VANMARK®

Potato & Produce Processing Equipment

Technical Equipment Manual

Peeler/Scrubber/Washer 02420/02421 Model

To feed our growing world - Together

EU DECLARATION OF INCORPORATION FOR PARTLY COMPLETED MACHINERY

In accordance with the EC machine directive 2006/42/**EC** of 17. May 2006, Annex II B, we hereby declare that the following described partly completed machine in its conception, construction and form put by us on the market, is in conformity with all the relevant essential health and safety requirements of the EC machinery directive 2006/42/EC **and Regulation of material intended to come into contact with food (EC) 1935/2004 and EU 10/2011** as amended and the national laws and regulations adopting this directive. In case of alteration of the Partly Completed machine, not agreed upon by us, this declaration will lose its validity.

Machine Model: **2400 Series**
Machine Type: **Peeler/Scrubber/Washer**
Serial Numbers: **02420, 02421**
Year of construction: **2022 and Later**

Applicable harmonized European Standards:

- **EN 12100-2010:** Safety of Machinery - Basic concepts, general principles for design.
- **EN 1672-2:2005+A1:2009:** Food Processing Machinery – Basic concepts – Part 2 :Hygiene requirements.
- **EU 10/2011:** Food Contact Materials – Plastics and Articles intended to come into contact with food.
- **EN 13857:2008:** Safety of Machinery – Safe Distances to prevent hazard zones being reached by upper and lower limbs.
- **EN 60204-1:2006+A1: 2018:** Safety of Machinery - Electrical equipment of machines - general requirements.

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Declaration of Compliance with REGULATION (EC) 1935/2004 EU Food Contact Certification

Machine: 02400 Series

Serial Number: 02420, 02421

Manufacture Date: 2022 and later

The machine listed above has been designed, manufactured, and assembled using components that are in compliance with Regulation 1935/2004, which states that:

"Material intended to come into contact directly or indirectly with food must be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in composition of the food or a deterioration in its organoleptic properties."

Further, plastics used in the construction of this machine which are intended to come in contact with food are in compliance with EU 10/2011, which more specifically defines the Scope, Definitions, and Test Methods for those materials. Materials are rated for food contact by their respective manufacturers. Note: This regulation does not apply to rubbers and silicones.

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Vanmark Peeler/Scrubber/Washer

Machine Model: 2400 Series
Machine Type: Peeler/Scrubber/Washer
Serial Numbers: 02420, 02421
Year of construction: 2022 and later

Specifications for compliance with EU directives.

When this machine is installed, the electrical control system must ensure the drive motor/s on the machine are disabled when the peeler door/s are opened. All doors including upper and lower side doors on both sides, and the discharge end door must be closed and locked before drive motor/s can be enabled. The machines come standard with door interlock devices to verify all doors are closed prior to operation. If the user selected to remove the standard interlock devices to incorporate their own, they must be incorporated properly to ensure all doors are fully closed and secured prior to enabling any drive motor/s. Failure to do so can result in injury from abrasion or pinching/drawing-in of small appendages.

The machine has openings where product enters and exits the machine. Hazard symbols are placed near these areas as they cannot be completely covered preventing product from entering or exiting the machine removing the machine's primary function. Interconnecting equipment feeding product to the machine infeed area and collecting product from the machine discharge area shall be incorporated to prevent reaching hazards into these product openings.

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EQUIPMENT MODIFICATIONS

To comply with OSHA safety requirements and standards, modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the below requirements have been met:

- Manufacturer review and approval
- The manufacturer approves the modification/additions in writing
- Procedures and instruction manuals are modified as necessary to agree with the modification/additions
- The original safety factor of the equipment is not reduced

Any changes or modifications not expressly approved by VANMARK EQUIPMENT, LLC may void the user's warranty and manufacturer's liability of this system/equipment.

DISCLAIMER

The equipment described herein has been designed to comply with OSHA safety requirements and standards however, this equipment can cause bodily harm if operated in an improper manner. Do not attempt to operate this machine without first installing it correctly. The user is responsible for the proper operation of the machine and for following proper safety standards when operating it.

No warranty or representation, either expressed or implied, is made with respect to the contents of this documentation, its quality or performance for a particular purpose. Information presented in this documentation has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. This document and other information from Vanmark, its subsidiaries, and authorized distributors provide product and/or system options for further investigation by users having technical expertise. Due to the variety of operating conditions and applications for these products or systems, the user, through his/her own analysis and testing, is solely responsible for making the final selection of the product and systems and assuring that all performance, safety, and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs, availability, and pricing are subject to change by Vanmark and its subsidiaries at any time without notice.
In the event that this manual is translated into any other language besides English and there is a discrepancy between the two versions, the English version shall prevail and Vanmark shall not be held accountable against any damage or injury resulting from a misunderstanding caused by improper translation of the manual to the local language.

TRADEMARKS

This manual as well as the equipment described in this manual contains trademarks, copyrights, and other proprietary intellectual properties of VANMARK EQUIPMENT, LLC and its affiliates. Unauthorized use, copying, modification, distribution, or disclosure of that proprietary information is subject to civil and criminal penalties under both United States and international law.

VANMARK ® is a registered trademark of VANMARK EQUIPMENT, LLC

WARRANTY

For equipment warranty information, please visit https://vanmark.com/en-us/Terms-Conditions. If a master supply agreement or similar contract is in place, refer to the document/s for applicable terms and conditions.

SAFETY

GENERAL AWARENESS

- The safety and operation details in this manual must be read and understood by any individual before that person operates, cleans, repairs, adjusts, supervises the operation of, or uses this machine
- Permit only authorized personnel to operate, install and maintain this equipment
- Ensure environment including building, floors, and foundations are suitable for supporting and installing the equipment prior to installation.
- Ensure all safety devices and guards are properly fastened, wired, and plumbed before energizing the system
- Do not interfere with the safety features on the system
- If temporary removal of any safety features is required, turn off and lockout motors and other energy sources as well as the control system (de-energizing electrical and pneumatic components) until the required maintenance has been complete
- Read all procedures in this document before installation or maintenance of this equipment has been performed

TYPE(S) AND MAGNITUDE(S) OF HAZARDOUS ENERGY

- Type: Electrical
    - Magnitude: See applicable motor nameplates: 208VAC-575VAC, 120VAC, 24VDC
    - Hazards (include but not limited to): Shock, Arc Flash
- Type: Pneumatic
    - Magnitude: Plant supplied air pressure
    - Hazards (include but not limited to): Pressurized tubing, Noise
- Type: Kinetic (Rotating Mass)
    - Magnitude: Spinning Drive pullies, sprockets, rolls, shafts
    - Hazards (include but not limited to): Entanglement
- Type: Hydraulic
    - Magnitude: Plant supplied water pressure
    - Hazards: Pressurized piping (if applicable ie. Spray bars)

GENERAL SAFETY PRECAUTIONS

Safety is very important and certain safety symbols are used throughout this manual as described below. Always read and obey all safety messages. These messages are not meant to cover all possible situations that may occur. Common sense, caution and care must be exercised when installing, maintaining, or operating this equipment.

This is the safety alert symbol. This symbol alerts you to hazards that can kill or injure you or others. This symbol may be paired with other symbols and explanation to assist you.

DANGER

Failure to follow safety warnings and instructions WILL **result in death or serious injury.**

WARNING

Failure to follow safety warnings and instructions COULD result in death or serious injury.

CAUTION

Failure to follow safety warnings and instructions could result in moderate injury and/or damage to the equipment.

NOTICE

Failure to follow instructions could result in improper use or damage to your equipment.

1.0 INTRODUCTION

Vanmark Equipment provides customer service for this equipment through our Creston, IA USA location.

Support Includes:

- Telephone/Email support for all Vanmark Equipment
- Prompt delivery on parts orders
- On-site service calls by our field service team or global dealers

1.1 CONTACT INFORMATION

1.1.1 CRESTON, IA, USA LOCATION

- Phone: +1 740-201-0004
- Fax: +1 641-782-9209
- E-mail: sales@vanmark.com
- General Request Location

1.1.2 GLOBAL DEALERS

- List of Global Dealers
- If uncertain of who the dealer is in your area, please contact us

1.1.3 BOISE, ID, USA LOCATION

- Phone: +1 208-362-5588
- Fax: +1 208-362-3171

1.2 DATA SHEET

Purchaser Name _____

Address _____

_____

_____

Model No/Serial No: _____

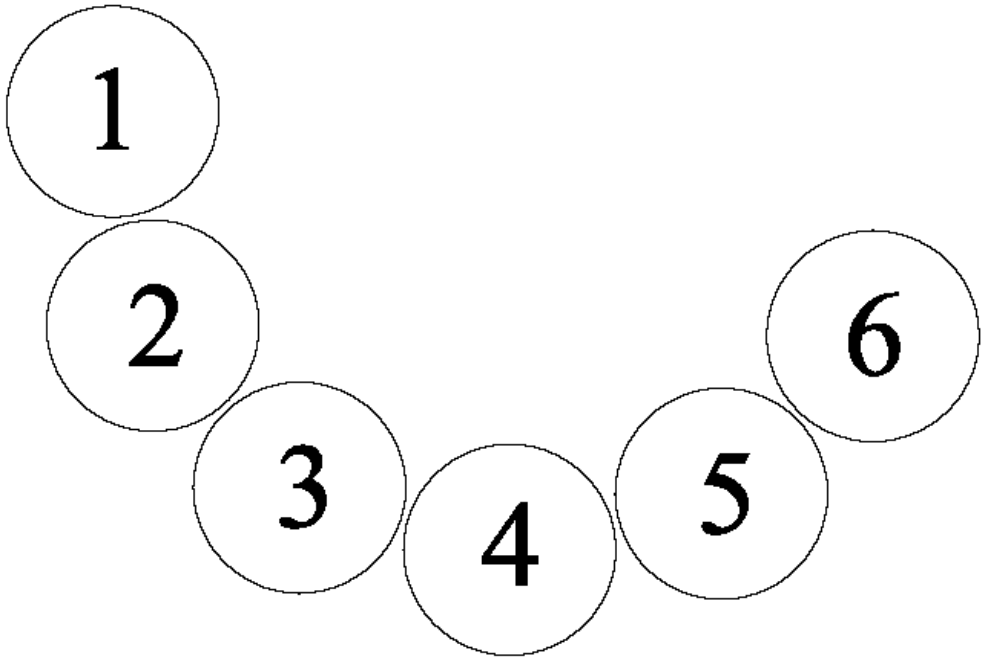
Date SHIP DATE

NOTICE

Please refer to this information when using your manual. Any communication to Vanmark Equipment for parts and service; use the model and serial number above.
Item numbers below (ie. ITEM #21, ITEM #7) refer to the parts pages in Section 5.0.

BASE MACHINE:	Choose a Base Machine		
IMPERIAL OR METRIC:	Choose Imperial or Metric		
DISCHARGE:	Choose a Discharge		
DISCHARGE (ITEM #18)	Choose Discharge		
DRAIN PAN (ITEM #8):	Choose a Drain Pan		
DRIVE MOTOR (ITEM #19):	Choose a Drive Motor		
INVERTER (ITEM #23):	Choose inverter.		
DRIVEN SPROCKET (ITEM #16):	Choose driven sprkt.		
DRIVE BUSHING (ITEM #15):	Choose drive bushing.		
DRIVE SPROCKET (ITEM #14):	Choose drive sprkt.		
TRAPPED KEY:	Choose an item.	**MASTER KEY CODE:**	KEY CODE
SPRAY BAR SOLENOID VALVE:	Choose a Solenoid Valve.		
SMALL PRODUCT DISCH. RING	☐	**REVERSING ROLLS**	☐

1.2.1 ROLL CONFIGURATION



VIEWED FROM DISCHARGE END

FACTORY CONFIGURATION:

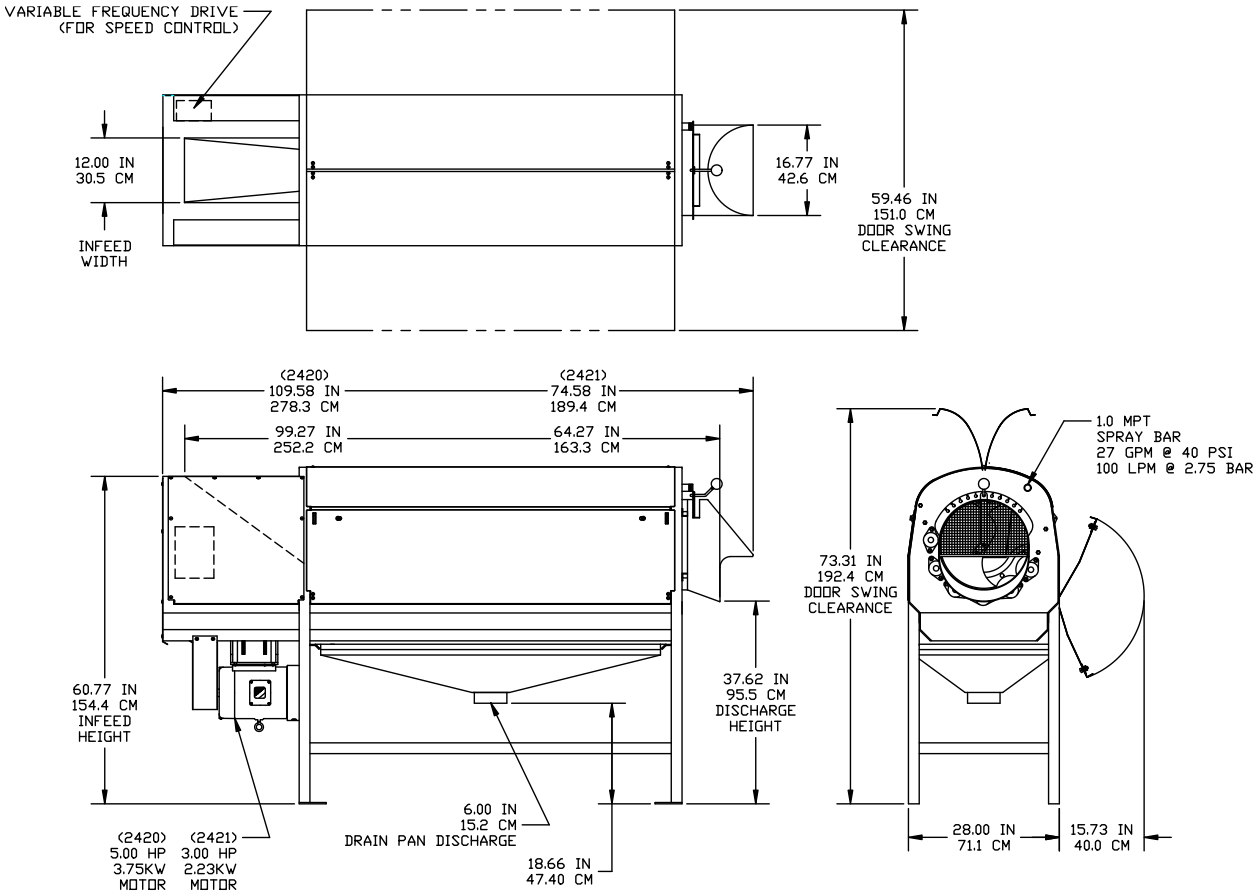
ROLL 1: Choose an item.
ROLL 2: Choose an item.
ROLL 3: Choose an item.
ROLL 4: Choose an item.
ROLL 5: Choose an item.
ROLL 6: Choose an item.

NOTES: IN A 4-ROLL CONFIGURATION, ROLLS 1 AND 6 WILL BE EMPTY

ROLL LENGTH (INCHES)	ROLL LENGTH (CM)
02420: 69.75	02420: 177.2
02421: 34.75	02421: 88.3
02420, MID-LENGTH ROLL: 34.75 *REQUIRES ADDITIONAL ROLL SEGMENTS TO MAKE A COMPLETE ROLL	02420, MID-LENGTH ROLL: 88.3 *REQUIRES ADDITIONAL ROLL SEGMENTS TO MAKE A COMPLETE ROLL

1.3 SPECIFICATIONS

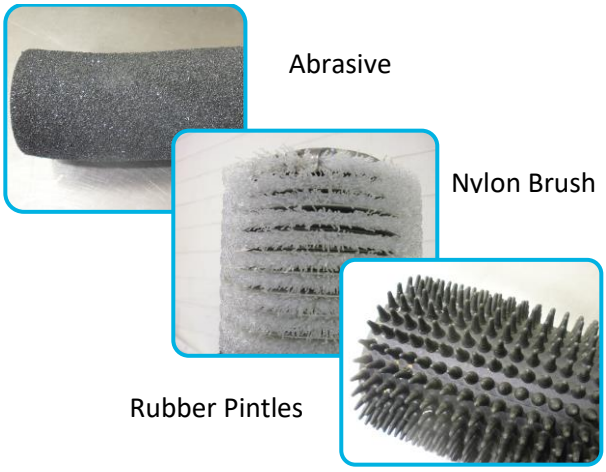
Machine Properties		
	02420	02421
Equipment Weight lbs. (kg):	1500 (680)	1300 (590)
Overall Length in. (cm):	110.0 (280)	74.75 (190)
Overall Width in. (cm):	28.0 (71.12)	
Overall, Height in. (cm):	63.0 (150)	
Motor HP (KW):	5.0 (3.75)	3.0 (2.2)
Roll Speed:	150 – 450 RPM	
Spray Bar Water Flow	1.00” (Nominal) NP	



1.4 MACHINE DESCRIPTION

Vanmark's Peeler/Scrubber/Washers integrate the washing and peeling of a variety of products into one machine effectively and efficiently. The 2420 and 2421 models are available with six or four rolls and are specifically designed for a large scale, around-the-clock operations. Product is tumbled through a configurable combination of rollers, speed, and settings – ensuring thorough cleaning and/or peeling. Spray bars and optional reversing roll quickly remove peel waste and debris to increase efficiency.

The peelers are constructed of stainless steel with good hygienic design practices making them easy to clean. High quality materials and components are used ensuring long-term operation with minimal maintenance.

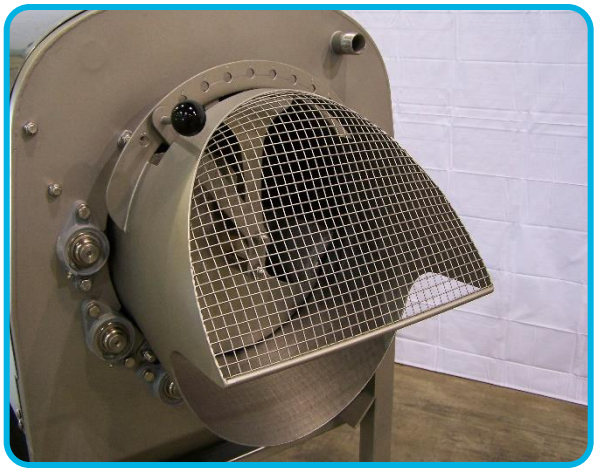


The peeling chamber consists of six (6) or four (4) rolls with three (3) types of surface coverings. Roller types include:

- Abrasive in various grit sizes, available in Sine - Wave, straight, agitator, and lift rolls
- Nylon Brushes with varied rigidity
- Rubber Pintles in straight, or sinewave.

The sinewave double contoured rollers are designed to create a natural tumbling action for consistent peel removal. The Sine-Wave design helps prevent flat spots, even in regular shaped fruits vegetables. This means less waste and a clean finished product.

A peel chamber spray bar with nozzles along its length is located on the upper left side of the peeling chamber. This spray bar provides a constant water spray on and throughout the product as it is being processed inside the peel chamber.



The product depth in the peeling bed is controlled at the discharge end of the machine with a gate or an auger, changing the effect of the rollers on the product. The natural flow discharge gate (pictured) is manually adjustable. To increase or decrease the discharge opening, the handle is rotated until the desired position of the gate is reached. The discharge gate assembly is part of the hinged discharge door.

2.0 RECEIVING AND POSITIONING

NOTICE

RECEIPT & INSPECTION: Inspect machine for shipping damage and, if needed, make carrier claims immediately. Make sure to inspect the entire shipping skid surface for additional parts, equipment manuals, slip legs, or other loose pieces for the machine.

TRANSPORTING: Skidded machines may be moved by picking up the heavy end no more than 6" off the floor (where the machine drive motor is oriented) and sliding the skid on the opposite end to a destination. If a machine must be picked up entirely, care must be taken to not damage any part of the machine. Pick up on the skid only using a proper fork truck, pallet jack, or similar equipment designated for that purpose.

UNCRATING: Cut and discard all hold-down straps. Remove crating from around the machine. Remove machine from skids. **Remember to check the skid for any additional parts or materials such as equipment manuals or boxes, before discarding the skid.**

⚠CAUTION

POSITIONING: Locate the machine to properly receive and discharge product. Interfacing with adjacent equipment should allow for smooth product transitions and minimal gaps to prevent product spills, prevent reaching hazards, and meet all safety requirements.

LEVELING: Unless otherwise specified, all machines are to be secured in a level position to properly function. The machine legs and frame must be plumb and level while the upper body slope can be adjusted as needed using the provided adjustment points (horizontal/level by default).

FASTENERS: All fasteners must be properly secured.

1. Inspect machine for shipping damage and make carrier claims immediately if necessary.
2. Locate the machine near its final or other desired location for un-skidding.
    a. Machine is shipped on skid that may be towed on a level surface by the end cross member. Machine may also be carried on lift truck by extending forks under lowest horizontal tubing member of the frame. Note the center of gravity is approximately one-third of overall length from inlet end.
    b. NOTE: If the drain pan extends below the lowest horizontal braces, it may be necessary to remove drain pan when using a lift truck.

c. If a jib crane is used to move machine, use two (2) slings under lowest horizontal tubing of frame. Use spreaders on top of the machine to reduce sling pressure against the sides/doors of machine.

3. Remove the bolts and straps holding the machine to the skid and lift the machine off the skid.
4. Machine is to be located over a waste trench, floor drain, drainpipe, or other means to dispose of water and product waste that exits the machine drain pan. Locate machine to allow for adequate clearances to other equipment. Before final setting of the machine, verify proper access to covers, removal and/or opening of discharge door with natural flow gate or auger discharge, peeling chamber doors, product infeed and discharge openings, Auto Lube Pump (if supplied) and ventilation around the drive compartment.
5. Machine doors must be clear of all obstacles:
   a. Two (2) peel chamber top
   b. Two (2) peel chamber side doors
6. Fixed drive compartment panels shall remain removable, free of plumbing and conduit mounts.
7. Vanmark does not recommend drilling and tapping holes in machine frame for mounting utilities as they are hermetically sealed for good hygiene practices.
8. Machine is typically level for proper operation. Verify machine level on the bottom roller inside the machine. To make level adjustments, turn the appropriate foot pads in or out of the frame legs to adjust their height. For certain applications, the machine may have a fall of 0 – 1”/2.5cm in six (6) feet/1.83m toward discharge end. The machine cannot be sloping towards the infeed end of the machine.
9. After final position and level is determined, anchor the machine to the floor through the holes in hold down pads in the frame. If mounting the machine on stand or elevated framework, level the machine as previously described and anchor it by bolting or welding it to the stand.
10. Check that all fasteners are tight.
11. It is the responsibility of the equipment owner, user, and/or installer to ensure mating equipment is setup to adequately prevent reaching hazards through the product inlet and discharge paths and drains are connected to minimize peel residue and water on the area floor that may cause slippery conditions.

⚠CAUTION

Keep all hands, feet, loose clothing, and foreign objects out of machine while it is operating. Always de-energize and lockout the machine when maintenance is required. Always verify door prop rods are secure before resting the door on them. Use care when closing and opening machine doors ensuring nothing may be pinched, trapped, or jammed between the door and a fixed surface.

2.1 UTILITY CONNECTIONS

- Vanmark does not supply any material or labor for utility connections.
- All electrical connections shall be permanent water-tight and shall conform to Local and National electrical codes. **Confirm all voltages prior to applying power to machine.**
- When routing cables, conduit, and water piping; do not interfere with access to machine covers and other moving and removable parts.
- There is no 3-phase junction box on the peeler so motor wiring will connect directly to the motor conduit box or to the local disconnect (available option) if present. Motor/s are to be connected to and controlled by an inverter for speed control. A 3 second ramp-up and 1-2 second ramp-down delay is recommended to limit stress on drive components and meet safety requirements for door opening. The recommended frequency range is from 20 to 90 Hz. Verify all motor rotation directions by "bumping" the motors. Refer to the diagram below for proper rotation directions. Motor and roll rotation is counterclockwise, when viewed from the discharge end of machine.
- Water supply to the spray bar connection is made at the 1.00" MPT located at top, discharge end of machine. Installation of solenoid valve connected to the main drive power and a manual valve (spherical ball type) to control and isolate water flow is recommended.
- Open the ball valve fully to flush contaminates from new piping. Check that water flow at the nozzles is even and full. If any display reduced or incomplete water flow, stop water flow and remove, clean, and re-install the nozzle if necessary. Set the ball valve position at a minimum flow setting that provides full spray coverage of the peel chamber to minimize the use of water.
- **Note: Other Utility connections may be required for optional equipment. Refer to the Data Sheet in Section 1.2 and the Options pages in Section 6.0 for specifics on your machine and connection details.**

⚠WARNING

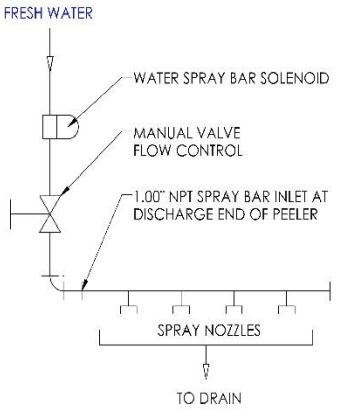
Utility Requirements: See section 1.2 Data Sheet and the Schematics Section 8.0 for utility requirements. Always verify utility requirements on supplied motor nameplates and equipment approval drawings.

Electrical Connections: All connections shall be permanent, water-tight, and shall conform to National and Local electrical codes. When routing cables and conduit; do not interfere with access to machine covers, doors, product transfer areas, and other moving or removable parts. It is recommended to use flexible conduit for motor connections. Ensure all powered devices are properly controlled by local emergency stop and/or disconnect switches.

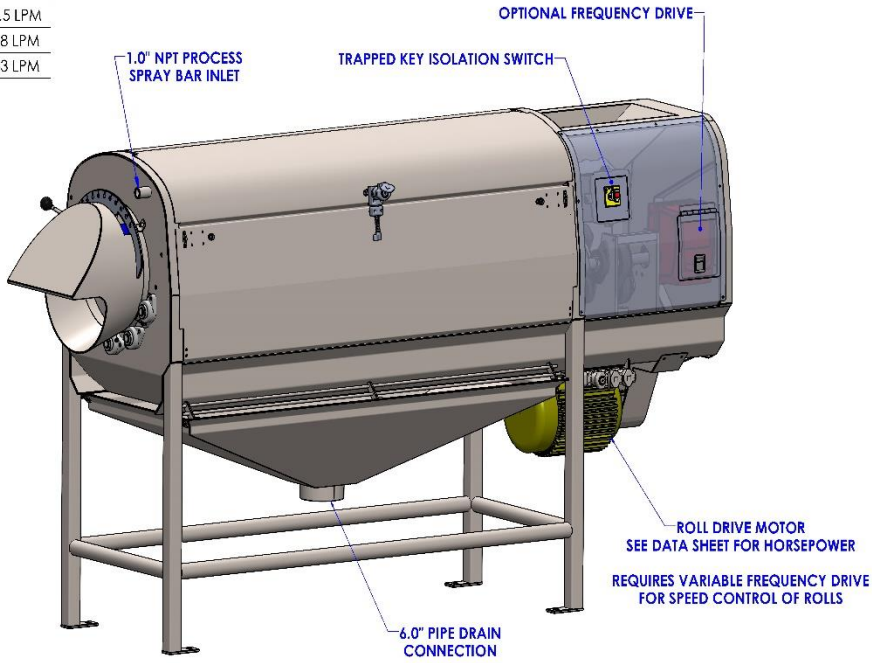
Safety: All safety protocols must be followed when making utility connections. Only properly qualified personnel can make utility connections. All connections shall be treated as potential hazards until being tested and inspected where they may be deemed "safe". It is recommended to use non-slip flooring around the peelers to prevent slipping from water or peel residue on the floor.

PROCESS SPRAY BAR		
PRESSURE	02420(4 NOZZLES)	02421(3 NOZZLES)
2.5 PSI/0.12 BAR	6 GPM/23 LPM	2.5 GPM/9.5 LPM
5 PSI/0.34 BAR	10 GPM/38 LPM	5 GPM/19 LPM
10 PSI/0.69 BAR	14 GPM/53 LPM	7 GPM/26.5 LPM
20 PSI/1.38 BAR	19 GPM/72 LPM	10 GPM/38 LPM
40 PSI/2.76 BAR	27 GPM/102 LPM	14 GPM/53 LPM

RECOMMENDED PLUMBING DIAGRAM



UTILITY CONNECTION
STANDARD MACHINE (02420/02421)



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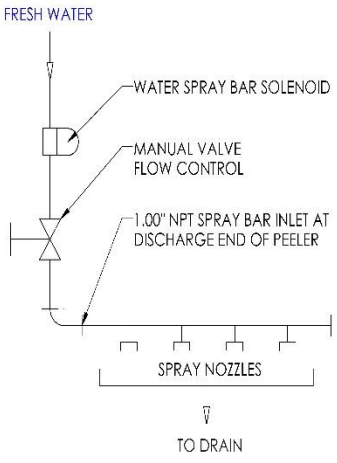
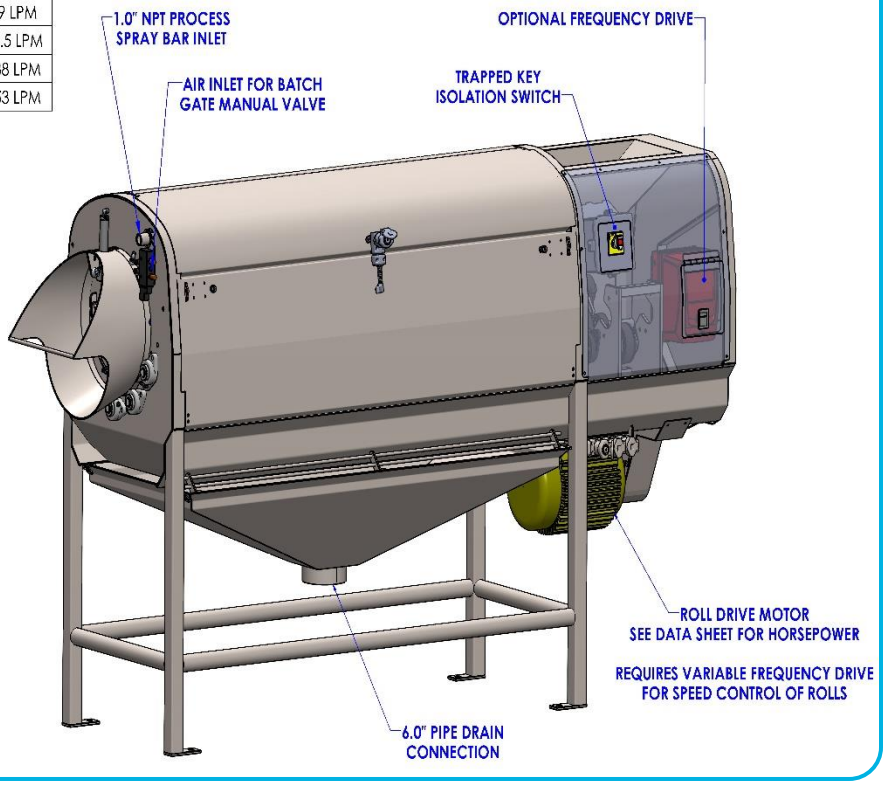
40 PSI/2.76 BAR	27 GPM/102 LPM	14 GPM/53 LPM

RECOMMENDED PLUMBING DIAGRAM



UTILITY CONNECTION
BATCH GATE DISCHARGE (02420/02421)



2.2 TRAPPED KEY SAFETY SYSTEM

2.2.1 SYSTEM OVERVIEW AND GENERAL OPERATION

The trapped key system is a safety system designed to avoid potential hazards for operators and it must be used and controlled properly. Each machine door is equipped with a door lock and the trap key system is located on the left rear side of the peeler near the drive case.

1. With the trapped key isolation switch switched OFF, this disconnects power to the main drive motor, or the optional inverter. The master key is now permitted to be removed. ***Note the door keys are still not accessible at this stage.***
2. Insert the master key into the key exchange in the master key slot and turn it. Now the door keys are accessible. ***Note, with <u>any</u> door key removed from the key exchange, the master key is trapped in the key exchange.***
3. With a door key removed, it now can be used to unlock a machine door. Insert the key into the door lock and turn it. Then the lever can be turned and pulled to unlock the door.
4. When finished, close the machine door and lock it by re-inserting the lever into the lock. ***Note the door key is trapped in the lock while the lever is unlocked.*** Once the lock lever is adjusted to lock the door, the door key can be removed.
5. Return the door key to the key exchange and turn it into position. Once ALL door keys are returned and in place, the master key can again be removed.
6. Return the master key to the isolation switch master key slot and turn to ON position. The main drive is enabled again to run the machine and the door keys are not accessible. **Enabling the roll drive by returning the key <u>does not and must not</u>, start the machine.**

<u>Safety System Purpose</u>

- Prevent the machine from being enabled/started unless all safety conditions are met:
  - All doors are closed and locked
  - All door keys in the exchange panel
  - Master key in the main disconnect switch and locked
- Prevent opening a machine door unless the drive motor (and all other motors) have been stopped

⚠WARNING

A "Trapped Key Delete" option is available allowing users to integrate their own safety system used in their operation. It is the user's responsibility to properly apply this safety system to meet applicable safety requirements and achieve the safety system purpose outlined above.

2.2.2 SAFETY KEYS

Each peeler in each facility will be issued unique codes for the primary and secondary keys to prevent unlocking of one peeler using another peeler's key. Vanmark uses alpha numeric key sets, A101 – Master key, B201 – Secondary keys; each key is uniquely machined so that only that key will work in its specific lock or switch. All door keys on one machine are the same.

2.2.3 ISOLATION SWITCH

The isolation switch is mounted on the left side of the machine, near the infeed. This is where you will need to wire the machine into the plant power supply. This acts as a disconnect, and a switch containing the master key. When switching to the OFF position it will disconnect power to the drive motor, or the optional inverter. While also releasing the master key to be used in the key exchange to release the secondary keys that will be used to open the side doors, allowing for maintenance on the machine.

2.2.4 KEY EXCHANGE UNIT

The key exchange operating principle is such that no secondary key can be removed from the unit until all master keys have been inserted, rotated, and trapped.

After the master key has been released from the Isolation switch, it must be inserted into the key exchange and rotated which allows the secondary keys to be rotated and removed. The master key remains trapped until all secondary keys have been re-inserted, rotated, and trapped.

The secondary keys may be used to unlock the guard locks on the doors. Like all other steps in the process, the key is trapped in the door lock when the lock is opened. The key only becomes free to return to the key exchange after the lock is closed and locked.

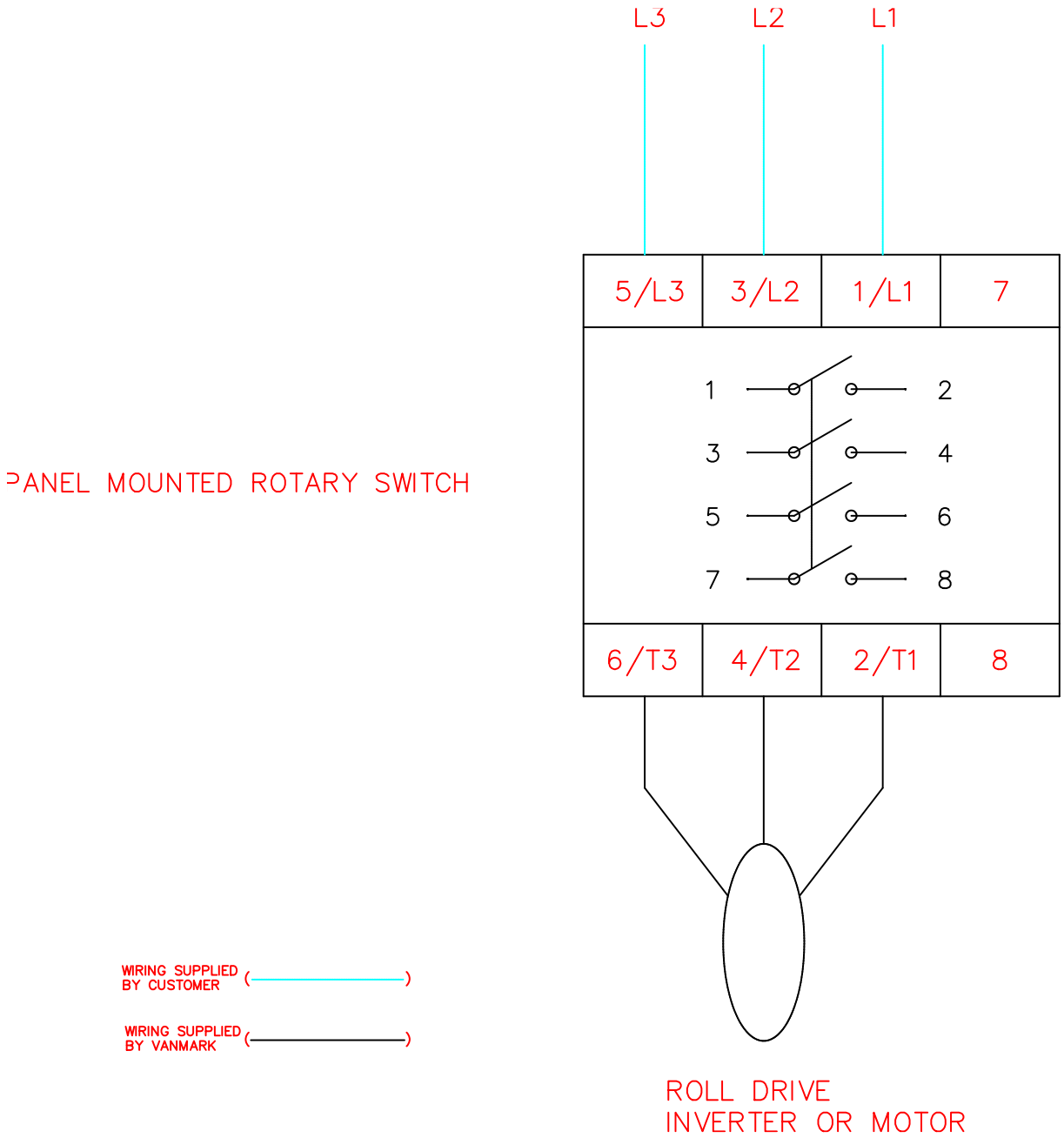
2.2.5 DOOR LOCKS

The door locks are designed to prevent access to a potentially hazardous area unless the appropriate key is inserted into the lock.

The locks are configured so that the lever handle cannot be released until a key is inserted, rotated, and trapped, allowing the door to be opened.

The key cannot be removed until the latch handle is inserted back into the lock and rotated

2.2.6 TRAPPED KEY WIRING SCHEMATIC

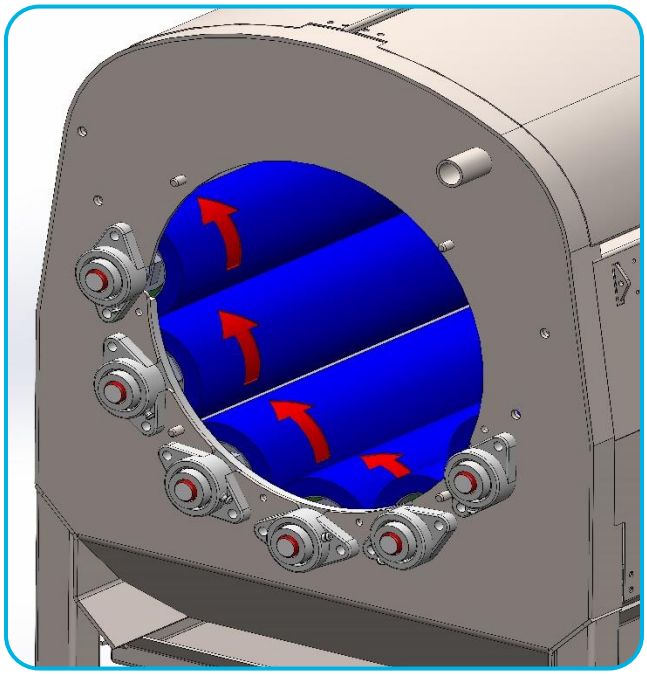


60-61035

3.0 START UP AND SHUTDOWN

3.1 FIRST-TIME START-UP

1. Lubrication – At the discharge end, check grease lines to discharge bearings; check that bearings have grease and set screws are tight (45-50 in-lbs.).
    a. Auto lube System (if applicable) – Check that the grease pump reservoir is full, and power is available to the pump.
2. Discharge Gate – Verify that the discharge gate is set to approximately halfway open.
3. Loose Equipment - Check that all chutes or other loose items are in their proper place before powering up machine.
4. Peeling Chamber – Verify the peel chamber is clear of any loose or foreign items.
5. Covers – Close, latch, and lock all peeler doors and ensure all fixed covers are in place and secured.
6. Personnel - Verify all people are clear of machine.
7. Power-Drive System - Turn on power but do not start machine.
8. Drive System – Set motor control for the main roll drive to 250 rpm for initial startup.
    a. Motor Rotation – “Bump” the power to the roll drive motor and check that roll rotation is the proper direction. When viewed from the discharge end of machine, the peeling rolls should turn counterclockwise. Repeat and verify rotation directions for other drives on the peeler (if applicable). See diagram below:



9. Water - Turn on water to spray bar at machine or ahead of solenoid valve and test water flow to spray bar.
10. Product Tests - Machine is now ready to run product and machine may be turned on:
11. Filling Bed - Allow peel chamber to fill with product (typically full until even with roll #8 centerline). For best results, product flows to machine should be kept as even as possible since fluctuating flow will fluctuate bed depth.
12. Discharge Gate - Adjust the discharge gate manually until the desired peel removal or washing performance and flow rate is achieved. See Section 3.3 for guidance on making adjustments.
13. End of Test - See Section 3.4 for shut-down sequence of operation.
14. Daily Operation - Machine is now ready for production. See Section 3.2 for start-up sequence of operation.

3.2 START-UP

1. Check all lubricant and fluid levels to be sure they are adequate. Check all bearings for proper lubrication and grease as required.
2. All parts shipped loose from base machine should be properly installed and secured and machine is ready to receive and properly handle incoming product.

⚠WARNING

All covers and shields should be properly closed, affixed, and in place prior to start-up. Keep all hands, feet, loose clothing, and foreign objects out of machine while it is operating. Always turn off and lockout power when maintenance is required.

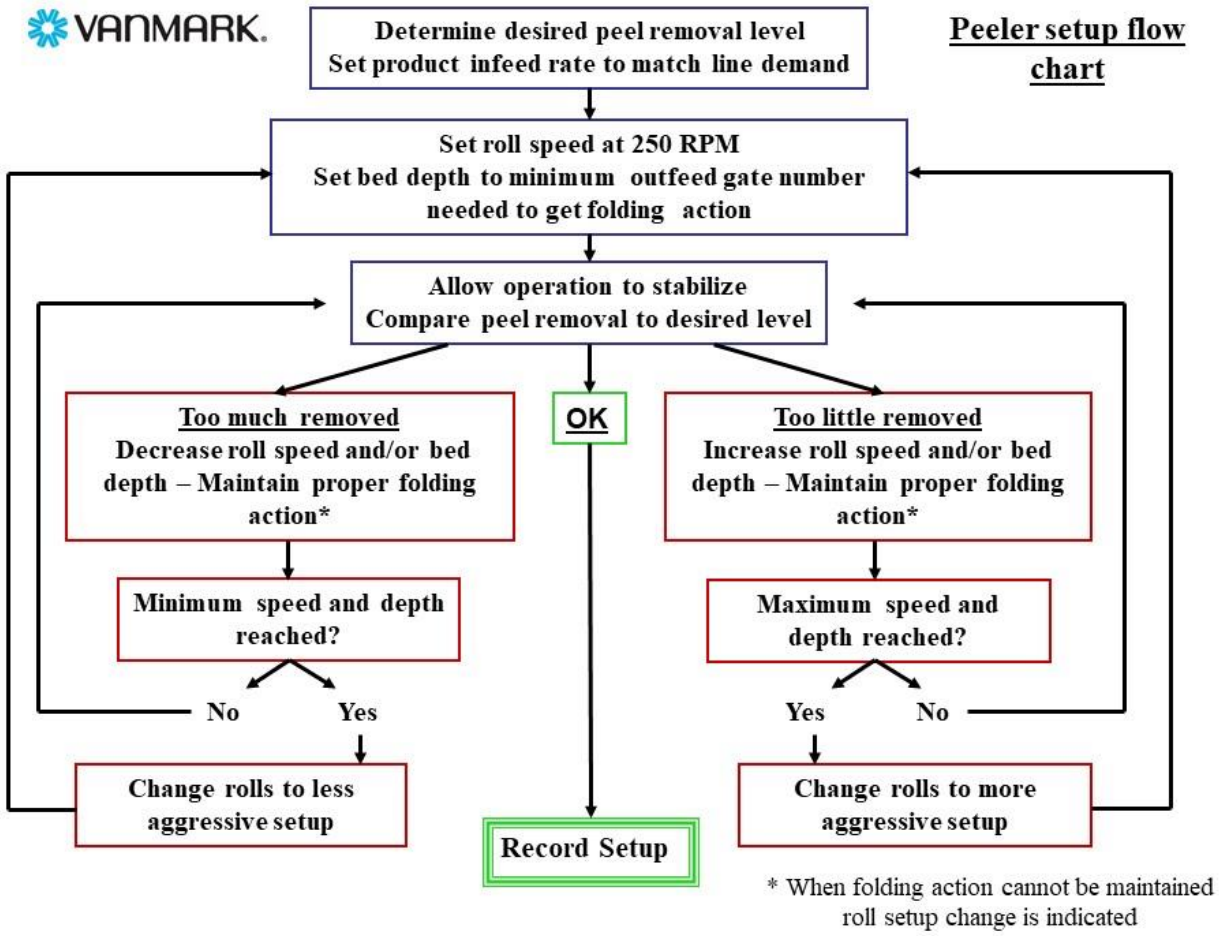
3. All people should be clear of any moving parts of the machine.
4. Manually close the discharge gate allowing the machine to fill with product upon initial startup.
5. Turn on necessary utilities to machine. Some (ie. Water) are manual and only turned-on during production. Water may be controlled by a solenoid and a manual valve to allow fresh water supply to the system. Drives should start between the low and middle range of their speeds.

⚠CAUTION

Keep all hands, feet, face, loose clothing, and foreign objects out of machine while it is operating. Always de-energize and lockout the machine when maintenance is required. Water/Chemical Spray may be present inside the machine when water is on.

6. Begin product flow. After the peeling chamber fills with product (approx. level with Roll #6), manually open the discharge gate to the desired position and product depth is adequate for achieving good peel removal or washing. Run product through the machine at normal flow rate. Check for product condition, proper machine function, and roll speed/flow rate targets. See Section 3.3 for making adjustments.

3.3 ADJUSTMENTS



Three major factors that affect continuous peeling efficiency are:

1. Effect of roller surface on product.
2. Amount of roller surface moving past product.
3. Retention time of product in peeling chamber.

Discharge Gate Position: Discharge Gate position will control product load level and retention time. Product load level will determine how much force is applied to the product on the roll surface and will affect tumbling action.

Product Tumbling: A good tumbling action will produce a more evenly peeled product. Retention time is how long the product is in contact with the rolls inside the machine. These adjustments work hand in hand with roll speed.

Roll Speed: Roll speed is a very important factor in how well your peeler/washer performs. It is very easy to run the rolls at a higher rpm than required to achieve proper peeling/washing. Roll over speed will cause increased peel loss and product damage, and an inconsistent peel removal. After machine installation, take some time to determine proper bed depth and tumbling action with as low roll rpm as possible.

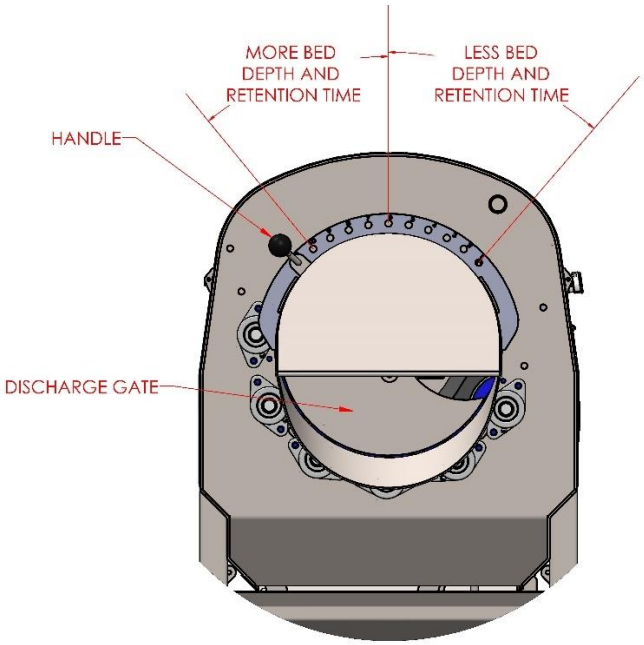
Operation: For best results, a steady inlet flow of product is necessary for consistent machine operation.

Adjustments are a judgment of the operator that is made by examining the product when it reaches the inspection table. Speed of rolls and discharge gate opening should complement each other. Different products and product condition will determine ultimate machine setup.

Remember - - too much peel removal creates excess product loss. Proper adjustment is essential for efficient operation of machine.

Roll speed on the 2420 Peeler/Washer is set with an electrical inverter. Inverter installation and operation is the responsibility of the customer given the specific nature of the application. Electrical requirements for this machine can be found in Section 1.2. To find the exact Hertz output to roll RPM, a handheld tachometer will be needed to set the roll RPM manually through the inverter. A table with approximate roll speeds is shown in Section 8.5. A local certified electrician will be needed to install and program an inverter for use by personnel.

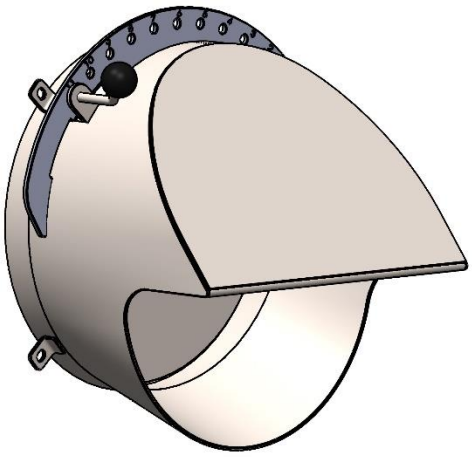
3.3.1 DISCHARGE GATE ADJUSTMENT



To adjust discharge opening, move handle to rotate gate to desired location.

Note: Numbers on calibration plate are for reference in daily settings, they do not give any specific product volume discharging from machine.

3.3.2 DISCHARGE GATE REMOVAL



To remove gate from machine, remove the 4 nuts that are evenly spaced around the outside. See section 4.6.1 – **Peeling Roller Removal**.

3.4 SHUT-DOWN

1. Stop all product flow to the machine. If the machine is part of a processing line, it requires progressive product clearing beginning with the first machine in the process (product introduction) and working downstream.
2. Allow product to discharge from the machine until it's empty. This can be accelerated by manually opening the discharge gate.

⚠CAUTION

Never force product through machine or manually remove product or debris unless the machine is properly de-energized and locked out.

3. If machine is outfitted with optional CIP, Pan Spray, or other cleaning system, cycle the cleaning systems with the machine rolls ON.
4. Turn OFF all drives, water supply, and other utilities and remove power
5. With extended shutdowns for maintenance, sanitation, or other activity, disconnect, de-energize, and lockout all sources of energy on the machine.

⚠WARNING

Always use proper lockout/tagout procedures when de-energizing machine for maintenance, sanitation, or other similar process on the equipment.

6. Cleaning - Wash down peeling chamber ensuring peel residue and other process debris is rinsed from the peeling chamber, peeling rolls, and surrounding sheet metal. Reference Section 4.0 for sanitation guidelines.

NOTICE

During high pressure cleaning do not aim steam directly into drive compartment or onto bearings.

7. Grease discharge end bearings until grease is visible manually
8. Covers - Close all covers and lock machine doors.
9. Clean exterior of machine - High pressure spray or a cleaning solution used with a cloth, is recommended. Reference Section 4.0 for sanitation guidelines.

NOTICE

During high pressure cleaning do not aim steam directly into drive compartment or onto bearings.

10. Loose Equipment - Check that all chutes and other loose items are in their proper place.

4.0 PREVENTATIVE & ROUTINE MAINTENANCE

Your Vanmark machine is designed and constructed for efficient operation, but it does require service and maintenance. A major breakdown can be expensive, so it is economical to follow a routine service program preventing or identifying problems prior to becoming a breakdown.

The estimated service schedule is based on eight (8) hours of production per day, five (5) days per week under normal operating conditions. Frequency may vary as production time and operating conditions change.

4.1 DAILY:

- Clean peeling chamber, peeling rolls, and all areas of machine to remove debris, disinfect, and sanitize the machine.
  - Frequency may be multiple times per day per operation schedule.
- Check condition of peeling rolls.
- Check for clogged nozzles on spray bar.
- Check for line up-time (maximum number of shut-offs not to exceed three (3) times per hour with 85 - 90% line up-time).
- Grease roller bearings at discharge end of machine with #2 food grade grease.
- For manual grease systems, grease every 8 hours, and after every sanitation routine.
- Grease bearings until grease expelled from seal is visible.

4.2 WEEKLY:

- Check for loose or binding hardware.
- Check bearings for excessive wear.

4.3 MONTHLY:

- Check/Tighten set screws in bearings. (45-50 in.-lbs.)
- Inspect drive case bearings for excessive wear.
- Check for frayed or misaligned belts and or pulleys.
- Adjust drive belt if required.

⚠CAUTION

Keep all hands, feet, face, loose clothing, and foreign objects out of machine while it is operating. Always turn off and lockout power when maintenance is required. Discharge End Bearings may be hot if low on grease or near end of life. Water/Chemical Spray may be present inside the machine when utilities are on, always wear appropriate PPE [Personal Protective Equipment].

4.4 SANITATION

Vanmark' s equipment and parts have been designed and made of materials and workmanship that make them adequately cleanable when properly maintained. Various optional "CIP" and/or pan spray systems are available for the machine to aid with cleaning. It is at the equipment user's discretion to determine the appropriate level of sanitation required for each machine's specific application and location within a given facility. This should be done by the user to maintain compliance, and consistency with each company's own sanitation standards.

4.4.1 DAILY RECOMMENDATIONS:

- Wash down entire machine including peeling rolls, ensuring the machine is clear of residue and debris.
- High pressure spray and/or cleaning solution may be used.
- Perform any re-lubrication after clean-up.
    - If your machine is equipped with an optional Auto Lube System, press and hold the orange button on the electrical enclosure to perform a manual lube cycle

⚠WARNING

All covers and shields should be properly closed, affixed, and in place prior to start-up. Keep all hands, feet, loose clothing, and foreign objects out of machine while it is operating. Always turn off and lockout power when maintenance or sanitation is required.

NOTICE

During high pressure washdown, DO NOT aim directly at bearings or electrical boxes.

4.5 TROUBLESHOOTING

SYMPTOM / PROBLEM	POSSIBLE CAUSE	SOLUTION
Poor Peel Removal	Tumbling action in peeling chamber is slow.	Increase speed – See Section 3.2 for Adjustments
	Sequence and type of roller is not effective with product	Contact Vanmark for recommendations
	Too much product in peeling chamber	Adjust discharge gate (See Adjustments Section), Maintain even infeed
	Excessive downtime	Control product flow for constant/even infeed rate
	Abrasive rollers have starch build up or are worn	Clean or replace
	Inadequate water volume	Check process spray bar for adequate water supply and clogged nozzles
	Brush roller are worn	Replace
	Brushes installed backwards	Verify brush orientation such that off-colored stripes on the brush are located at the infeed end of the machine
	Roll setup is not effective with product	Contact Vanmark for recommendations
	Roll Rotation Direction is incorrect	See Section 3.0 for diagram on rotation directions and verify proper roll rotation
Product loss from peeling chamber	Roller surface worn	Replace
	Splash Guards improperly aligned or missing	Realign by lifting the splash guard over the roll inserting the guide pins into the end and adjust bolts on opposite end as needed
Rollers not turning	Product or foreign item jammed in bed	Turn off power to peeler, remove obstruction. Restart
	Belt Loose or Broken	repair or replace
Rollers run clockwise at discharge end	Drive motor rotation is counterclockwise	Change motor rotation

Troubleshooting Continued

Electric drive or tumbling motors do not run	Power is off	Turn on Power (check local disconnect, breaker, and main power)
	Wiring loose or disconnected at motor or motor starter	Check wiring
	Motor defective	Replace motor
	Breaker off or tripped	Reset breaker, turn off power to peeler/washer. Check peeler bed, tumbler, drive case, belts, etc. for obstruction that may have caused breaker to trip. Reset breaker, turn on peeler. If breaker continues to trip, check for proper breaker size, based on motor amp draw.
No water to spray bar	Manual valve closed	Open valve
	Nozzles on spray bar clogged	Clean nozzles
	Solenoid defective or incorrectly wired	Replace Solenoid
	Drive motor is off	Turn on motor to activate water solenoid (control setup may vary for water solenoid)

****Note: Some Troubleshooting information for machine options are described in the options pages. See Section 6.0 for equipment options.**

⚠DANGER

Keep all hands, feet, loose clothing, and foreign objects out of machine while it is operating. Always turn OFF power and lockout machine when maintenance is required. All covers and shields should be properly closed, affixed, and in place prior to start-up. Only qualified personnel should perform maintenance tasks.

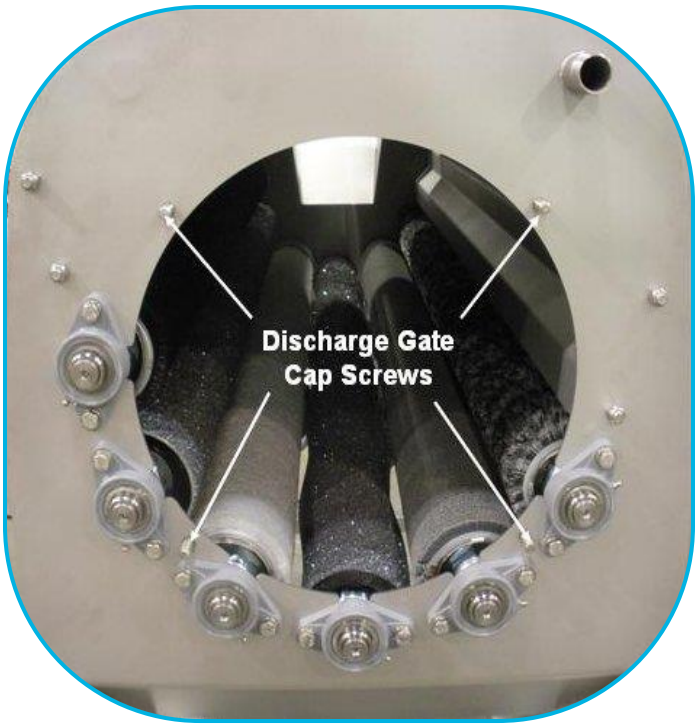
4.6 PEELING CHAMBER AND ROLLERS

4.6.1 PEELING ROLLER REMOVAL

Roller removal is required to change roll arrangement, replace rolls or shafts, or to service certain items in the drive compartment such as drive coupling replacement, belts, shafts, or bearings. To work on roller related drive components with rollers still in machine is nearly impossible.

Roll Removal - First, remove power and lockout the peeler to ensure it is disabled before performing service or activate the trap key door locks by removing the master key which must disable all drives on the machine. Access the peeling rolls by unlocking the trap key door locks and opening the peel chamber side covers and the discharge door to their fully open positions. Open top covers and use provided prop rods to keep covers in fully open position.

Discharge Gate Removal - First remove the four (4) nuts that hold the shroud to the discharge plate. Then remove the gate from the machine.



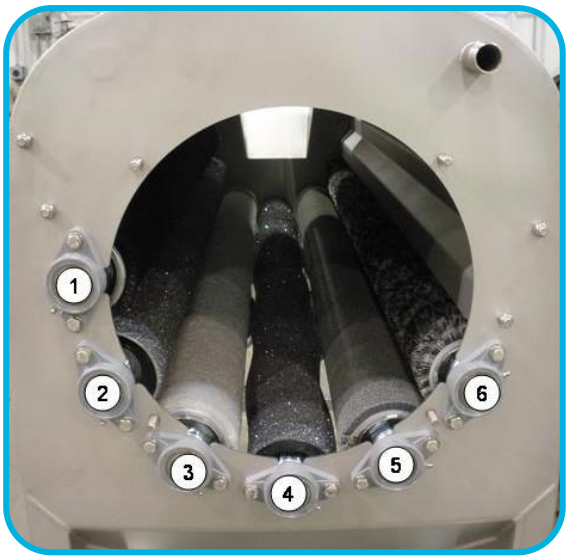
Splash Guard Removal - Splash Guard removal is not necessary to remove the rollers, however, it is more convenient to remove them before work is started on roller removal.

1. Remove bolts and nuts that attach splash guard to discharge plate at discharge end of machine.
2. Remove bolts and nuts from the 4 locations on the inlet end of the machine.

⚠CAUTION

DO NOT OPERATE MACHINE WITHOUT SPLASH GUARDS IN PLACE. IT IS RECOMMENDED TO USE ASSISTANCE FROM ANOTHER PERSON TO PREVENT INJURY FROM ERGONOMIC LIFTING AND/OR MANEUVERING ROLLS.

4.6.2 IDENTIFYING PEELING ROLLERS

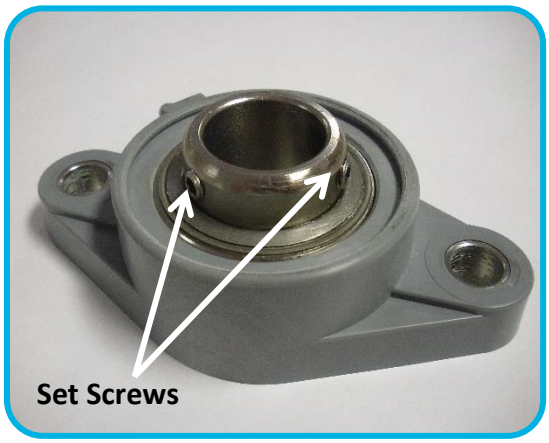


Six (6) Roller Units

Eight (6) Roller Units: Before removing any roller shafts in chamber, identify the kind and position of roller by numbering them from 1 through 6. Rollers must be reassembled in the same position as they were originally installed, or peeling efficiency will be affected.

See Section 1.2 or 8.1 for Peeling Roll Configuration

4.6.3 REMOVING PEELING ROLLER



Loosen two (2) set screws on bearing collar. Unbolt bearing, and remove, set aside. From the side of the machine, support the roll with both hands, lifting the discharge end high enough so roller will clear end plate. At the same time, apply lateral pressure pushing the roll out through the discharge opening together with a slight twisting (rocking) motion to help release drive end (infeed end) from the drive coupler. Remove the roll from the machine. Repeat the procedure for each remaining roller.

HEAVY LIFT: USE 2 PEOPLE OR MORE

4.6.4 REASSEMBLY OF PEELING ROLLERS

1. Clean bearing components.

NOTICE

Food grade anti-seize is applied at the factory to all bearing bores, bearing shaft, and cap screw threads in this assembly at the time of assembly. It is <u>strongly recommended</u> that this procedure be followed to prevent seizure of any components.

2. To reassemble, reverse the procedure in Section 4.6.1. Rollers should be replaced in No. 4 and 5 positions first, working outward to each side. See section 5.0 for the roller component list. Install rollers in pairs noting the following:

    a. Consult the roll arrangement in Section 1.2 for the original roller arrangement. Placing each roll in the correct position is important to achieve optimum performance.

NOTICE

Your machine will be set up to perform for the application target when the machine was ordered. Products and applications change, so if you would like to revisit the roll set up provided, please reach out to the Vanmark team that can look at your processing target, and adjust rolls and/or configurations as the product evolves. We have a vast array of brushes and rolls to fit most any application you may come across and would be happy to review with you on options available.

    b. Two (2) set screws in each discharge end bearing should be loose allowing the bearing to slide freely on the shaft.

    c. For brushes, make sure the driven end with square shaft shows the colored stripes on the brush. Similarly, with sine wave rolls, ensure their orientation is correct with the direction name stamped on the ends.

3. Guide the square end of the roller shaft into the drive coupling until the end of the shaft "bottoms out" in the coupling. **Do not use force – firm hand pressure is sufficient**.

4. Slide bearing on shaft, bolt bearing to discharge plate with bolts that were removed, making sure to use food grade ani seize to prevent seizure.

5. Ensure the shaft is still "bottomed out" against drive coupling by applying firm hand pressure on the round end of the shaft (the shaft is free to slide through the bearing). Tighten two (2) socket head (Allen type) set screws (1/8 wrench) in each bearing with the following procedure:

    a. Torque the first setscrew to 20-30 in-lbs.

    b. Torque the second set setscrew to 45-50 in-lbs.

    c. Return to the first setscrew and torque it to 45-50 in-lbs.

6. Re-install splash guards in the same fashion they were removed and close all machine covers before re-starting machine and checking roller action.

4.6.5 LOCK NUT ASSEMBLY INSTRUCTIONS

Visible Threads Locking Nut

- Pictured (Left) illustrates the ideal locking nut position on finished roll assembly.
- There **must** be 1 to 2 full threads visible beyond the nut.
- Minimum torque required to achieve nut position should **NOT** be **LESS** than 35 ft.-lbs.
- A new locking nut is required if 3 or more threads are visible by applying less than 35 ft.-lbs. torque.

NOTICE

Tightening nut to 4 or more visible threads will cause product damage, product loss at discharge end of peeler, damage to infeed end wall plate, and brush at the infeed end.

2” Aluminum Socket

1 3/8-6 Locking Nut

4.6.6 ABRASIVE (GRIT) ROLLERS

Disassembly: A cart or rack can be helpful to store and transport peeling rolls. Contact Vanmark if you'd like a custom-built rack for storing and transporting your rolls. Having a full set of spare rolls and shafts on hand allows you to remove and replace the rolls immediately reducing the machine downtime. The roll disassembly can then be done offline in a maintenance area reducing machine downtime.

1. Once the rolls are removed, remove the bearing by loosening the set screws and sliding it off the shaft.
2. Fix the square end of the shaft to prevent the roll from rotating (this is built into our roll carts).
3. Using the provided 2" Aluminum socket, loosen and remove the Locking Nut located behind the bearing (see Section 4.6.5).
4. Remove the shaft from the roll pulling from the driven square end and set it aside.

NOTICE

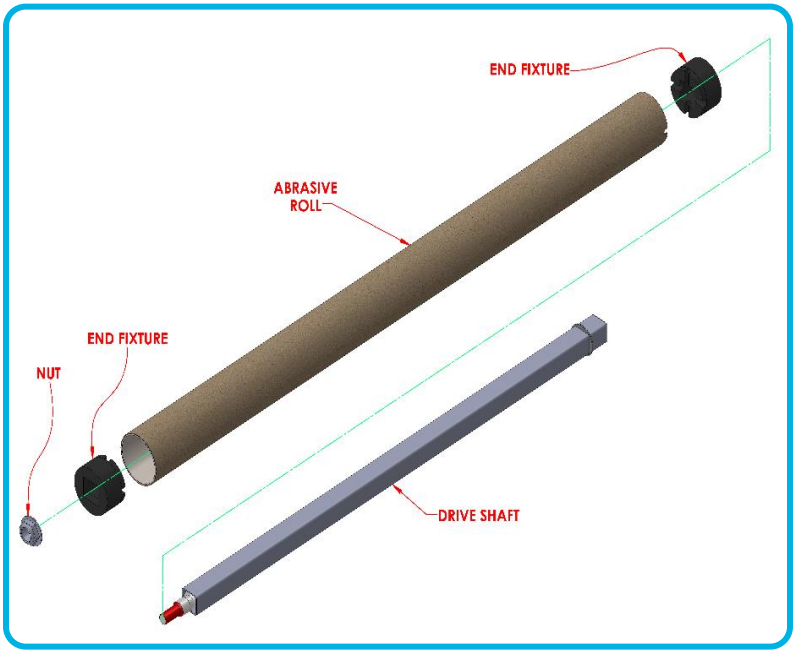
Be sure to use care handling the shafts and do not drop them on hard surfaces such as concrete which could bend them.

5. Remove polyurethane fixture from each end of roller and set them aside.
    a. On occasion, the end fixtures may be stubborn to remove, especially if the roll has not been disassembled for some time. To easily remove these, drive them out from the opposite end using a wooden closet rod or dowel approximately 80" in length.
    b. A gentle tap should be enough to get the end fixtures loose ensuring you are not driving against the welded lugs inside the tube and just against the end fixture. Prying out the end fixtures may damage them so they can't be re-used.
6. Clean all components and inspect them for unusual wear or damage. Refer to Section 7.0 for spare parts if needed.

Reassembly: Re-assembly is essentially the same as the disassembly process in reverse. Position the new roll on a stable surface such as a cart or workbench.

1. Install polyurethane fixture on drive end of roller. A light coat of food grade grease on the outer diameter of the end fixture can help with installation. Ensure the keys inside the roll are aligned with the notches on the end fixture and it's properly fully seated over the keys

   a. **NOTE**: For rollers having more than one grade of abrasive "grit", use the larger (coarsest) abrasive on the driven/infeed end. This end is mounted at the inlet or drive end of machine; also, rollers that have notches go toward drive end.



2. Insert the round end of the shaft into the driven end of the roll through the center of the end fixture. Make sure with brushes, the shaft is inserted into the end with the colored stripes. As the shaft is inserted, align the square shaft with the square opening of the end fixture. Continue to slide the shaft through until the washer at square end is flush with the end fixture. Care should be taken to not damage threads on bearing shaft by striking roller tube lugs.
3. Elevate the shaft to the center of the roller and slide the second polyurethane end fixture over the bearing end of drive shaft. Ensure it is aligned with the keys/lugs inside the roll and with the square shaft. A little food grade grease on the ID of the tube can help with installation. Gently tap the end fixture into the roll until it is fully seated (take care to not tap on the shaft end).
4. Install the 1 3/8–6 locking nut by hand onto the shaft threads with the flat washer towards the end fixture. Before tightening nut securely, center polyurethane fixture in roller for smooth operation. With the square/driven end of the shaft fixed, tighten the nut using the supplied socket wrench.

NOTICE

DO NOT over tighten the locking nut as damage can occur. See Section 4.6.5 for locking nut assembly instructions. Tighten the nut until 1-2 full threads are visible beyond the nut and the torque should exceed 35 ft.-lbs. If 3 or more threads are visible with less than 35 ft.-lbs. of torque applied, the nut requires replacement.

When the nut is properly tightened, it will eliminate any play in the ends of the shafts, between the end fixtures and tube.

4.6.7 SINEWAVE ABRASIVE SEGMENTS

Disassembly: A cart or rack can be helpful to store and transport peeling rolls. Contact Vanmark if you'd like a custom-built rack for storing and transporting your rolls. Having a full set of spare rolls and shafts on hand allows you to remove and replace the rolls immediately reducing the machine downtime. The roll disassembly can then be done offline in a maintenance area reducing machine downtime.

1. Remove the bearing and 1-3/8-6 locking nut using the 2" aluminum socket provided with machine.
2. Place a wooden board of suitable size on the floor. Hold the roll vertically with the bearing (threaded) end facing down. Strike the board with the entire roller assembly. This should loosen segments from shaft and shift them towards the threaded bearing end on the shaft. Repeat procedure if segments do not come loose the first time.

NOTICE

Do NOT strike bearing shaft on bare floor or with hammer. Resulting damage might require dressing down or replacement.

3. Remove segments from bearing end of shaft one at a time. The stop washer on the driven end of the shaft prevents removal from the drive (square) end.
4. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable replace now.

Reassembly

1. Stage the new abrasive segments by standing them on end so that stamped word (either right or left) is facing up. If more than one grade of abrasive segment is installed on same shaft, coarsest grit segments ordinarily go next to the drive (square) end of shaft and are installed first.
2. Rest the driven/square end of the shaft on the floor and support the bearing end such that the shaft is vertical. Place segments on shaft with the stamped word facing upwards towards the threaded bearing end of the shaft. Slide it toward drive end until the stop washer is seated in recess of segment.
3. Repeat the procedure to install the remaining four (4) segments. Always keep the stamped word towards the bearing end of the shaft and in direct line with the word on the segment previously installed (aligned with same square side of the shaft).

NOTICE

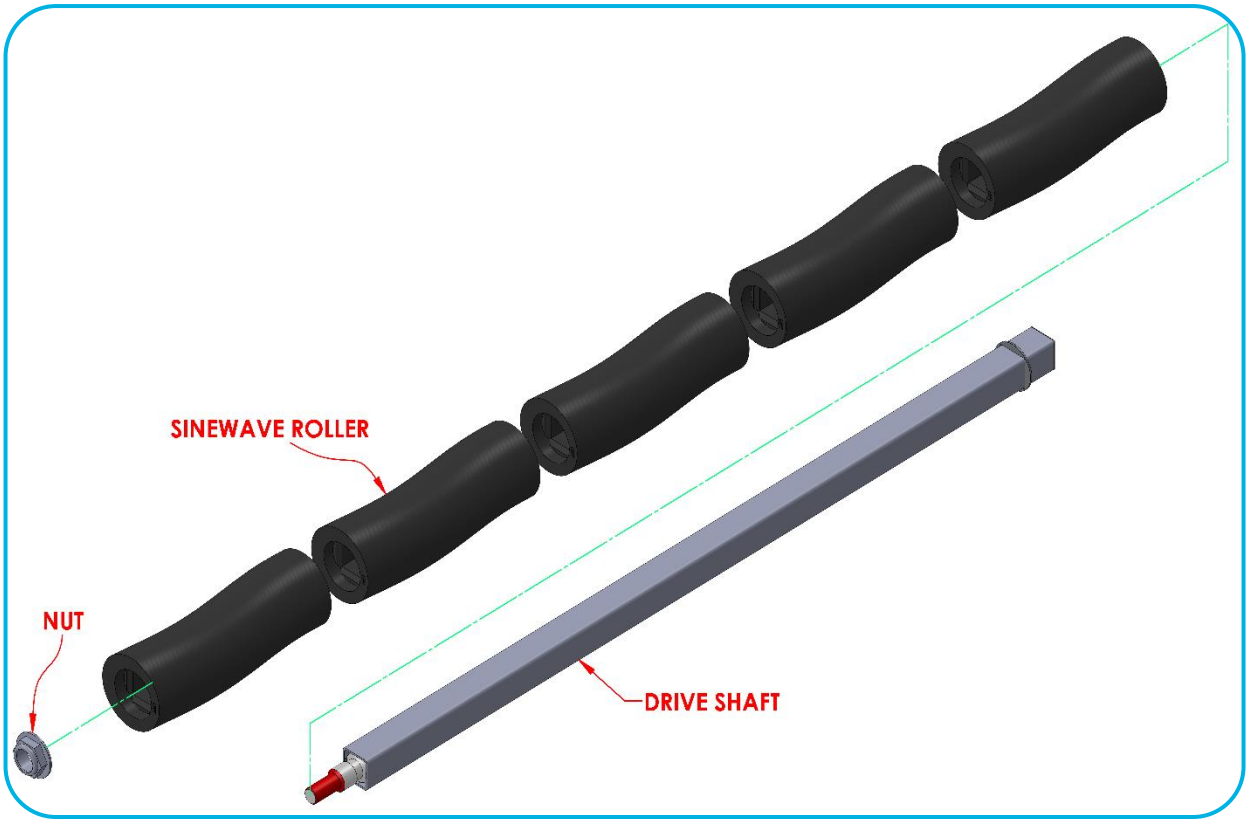
DO NOT install right and left segments on same shaft. Segment can be determined right or left-handed by looking along its length from either end. If helix or "high" part of wind curves to your left, it is left-handed; if it curves to the right, it is right-handed.

4. Install 1 3/8-6 locking nut and tighten securely. Segments must not appear to be loose on shaft; however, **DO NOT** over tighten as damage to segments can occur.

NOTICE

DO NOT over tighten the locking nut as damage can occur. See Section 4.6.5 for locking nut assembly instructions. Tighten the nut until 1-2 full threads are visible beyond the nut and the torque should exceed 35 ft.-lbs. If 3 or more threads are visible with less than 35 ft.-lbs. of torque applied, the nut requires replacement.

When the nut is properly tightened, any play between the sine wave segments and tube should be eliminated.



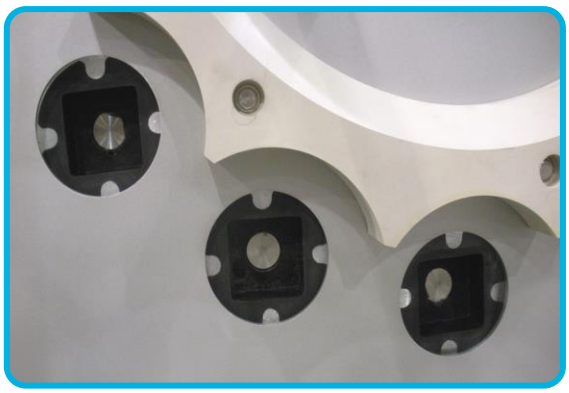
4.6.8 TIMING THE DRIVE ROLLERS (SINE WAVE ONLY)

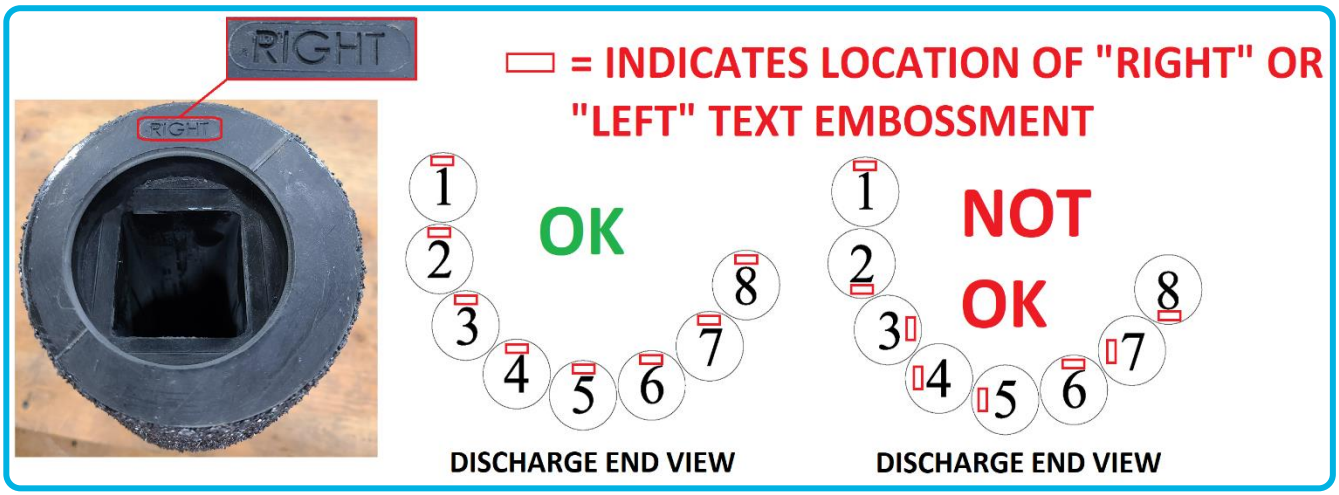
Coordinated rotation of rollers is only required with sine wave rollers and only possible in machines using mechanical drive cases. This is referred as “timing” the rolls (to one another) and is a critical step when re-installing sine wave style rolls into your machine.

NOTICE

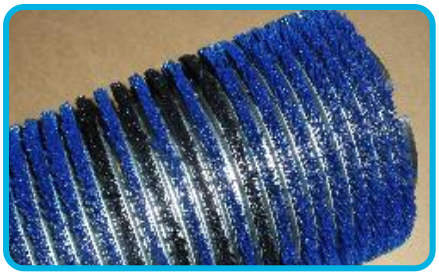
Failure to properly set up roll timing with sine wave roll types can result in damage to the rolls, drive system, or cause damage and/or loss of product.

1. To time sinewave abrasive rollers, rotate mechanical drive case so that the sides of the square openings in couplings are in a horizontal and vertical position.
2. Install abrasive rollers into the machine with the driven end properly inserted into the drive coupler, and with the embossed word “left” or “right” on the segment end closest to discharge bearing is in the same position. The position of the word on the first shaft installed is not important but keeping all the words of succeeding rollers in same position as the first is critical.





4.6.9 BRUSH ROLLERS



Disassembly: A cart or rack can be helpful to store and transport peeling rolls. Contact Vanmark if you'd like a custom-built rack for storing and transporting your rolls. Having a full set of spare rolls and shafts on hand allows you to remove and replace the rolls immediately reducing the machine downtime. The roll disassembly can then be done offline in a maintenance area reducing machine downtime.

1. Once the rolls are removed, remove the bearing by loosening the set screws and sliding it off the shaft.
2. Fix the square end of the shaft to prevent the roll from rotating (this is built into our roll carts).
3. Using the provided 2" Alum. socket, loosen and remove the Locking Nut located behind the bearing (see Section 4.6.5).
4. Remove the shaft from the roll pulling from the driven square end and set it aside.

NOTICE

Be sure to use care handling the shafts and do not drop them on hard surfaces such as concrete which could bend them.

5. Remove polyurethane fixture from each end of roller and set them aside.
    a. On occasion, the end fixtures may be stubborn to remove, especially if the roll has not been disassembled for some time. To easily remove these, drive them out from the opposite end using a wooden closet rod or dowel approximately 80" in length.

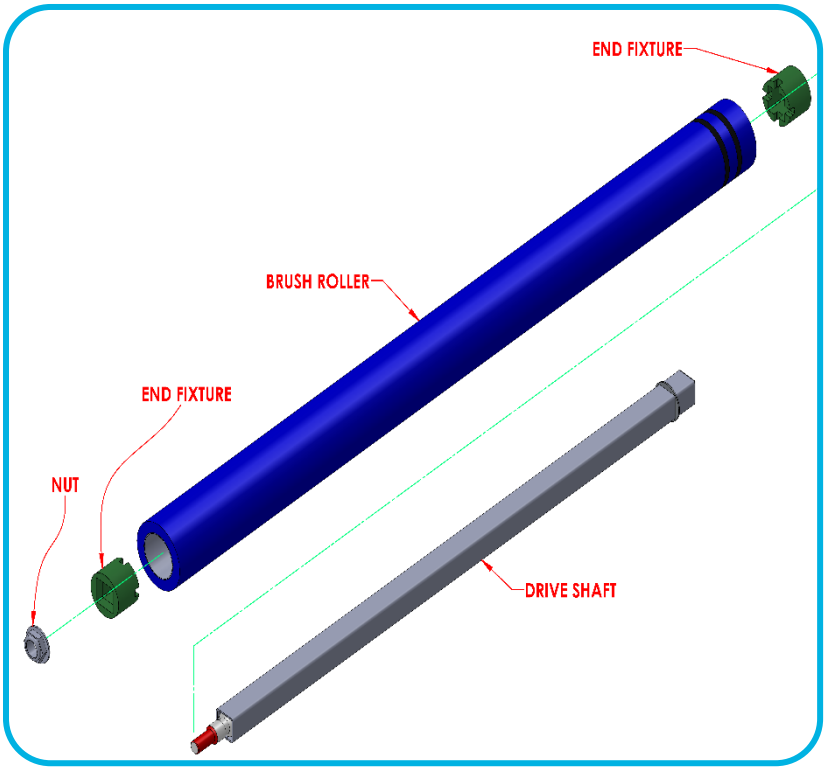
    b. A gentle tap should be enough to get the end fixtures loose ensuring you are not driving against the welded lugs inside the tube and just against the end fixture. Prying out the end fixtures may damage them so they can't be re-used.
6. Clean all components and inspect them for unusual wear or damage. Refer to Section 7.0 for spare parts if needed.

Reassembly: Re-assembly is essentially the same as the disassembly process in reverse. Position the new roll on a stable surface such as a cart or workbench. Make sure to note one end has a series of colored stripes to identify the infeed/driven end of the brush. The stripes must be nearest the square (driven) end of the shaft.

NOTICE

With brushes, the stripes must be nearest the square (driven) end of the shaft and after installed in the machine, near the infeed end. The brushes are uniquely manufactured to Vanmark's specifications requiring this orientation. If installed incorrectly, the machine will not perform as designed and result in reduced performance or damage to the product or brush.

1. Install polyurethane fixture on drive end of roller. A light coat of food grade grease on the outer diameter of the end fixture can help with installation. Ensure the keys inside the roll are aligned with the notches on the end fixture and it's properly fully seated over the keys
   a. **NOTE**: For rollers having more than one grade of abrasive "grit", use the larger (coarsest) abrasive on the driven/infeed end. This end is mounted at the inlet or drive end of machine; also, rollers that have notches go toward drive end.



2. Insert the round end of the shaft into the driven end of the roll through the center of the end fixture. Make sure with brushes, the shaft is inserted into the end with the colored stripes. As the shaft is inserted, align the square shaft with the square opening of the end fixture. Continue to slide the shaft through until the washer at square end is flush with the end fixture. Care should be taken to not damage threads on bearing shaft by striking roller tube lugs.
3. Elevate the shaft to the center of the roller and slide the second polyurethane end fixture over the bearing end of drive shaft. Ensure it is aligned with the keys/lugs inside the roll and with the square shaft. A little food grade grease on the ID of the tube can help with installation. Gently tap the end fixture into the roll until it is fully seated (take care to not tap on the shaft end).

4. Install the 1 3/8–6 locking nut by hand onto the shaft threads with the flat washer towards the end fixture. Before tightening nut securely, center polyurethane fixture in roller for smooth operation. With the square/driven end of the shaft fixed, tighten the nut using the supplied socket wrench.

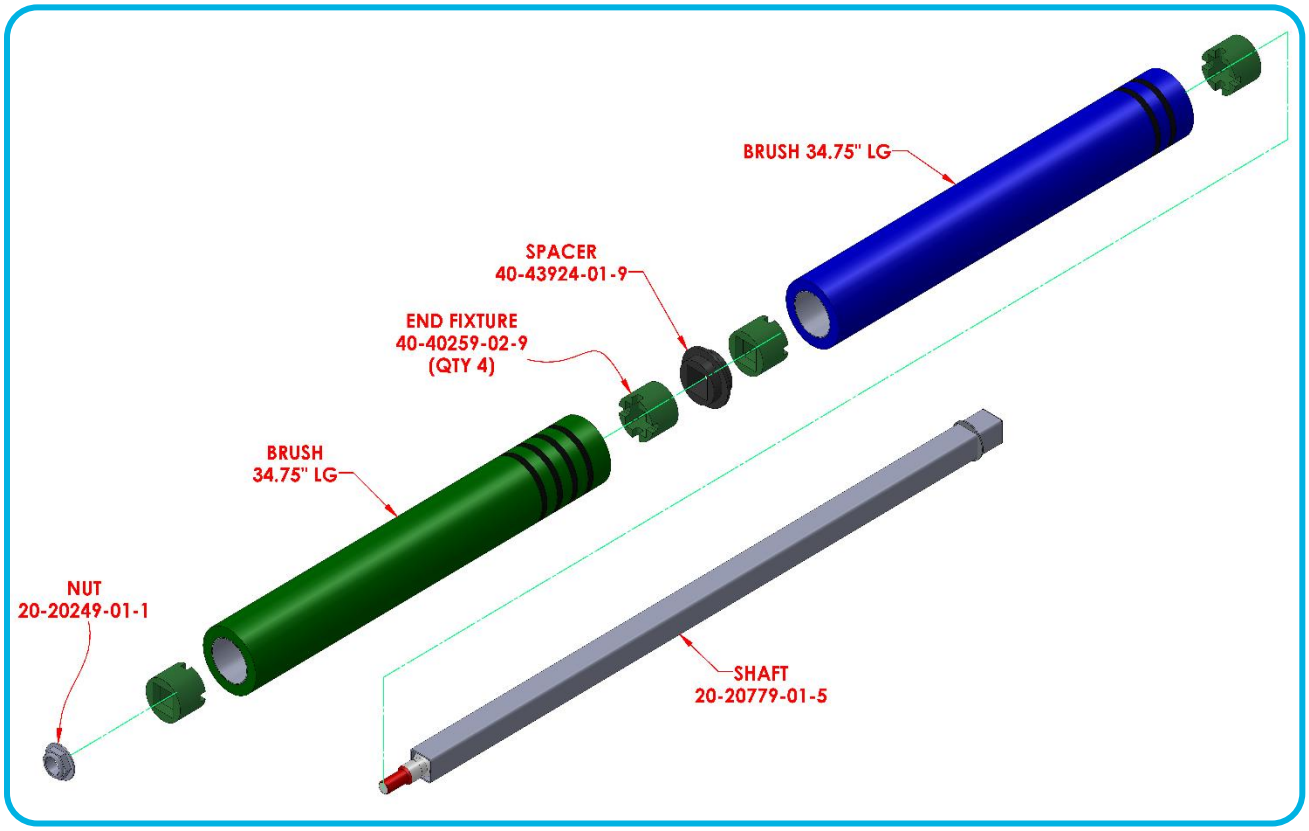
NOTICE

DO NOT over tighten the locking nut as damage can occur. See Section 4.6.5 for locking nut assembly instructions. Tighten the nut until 1-2 full threads are visible beyond the nut and the torque should exceed 35 ft.-lbs. If 3 or more threads are visible with less than 35 ft.-lbs. of torque applied, the nut requires replacement.

When the nut is properly tightened, it will eliminate any play in the ends of the shafts, between the end fixtures and tube.

4.6.10 TWO PIECE BRUSH ASSEMBLY

Much like a standard brush assembly, a two-piece brush assembly provides a different roll arrangement option with coarser brush filaments at the infeed end and softer elements towards the discharge end. The idea is the coarser infeed end does the "heavy lifting" of breaking through tough product skin or protective layers while the softer discharge end, is gentle on the product after the tougher protective layer is removed to minimize product damage or yield loss.



Disassembly

1. Repeat steps described in the Brush Roller disassembly with one difference:
    a. There are (2) additional end fixtures and a Spacer which is located between the (2) brush halves
    b. Like a full-length brush, each brush half, receives an end fixture in each end; (4 total)
2. Clean all components thoroughly and inspect for abnormal wear or damage. If questionable, replace now.

Reassembly: Re-assembly is essentially the same as the disassembly process in reverse. Position the new roll on a stable surface such as a cart or workbench. Make sure to note one end of each brush has a series of colored stripes to identify the infeed/driven end of the brush. The stripes must be nearest the square (driven) end of the shaft.

NOTICE

With brushes, the stripes must be nearest the square (driven) end of the shaft and after installed in the machine, near the infeed end. The brushes are uniquely manufactured to Vanmark's specifications requiring this orientation. If installed incorrectly, the machine will not perform as designed and result in reduced performance or damage to the product or brush.

1. Install a polyurethane end fixture on the drive end of each brush segment (end with stripes). A light coat of food grade grease on the outer diameter of the end fixture can help with installation. Ensure the keys inside the roll are aligned with the notches on the end fixture and it is properly fully seated over the keys

a. **NOTE**: For two-piece brushes, the coarsest abrasive should be positioned on the driven/infeed end of the roll. This end is mounted at the inlet or drive end of machine; also, rollers that have notches go toward drive end.

2. Insert the round end of the shaft into the driven end of the coarser brush segment first through the center of the end fixture. Make sure with brushes, the shaft is inserted into the end with the colored stripes. As the shaft is inserted, align the square shaft with the square opening of the end fixture. Continue to slide the shaft through until the washer at square end is flush with the end fixture. Care should be taken to not damage threads on bearing shaft by striking roller tube lugs.
3. Elevate the shaft to the center of the roller and slide the second polyurethane end fixture over the bearing end of drive shaft. Ensure it is aligned with the keys/lugs inside the brush segment and with the square shaft. A little food grade grease on the ID of the tube can help with installation. Gently tap the end fixture into the roll until it is fully seated (take care to not tap on the shaft end).

4. Slide the Spacer over the round bearing end of the shaft aligning the square bore to the square shaft until is fully nested against the end fixture of the first brush segment.

5. Now install the second brush segment by inserting the bearing end of the shaft, through the end fixture in the striped end of the brush segment. The second brush segment will be located towards the discharge end of the peeler and is typically a softer, less abrasive brush than the first.

6. Elevate the shaft to the center of the roller and slide the last polyurethane end fixture (second end fixture in the second brush segment) over the bearing end of drive shaft. Ensure it is aligned with the keys/lugs inside the brush segment and with the square shaft. A little food grade grease on the ID of the tube can help with installation. Gently tap the end fixture into the roll until it is fully seated (take care to not tap on the shaft end).

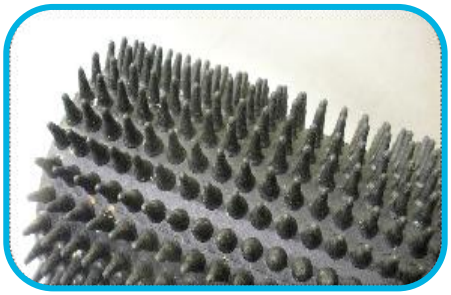
7. Install the 1 3/8–6 locking nut by hand onto the shaft threads with the flat washer towards the end fixture. Before tightening nut securely, center polyurethane fixture in roller for smooth operation. With the square/driven end of the shaft fixed, tighten the nut using the supplied socket wrench.

NOTICE

DO NOT over tighten the locking nut as damage can occur. See Section 4.6.5 for locking nut assembly instructions. Tighten the nut until 1-2 full threads are visible beyond the nut and the torque should exceed 35 ft.-lbs. If 3 or more threads are visible with less than 35 ft.-lbs. of torque applied, the nut requires replacement.

When the nut is properly tightened, it will eliminate any play in the ends of the shafts, between the end fixtures and tube.

4.6.11 PINTLE ROLLERS:



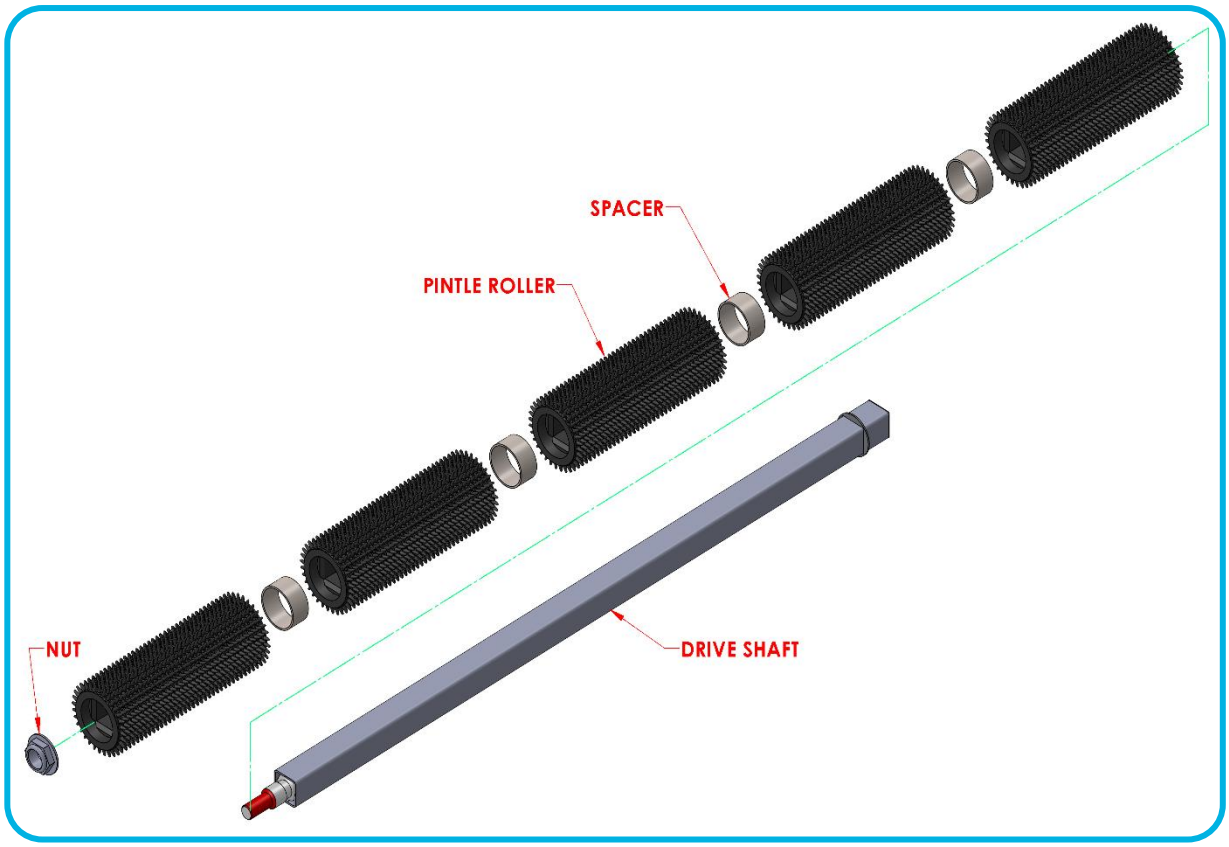
Refer to Section 4.6.7 for disassembly and assembly instructions for sinewave abrasive rollers. The process is the same except:

1. Pintle rollers are straight; not sinusoidal. This means pintle segments do not require timing or specific alignment so those portions of the assembly/ disassembly may be ignored.
2. Spacers are required between each pintle segment. During disassembly, set aside the spacers to be re-used during re-assembly.

NOTICE

Spacers MUST BE INSTALLED between each pintle segment. DO NOT over tighten the locking nut as damage can occur. See Section 4.6.5 for locking nut assembly instructions. Tighten the nut until 1-2 full threads are visible beyond the nut and the torque should exceed 35 ft.-lbs. If 3 or more threads are visible with less than 35 ft.-lbs. of torque applied, the nut requires replacement.

When the nut is properly tightened, it will eliminate any play in the ends of the shafts, between the end fixtures and tube.



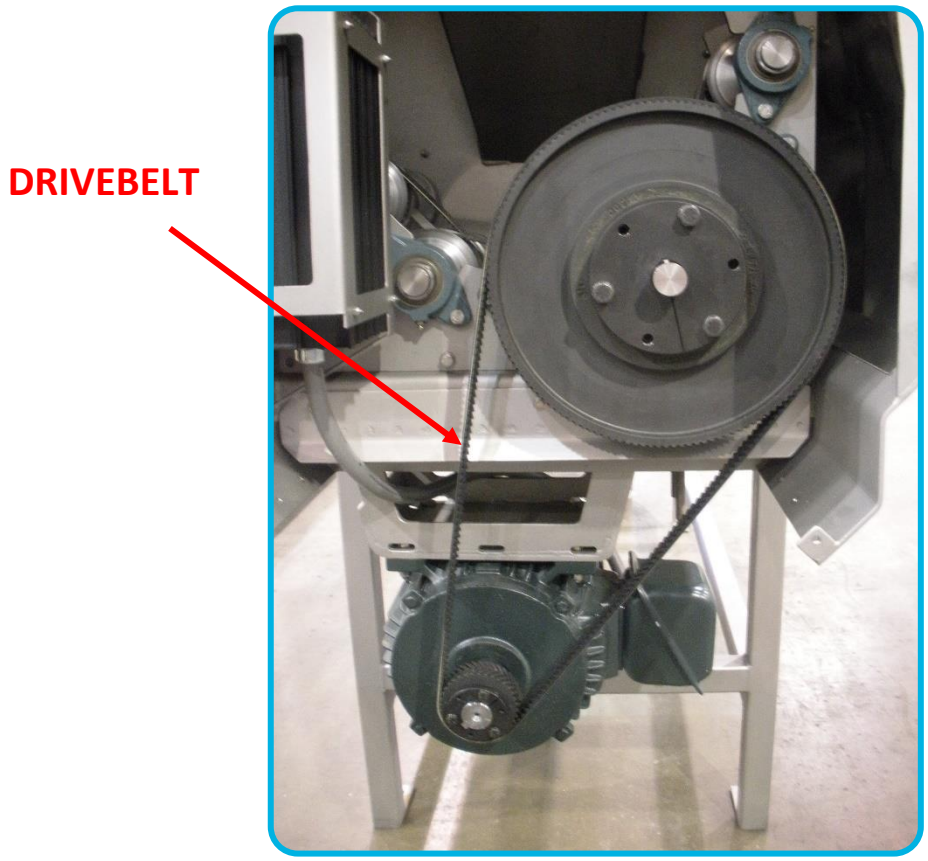
4.7 BELT DRIVE

Consists of a drive sprocket with hub, driven pulley with hub, and a self-tracking drive belt. The belt drive must be disassembled to remove the drive case, replace drive case components on rollers 4 and 5, or to replace belt drive parts.

⚠WARNING

The Belt Drive is covered by a Fixed Guard. Anytime the guard is removed for access, ensure that drive is not unexpectedly started. Turn off and lock out power source before proceeding. Failure to observe these precautions could result in bodily injury.

Always ensure the fixed guard is properly secured during re-installation prior to restarting the machine or applying power.



Shown with belt guard removed

4.7.1 DRIVE BELT REPLACEMENT

⚠WARNING

To ensure that drive is not unexpectedly started, turn off and lock out power source before proceeding. Failure to observe these precautions could result in bodily injury.

1. Remove the drive compartment panel on inlet end of machine by removing four (4) 1/4” bolts.
2. Remove five (4) 1/4” bolts that retain the belt cover.
3. Loosen the belt tension fastener at the motor mount to remove tension from the belt and remove the belt.

a. ***Note:** It may be helpful to mark the tensioning position prior to loosening for reference during re-installation. A new belt may not return to the exact same tension position (see step 6 below) but the mark can provide a reference point.

4. Place the belt on each sprocket and ensure proper engagement between the sprocket and belt teeth.
5. Lengthen the center distance to remove any belt slack by adjusting the tensioning fasteners at the motor mount.

NOTICE

Notice the Self-Tracking belt tooth direction. This must align with the drive sprockets and properly engage with the sprocket teeth. Verify the small sprocket on the motor and the large driven sprocket are properly aligned with the belt teeth. Sprockets should be centered on the belt width. Failure to properly align the belt teeth with sprockets could result in damage to the belt.

6. After tensioning, the belt should have 3/8” (0.375 in.) deflection in belt with 24 lbs. of force applied to span length of belt.
7. Lock down the center distance adjustments and re-check the sprocket alignment after the belt is properly tensioned.
8. Re-check the belt tension and alignment after 8 hours of operation to ensure the drive has not shifted.

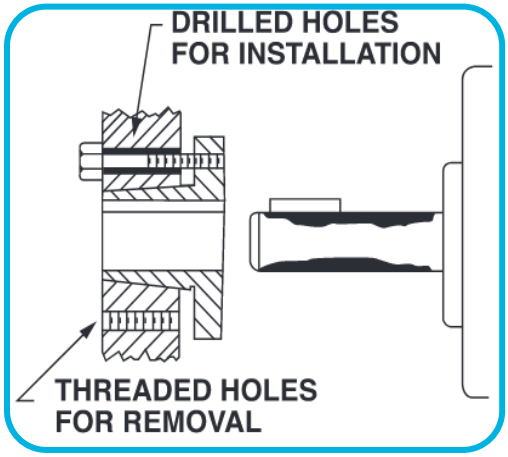
4.7.2 PULLEYS AND PULLEY HUB BUSHINGS

Disassembly

⚠WARNING

The Belt Drive is covered by a Fixed Guard. Anytime the guard is removed for access, ensure that drive is not unexpectedly started. Turn off and lock out power source before proceeding. Failure to observe these precautions could result in bodily injury.
Always ensure the fixed guard is properly secured during re-installation prior to restarting the machine or applying power.

1. **SHUT-OFF AND LOCK-OUT ELECTRICAL POWER** to prevent accidental starting.
2. Remove drive compartment panel, belt cover, and drive belt as described in Section 4.7.1.
3. Loosen and remove cap screws in bushing.
4. Insert cap screws in tapped removal holes and progressively tighten each one until pulley is loose from the bushing.
5. Remove the pulley from the bushing.
6. Remove the bushing from the shaft.



Reassembly

1. Thoroughly inspect bore of mating part and tapered surface of bushing. Any paint, dirt, oil, or grease must be removed.

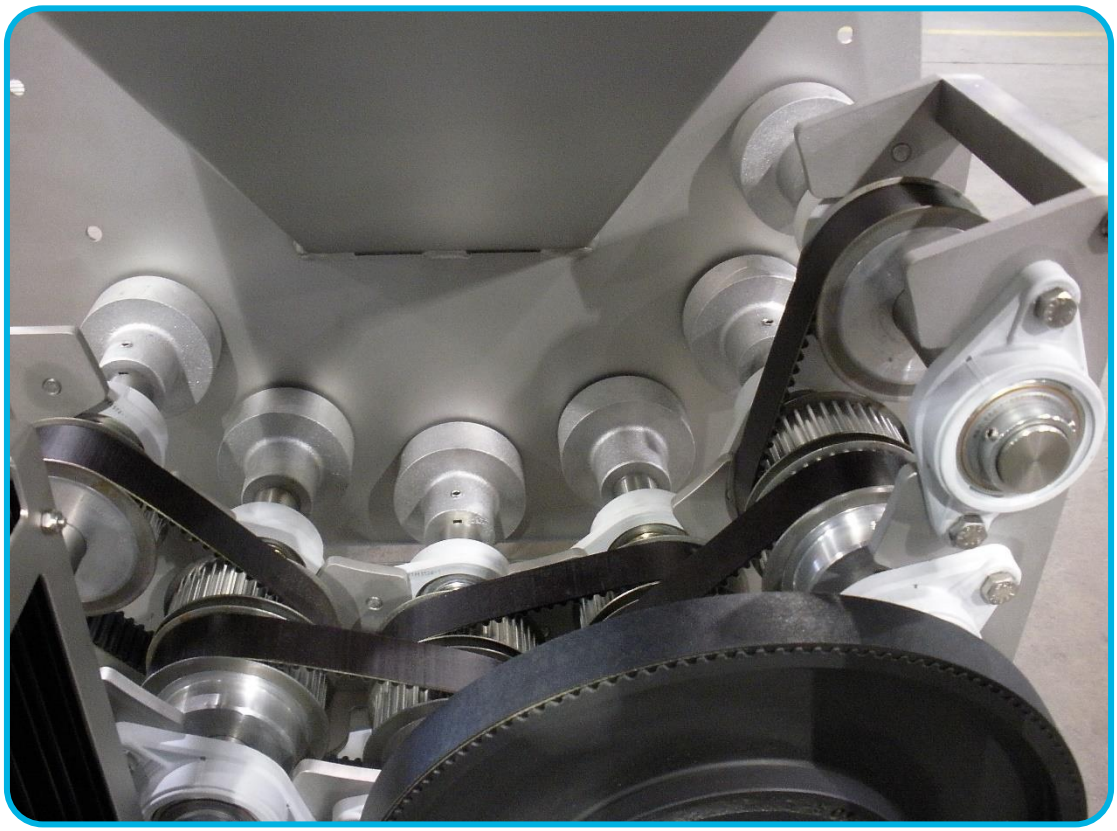
NOTICE

Do NOT use lubricants on the bushing. Food-grade Anti-seize may be used on the bolts and shaft OD only, not between the bushing and sprocket.

2. Insert bushing into pulley and loosely insert cap screws into bushing and pulley.
3. With the key in the key seat of the shaft, slide the assembly onto the shaft aligning the key/keyway. If it is difficult to slide the bushing onto the shaft, wedge a flat screwdriver blade or similar item into the bushing's compression slit to relieve the compression.
4. Position the assembly on the shaft and align it with a straightedge against the outside edge of the small and large drive belt pulleys. Adjust the pulleys until the straightedge touches two (2) outside and two (2) inside edges of the pulleys and both pulleys have proper shaft engagement. (Straightedge should cross pulleys as near shaft as possible.)
5. Tighten cap screws evenly and progressively until obtaining correct torque of 40 ft-lbs. There must be a gap between the bushing flange and mating hub when installation is complete. Replace the drive belt as described in Section 4.7.1 and replace covers.

4.8 MECHANICAL ROLLER DRIVE CASE

The mechanical drive case transfers power from the drive motor to each of the peeler rolls. It consists of a series of interconnected sprockets and belts. The drive case is a sub-assembly that can be removed from the machine while remaining mostly assembled except from the main drive sprocket. Repair of sub-components is possible without removal of the entire drive case unit from the machine. However, major repair is more easily accomplished with entire unit removed from machine. See Section 5.0 for parts and dimensions.



4.8.1 DRIVE CASE REMOVAL AND INSTALLATION

⚠WARNING

To ensure that drive is not unexpectedly started, turn off and lock out power source before proceeding. Failure to observe these precautions could result in bodily injury.

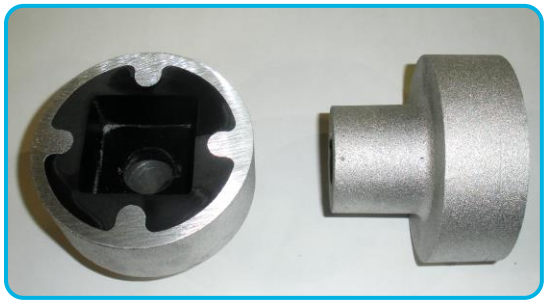
1. **SHUT-OFF AND LOCK-OUT ELECTRICAL POWER** to prevent accidental starting.
2. Remove all peeling rollers as described in Section 4.6.1
3. Remove drive panels, and drive belt as described in Section 4.7.1.
4. Remove three (4) 1/4” bolts that retain the drive belt cover and rotate it down out of the way; it does not need to be removed from the motor.

5. Loosen four (4) 3/4” bolts that hold the drive case to the drive mount. **Note:** Keep any shims/washers used to position the drive couplers in the roll openings of the frame.
6. Use a lifting device to lift the drive case up and off the mount sliding it out the right-hand side of machine. Due to the roll orientation and trapped key components, it can only go out the back or right-hand side of the machine.
7. To install the drive case sub-assembly, reverse steps 1-7 above including any shims removed in step 5.

4.8.2 DRIVE SHAFT AND ROLL SHAFT REPLACEMENT

The design of drive case makes it necessary to remove the outer most shafts first, working towards the center of the drive case until the desired shaft or belt is reached for replacement. Drive case dimensions and part identification can be found in Section 5.0. Drive coupling removal and installation can be found in the next section below.

4.8.3 ROLLER DRIVE COUPLING (ALUMINUM)



The drive coupling provides support for the drive end of each roller and transfers power to the peeling bed rollers. No maintenance or adjustment is required for day-to-day operation. Visual inspection on a regular basis should be made for cracks in the casting, loose or missing set screws and excessive play between the coupling and drive shaft. When any peeling rollers are removed from machine, careful inspection of urethane mold should be made. Check for excessive wear or deformation in the square opening, softness of the urethane mold, and that the urethane is firmly adhered to the casting. Replace the coupling if any one of these conditions are found. Drive couplings are bored to a very close press-fit tolerance on the round drive shaft utilizing a heat-shrink process to install them onto the drive shafts.

NOTICE

DO NOT:

- **Increase bore diameter of coupling.**
- **Decrease (dress down) overall size of output shaft.**
- **Overheat casting to point of melting or modify urethane mold.**
- **Use undue force when mounting coupling.**

Disassembly

1. Remove the drive case and drive shaft from the machine as described in Sections 4.8.1 & 4.8.2.
2. Loosen the set screw in the drive coupling being replaced.
3. Remove the coupling from shaft using a gear puller and heat, if required. Use care when applying heat (see Notice above).

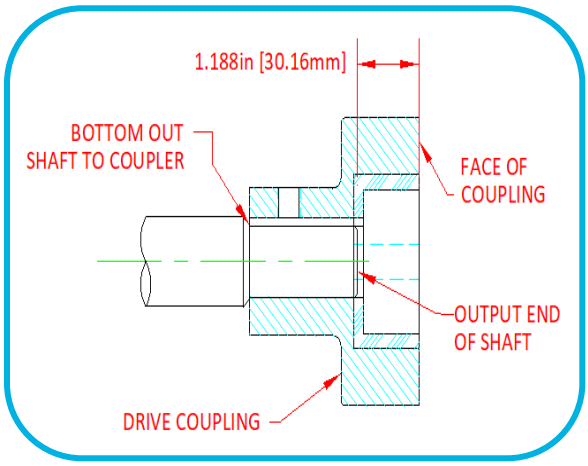
Reassembly

1. Check key in output shaft keyway for nicks. Replace if necessary.
2. Clean any foreign material from the surface of the output shaft. Do not reduce or modify the outer diameter of the shaft.
3. Remove any nicks or burrs from the bore and keyway of coupling. Do not enlarge the inside bore diameter.
4. Remove the set screws from the coupling.
5. Place the coupling on a solid flat work area with the urethane side down. Apply heat with torch for a few moments to the external part of coupling bore. **Do not overheat** causing the aluminum or urethane to melt. Rotate the coupling during heating to distribute the heat evenly.

⚠WARNING

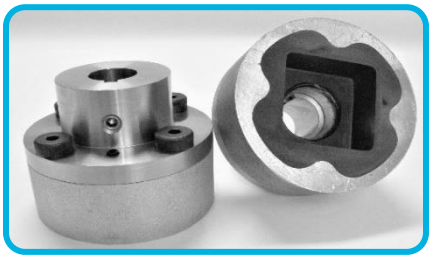
Always wear appropriate eye protection. Use heavy gloves as aluminum couplings become too hot to handle with bare hands. Take care to NOT OVERHEAT the coupling as it could cause damage to the part.

6. Align the keyways of the shaft and coupling pushing the heated coupling onto the shaft until it bottoms out against the step on the shaft.
7. Correctly heating the casting and quickly installing it onto the shaft will allow the coupling to "slip" onto the mating shaft quite easily.
8. Immerse the coupling in coolant (ie. Water) immediately after installation to preserve the urethane and its bond to the casting. Reinstall set screws and torque to 120 inch-lbs.



4.8.4 ROLLER DRIVE COUPLING (QUICK CHANGE)

The Quick-Change Coupler (std.) outfits the machine with an alternate version of the drive coupler (refer to Section 4.8.3 for details) that allows for quick disassembly and re-assembly.

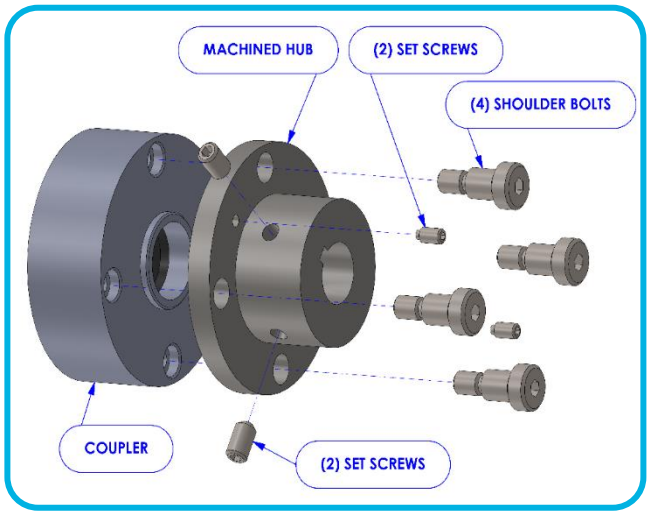


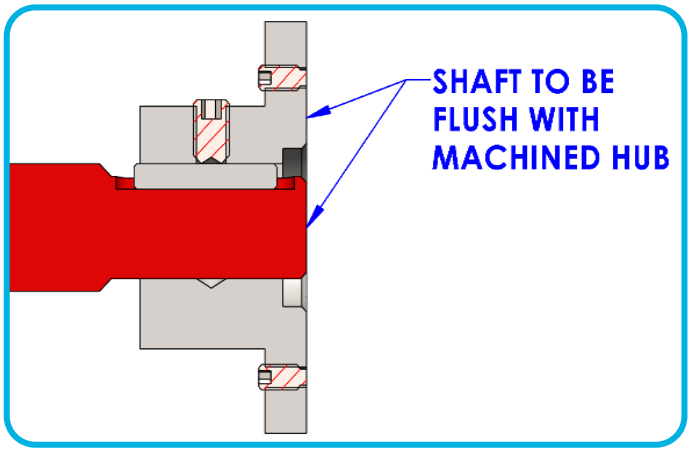
Disassembly

1. Remove the Drive Case access panel from the sides or end of the machine.
2. Loosen the (4) large shoulder bolts on the backside of the quick-change hub but do not remove. The heads of the shoulder bolts should be raised from the hub face.
3. Progressively tighten the (2) small set screws on the hub face to "push" the aluminum coupler away from the hub.
4. Once the coupler is loose from the hub, loosen the (2) set screws to relieve pressure, and remove the (4) shoulder bolts and aluminum coupler.

Reassembly

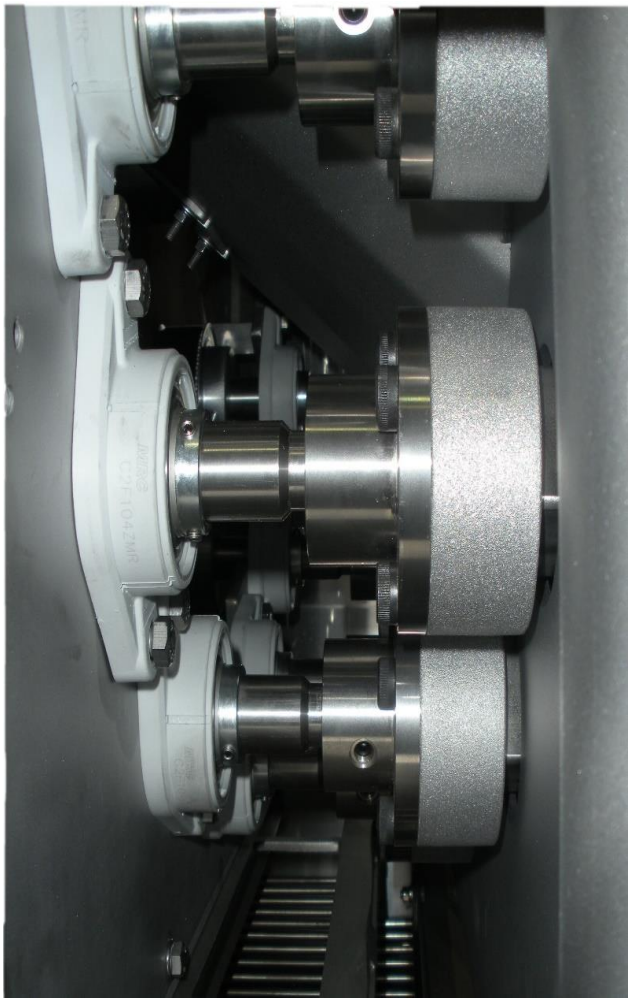
1. Inspect key in output shaft keyway for nicks. Replace if necessary.
2. Clean any foreign material from surface of output shaft. Do not reduce overall diameter of shaft.
3. Remove any nicks or burrs from bore and keyway of coupling. Do not enlarge inside bore diameter.
4. Loosen set screws in Machined Hub.
5. Install Machined Hub onto drive shaft until the end faces of the Machined Hub and drive shaft are flush (see image right). Tighten (2) Set Screws to lock the Machined Hub to the drive shaft.
6. Align the Coupling center with the bore of the Machined Hub and the (4) bolt holes. Ensure the Coupling is fully seated, flat, and flush with the Machined Hub.
7. Insert and finger-tighten the (4) Shoulder Bolts through the Machined Hub and into the Coupling. Torque the (4) Shoulder Bolts to 12-16 ft-lbs.





Quick Change Coupler Parts Overview

The quick-change coupler is a two-piece design; with the urethane insert half being removed and replaced without removing the shaft or drive-case from the machine; significantly reducing service time.



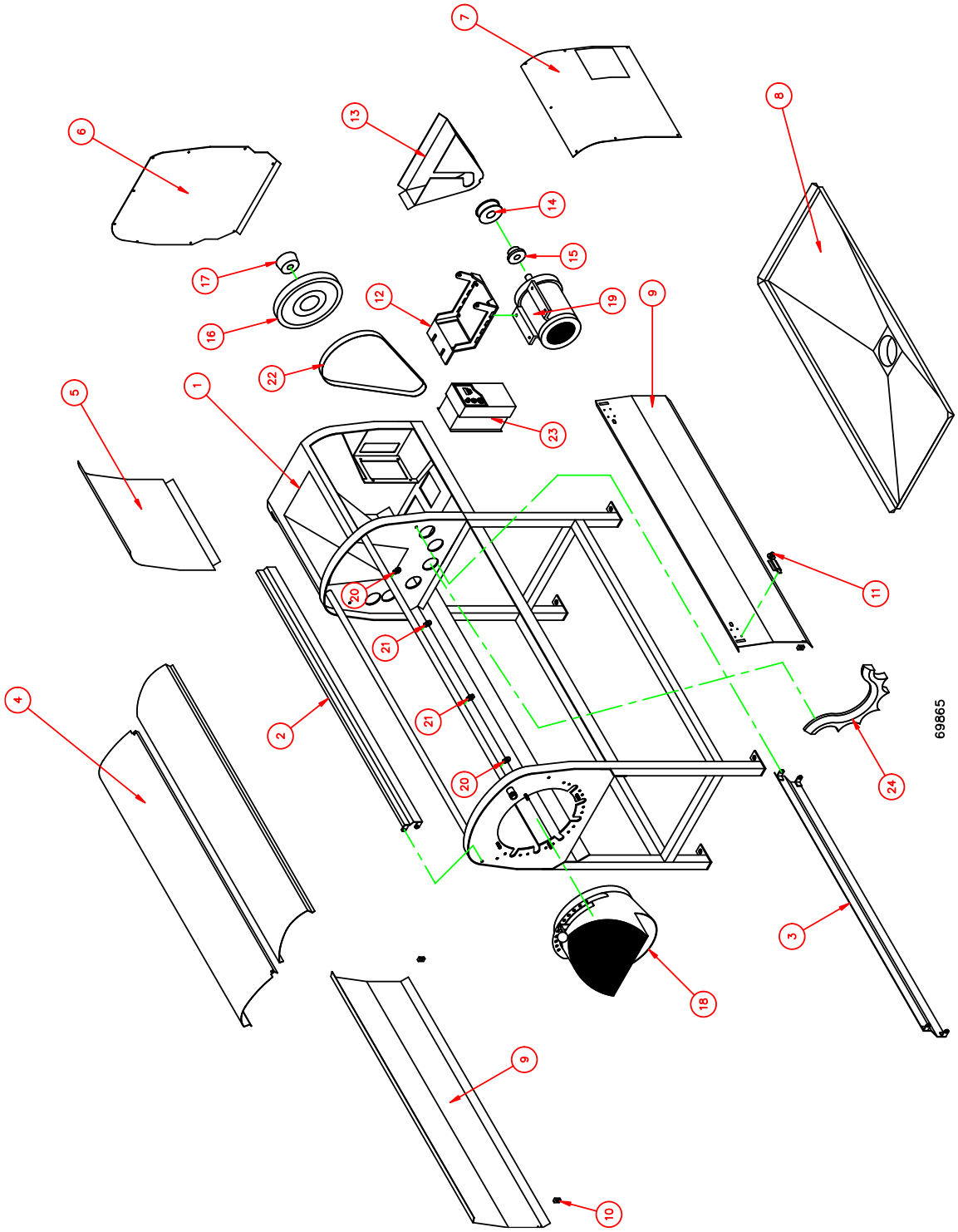
Quick Change Coupler Kit
Complete Coupler
P/N 60-60660-01-5

Coupler Mount Hub With Set Screws
P/N 50-59360-01-5

Replaceable Coupler With 4 Bolts
P/N 50-59359-01-9

Bolts can be ordered individually
P/N 48-48398-01-5

5.0 PARTS (02420)



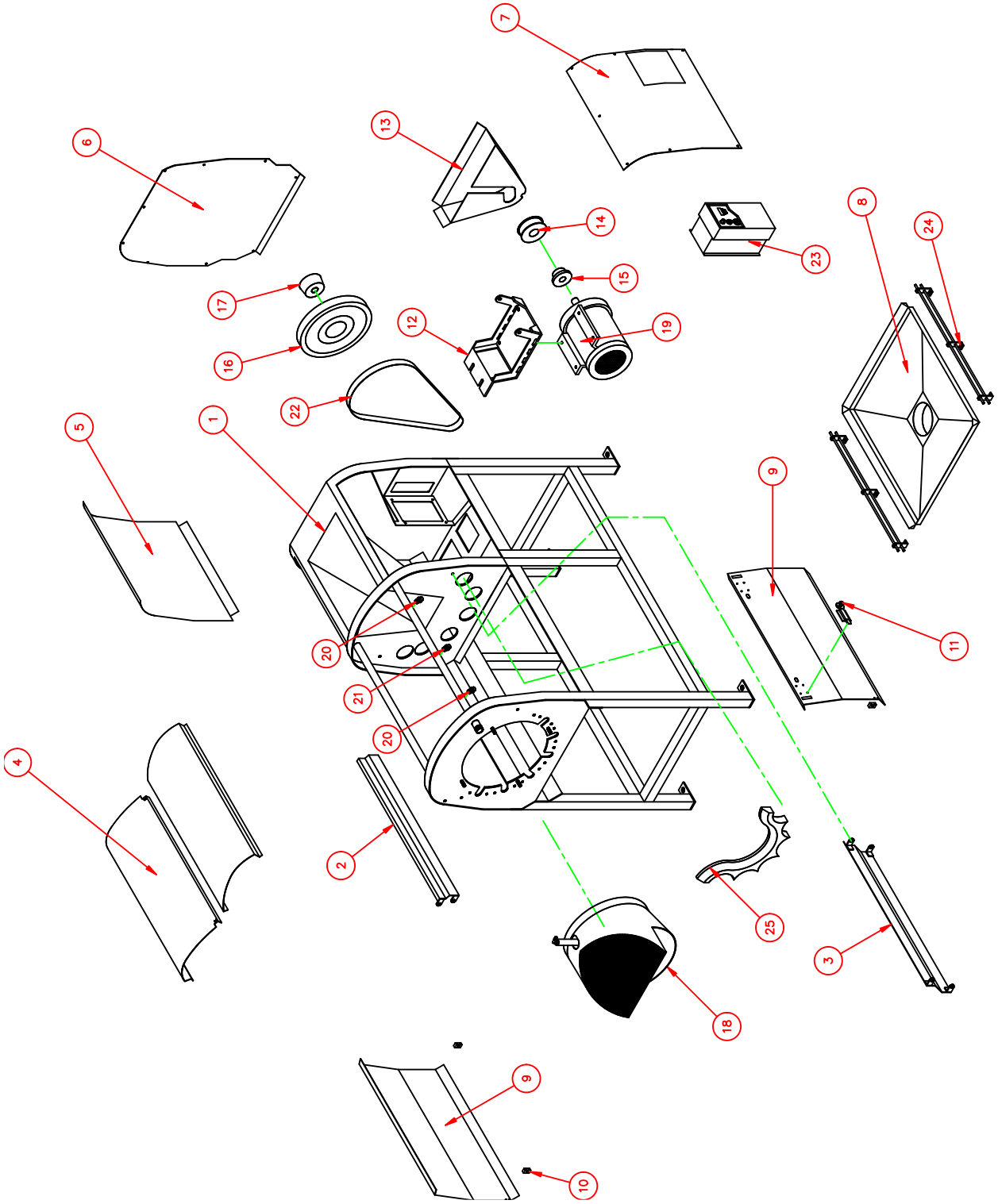
5.1 02420 (IMPERIAL) PART IDENTIFICATION

NOTICE

**** Part listed is for standard machine. See Section 1.2 Data Sheet and Section 6.0 for available options/alternate part numbers**

REF. NO	PART NUMBER	NO. REQ.	DESCRIPTION
1	20-25628-01-5	1	Frame, 2420 Peeler
2	20-25640-01-5	1	Splash Guard, 02420 R.H.
	20-27198-01-5	1	Splash Guard, 02420 – 4 Roll R.H.
3	20-25639-01-5	1	Splash Guard, 02420 L.H.
	20-27197-01-5	1	Splash Guard, 02420 – 4 Roll L.H.
4	40-43812-01-5	1	Cover, Peel Chamber Top, 02420
	50-59341-03-5	1	Inspection Door, 2420 Peel Chamber
5	30-39107-01-5	1	Panel, R.H. Drive Side
6	30-39106-01-5	1	Panel, Inlet End, 02420
7	20-25657-01-5	1	Panel, L.H. Drive Side W/ Inverter Door
	30-39109-01-5	1	Panel, L.H. Drive Side
	20-25657-02-5	1	Panel, L.H. Drive Side, w/2 Cutouts
8	20-25636-01-5	1	Drain Pan, 02420
9	30-39104-01-5	2	Panel, Lower Peel Chamber
10	30-38818-01-9	8	Hinge, Door
11	30-39000-01-5	4	Latch, Peel Chamber Door
12	20-25646-01-5	1	Pivot Plate, 02420, 215T *–before ser. # 02420-0032*
	20-26862-01-5	1	Pivot Plate, 02420 w/enclosure – *after ser. # 02420-0031*
13	20-25650-01-5	1	Cover, Drive Belt, 02420*–before ser. # 02420-0032*
	20-26861-01-5	1	Cover, Drive Belt, 02420 w/encl – *after ser. # 02420-0031*
14	40-43794-03-9	1	SPRKT, Eagle PD, 36T
15	See Section 1.2**	1	Bushing, QD, #SH
16	40-43794-04-9	1	SPRKT, Eagle PD, 140T
17	40-42294-08-1	1	Bushing, QD, #E, 1.25B
18	See Section 1.2**	1	Discharge
19	See Section 1.2**	1	Motor, 5HP
20	40-42477-02-9	2	Nozzle, Vee Jet
21	40-42195-03-9	2	Nozzle, Full Jet
22	40-43793-02-9	1	Belt, Eagle PD – *before ser. #02420-0032*
	40-43793-11-9		Belt, Eagle PD – *after serial # 02420-0031*
23	See Section 1.2**	1	Inverter, 5 HP
24	40-43808-01-9	1	Product Protector, Inlet End
	50-59350-01-9		Small Product Ring

5.2 PARTS (02421)



5.3 02421 PART IDENTIFICATION

NOTICE

**** Part listed is for standard machine. See Section 1.2 Data Sheet and Section 6.0 for available options/alternate part numbers**

REF. NO	PART NUMBER	NO. REQ.	DESCRIPTION
1	20-26063-01-5	1	Frame, 2421 Peeler
2	20-25640-02-5	1	Splash Guard, 02421 R.H.
3	20-25639-02-5	1	Splash Guard, 02421 L.H.
4	40-43994-01-5	1	Cover, Peel Chamber Top, 02421
	50-59341-06-5	1	Inspection Door, 2421 Peel Chamber
5	30-39107-01-5	1	Panel, R.H. Drive Side
6	30-39106-01-5	1	Panel, Inlet End, 02420
7	20-25657-01-5	1	Panel, L.H. Drive Side W/ Inverter Door
	30-39109-01-5	1	Panel, L.H. Drive Side
	20-25657-02-5	1	Panel, L.H. Drive Side, w/2 Cutouts
8	20-26065-01-5	1	Drain Pan, 02421
9	30-39104-01-5	2	Panel, Lower Peel Chamber
10	30-38818-01-9	8	Hinge, Door
11	30-39000-01-5	4	Latch, Peel Chamber Door
12	20-25646-01-5	1	Pivot Plate, 02421, 215T, - *before ser. # 02421-0003*
	20-26862-01-5	1	Pivot Plate, w/enclosure - *after ser. # 02421-0002*
13	20-25650-01-5	1	Cover, Drive Belt, 02421 - *before ser. # 02421-0003*
	20-26861-01-5	1	Cover, Drive Belt, 02421 – *after ser. # 02421-0002*
14	40-43794-03-9	1	SPRKT, Eagle PD, 36T
15	See Section 1.2**	1	Bushing, QD, #SH
16	40-43794-04-9	1	SPRKT, Eagle PD, 140T
17	40-42294-08-1	1	Bushing, QD, #E, 1.25B
18	See Section 1.2**	1	Discharge
19	See Section 1.2**	1	Motor, 3HP
20	40-42477-02-9	2	Nozzle, Vee Jet
21	40-42195-03-9	1	Nozzle, Full Jet
22	40-43793-02-9	1	Belt, Eagle PD – *before ser. # 02421-0003*
	40-43793-11-9		Belt, Eagle PD – *after ser. # 02421-0002*
23	See Section 1.2**	1	Inverter, 5 HP
24	20-25665-02-5	2	Grill, Pan side – 02421
25	40-43808-01-9	1	Product Protector, Inlet End
	50-59350-01-9		Small Product Ring

5.4 02420 (METRIC) PART IDENTIFICATION

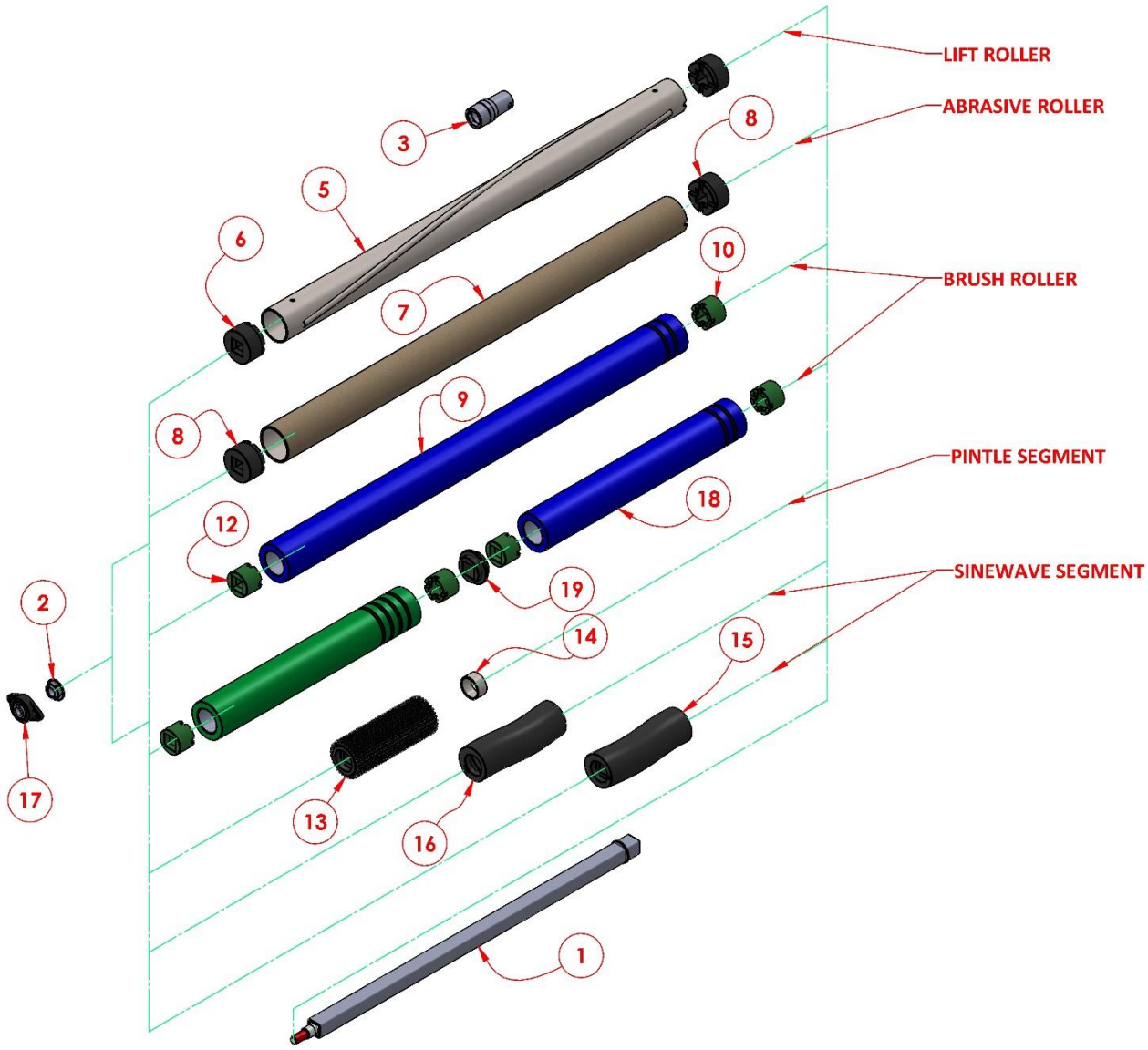
NOTICE

**** Part listed is for standard machine. See Section 1.2 Data Sheet and Section 6.0 for available options/alternate part numbers**

REF. NO	PART NUMBER	NO. REQ.	DESCRIPTION
1	20-25628-02-5	1	Frame, 2420 Peeler (Metric)
2	20-25640-01-5	1	Splash Guard, 02420 R.H.
	20-27198-01-5	1	Splash Guard, 02420 – 4 Roll R.H.
3	20-25639-01-5	1	Splash Guard, 02420 L.H.
	20-27197-01-5	1	Splash Guard, 02420 – 4 Roll L.H.
4	40-43812-01-5	1	Cover, Peel Chamber Top, 02420
	50-59341-03-5	1	Inspection Door, 2420 Peel Chamber
5	30-39107-01-5	1	Panel, R.H. Drive Side
6	30-39106-01-5	1	Panel, Inlet End, 02420
7	20-25657-01-5	1	Panel, L.H. Drive Side W/ Inverter Door
	30-39109-01-5	1	Panel, L.H. Drive Side
	20-25657-02-5	1	Panel, L.H. Drive Side, w/2 Cutouts
8	20-25636-01-5	1	Drain Pan, 02420
9	30-39104-01-5	2	Panel, Lower Peel Chamber
10	30-40433-01-9	8	Hinge, Door Skins (Metric)
11	30-39000-01-5	4	Latch, Peel Chamber Door
12	20-25646-01-5	1	Pivot Plate, 02420, 215T *–before ser. # 02420-0032*
	20-26862-01-5	1	Pivot Plate, 02420 w/enclosure *– after ser. # 02420-0031*
13	20-25650-01-5	1	Cover, Drive Belt, 02420*–before ser. # 02420-0032*
	20-26861-01-5	1	Cover, Drive Belt, 02420 w/enclos *– after ser. # 02420-0031*
14	40-43794-03-9	1	SPRKT, Eagle PD, 36T
15	See Section 1.2**	1	Bushing, QD
16	40-43794-04-9	1	SPRKT, Eagle PD, 140T
17	40-42294-08-1	1	Bushing, QD, #E, 1.25B
18	See Section 1.2**	1	Discharge
19	See Section 1.2**	1	Motor, 5HP
20	40-42477-02-9	2	Nozzle, Vee Jet
21	40-42195-03-9	2	Nozzle, Full Jet
22	40-43793-02-9	1	Belt, Eagle PD *– before ser. #02420-0032*
	40-43793-11-9		Belt, Eagle PD *– after serial # 02420-0031*
23	See Section 1.2**	1	Inverter, 5 HP
24	40-43808-01-9	1	Product Protector, Inlet End
	50-59350-01-9		Small Product Ring

5.5 PEELING ROLLS

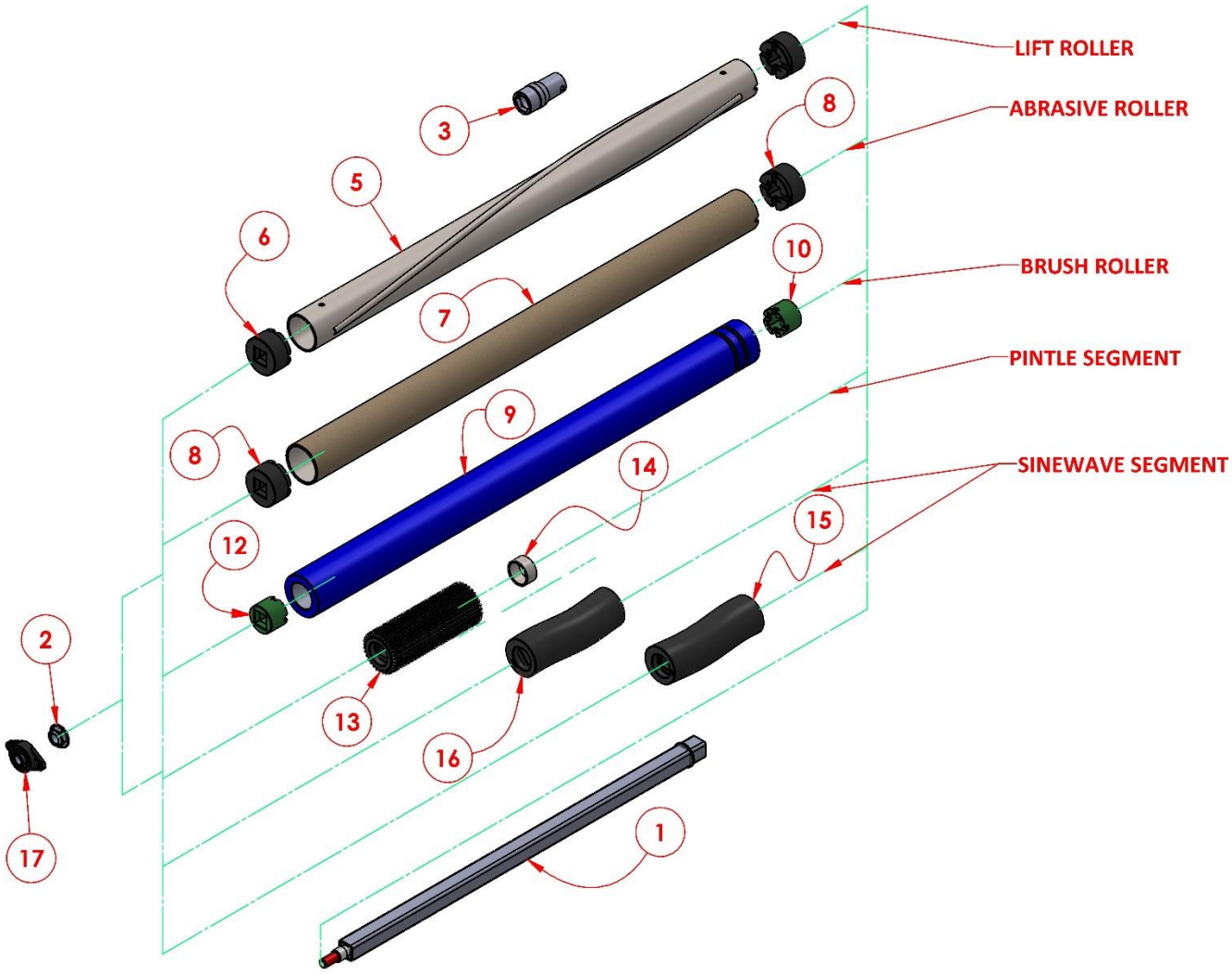
5.5.1 02420 PEELER ROLLS



Ref. No.	Part Number	Description
1	20-20779-01-5	SHAFT, Peeling Roll
2	20-20249-01-1	NUT ASSEMBLY
3	30-31126-01-9	SOCKET, Nut Assembly
5	20-20750-01-5	ROLL, Lift - LH - 4.50 OD
	20-29336-01-5	ROLL, Lift - Abrasive - #10 Grit
	20-29336-02-5	ROLL, Lift - Abrasive - #20 Grit
	20-29336-03-5	ROLL, Lift - Abrasive - #36 Grit
	20-29337-01-5	ROLL, Lift - Abrasive - .50- #10 & .50- #20 Grit
6	30-32485-01-9	ROLL, Lift End Fixture - 2 / Roll
7	20-29252-02-1	ROLL, Abrasive - .50- #10 & .50- #20 Grit - 4.75 OD
	20-29252-04-1	ROLL, Abrasive - .75- #10 & .25- #20 Grit - 4.75 OD
	20-29316-02-1	ROLL, Abrasive - #10 - 4.75 OD
	20-29316-01-1	ROLL, Abrasive - #20 - 4.75 OD
	20-29207-01-1	ROLL, Abrasive - #20 Grit - 5.00 OD
	20-29207-05-1	ROLL, Abrasive - #30 Grit - 5.00 OD
	20-29207-02-1	ROLL, Abrasive - #36 Grit - 5.00 OD
	20-29207-03-1	ROLL, Abrasive - #60 Grit - 5.00 OD
	20-29207-06-1	ROLL, Abrasive - #80 Grit - 5.00 OD
	20-29319-01-1	ROLL, Abrasive - .67-#20 Grit & .33-#36 Grit - 5.00 OD
8	40-41129-01-9	ROLL, Abrasive End Fixture - 2 /Roll
9	40-44230-02-9	BRUSH, NYLN BLU/BLK 026/ DIAMOND
	40-44231-01-9	BRUSH, NYLN GRN 022/036, DIAMOND 1/2
	40-41329-02-9	BRUSH, .014 – Black/2 Blue stripes
	40-43534-08-9	BRUSH, .026 – Blue/2 Black stripes
	40-43738-04-9	BRUSH, .010 – Black/1 Blue stripes
	40-40261-15-9	BRUSH, NYLN BLK 022/ 3 BLUE STRIPES
	40-40260-03-9	BRUSH, .045 – Blue/4 Black stripes
	40-40347-14-9	BRUSH, Nylon - .022/.036 60/40
	40-43034-01-9	BRUSH, Abrasive Tynex A - .022 - #120 Epoxy Filled
10	40-40259-02-9	BRUSH, End Fixture - 2 / Roll
11	40-41566-09-9	BRUSH, .022 - Random Trim - 3.12 ID
	40-42699-01-9	BRUSH, Abrasive Tynex A - .040 - #120 - 3.12 ID
12	30-33740-01-9	BRUSH, 3.12 ID End Fixture -
13	40-40369-01-9	SEGMENT, Pintle Straight Rbr -
	40-40369-02-9	SEGMENT, Pintle Straight Ntrl -
	40-40242-01-9	SEGMENT, Pintle Sine RH Rbr -
14	30-32118-01-5	SPACER – Pintle 3.00” O.D. X 1.44
15	30-31990-01-9	SEGMENT, Abrasive Sine - LH - #10
	30-31156-01-9	SEGMENT, Abrasive Sine - LH - #20
	30-33658-01-9	SEGMENT, Abrasive Sine - LH - #36
16	30-31991-01-9	SEGMENT, Abrasive Sine - RH - #10
	30-31157-01-9	SEGMENT, Abrasive Sine - RH - #20

	30-33659-01-9	SEGMENT, Abrasive Sine - RH - #36
17	40-41978-06-9	BEARING, BALL FLG 2 BLT1.00” PLASTIC
	50-59323-01-9	BEARING, 02420 DISCHARGE
18	40-40261-16-9	BRUSH, NYLN BLK/BLU 022 (34.75 LG)
	40-43926-02-9	BRUSH, NYLN BLK/BLU 060 (34.75 LG)
	40-43813-02-9	BRUSH, NYLN BLK/NAT 014 (34.75 LG)
	40-43534-10-9	BRUSH, NYLN BLU/BLK 026 (34.75 LG)
	40-40260-04-9	BRUSH, NYLN BLU/BLK 045 (34.75 LG)
	40-41566-03-9	BRUSH, NYLN COM/BLK 022 (34.75 LG)
19	40-43924-01-9	SPACER, BRUSH CENTER ADAPTER

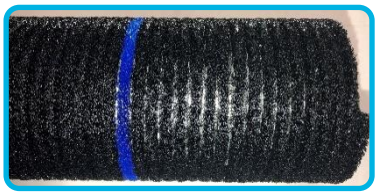
5.5.2 02421 PEELER ROLLS



Ref. No.	Part Number	Description
1	20-20779-03-5	SHAFT, Peeling Roll
2	20-20249-01-1	NUT ASSEMBLY
3	30-31126-01-9	SOCKET, Nut Assembly
5	20-20750-03-5	ROLL, Smooth – 34.75
6	30-32485-01-9	ROLL, Lift End Fixture - 2 / Roll
7	20-29207-04-1	ROLL, ABRSV 5.00 OD #36 GRIT 34.75LG
	20-29207-07-1	ROLL, ABRSV 5.00 OD #20 GRIT 34.75LG
	20-29207-08-1	ROLL, ABRSV 5.00 OD #60 GRIT 34.75LG
	20-29207-09-1	ROLL, ABRSV 5.00 OD #10 GRIT 34.75 LG
8	40-41129-01-9	ROLL, Abrasive End Fixture - 2 /Roll
9	40-44231-01-9	BRUSH, NYLN GRN 022/036, DIAMOND 1/2
	40-40261-16-9	BRUSH, NYLN BLK/BLU 022 (34.75 LG)
	40-43926-02-9	BRUSH, NYLN BLK/BLU 060 (34.75 LG)
	40-43813-02-9	BRUSH, NYLN BLK/NAT 014 (34.75 LG)
	40-43534-10-9	BRUSH, NYLN BLU/BLK 026 (34.75 LG)
	40-40260-04-9	BRUSH, NYLN BLU/BLK 045 (34.75 LG)
	40-41566-03-9	BRUSH, NYLN COM/BLK 022 (34.75 LG)
10	40-40259-02-9	BRUSH, End Fixture - 2 / Roll
13	40-40369-01-9	SEGMENT, Pintle Straight Rbr -
	40-40369-02-9	SEGMENT, Pintle Straight Ntrl -
	40-40242-01-9	SEGMENT, Pintle Sine RH Rbr -
14	30-32118-01-5	SPACER – Pintle 3.00” O.D. X 1.44
15	30-31990-01-9	SEGMENT, Abrasive Sine - LH - #10
	30-31156-01-9	SEGMENT, Abrasive Sine - LH - #20
	30-33658-01-9	SEGMENT, Abrasive Sine - LH - #36
16	30-31991-01-9	SEGMENT, Abrasive Sine - RH - #10
	30-31157-01-9	SEGMENT, Abrasive Sine - RH - #20
	30-33659-01-9	SEGMENT, Abrasive Sine - RH - #36
17	40-41978-06-9	BEARING, BALL FLG 2 BLT1.00” PLASTIC
	50-59323-01-9	BEARING, 02420 DISCHARGE

5.5.3 COMMON BRUSH PART NUMBERS

0.010 NYLON BRUSH
40-43738-04-9 – 69.75” LG



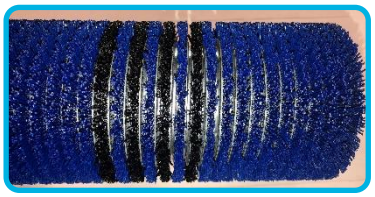
0.014 NYLON BRUSH
40-41329-05-9 – 69.75” LG

0.022 NYLON BRUSH
40-40261-15-9 – 69.75” LG
40-40261-16-9 – 34.75” LG

0.022 RANDOM TRIM NYLON BRUSH
40-41566-09-9 – 69.75” LG

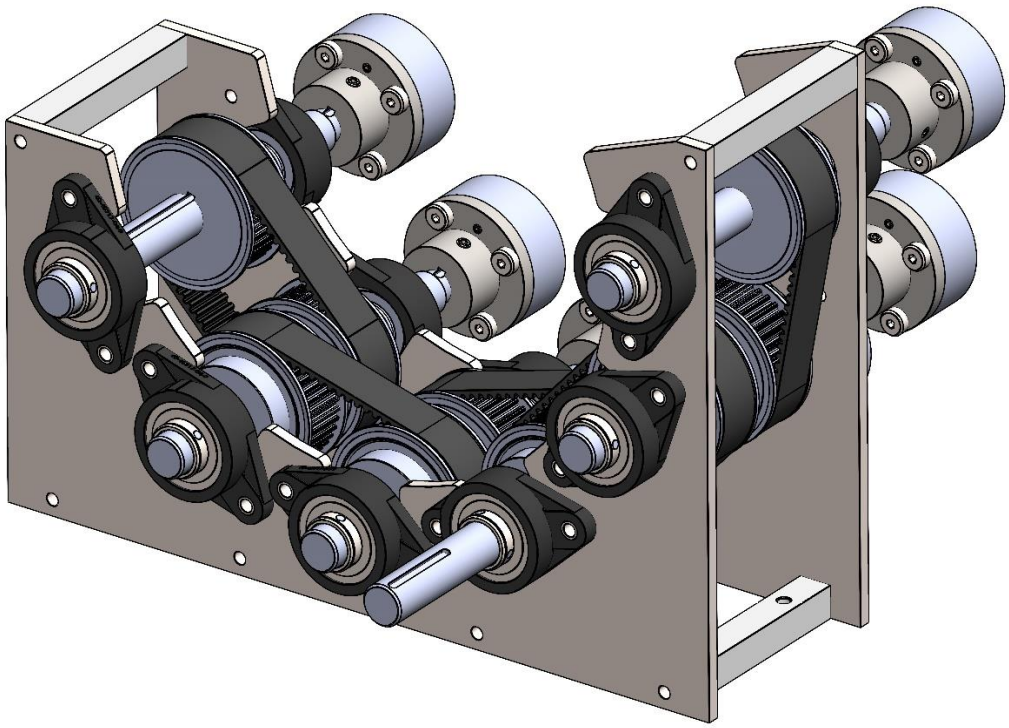
0.026 NYLON BRUSH
40-43534-08-9 – 69.75” LG
40-43534-10-9 – 34.75” LG

0.045 NYLON BRUSH
40-40260-03-9 – 69.75” LG



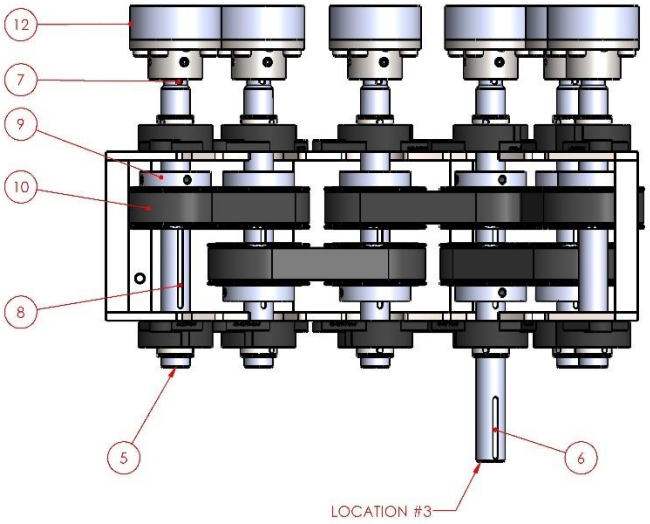
0.022/0.036 NYLON BRUSH
40-40347-14-9 – 69.75” LG
40-43993-01-9 – 34.75” LG

5.6 DRIVE CASE (IMPERIAL PARTS, 6-ROLLS)



59338-02

Ref. No.	Part Number	No. Req.	Description
1	30-39094-01-5	2	PLATE, DRIVE CASE 02400
2	30-31489-01-5	4	CONNECTOR, 6.75
3	30-31489-02-5	2	CONNECTOR, 6.75 2 HOLES
4	30-38947-03-5	1	SHAFT, DRIVE CASE DRIVE 18.75"G (C)
5	30-38947-02-5	5	ROLL SHAFT, STEEL DRIVE CASE
6	30-34185-29-5	6	KEY, .25 SQ. x 5.25 LG SS
7	30-34185-07-5	6	KEY, .25 SQ. x 1.50 LG SS
8	30-34185-25-5	1	KEY, .25 SQ X 2.50 LG
9	40-43731-01-9	10	SPROCKET, POLY CHAIN GT
10	40-42937-13-9	5	BELT, POLY CHAIN GT
11	40-40917-04-9	12	BEARING, BALL FLANGE 1.25B
12	60-60660-01-5	6	COUPLER, QUICK CHANGE ASSY, 1.00 B
	40-40236-01-9	6	COUPLER, URETHANE 1.00B (pre 2012)
13	48-48080-01-5	24	SCREW, .44 – 20 x 1.00 SS
14	48-48050-01-5	12	SCREW, .38 – 16 x 1.25 HEX SS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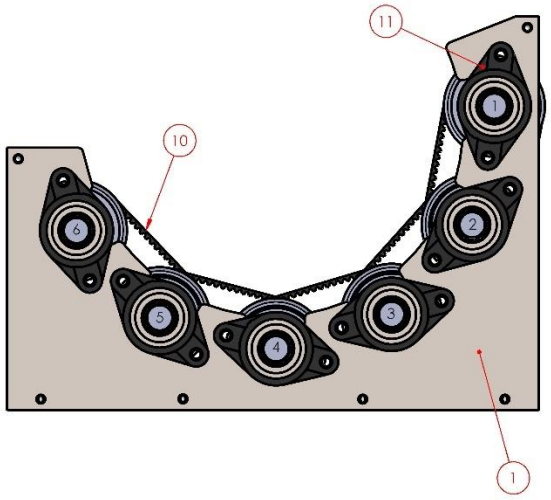
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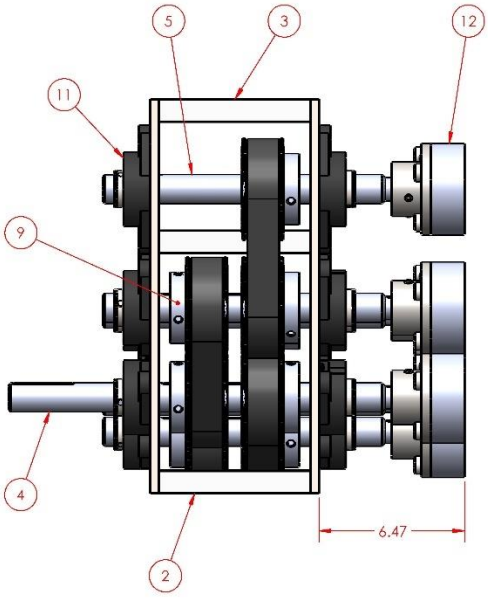
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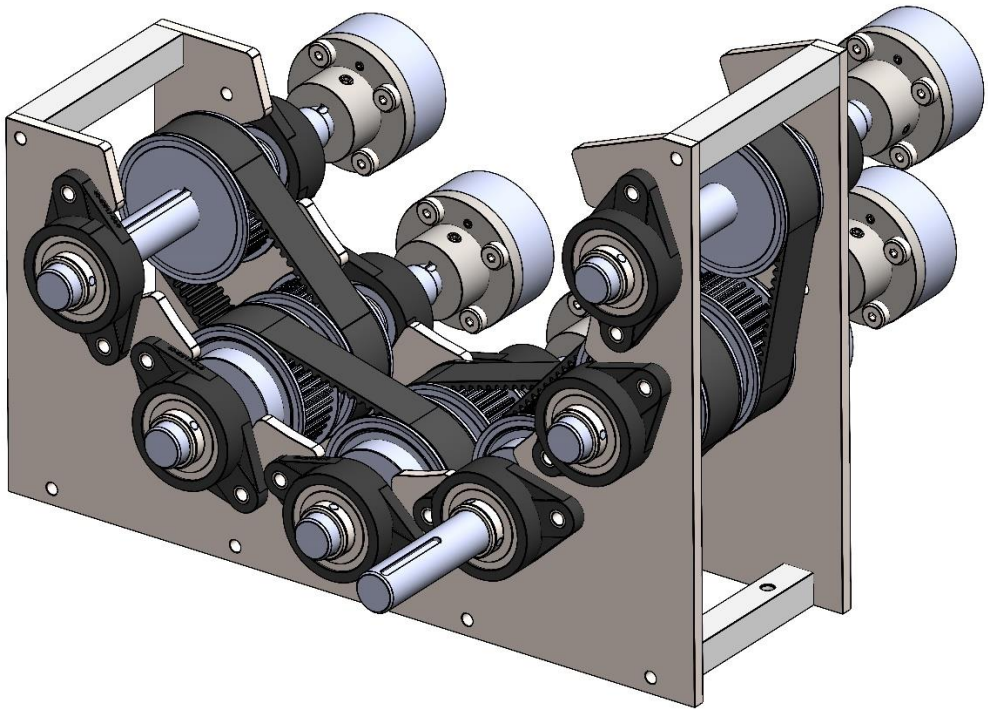
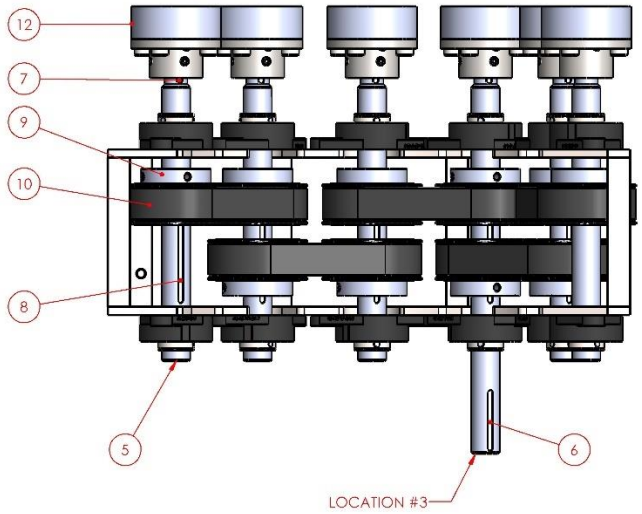
5.7 DRIVE CASE (METRIC PARTS 6-ROLLS)



59338-04

Ref. No.	Part Number	No. Req.	Description
1	30-39094-02-5	2	PLATE, DRIVE CASE 02400 METRIC
2	30-31489-03-5	4	CONNECTOR, 6.75 - M10-1.50 THRD
3	30-31489-04-5	2	CONNECTOR, 6.75 2 HOLES - M10-1.50 THRD
4	30-38947-03-5	1	DRIVE SHAFT, 2920, Position #4
5	30-38947-02-5	5	SHAFT, STEEL DRIVE CASE, ROLL
6	30-34185-29-5	6	KEY, .25 SQ. x 5.25 LG SS
7	30-34185-07-5	7	KEY, .25 SQ. x 1.50 LG SS
8	30-34185-25-5	1	KEY, .25 SQ X 2.50 LG
9	40-43731-01-9	10	SPROCKET, POLY CHAIN GT
10	40-42937-13-9	5	BELT, POLY CHAIN GT
11	50-59599-01-9	16	BEARING, BALL FLANGE 1.25B W/ METRIC BUSHINGS
12	60-60660-01-5	8	COUPLER, QUICK CHANGE ASSY, 1.00” B
	40-40236-01-9	8	COUPLER, URETHANE 1.00”B (pre 2012)
13	48-48433-25-5	44	SCR, M10-1.50 X 25.00 HEX SS
14	48-48433-35-5	8	SCR, M10-1.50 X 25.00 HEX SS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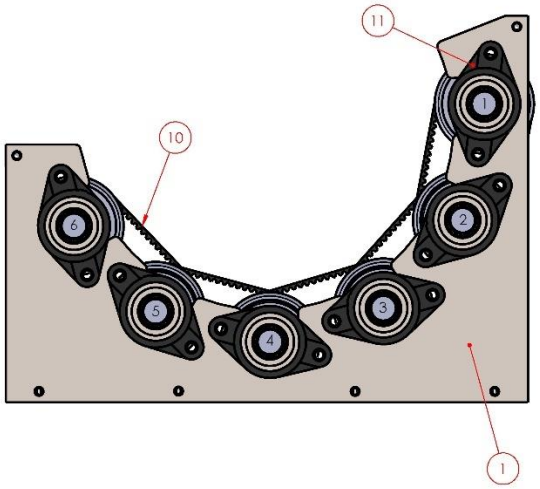
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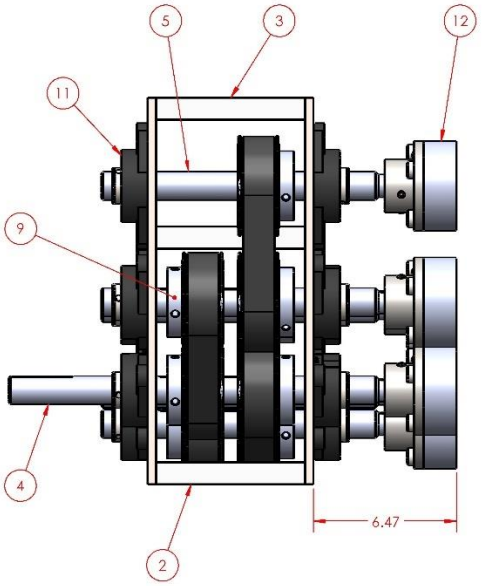
5
3
12
11
9
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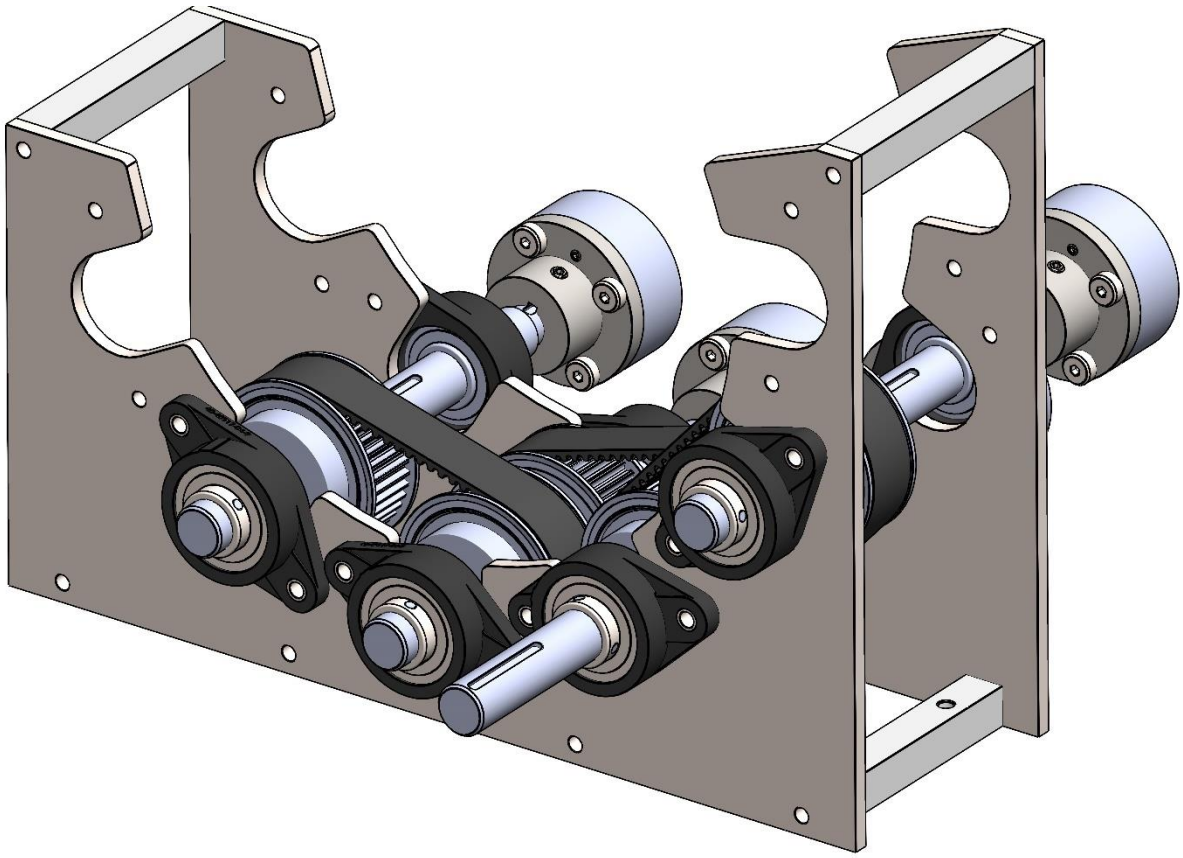
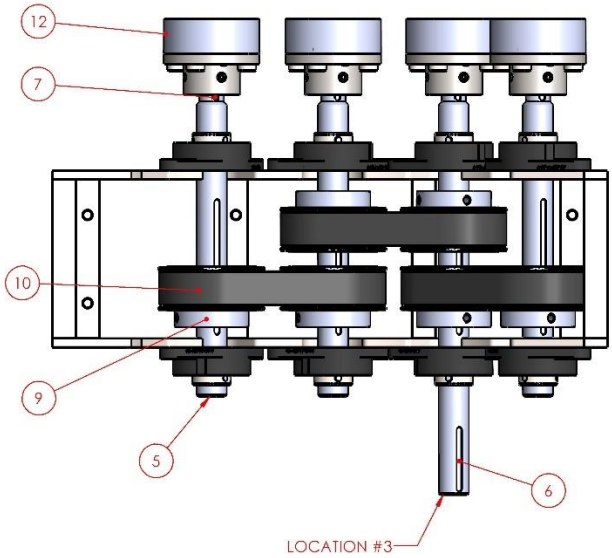
6.47
2

5.8 DRIVE CASE (IMPERIAL PARTS, 4 ROLLS)



59338-03

Ref. No.	Part Number	No. Req.	Description
1	30-39094-01-5	2	PLATE, DRIVE CASE 02400
2	30-31489-01-5	4	CONNECTOR, 6.75
3	30-31489-02-5	2	CONNECTOR, 6.75 2 HOLES
4	30-38947-03-5	1	SHAFT, DRIVE CASE DRIVE 18.75"G (C)
5	30-38947-02-5	3	ROLL SHAFT, STEEL DRIVE CASE
6	30-34185-29-5	4	KEY, .25 SQ. x 5.25 LG SS
7	30-34185-07-5	4	KEY, .25 SQ. x 1.50 LG SS
8	30-34185-25-5	1	KEY, .25 SQ X 2.50 LG
9	40-43731-01-9	5	SPROCKET, POLY CHAIN GT
10	40-42937-13-9	3	BELT, POLY CHAIN GT
11	40-40917-04-9	8	BEARING, BALL FLANGE 1.25B
12	60-60660-01-5	4	COUPLER, QUICK CHANGE ASSY, 1.00 B
	40-40236-01-9	4	COUPLER, URETHANE 1.00B (pre 2012)
13	48-48080-01-5	16	SCREW, .44 – 20 x 1.00 SS
14	48-48050-01-5	12	SCREW, .38 – 16 x 1.25 HEX SS


12
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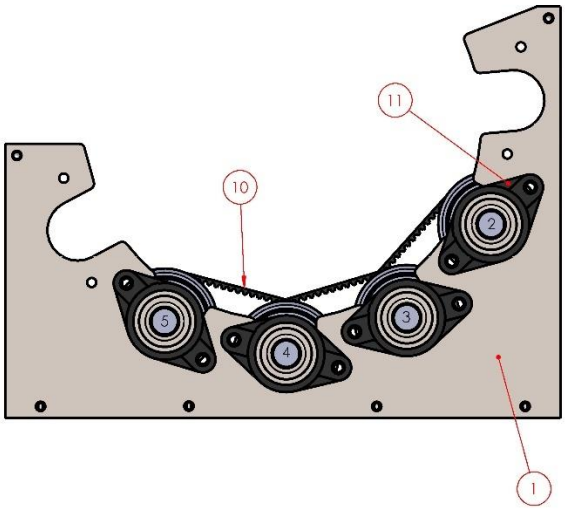
LOCATION #3


11
10
2
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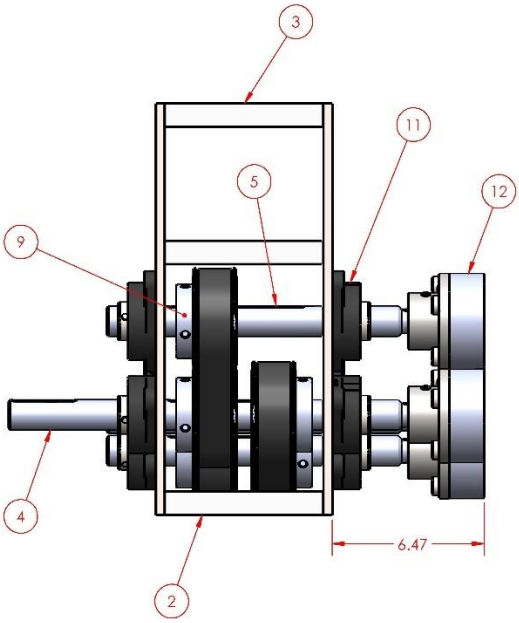
3
11
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2

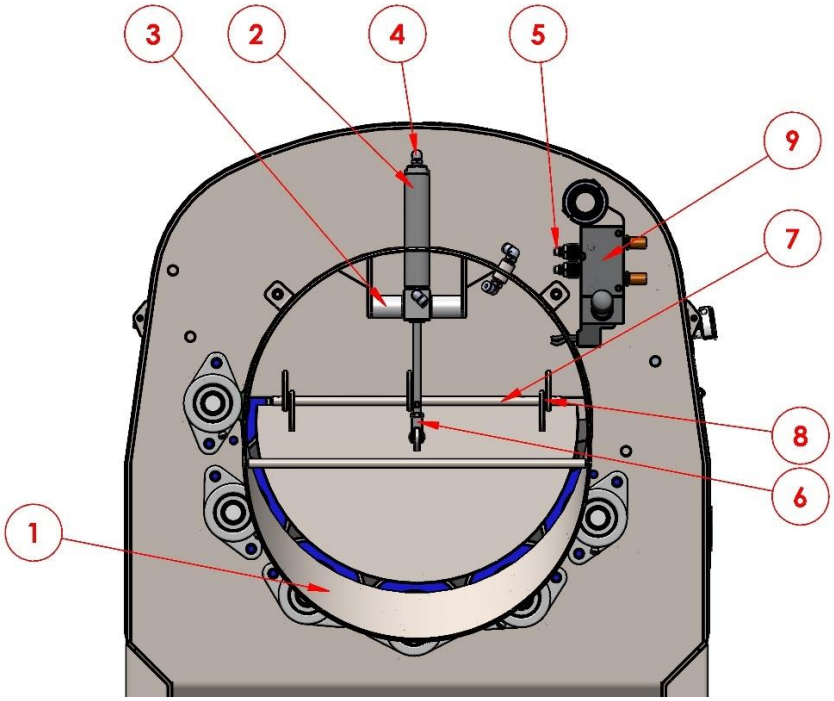
6.0 EQUIPMENT OPTIONS

NOTICE

Refer to Section 1.2 Data Sheet which identifies which options your machine was originally manufactured with and the corresponding machine serial number. This is critical for selecting the proper components for your machine.

6.1 DISCHARGE GATE

6.1.1 BATCH DISCHARGE GATE



Ref. No.	Part Number	No. Req.	Description
1	20-26068-01-5	1	Gate, Batch Chute - 2400
2	40-43995-01-9	1	Cylinder, 1.06B x 4.00 Stroke
3	30-39262-01-9	2	Mount, Trunnion - Air Cylinder
4	40-43842-02-9	4	Elbow, Poly 90, 0.25 T x .12MPT Swivel
5	40-40284-04-9	2	Valve, Flow Control, 0.25 NPT
6	40-43404-02-9	1	Clevis, THD .32-24
7	20-26069-01-5	1	Pin, Pivot
8	40-43996-01-9	6	Bearing, Sleeve .375 Polymer W/Flange
9	40-44005-01-9	1	Valve, 0.25 NPT, 2 Position, Manual

⚠CAUTION

Keep all hands, feet, loose clothing, and foreign objects out of machine while it is operating. Always de-energize and lockout the machine when maintenance is required.

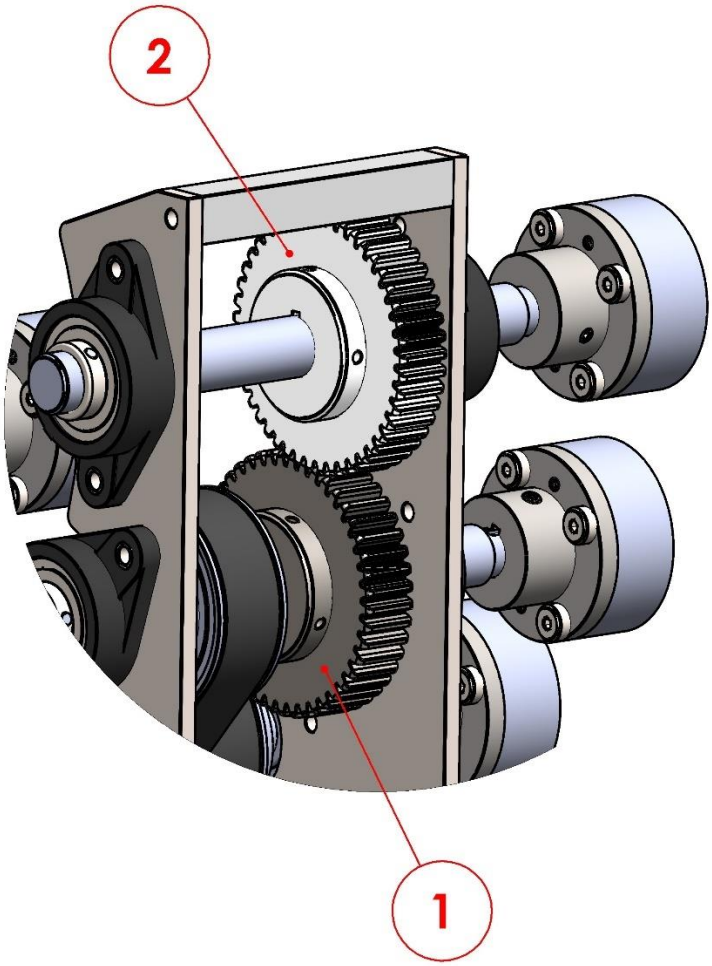
6.2 REVERSING ROLLS

6.2.1 REVERSING ROLLS INSTALLATION

Refer to Section 4.8 for details on removal of the drive case and drive/roll shafts.

1. Remove the cap screws from the bearings on the shaft that is going to be reversed, and the shaft adjacent.
2. Move the shaft assemblies toward the center and loosen the set screws on the outer bearing and belt pulley.
3. Remove the bearing, pulley, and belt.
4. Slide the steel gear onto the shaft closest to the drive shaft, re-using the shaft key.
5. Slide the plastic gear onto the adjacent shaft also re-using the shaft key.
6. On the shaft closest to the driveshaft, re-install one belt pulley, and on both shafts, re-install the belt and bearings.
7. Re-install the cap screws in the bearings, align belt pulleys and tighten set screws.
8. Align the gears so they are flush, and the teeth are properly meshed. Lock both gears in position by tightening the set screws.

6.2.2 REVERSING ROLL PARTS



Ref No.	Part Number	No. Req.	Description
1	30-39115-01-9	1	Spur Gear – Steel, 135MM, 45T
2	30-39116-01-9	1	Spur Gear – Plastic, 135MM, 45T

7.0 SPARE PARTS (SUGGESTED)

7.1 02420 SPARE PARTS

Part Number	Est. Qty/Year		Description
	Intermit	Cont.	
20-20779-02-5	2	4	SHAFT ASSEMBLY, Peeling Roll
30-38947-02-5	1	2	SHAFT, Peeling Roller (Steel Drive Case)
30-38947-03-5	1	1	SHAFT, STEEL DRIVE CASE, DRIVE
20-20249-01-1	1	2	NUT ASSEMBLY, Peeling Roller
40-43731-01-9	1	1	SPROCKET, Drive Case Roll
40-42937-13-9	1	2	BELT, Drive Case Timing
40-43793-11-9	1	1	BELT, Drive Case Drive Belt *after ser. # 02420-0031*
See Section 1.2	1	1	SPROCKET, Motor Drive
See Section 1.2	1	1	SPROCKET, Motor Driven
40-41978-06-9	2	2	BEARING, BALL FLG 2 BLT1.00” PLASTIC
50-59323-01-9			BEARING, 02420 DISCHARGE (METRIC BUSHINGS)
60-60660-01-5	2	2	COUPLER, QUICK CHANGE ASSY, 1.00 B
50-59359-01-9	2	2	REPLACEMENT COUPLER W/BOLTS
40-40917-04-9	2	2	BEARING, BALL FLANGE 1.25B
50-59599-01-9	2	2	BEARING, BALL FLANGE 1.25B W/ METRIC BUSHINGS

NOTE: Quantities to have on hand for standard intermittent use are based on a production schedule of eight (8) hours per day, five (5) days per week with at least one year of such usage anticipated.

Quantities to have on hand for continuous use are based on a production schedule of twenty-four (24) hours per day, five (5) days per week with at least one year of such usage anticipated.

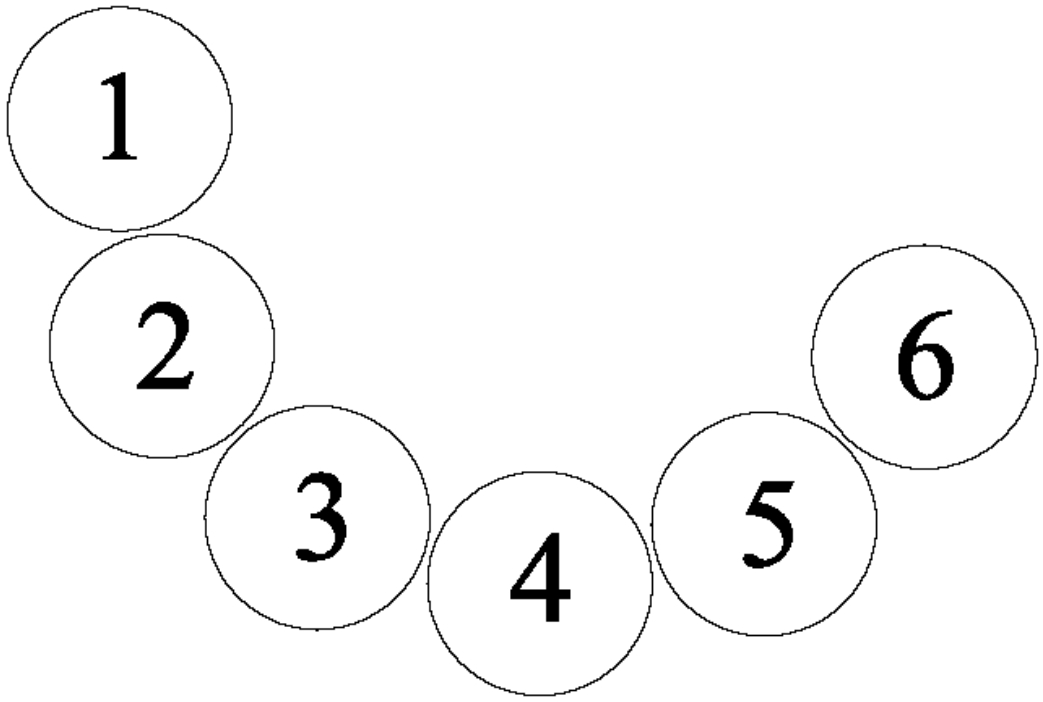
7.2 02421 SPARE PARTS

Part Number	Est. Qty/Year		Description
	Intermit	Cont.	
20-20779-03-5	2	4	SHAFT ASSEMBLY, Peeling Roll
30-38947-02-5	1	2	SHAFT, Peeling Roller (Steel Drive Case)
30-38947-03-5	1	1	SHAFT, STEEL DRIVE CASE, DRIVE
20-20249-01-1	1	2	NUT ASSEMBLY, Peeling Roller
40-43731-01-9	1	1	SPROCKET, Drive Case Roll
40-42937-13-9	1	2	BELT, Drive Case Timing
40-43793-11-9	1	1	BELT, Drive Case Drive Belt *after ser. # 02421-0002*
See Section 1.2	1	1	SPROCKET, Motor Drive
See Section 1.2	1	1	SPROCKET, Motor Driven
40-41978-06-9	2	2	BEARING, BALL FLG 2 BLT1.00" PLASTIC
50-59323-01-9			BEARING, 02420 DISCHARGE (METRIC BUSHINGS)
60-60660-01-5	2	2	COUPLER, QUICK CHANGE ASSY, 1.00 B
50-59359-01-9	2	2	REPLACEMENT COUPLER W/BOLTS
40-40917-04-9	2	2	BEARING, BALL FLANGE 1.25B
50-59599-01-9	2	2	BEARING, BALL FLANGE 1.25B W/ METRIC BUSHINGS

NOTE: Quantities to have on hand for standard intermittent use are based on a production schedule of eight (8) hours per day, five (5) days per week with at least one year of such usage anticipated.

Quantities to have on hand for continuous use are based on a production schedule of twenty-four (24) hours per day, five (5) days per week with at least one year of such usage anticipated.

8.0 CHARTS & SCHEMATICS



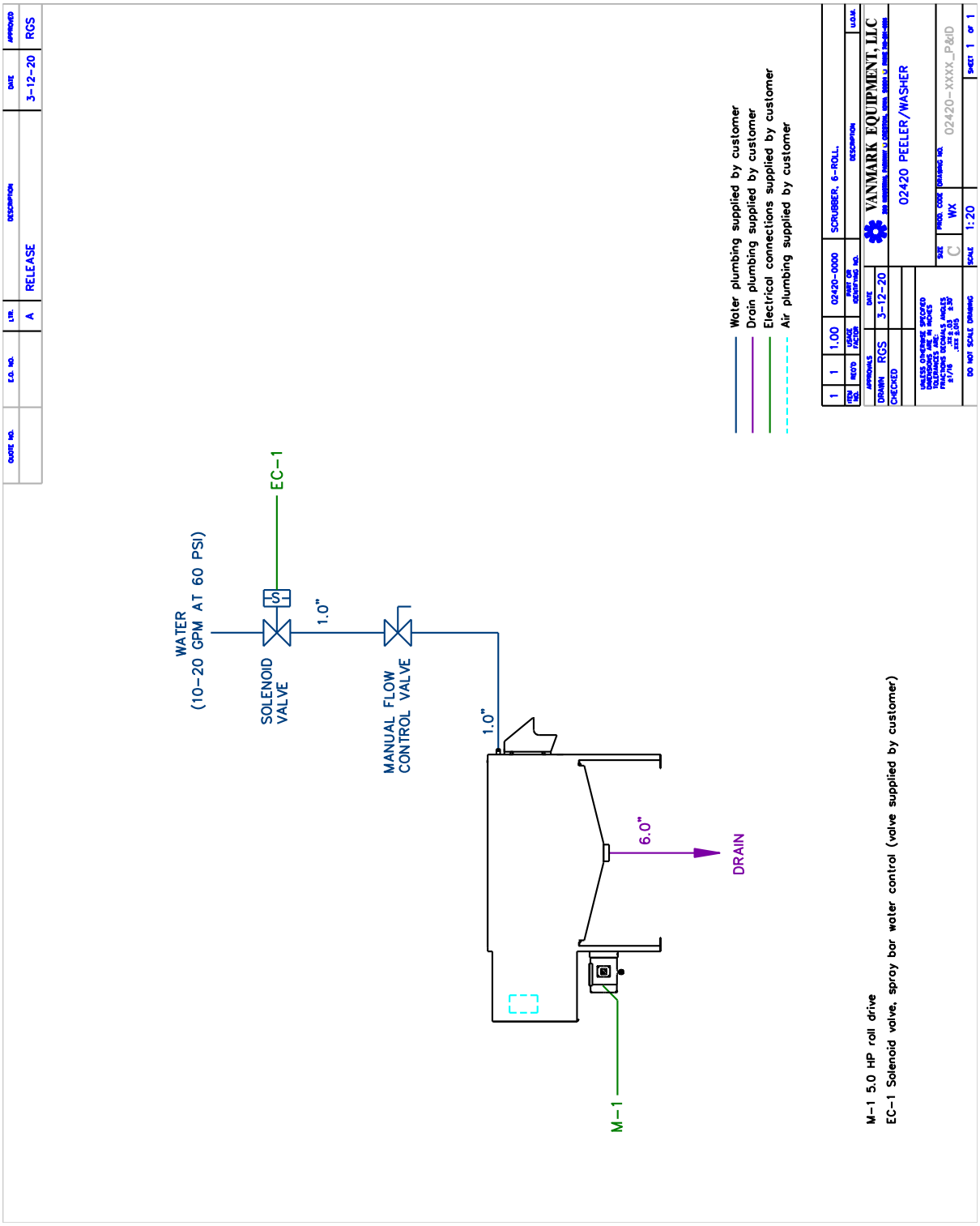
8.1 PEELING ROLL CONFIGURATION

DISCHARGE END VIEW

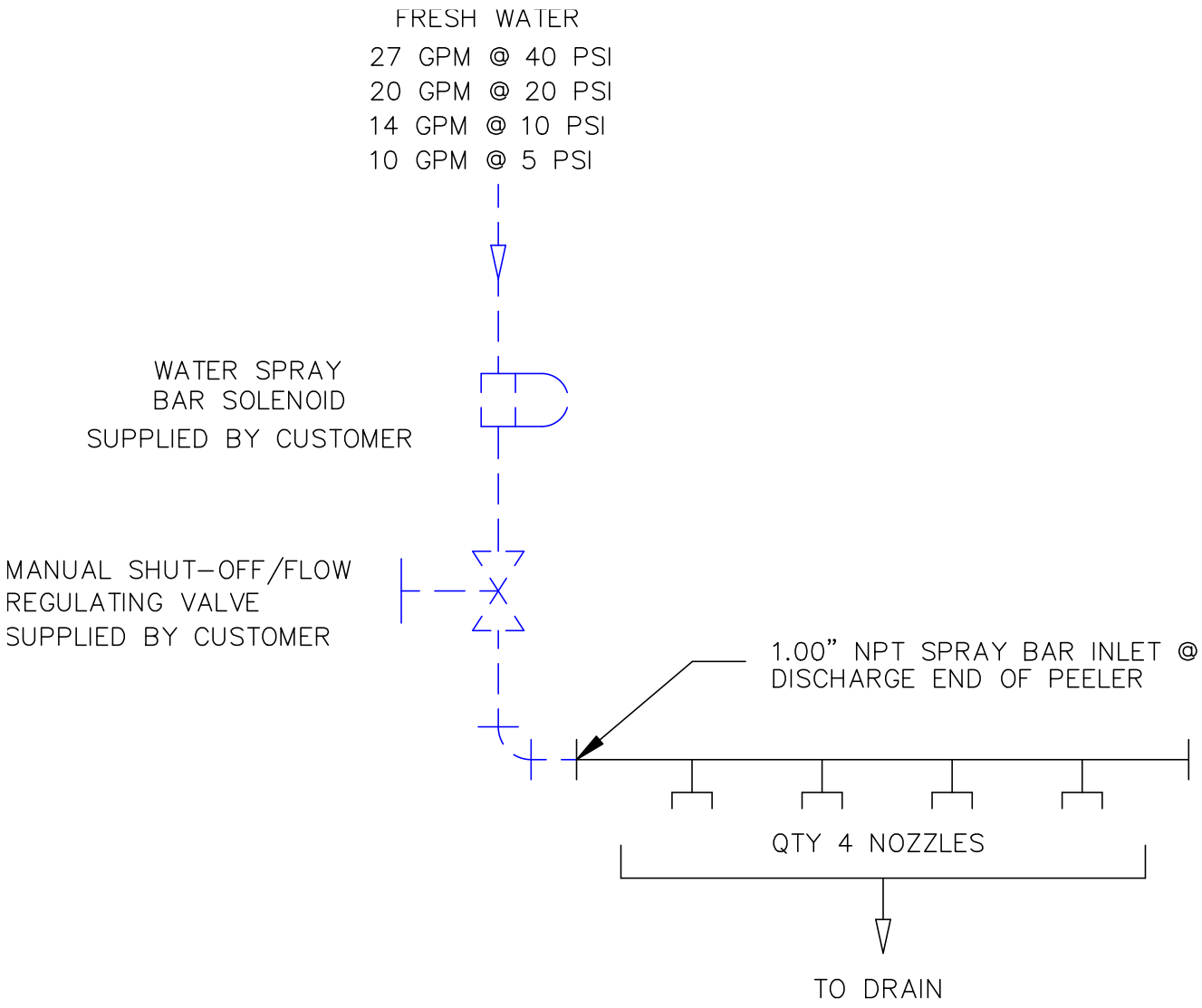
Roll No.	Part Number	Roll Type
1		
2		
3		
4		
5		
6		

NOTE: No. 1 and 6 rolls are not used in 4 roll units

8.2 PEELER P&ID

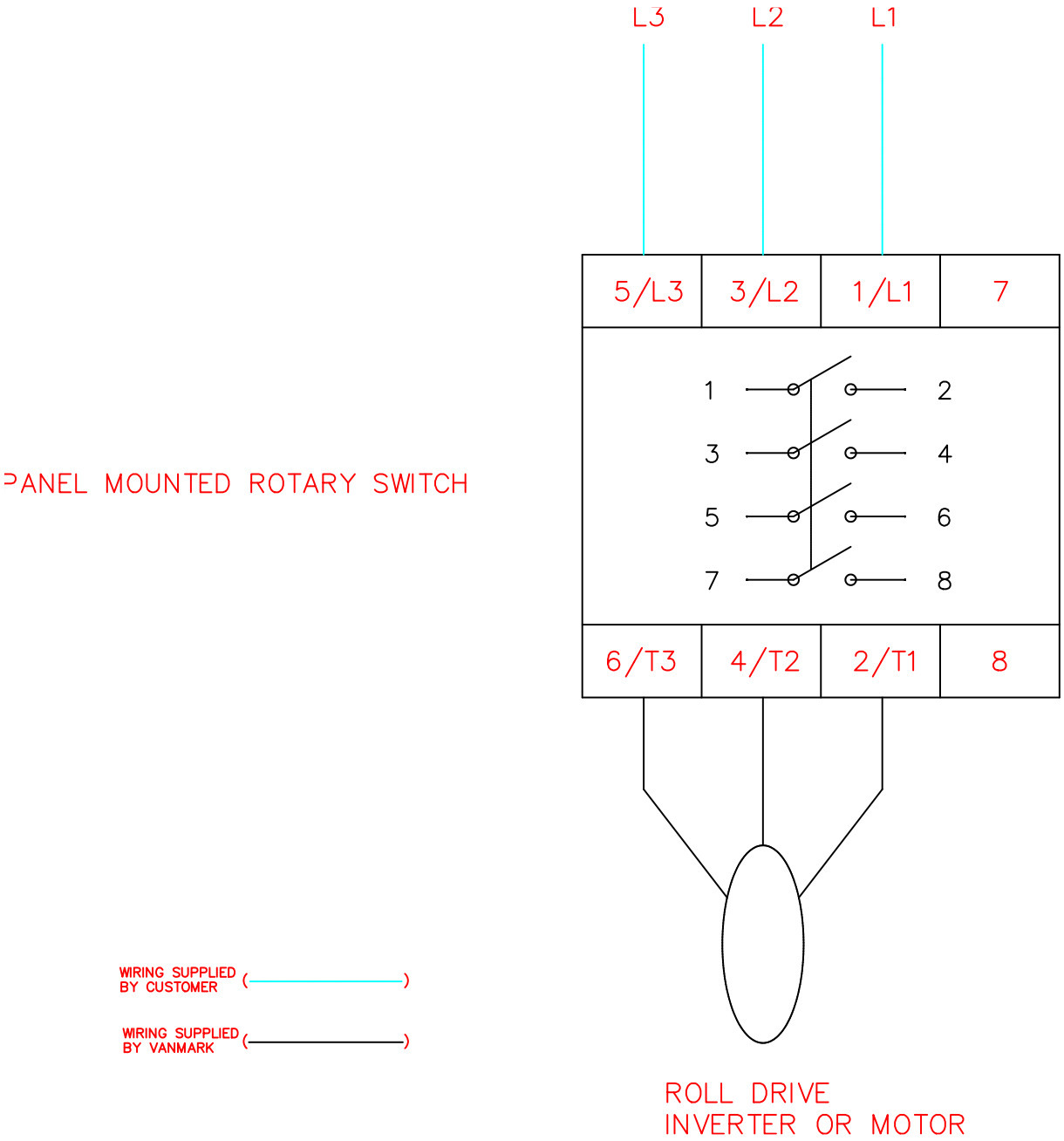


8.3 RECOMMENDED WATER SCHEMATIC



8.4 TRAPPED KEY WIRING

8.4.1 ISOLATION SWITCH



8.5 DRIVE MOTOR Hz TO RPM CONVERSION

Inverter Hz	RPM
20	98
25	122
30	147
35	171
40	195
45	220
50	244
55	269
60	293
65	318
70	342
75	367
80	391
85	415
90	440

9.0 COMPONENT CUT SHEETS

Subcomponent cut sheets are provided in electronic form with the equipment. If any replacement cut sheets are needed, please contact Vanmark Equipment, and provide the equipment serial number from Section 1.2.

Cut Sheets Provided (If Applicable):

- Trap Key
  - Key Access
  - Key Exchange