8.8	96.00	87.00	72.00	65.25
M14 x 2.00	8.8	140.00	125.00	105.00	93.75
M14 x 1.50	8.8	150.00	135.00	112.50	101.25
M16 x 2.00	8.8	215.00	195.00	161.25	146.25
M18 x 2.50	8.8	300.00	280.00	225.00	210.00
M20 x 2.50	8.8	430.00	390.00	322.50	292.50
M22 x 2.50	8.8	580.00	530.00	435.00	397.50
M24 x 3.00	8.8	740.00	670.00	555.00	502.50
M6 x 1.00	10.9	15.50	14.00	11.63	10.50
M8 x 1.25	10.9	37.00	34.00	27.75	25.50
M10 x 1.50	10.9	75.00	68.00	56.25	51.00
M12 x 1.75	10.9	160.00	117.00	97.50	87.75
M14 x 2.00	10.9	205.00	185.00	153.75	138.75
M16 x 2.00	10.9	310.00	280.00	232.50	210.00

# Metric Torque Chart

#### **Pequea Machine's Limited Warranty**

Pequea Machine Company warrants to the original Purchaser all Machinery, Equipment, or Trailers manufactured by it, to be free from defects in material and workmanship under normal use and service. Its obligation under this Warranty shall be limited to replacement or repair of any parts thereof, free of charge to the original Purchaser, at its place of business, provided, however, that the part(s) to be replaced or repaired, shall within one (1) year after delivery to the original Purchaser, be demonstrated to be defective; which determination shall be made by the Company. The said components or parts must be returned through the Selling dealer or distributor directly to the Company with all transportation charges prepaid. Notice of defect shall be furnished in writing to the Seller and to the agent through whom the machinery was received, disclosing in full all known defects and failure in operation and use, and reasonable time shall be given to the Seller to remedy any such defects and failures. Failure to make such trial or give such notice shall be deemed an absolute acceptance by the Buyer and satisfaction in full of this Limited Warranty.

This Warranty does not cover, under any circumstances, any parts, components, or materials which, in the opinion of the Seller and Company, have been subjected to neglect, misuse, alteration, accident, or if repaired, with parts other than those manufactured by and obtained from Pequea Machine Company.

This Warranty does not cover components which are already covered by a separate Warranty provided by the supplier of said parts or components.

The Company's obligation under this Warranty is limited to repair or replacement, free of charge to the original Purchaser, of any part which in judgment of the Company is defective. This Warranty does not cover normal wear and tear.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR USE AND PURPOSE AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON ITS PART AND ANY IMPLIED WARRANTY. AND IT NEITHER ASSUMES NOR AUTHORIZES ANY OTHER LIABIL-ITY IN CONNECTION WITH A SALE OF THIS MACHINE. THIS WARRANTY SHALL NOT APPLY TO THIS MACHINE OR TO ANY PART THEREOF WHICH HAS BEEN SUBJECT TO ACCIDENT, NEGLIGENCE, ALTERATION, ABUSE, OR MISUSE.

The Company makes no Warranty whatsoever in respect to accessories or parts not supplied by the Company. The term "original Purchaser" as used in this warranty, shall be deemed that person for whom the Machine, Equipment, or Trailer is originally supplied. This Warranty shall apply only within the boundaries of the continental United States.

Under this Warranty, the Company cannot guarantee that existing conditions beyond its control will not affect its ability to obtain materials or manufacture necessary replacement parts.

No one is authorized to alter, modify, or change the terms of this Warranty in any manner.

The Company warrants the Construction of the equipment sold herein and will replace at its expense for a period of (1) year from the date hereof, any parts which prove defective as determined under the terms of this Limited Warranty.



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