
Operation and Maintenance Manual



Bremner Ripon

Model: 107-20

SN: 8873

October 2007

WARRANTY

ARPAC warrants the equipment of its manufacture to be free from defective material or workmanship for a period of one year from date of shipment from the factory, provided that:

1. Such equipment is given normal and proper usage.
2. It is still owned by the original purchaser.
3. The equipment has been operated in accordance with generally approved practice and in accordance with ARPAC's instructions.
4. No repairs, alterations, or replacements have been made by others without ARPAC's written approval.

The purchaser shall notify ARPAC immediately of any defective parts and ARPAC shall take corrective action. If such correction requires the replacement of a defective part or parts, ARPAC will supply them F.O.B. the factory.

ARPAC shall in no event be held liable for damage or delay caused by defective parts and will not accept any charges for work performed by purchaser in making adjustments or repairs to the equipment unless such work has been authorized in writing by ARPAC.

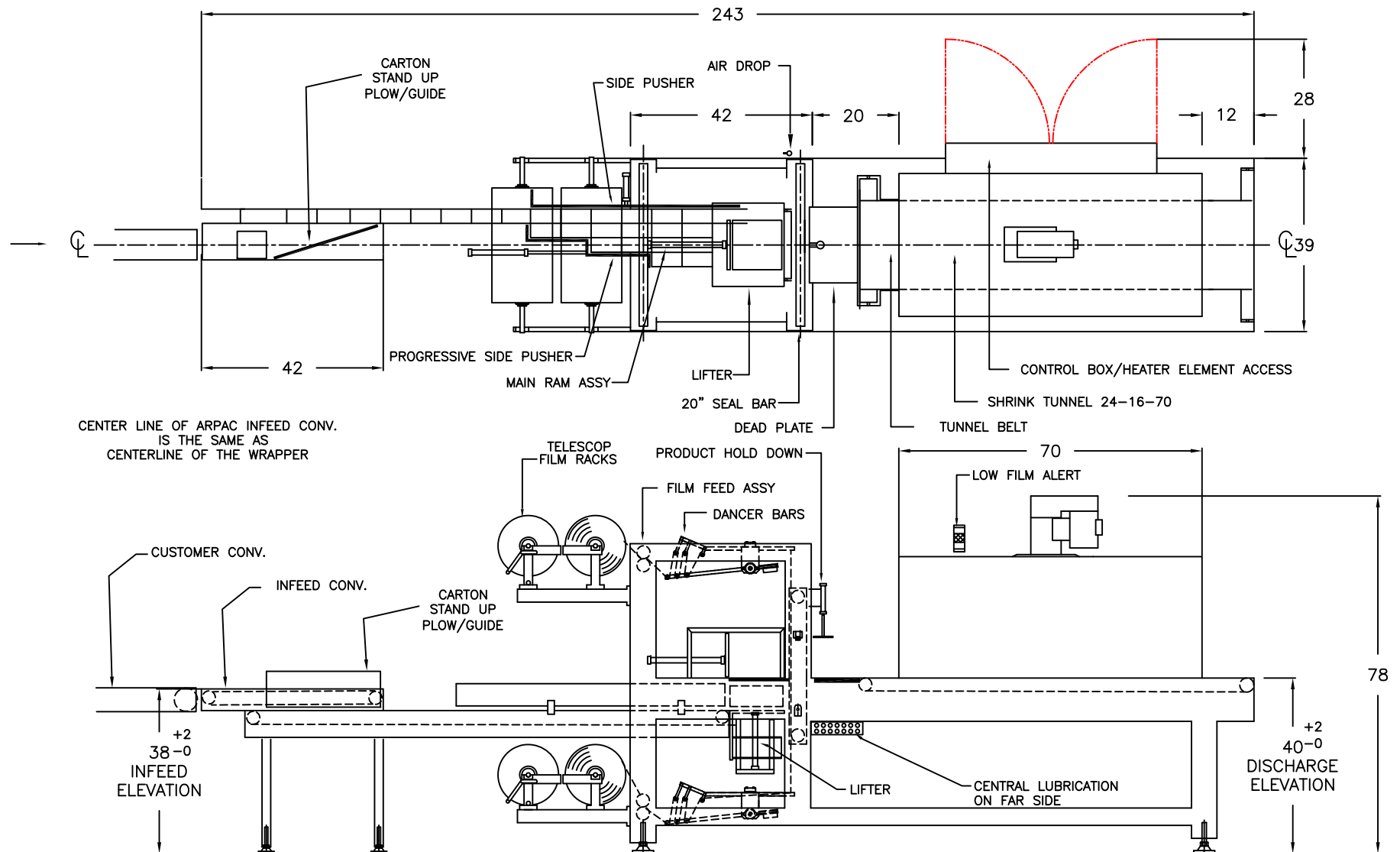
Any equipment or component not of ARPAC's own manufacture is sold under whatever warranty is provided by the maker, to the extent ARPAC is able to enforce such warranty. Such items are not warranted by ARPAC in any way.

When components are sold to be assembled in combination of purchaser's design, the warranty shall be limited to each separate component and shall not apply to any combinations or components.

ARPAC's liability (except as to title) arising out of the supplying of the equipment shall in no case exceed the purchase price of the said equipment. ARPAC makes no guarantee or warranty, expressed or implied, other than as stated above.

ARPAC factory trained, qualified technical services personnel are available for start-up and instructional assistance. If the customer does not utilize ARPAC personnel for this function, ARPAC is only liable for replacement of defective parts, not for labor or expenses necessary to adjust any problems out in the field.

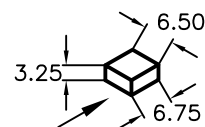
ARPAC personnel are available for ARPAC equipment training either on-site/hands on or in classroom environment, supported by visual aid and literature to be administered under a separate purchase order.



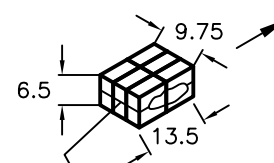
GENERAL NOTES:

INFEED AT 38 +2/-0", DISCHARGE AT 40 +2/-0"
 ELEC. SPECS: 460V-3PH-60Hz
 CONTROL BOX: L/H
 AIR SUPPLY: 80 PSI MIN
 FILM SIZE: 1.5 MIL LDPE

PRODUCT IN



BUNDLE OUT



SEAL LINE

ARPAC		9511 WEST RIVER ST. SCHILLER PARK, IL 60176	
FILENAME s8873	DRAWN BY JW	SCALE: 4:3/8"	SIZE:
DATE 8-21-07	REVISED	APPROVED BY: JW	
MODEL 107-20 AUTOMATIC SLEEVE WRAPPER			
FOR BRENNER		DRAWING NUMBER s8873	

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SECTION 7

Maintenance

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Maintenance

The most important for this or any other machinery is to keep the system clean. It is also essential to make periodic inspections to detect small problem before they become big problems. A clean, properly maintained machine enhances productivity. A little P.M. now goes a long way in future system operation and machine reliability.

Preventive Maintenance



DANGER: The following procedures should only be done after the machine has been turned off, allowed to cool down and the air pressure has been released. Always follow Lockout/Tagout procedures. Always wear safety glasses.

Preventive Maintenance Schedule

Daily	Weekly	Monthly
☐ Clean machine and surrounding area ☐ Clean and drain air line filter ☐ Inspect air line lubricator ☐ Inspect the seal frame mounting bolts ☐ Inspect rollers around seal bars for film accumulation. ☐ Inspect hot bar for melted film and/or damage ☐ Inspect Teflon tape on cold bar ☐ Check unwind and dancer bar rollers for freedom of movement	☐ Inspect pneumatic filter elements ☐ Inspect electrical cables on seal bars ☐ Inspect seal frame chain and tranorque bushings ☐ Inspect drive chains ☐ Inspect seal frame chains ☐ Inspect seal frame shock absorbers ☐ Inspect and clean conveyor belts and/or rollers. ☐ Clean main control box and inspect PLC Low battery indicator.	☐ Lubricate bearings on dancer bars and conveyor transfer rollers ☐ Inspect film feed lagging ☐ Lubricate drive chains ☐ Check drive chain take ups ☐ Check for oil in gearboxes ☐ Inspect seal bar insulators ☐ Inspect bearing conditions ☐ Inspect cold bar pad ☐ Replace worn or damaged rollers ☐ Inspect tunnel blower pulleys and belts

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Preventive Maintenance

Preventive Maintenance Schedule

Daily	Weekly	Monthly
☐ Clean all photo eyes ☐ Inspect film feed rollers ☐ Check emergency stop buttons for proper operations ☐ Inspect shrink tunnel ☐ Inspect tunnel belt for melted film and/or damage ☐ Inspect heater element tray		☐ Inspect all clutches ☐ Inspect tunnel curtains for damage

Preventive Maintenance

Cleaning

Daily cleaning of some parts of the machines and weekly cleaning of the rest of it should prevent the accumulation of dirt, dust, lubricants, spilled product and other foreign material that can interfere with the machine operation. Spots of glue, scraps of paper residue, and spilled product can cause the machine to grab or hesitate.



DANGER: To avoid personnel injury, the machine shall be stopped prior to cleaning. The moving parts of a machine could pull a cleaning rag and your hand into the machine and cause injury.

Before cleaning the machine:

- Stop the machine and ensure that all safety devices are activated
- Remove or store any unused product, material or containers that may be damaged by water or other cleaning materials.
- Disconnect and lockout electrical power to machine.
- Remove water from air filters in the pneumatic system.

Cleaning:

1. Wipe the machine with a clean, dry cloth.
2. Blow off loose dust or particles with low pressure air (film rack air tool may be used).
3. Wash machine parts with mild soap and water.

After cleaning the machine:

- Re-lubricate any areas where lubricants have been removed by cleaning.
- Inspect all surfaces that will come in contact with the product or containers.
- Thoroughly dry all wet areas.

Preventive Maintenance

Air Line Filters



DANGER: In high humidity environments, draining of the air line filter may be required several times a day. Failure to drain water from filter bowl may cause corrosion and eventual failure of pneumatic components.

When bowl becomes dirty, wipe with a clean dry cloth. Do not use certain compressor oils, household cleansers, solvents or paints as the fumes may have an adverse effect on the plastic bowl and cause bowl failure.

Periodically drain water from bowl. To drain, press on drain valve located on the bottom of the bowl.

Air Line Lubricators



DANGER: The lubricator cannot be filled without first shutting off air pressure and venting bowl. (Remove fill plug.) The bowl may be taken off, after the fill plug is removed, if a more rapid fill is required. Do not pressurize the bowl until the fill plug, bowl and bowl guard are in position and locked into place.

When bowl becomes dirty, wipe with a clean dry cloth. Do not use certain compressor oils, household cleansers, solvents or paints as the fumes may have an adverse effect on the plastic bowl and cause bowl failure.

Periodically check delivery rate and oil level. The oil delivery rate is controlled by turning the adjusting screw counterclockwise for more and clockwise for less oil delivery. For additional information, refer to the lubricator instruction sheet in section 12.

When adding oil, use clean oil preferably SAE 10 oil or lighter. Do not fill above the "MAX. FILL" line on the bowl.

Preventive Maintenance

Conveyor Belts and Rollers

These should be cleaned daily or weekly depending on the application and environment. For more information on cleaning conveyor belts see the vendor information in section 12.

Drive Chains



DANGER: Do not over tighten! It is better for a drive chain to be a little loose rather than too tight.

All drive chains should be checked monthly. Inspect the chain tension and adjust using the take-up, if necessary.

Electromagnetic Clutches

In dusty or dirty environments, periodic cleaning will be required to maintain crisp operation. With the machine shut off, blow air between the clutch plates using a dry air line source. This will be sufficient in most cases. Severely worn clutches should be replaced. Clutch facings are not replaceable.

Film Feed

Each day, inspect and clean the film feed rollers. Be careful not to damage the cork or rubber lagging. If it has been damaged, depending on the extent it should be replaced.

Seal Bars



DANGER: Never use a flammable solvent when cleaning the seal bars.

Inspect and clean the seal bars after each shift. Use a clean soft cloth only. Using a sharp object will damage the surface of the knife and bars. Never set the seal bar temperature over 450°F. Remember, higher temperature yields shorter seal bar life.

Preventive Maintenance

Seal Frame Chains

The chains linking upper and lower seal carriers are provided with take-ups at the bottom. The chains should be adjusted to remove slack, but must not be tight. Finger pressure on chains should cause approximately 3/8-inch deflection.

Shrink Tunnel

Each day, the tunnel belt and the inside of the tunnel should be checked and cleaned of loose film or product debris.

The tunnel curtains should be checked a couple of times per year. If they become frayed or damaged, they should be replaced. Damaged tunnel curtains will cause the tunnel to run inefficiently, by allowing heat to escape and will affect the quality of wrap your product receives.

Preventive Maintenance

Heater Element Tray

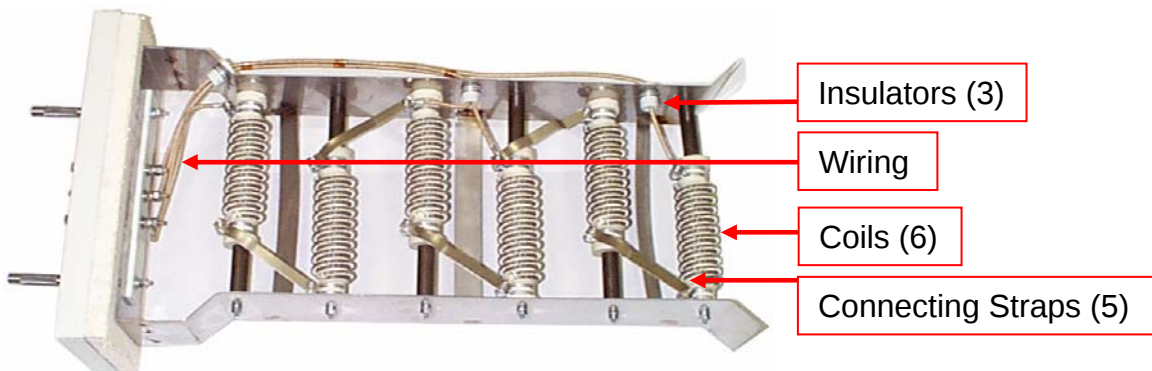


DANGER: The tunnel and its parts, especially the heater element tray, get very hot. Be very careful when working with the heater element tray. Allow sufficient cooling time when making replacements or adjustments to parts of the heater element tray



NOTE: The heater element coils may appear to have expanded from their normal size. This is normal. Expanded coils are adequate for use if there is no damage to the coil.

Every six months, inspect the heater element tray. Inspect for damaged or broken coils, insulators and connecting straps. Be sure that the heater coils do not touch any other part of the heater element tray. Examine the wiring to ensure that no wires are loose or damaged. Damaged parts of the heater element tray must be replaced to maximize shrink tunnel efficiency.



NOTE: The heater element tray in your machine may vary slightly from the tray pictured above. For detailed wiring and assembly information, consult the assembly drawings in section 10 and the electrical schematics in section 11.

Lubrication

Lubrication Schedule

Type and Location	Lubricant
Weekly	
Air line lubricators	SAE 10 oil or lighter (we recommend SAE 5 oil). Do NOT fill lubricator without isolating and venting to zero psi.
Monthly	
Oilite bearings Film feed pinch roller Conveyor idler pulleys Air clevis joints Pivot joints	SAE 20 non-detergent oil
Tunnel conveyor and blower bearings	High temperature grease
3 times per year	
Ball bearings	General purpose grease (i.e., lithium-based NGLI Grade 2)
Ball bushing	General purpose grease
2 times per year	
Worm gear boxes (drain and refill)	AGMA No. 8 EP comp. non-corrosive worm gear oil (i.e., Mobil SHC® 634)
Chain drives (clean and lubricate)	SAE 30 non-detergent oil
1 time per year	
Three-way cooling fan motor bearings	30 drops of SAE 20 non-detergent oil to both motor bearings

Lubrication

Air Line Lubricators



DANGER: The lubricator cannot be filled without first shutting off air pressure and venting bowl. (Remove fill plug.) The bowl may be taken off, after the fill plug is removed, if a more rapid fill is required. Do not pressurize until the fill plug, bowl and bowl guard are in position and locked into place.

The lubricators are preset at the factory to approximately 1/8 to 1/4-turn open. Periodically check the level of pneumatic oil in the sight glass. Verify air pressure gauge reads zero prior to adding oil. When adding oil, use clean oil preferably SAE 10 oil or lighter. Do not fill above the “MAX. FILL” line.

Air Cylinders

Air cylinders are pre-lubricated and sealed at the manufacturer's factory for extensive maintenance-free life.

Ball Bearings, Ball Bushings



NOTE: Do not over lubricate the bearings. Over lubricating will cause the seals to rupture and the bearing will be destroyed. Two squirts of grease per bearing is the maximum.

For tunnel conveyor and blower bearings, add high temperature grease once per month. For all other ball bearings and bushings, once every 2 to 3 months add a small amount of a good grade of general-purpose grease (such as lithium-based NGLI grade 2) to each bearing and bushing block.

Trantorque[®] Bushings

Do not lubricate Trantorque[®] bushings or shaft. The use of any lubricant on the contact surface could result in bushing failure.

Oilite[®] Bearings or Bushings

Once a month, add a few drops of SAE 20 non-detergent oil to each Oilite[®] bearing. Look for this type of bearing on film feed pinch rollers, conveyor idler pulleys, air cylinder clevis joints and most other pivot joints.

Lubrication

Worm Gear Boxes

Every six months, drain oil from the gear boxes. Refill with AGMA No. 8 EP non-corrosive worm gear oil, such as Mobil SHC® 634 synthetic. See the Boston Gear® 700 series worm gear speed reducer instruction manual in section 12 for additional details.

Drive Chains

Clean drive chains twice a year or as needed. Lightly apply SAE 30 oil to chain. Check tension as necessary and adjust to keep snug but not tight.

Tunnel Cooling Fan Motor

Once a year, clean area near oil fill cap and add 30 drops of SAE 20 non-detergent oil into bearing cup(s) of the tunnel cooling fan motor and tunnel belt cooling fan motor.

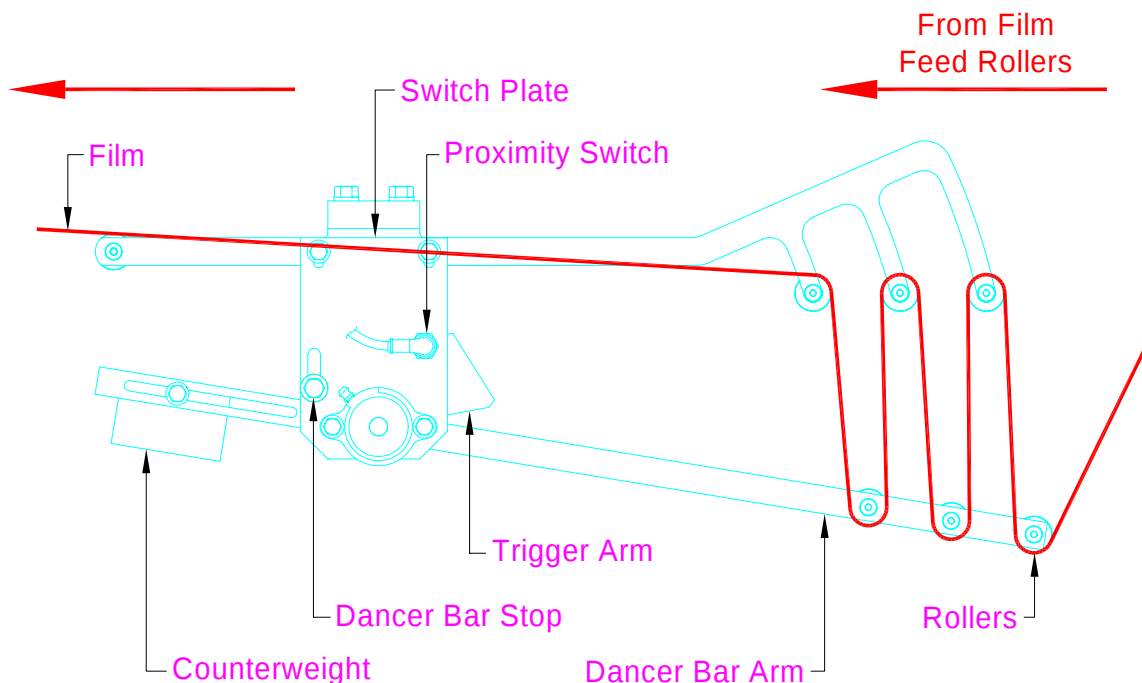
Corrective Maintenance



DANGER: Prior to performing any of the following procedures, shut down the machine and disconnect electrical and pneumatic power. Follow your company's lockout/tagout procedures.

Dancer Bar Stops

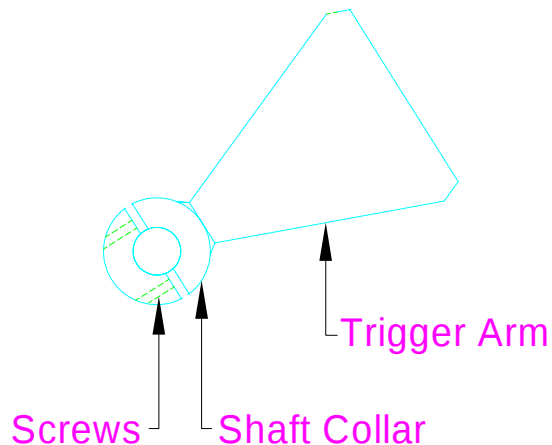
1. Loosen both of the dancer bar stops using a $\frac{1}{2}$ " wrench.
2. Allow the dancer arm to swing downward as far as possible without contacting any other parts of the machine, the product or the floor.
3. Retighten the dancer bar stops.
4. After adjusting the dancer bar stops, adjust the dancer bar trigger arms. See dancer bar trigger arm adjustment on the next page.



Corrective Maintenance

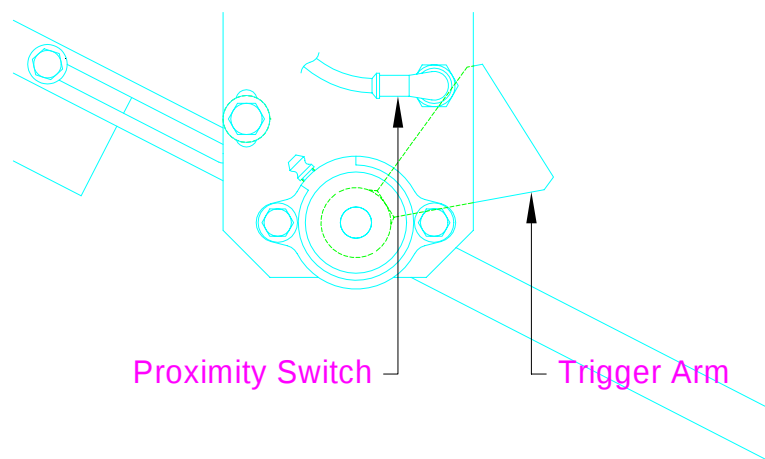
Dancer Bar Trigger Arm

1. Prior to adjusting the dancer bar trigger arms, adjust the dancer bar stops. See the previous page.
2. Loosen the dancer trigger arm shaft collars using a $\frac{9}{64}$ " hex key. Loosen only one of the screws for each trigger arm.



NOTE: If you are having trouble distinguishing between the trigger arms, remember that the lower dancer bar will not have a film break trigger arm. Also, the film feed trigger arms are on the opposite side of the machine as the film break trigger arm.

3. Adjust the film break trigger arm so that it moves away from the film break proximity switch when the dancer arm is just above its lowest point.

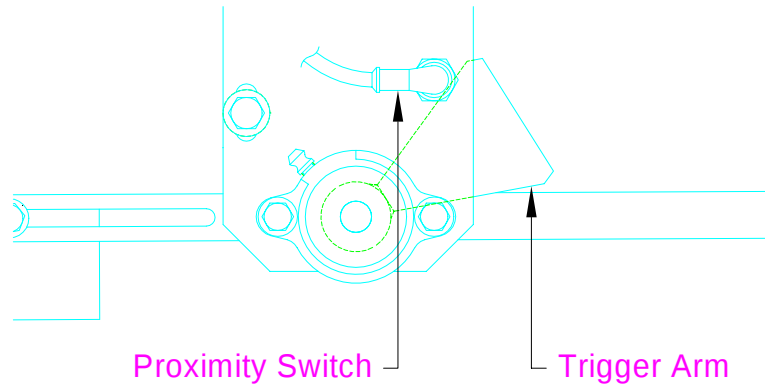


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Corrective Maintenance

Dancer Bar Trigger Arm

4. Retighten the the film break trigger arm shaft collar.
5. Adjust the film feed trigger arm so that it moves in front of the film feed proximity switch when the dancer arm is at the horizontal position.



6. Retighten the film feed trigger arm shaft collars.



NOTE: Be sure that the dancer bar trigger arms pass within $\frac{1}{8}$ " of the corresponding proximity switch.

Corrective Maintenance

Dancer Bar Counterweights

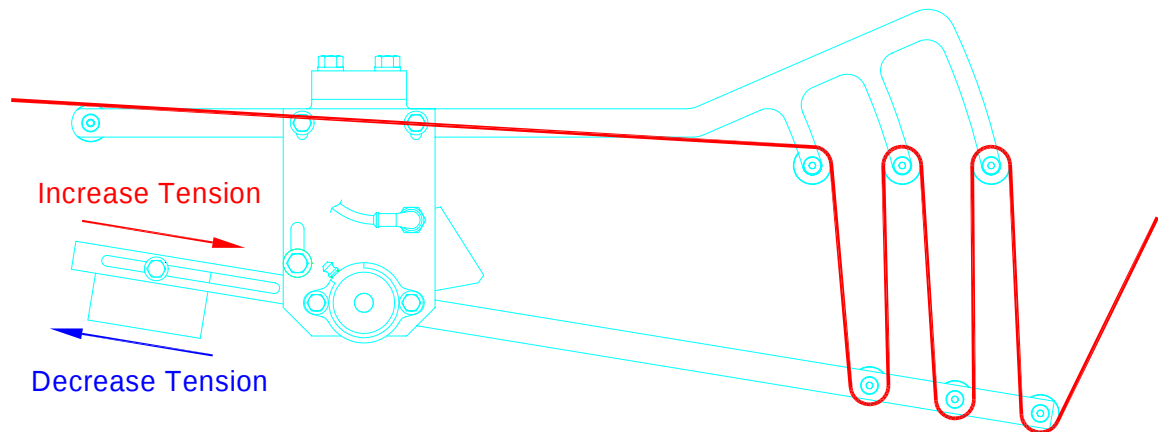
Film tension is set by the counterweights on the dancers. The tension should always be set close to the minimum, but not too light. The dancer bar must have enough tension on it to pull the film down. This will allow the dancer to respond quickly to the film that is being fed by the film feed rollers.

1. Loosen the bolts that hold in both counterweights using a $\frac{7}{16}$ " wrench.
2. Slide the counterweight to the desired position. Moving the counterweight toward the pivot point of the dancer arm will increase film tension. Conversely, moving the counterweight away from the pivot point will decrease film tension.



NOTE: Increased film tension will not result in a tighter wrap on the product, but will cause weak seals and broken film webs.

3. Retighten the bolts that hold in both counterweights.

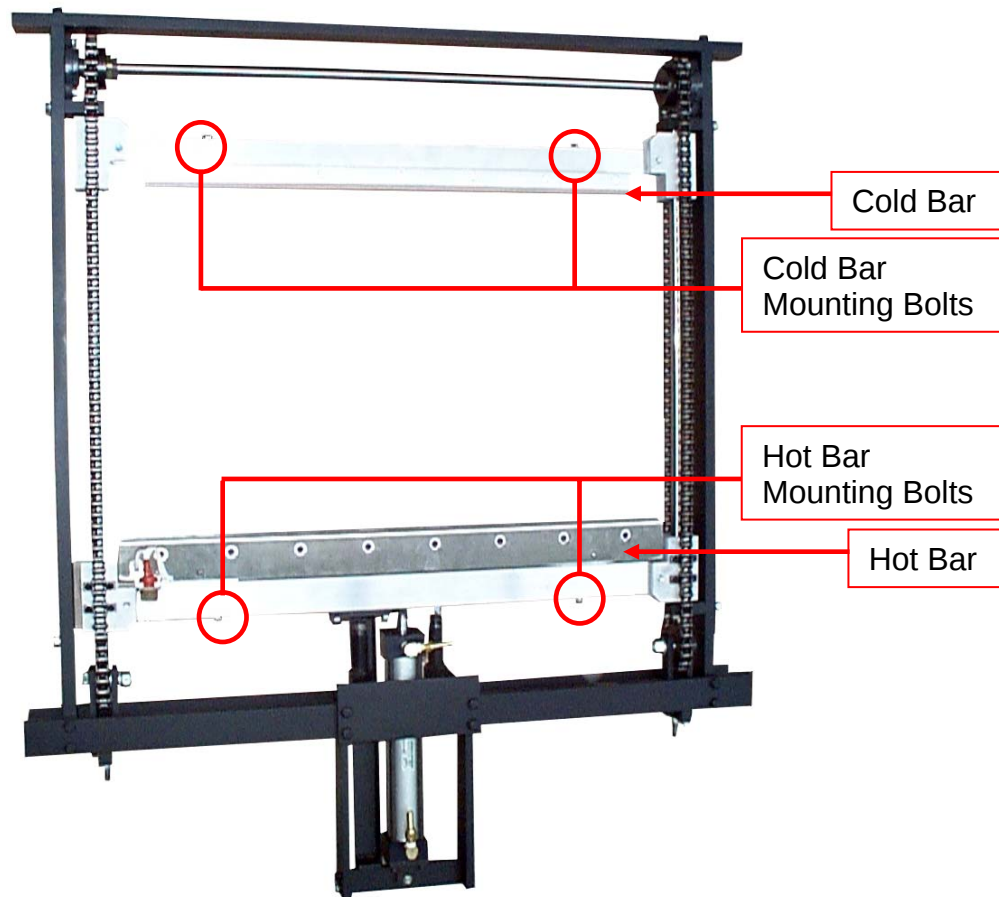


Corrective Maintenance

Seal Bar Removal and Installation

Seal Bar Removal

1. If removing the hot bar, disconnect the electrical disconnect.
2. Using a 9/16" wrench, remove the mounting bolts from the seal bar being removed.
3. Remove the seal bar.



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Corrective Maintenance

Seal Bar Removal and Installation

Seal Bar Installation

1. Position the seal bar on the carrier bar. When installing the hot bar, the electrical disconnect must be positioned near the electrical cable.
2. Install the seal bar mounting bolts. Do not tighten.



NOTE: Bolts which mount seal bars into wrapper must not extend more than one-half inch into expansion mount or the mount will be irreparably damaged. Be sure to use all washers originally supplied with these bolts. Replacement bolts should be of identical lengths.

3. Manually close the seal frame and make sure the bars line up. The mounting holes are intentionally oversized to allow precise alignment.
4. Using a 9/16" wrench, tighten the mounting bolts.



DANGER: Do not operate the seal bar with the thermocouple wires connected in reverse.

5. Connect the main power disconnect. Immediately after turning on the electric power, observe the temperature controller

If the display shows “FFF” or other unexpected temperature readout, the thermocouple may be open or not connected. Check and correct. If the display shows “---” or other unexpected temperature readout, or if the displayed temperature drops after power is applied, the polarity may be reversed.

Reconnect the leads. The display will show the actual temperature of the seal bar.

Seal Bar Installation

Test the strength of the seal by trying to pull it apart after seal has cooled. If the film separates at the seal without tearing when pulled, more heat or dwell time is required. If the film tears along seal line, the temperature setting or dwell time may be excessive.

Corrective Maintenance

Seal Bar Alignment



NOTE: This procedure may be done the opposite way (by centering the cold bar to the hot bar).

The seal bar alignment procedure is used to align the hot and cold bars in order to get the best possible seal.

1. Manually close the seal bars.
2. Loosen the two mounting bolts on the cold bar. Do not remove the bolts.
3. Set the hot and cold bar in line. The knife of the hot bar should be centered to the cold bar.
4. Retighten the mounting bolts.

Corrective Maintenance

Cold Bar Rebuilding

1. Remove the screws from the sides of the cold bar.
2. Remove the side plates from the cold bar.



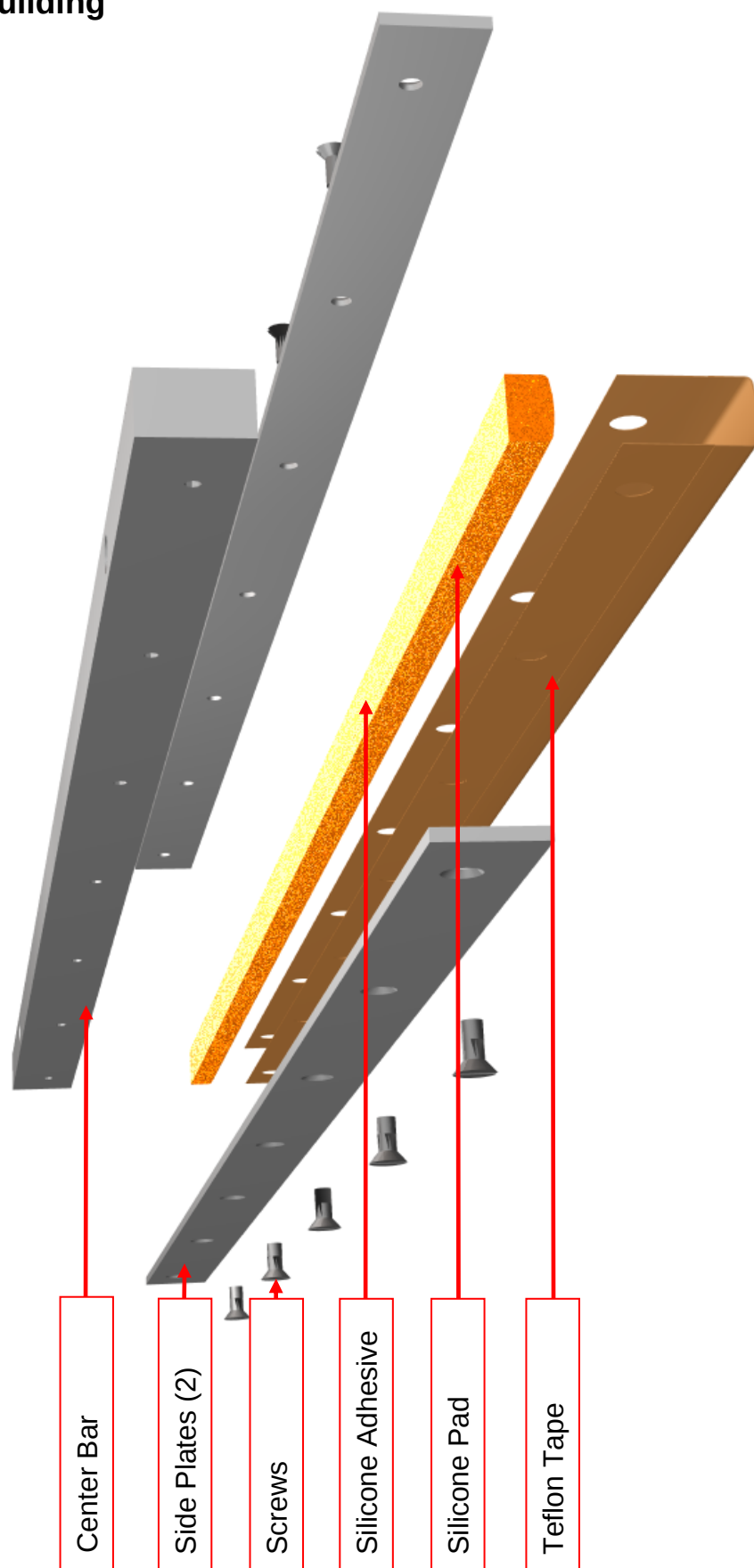
DANGER: Acetone is extremely flammable. Be sure to wipe all of the acetone off the bar before continuing with this procedure.

3. Remove the tape and the silicone pad from the center bar. Clean the center bar using acetone and a soft cloth.
4. Apply a thin layer of adhesive to the center bar. Smooth any ridges or bubbles in the adhesive by using a razor blade. There should be a layer of adhesive approximately 1/32 to 1/16" thick on the center bar.
5. Carefully position the silicone strip on the adhesive on the bar.
6. Invert the bar onto a flat surface and place a weight on it for at least six hours.
7. Using a razor blade, carefully trim any excess adhesive off of the sides of the center bar.
8. Place the Teflon cloth over the silicone strip, draping it down on both sides of the center bar. Do not use tape to hold the Teflon cloth.
9. Use a razor blade to cut holes in the Teflon to correspond with the holes in the center bar. Do not pull the Teflon tape tight over the silicone foam strip. Be sure that the tape has not wrinkled.
10. Reinstall the side plates and the screws.

(Continued on the next page)

Corrective Maintenance

Cold Bar Rebuilding



Corrective Maintenance

Polyethylene Hot Bar Rebuilding

Hot Bar Disassembly

1. Remove the stripper plate with the cutout by removing retaining screws.
2. Remove any of the spacer buttons and that have melted.
3. Remove all of the seal bar mounting screws.
4. Remove the seal bar inserts by sliding them out from between seal bar halves.
5. Remove the knife blade from between seal bar inserts.
6. If the heater element requires replacement, disconnect the wires at each end of the heater element rod. If heater element does not require replacement, skip ahead to the hot bar reassembly procedure on the next page.
7. Loosen the insulator screws until the seal bar halves come apart.
8. Remove the heater element.



DANGER: Acetone is extremely flammable. Be sure to wipe all of the acetone off the bar before continuing with this procedure.

9. Remove all old seal bar compound from seal bar halves.
10. Use acetone and a Brillo pad or a cloth to remove the compound.

(Continued on the next page)

Corrective Maintenance

Polyethylene Hot Bar Rebuilding

Hot Bar Reassembly

1. If reassembling after the replacement of the heater element, continue from this point on. If reassembling after the seal blade removal, go to step #5 below.
2. Add seal bar compound into the groove of one of the seal bar halves, which the heater element sits in.
3. Place the new heater element into the groove of one of the seal bar halves and rotate the heater element rod within. Do this until there is a uniform layer on the rod.
4. Place the second seal bar half onto the first half.
5. Screw the seal bar halves together with the mounting screws. Do not tighten the mounting screws.
6. Place the new blade between the seal bar inserts.
7. Slide the insert back into the seal bar halves.
8. Tighten the seal bar halves and the insulator screws.
9. Place the heater element wires back into the ends of the rod and tighten the two heater element nuts.
10. Replace all spacer buttons and screws that are needed.
11. Reinstall the stripper plate with the retainer screws.

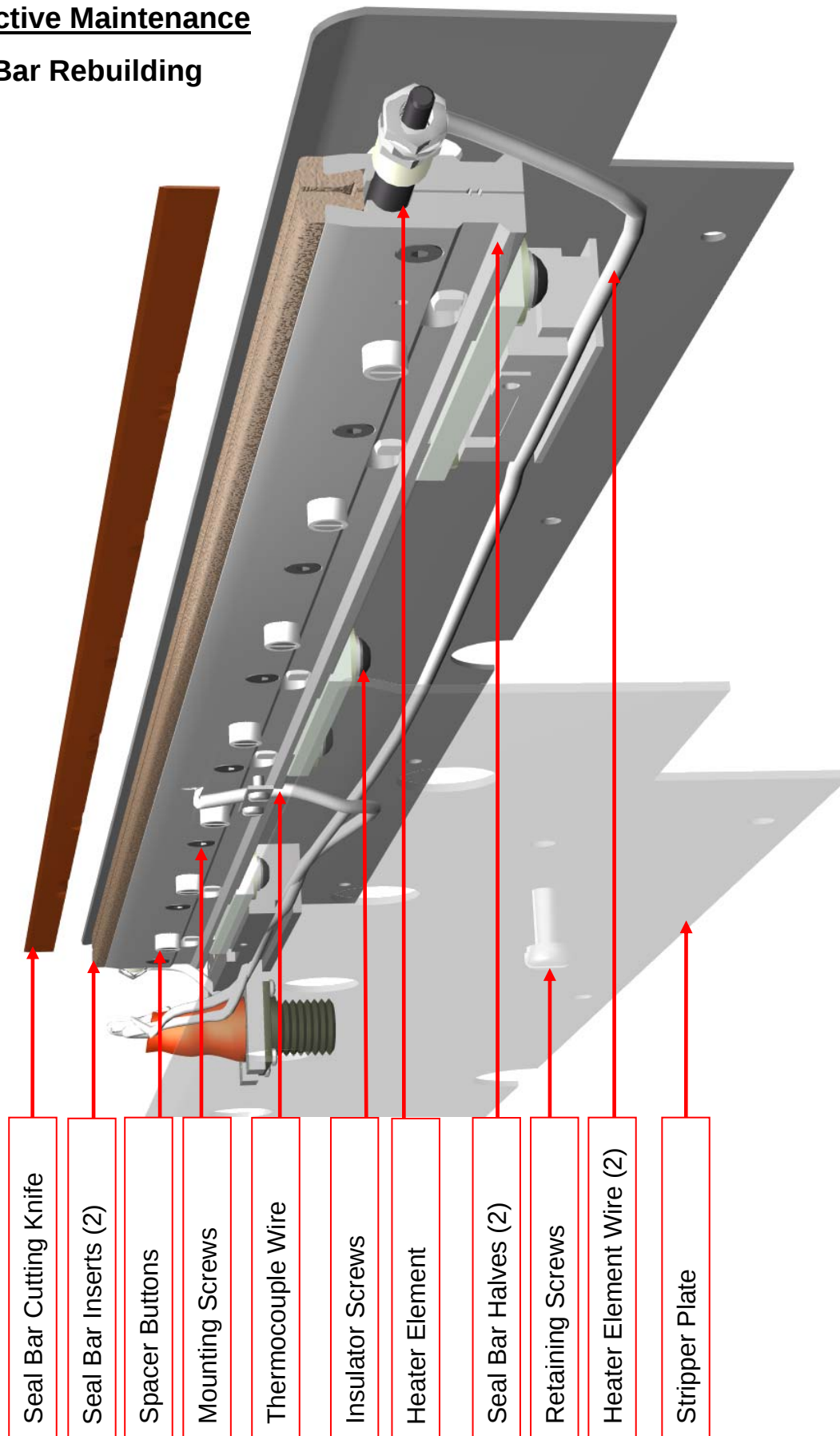


NOTE: Make sure that the thermocouple and heater element wires are routed correctly before tightening the retainer screws.

(Continued on the next page)

Corrective Maintenance

Hot Bar Rebuilding



Corrective Maintenance

Seal Frame Shock Absorbers

The MA600 is the standard adjustable shock absorber used on ARPAC seal frames. These units are intended to slow, but not stop, moving objects.

It is very important that the seal frame shock absorbers are adjusted properly. Improper settings will result in poor sealing action. If the shock absorber is set too stiff, the seal bars either will not fully close or will just barely close by the time the seal dwell timer times out. People in the field tend to compensate for this by increasing the seal temperature or the seal dwell time.

Check the setting on the shock absorber. It should be about “5” on the scale around the end of the shock. It can be slightly less for small but high-speed seal frames and slightly more for large low speed seal frames.

Use the softest shock setting that does not allow the seal head to “bang” on closing. Test the shock setting by placing a coin on the upper seal bar carrier. Use the softest setting that keeps the coin in place when the seal head closes. The coin may be tossed on opening.

The shock absorbers have a threaded exterior allowing them to be positioned to suit. A lock nut is provided which must be securely retightened whenever a shock is repositioned. Shocks must not be allowed to bottom out. Check with a feeler gauge.

The positioning of the shock absorbers is very important! The seal closing shock absorber must eliminate any and all bouncing of the seal bars on closure. The single-element seal bar will immediately cut the lower film on first contact.

Any bouncing of the seal bars will result in the lower film pulling partially or completely out of the seal jaws, resulting in poor closure or lack of closure on the back end of the product.



Corrective Maintenance

Seal Frame Squaring



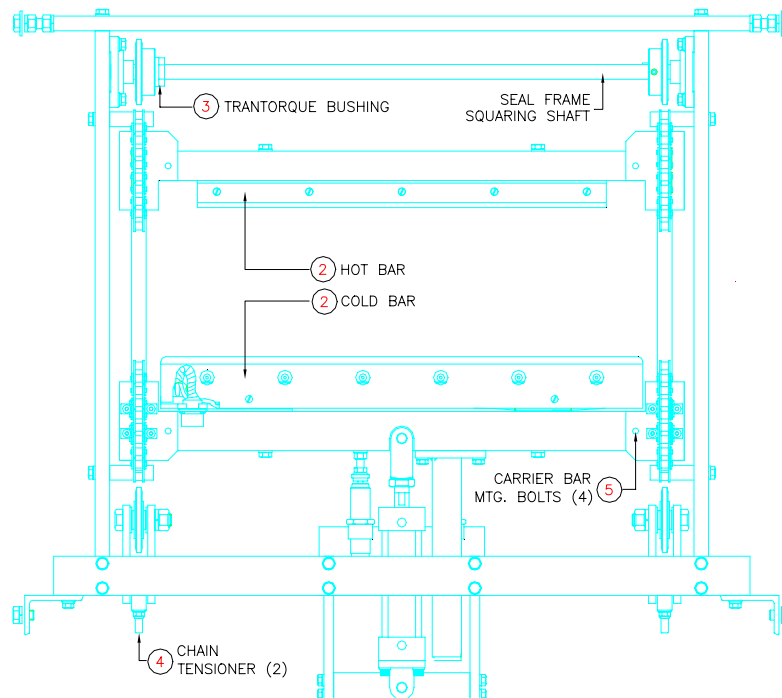
NOTE: Only qualified maintenance personnel should perform this procedure.

1. Before squaring the seal frame, make sure that the seal bars are aligned.



DANGER: The hot seal bar will remain hot for several minutes after the machine has been shut down. Allow sufficient time for the machine to cool down prior to squaring the seal frame.

2. Remove the hot and cold seal bars. See seal bar removal.
3. Using an 1-¹/₄" wrench, loosen the trantorque bushing on the seal frame squaring shaft.
4. Using a ⁹/₁₆" wrench, loosen the chain tensioners.
5. Using a ⁹/₁₆" wrench, loosen the carrier bar mounting bolts in the bushing blocks.



(Continued on the next page)

Corrective Maintenance

Seal Frame Squaring

6. Place two identical, evenly milled spacers vertically between the seal carrier bars.



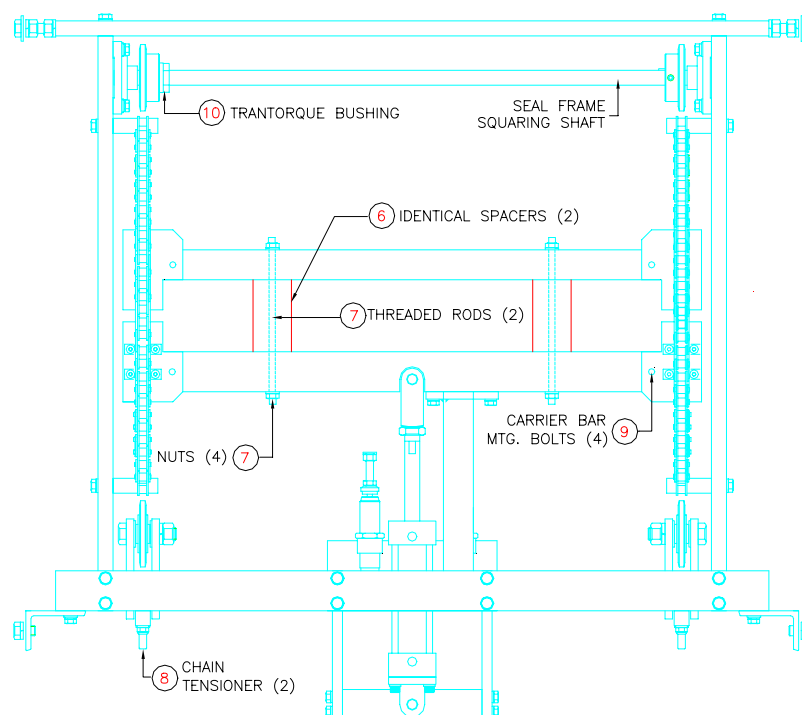
NOTE: For proper squaring, it is important that the spacers are identical.

7. Secure the spacers in place by placing two threaded rods through the clearance holes in the seal bar carriers. Tighten the rods down using four nuts.
8. Using a $\frac{9}{16}$ " wrench on the chain tensioners, retighten the chain evenly.



NOTE: When pulled at its midpoint, the chain should deflect approximately $\frac{1}{2}$ ".

9. With a $\frac{9}{16}$ " wrench, retighten the carrier bar mounting bolts in the bushing blocks.



(Continued on the next page)

Corrective Maintenance

Seal Frame Squaring

10. Retighten the trantorque bushing, using a 1-¹/₄" wrench.
11. Remove the spacers, threaded rods and nuts from the seal bar carriers.
12. Replace the hot and cold seal bars.
13. Connect a jumper to the wrapper door interlock. See the electrical schematics in section 11.



DANGER: Be sure that the only thing in the path of the seal bars is the paper. Be careful to keep your hands clear. We recommend using a large piece of paper.

14. Hold a piece of paper between the seal bars at one end and press the manual seal button. The paper should be held tight by the seal bars.



CORRECT



INCORRECT

15. Repeat step 14 on the other side of the bars. Hold the paper tightly again.
16. If the paper is loose on either side of the seal bar, repeat the entire procedure. If the paper is equally tight on both sides, the seal frame is squared properly.
17. Remove the jumper from the wrapper door interlock.

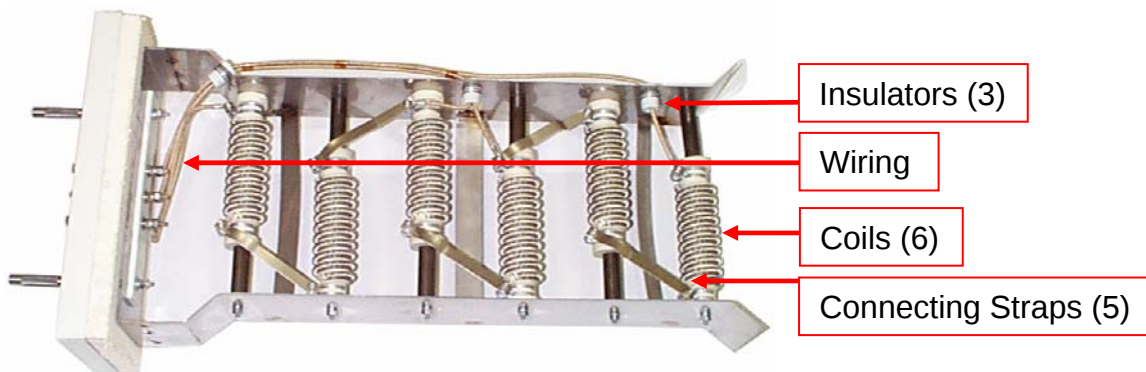
Corrective Maintenance

Heater Element Tray Repair



DANGER: The tunnel and its parts, especially the heater element tray, get very hot. Be very careful when working with the heater element tray. Allow sufficient cooling time when making replacements or adjustments to parts of the heater element tray

1. Perform the Long-Term Shutdown procedure.
2. Perform your company's lockout/tagout procedure.
3. Remove the three power leads from the element tray.
4. Remove the element tray retaining bracket.
5. Pull the element tray out from the tunnel blower bay.
6. Perform a continuity check on each coil to determine which coil(s) are bad.



NOTE: The heater element tray in your machine may vary slightly from the tray pictured above. For detailed wiring and assembly information, consult the assembly drawings in section 10 and the electrical schematics in section 11.

7. Remove the connector strap from the coil
8. To remove a damaged coil, remove 1/4-20 nut, 11" stainless steel threaded rod and the 2 5/8" long round tubing from the tray.
9. To replace a coil, place the coil in the tray.
10. Reinstall the 2 5/8" long round tubing and the 1/4-20 nut on the 11" threaded rod.
11. Reinstall the connector strap to the coil.

(Continued on the next page)

Corrective Maintenance

Heater Element Tray Repair

12. Slide the element tray back into the tunnel blower bay.
13. Reinstall the element tray retaining bracket.
14. Reinstall the three power leads.
15. Perform your company's lockout/tagout procedure to release the machine.
16. Perform the Quick Startup procedure.

Corrective Maintenance

Tunnel Blower Bearing Replacement

The following procedure is used to replace the tunnel blower 4-bolt flange bearings. Refer to Tunnel Blower Assembly Drawing in 10 of this manual.

Tools Required: 5/16, 3/8, 7/16, 1/2 and 9/16 wrenches or sockets

5/32 Hex key and T25 Torx wrench

Hammer and 1/2" or 3/4" diameter brass rod (used as a punch)

1. Disconnect and lockout electrical power to the tunnel. Follow company procedures.
2. Allow the shrink tunnel components to cool down to ambient temperature.
3. Using the 7/16-inch wrench, remove the four bolts and remove the V-belt guard.
4. Using the 1/2-inch wrench, remove the four bolts and remove the motor mounting bracket with motor and the V-belt from the weldment.
5. Using the 5/32-inch hex key, loosen the setscrew that holds the blower impeller shaft pulley and remove the pulley and cotter key from the impeller shaft.
6. When applicable use the 5/16 and 3/8-inch wrenches and remove the central lubrication lines to the bearings' grease fittings.
7. Using the T25 Torx wrench, loosen the setscrew in each of the Skwezloc fittings on each of the 4-hole flanged bearings and loosen the fittings from the blower shaft.



DANGER: To prevent the impeller and upper inside tunnel sheet metal from damage, do not use excessive force when separating the bearings from the impeller shaft. Excess force could cause the impeller shaft to drop down against or through the sheet metal on the upper inside of the tunnel.

8. If necessary use the hammer and brass rod and tap moderately on top of the impeller shaft end until it drops 1/2" to 1".
9. Using the 9/16-inch wrench, remove the four nuts that hold the tower weldment to the tunnel.



NOTE: Make note of the orientation of the tower weldment. In most cases the motor mounting holes are toward the infeed of the machine.

(Continued on the next page)

Corrective Maintenance

Tunnel Blower Bearing Replacement

10. Using the 9/16-inch wrench, loosen the four bolts of each of the impeller bearings and lift and remove the tower weldment while sliding the bearings off the shaft.
11. Remove the four bolts holding the two bearings to the tower weldment and discard the worn bearings.
12. Inspect and clean the impeller shaft. Be especially aware of areas where the pulley set screw and bearings contact the shaft. If the impeller shaft is severely scored or damaged replace it. See tunnel blower impeller and shaft replacement.
13. Loosely install new bearings to the tower weldment.
14. Re-install the tower weldment with bearings to the tunnel by sliding the bearings onto the impeller shaft and fitting the weldment over the studs on top of the tunnel.
15. Re-install and tighten the tower weldment nuts to the tunnel.
16. Tighten the bearings to the tower weldment. Make sure the impeller shaft moves freely up and down through the bearings. There should be 1 to 2 inches of movement.
17. Slide the impeller shaft up and down through the bearings and mark the upper and lower most points of travel on the impeller shaft.
18. Position the impeller shaft centered between the marks and tighten the setscrew in each of the Skwezloc fittings.
19. Re-install the lubrication fittings.
20. Loosely re-install the motor mounting bracket with motor.
21. Re-install the pulley with the cotter key on the impeller shaft, making sure it lines up with the motor pulley and tighten the setscrew.
22. Re-install the V-belt. When installing the V-belt, place a moderate amount of tension on the belt while tightening the motor mounting bracket bolts to the weldment.
23. Re-install the V-belt guard and bolts.

Corrective Maintenance

Tunnel Blower Impeller and Shaft Replacement

The following procedure is used to replace the tunnel blower impeller and shaft. Refer to Tunnel Blower Assembly Drawing in 10 of this manual.

Tools Required: 7/16 and 1/2 wrenches or sockets

5/32 Hex key and T25 Torx wrench

Hammer and 1/2" or 3/4" diameter brass rod (used as a punch)

1. Disconnect and lockout electrical power to the tunnel. Follow company procedures.
2. Allow the shrink tunnel components to cool down to ambient temperature.
3. Remove the associated heater element tray.
4. Remove all weldment and sheet metal plates located directly below the impeller shaft from inside the tunnel.
5. Exit the tunnel and place cushioning material on the tunnel belt to protect the belt when the impeller is dropped onto it.
6. Using the 7/16-inch wrench, remove the four bolts and remove the V-belt guard.
7. Using the 1/2-inch wrench, loosen the four bolts holding the motor mounting bracket with motor to the tower weldment and remove the V-belt.
8. Using the 5/32-inch hex key, loosen the setscrew that holds the blower impeller shaft pulley and remove the pulley and cotter key from the impeller shaft.
9. Using the T25 Torx wrench, loosen the setscrew in each of the Skwezloc fittings on each of the 4-hole flanged bearings and loosen the fittings from the blower shaft.



DANGER: To prevent the impeller and tunnel belt from damage, do not use excessive force when separating the impeller shaft from the bearings.

10. If necessary use the hammer and brass rod and tap moderately on top of the impeller shaft end until it drops onto the cushion on the tunnel belt.
11. Carefully remove the impeller with shaft from the tunnel.

(Continued on the next page)

Corrective Maintenance

Tunnel Blower Impeller and Shaft Replacement

12. Inspect the impeller shaft and bearings for wear and cause of the shaft damage.
13. Install the new impeller with shaft through the top of the tunnel and tower bearings.
14. Slide the impeller shaft up until it stops and temporarily tighten one of the Skwezloc fitting setscrews to prevent the impeller and shaft from dropping down again.
15. Re-install the sheet metal and all weldments previously removed from the inside of the tunnel.
16. Re-install the heater element tray.
17. Loosen the Skwezloc fitting setscrew and allow the impeller and shaft to drop down onto the sheet metal inside the tunnel.
18. Slide the impeller shaft up and down through the bearings and mark the upper and lower most points of travel on the impeller shaft.
19. Position the impeller shaft centered between the marks and tighten the setscrew in each of the Skwezloc fittings.
20. Re-install the pulley with the cotter key on the impeller shaft, making sure it lines up with the motor pulley.
21. Re-install the V-belt. When installing the V-belt, place a moderate amount of tension on the belt while tightening the motor mounting bracket bolts to the weldment.
22. Re-install the V-belt guard and bolts.

SECTION 8

Glossary of Terms

Glossary of Terms

Most every business field has its own language or terminology. The packaging industry is no exception. This section of the manual, Glossary of Terms, was designed to help the customer to become more familiar with this terminology. This in turn will help them to better understand their manual, as well as their machine. Because of the variety of equipment that ARPAC designs and manufacturers, not all of the following features or terms may be applicable to your machine.

45° Air Bar:

Film is fed around a nickel-plated steel bar used to redirect the film at a 90° angle. 45° air bars are required on machines with side film racks, because the film rack is positioned adjacent to the machine.

Acceleration Conveyor:

This conveyor runs a specific speed faster than the device immediately before it. Examples of the devices would be another conveyor or a mechanical pushing device. The function of this conveyor is to create a gap between products.

Accumulation Conveyor:

The conveyor on which products accumulate before entering the machine.

Belt Conveyor:

Flexible fiber or composite material such as silicone fiberglass, which is used as a conveyor belt material. The silicone fiberglass belt is standard on the ARPAC shrink tunnel conveyor.

Bottom Air Flow:

This refers to the airflow in a shrink tunnel that has been specially built to provide air to the bottom of the product. This is most often used with form/fill/seal and Brandpac[®] bottom lap seal applications. Bottom airflow tunnels must be equipped with a roller or a mesh tunnel conveyor.

Glossary of Terms

Bullseye:

A low density Polyethylene (LDPE) shrink film sleeve forms an oval area, void of film, as it shrinks. This is called the bullseye. The size of the bullseye is determined by the width of film used (i.e. The wider the film, the smaller the bullseye).

Collating/Collation:

The process of grouping products together in a pattern. A group of products assembled in a specific pattern.

Continuous Motion:

Refers to the Model 45, 50 and 60 families of wrappers. The seal carriage moves forward as the seal bars close on the sealing stroke and it moves backward to its home position while the seal bars open. This allows for a flying seal head operation, which is essential to increased speeds.

Control Panel:

The control panel is the enclosure, which houses the microprocessor and other electronics. It is either mounted on the right side or left side. The side the panel is mounted on is determined by looking at the system as if the product were flowing through it.

Conveyor Elevation:

This is the measurement from the floor to the top of the system conveyor. The ARPAC standard is 34 inches (+2, -0) on all systems except the continuous motion high-speed wrappers. These wrappers have a standard elevation of 36 inches (+2, -0).

Cooling Section:

The cooling section is mounted at the exit end of the tunnel. Its function is to cool the film wrapped around the product.

Glossary of Terms

Dancer Bars:

Part of the film-feed mechanism which provides a reservoir of film, the signal to activate the pinch roller film feed as needed and controls the film tension at the product.

Dead Plate:

A stationary metal plate that allows a group of products to collect. Applications where a dead plate is used include but not limited to, after the infeed conveyor and before a sliding plate (or grid), or allows products to collect in front of a pneumatically actuated ram pusher plate to move the products to the next station.

Discharge Conveyor:

See **Seal Conveyor**.

Escapement Fingers:

These are individual product detection fingers located in each lane in the lane divider area. The fingers sit on the product as it is moving through the lane divider assembly. If the photo eye connected to the assembly detects fallen, missing or jammed product, the lane divider assembly shuts down.

Film Former:

A device that forms the film in a Form/Fill/Seal application. Types of film formers include inverting heads and plows. Film formers can be fixed or adjustable.

Film Splice Bar:

A heat seal bar mounted on the film rack. It facilitates quick and easy film splicing from roll to roll. It is normally found on side-mounted film racks.

Flow Direction:

The direction a product travels through the wrapping system or on a conveyor.

Glossary of Terms

Form/Fill/Seal:

A method of wrapping in which a product travels through a web of film created by a film plow or a film former. The product is completely wrapped, the bottom is lapped upon itself and the ends are heat-sealed. The bottom lap seal is normally created by heat in the shrink tunnel but can also be formed by a drag wire heat-sealing device. The film can be shrink or non-shrink.

Heater Element Tray:

This is the shrink tunnel heater element tray on ARPAC wrappers. The heater element tray can be pulled out like a drawer, for replacement. This tray contains the heating elements for the tunnel.

Infeed Conveyor:

The infeed conveyor is the first conveyor on the machine, which receives the product from the customer's conveyor.

Interlocks:

Safety devices which interrupt normal machine cycle when a certain condition is met; can be guard door interlocks, product accumulation interlocks, etc.

Lane Divider:

This device can be as simple as a crowd-type lane set-up, where the product is forced into each lane by backpressure or it can be an air-operated or mechanical device that shunts the product into the proper lane. This device receives the products from one lane and places them into multiple lanes.

Leading Edge:

This is the front of the product in the direction of flow.

Glossary of Terms

Main Ram:

The mechanism that moves or transfers products through the seal frame. It is 90° to the product.

Magazine:

A device that stores and feeds stacks of corrugated carton blanks on a tray-packing machine.

Natural Closure:

Refers to the method of closing or sealing the open ends of the sleeve by oversizing the film width. This allows the top and bottom web of film to seal together in the shrink tunnel. The tunnel exit should be equipped with side-smoothing rollers in order to provide a better closure.

Operator Interface:

The external keypad and message display on the main control panel. The interface allows the operator to monitor and diagnose problems as well as set timing functions for conveyors and seal jaws. A security password can lock this feature, making it inaccessible for unauthorized users.

Overwrap:

Overwrap is a method of wrapping in which the film is wrapped completely around the product. Overwrap flight bars wrap the film around the product, leaving a portion of film overlapping under the product. The bottom airflow tunnel causes this overlap to fuse together.

Overwrap Flight Bar:

A mechanically driven device that wraps film completely around the product with the film overlaps on the bottom of the product.

Pacing Flight Bar:

A mechanically driven device that paces and advances the product.

Glossary of Terms

Pacing Gate:

The air-operated device which spaces the product at equal intervals, even though they may have been fed into the wrapper end to end. Normally a minimum four-inch gap is required between products to allow room for the seal bars.

Perforator:

A device which creates small holes along the width or length of the film. Holes are created for air escapement and/or to make the package easier to open.

Photoeye:

Photoeyes are photoelectric sensors are used to detect moving product or machine parts, and provide input to the PLC. They do this by transmitting a beam of light to a photo eye receiver. When the product or mechanical device blocks the beam, the product or device is detected.

PLC:

Programmable Logic Controller. The programmable microcomputer that reads the status of inputs, such as switches, photo-eyes and proximity switches. The PLC also performs programmed logic and controls outputs.

PLS:

Programmable Limit Switch. The device used to turn banks of switches on and off at different times depending on the position of a shaft.

Plow:

A type of film former used in Form/Fill/Seal application. A plow is not adjustable for different product sizes.

Glossary of Terms

Pop-Up Guides:

The air-operated guides that mounted below the machines deck. When activated the pop-up guides keep the products from going astray. When not activated they do not affect the products in any way.

Power Transition Rollers:

Powered rollers, which are small in diameter, are situated on each side of the seal gap to narrow the void and assist in the transition of the product across the gap.

Product Orientation:

The term's length, width and height determine product orientation. Width refers to the product as measured across the conveyor. Length as measured along the conveyor and height as the highest projection above the conveyor.

Proximity Sensors:

Typically, an inductive proximity sensor that detects the presence of metal used to provide input to the PLC, either for normal operation or to detect jam conditions. Also, known as a proximity switch.

Roller Flight Conveyor:

Free turning rollers that are mounted between two chains. When the chains move, the rollers are free to spin under the product thus providing low-pressure accumulation. There is typically one area of the conveyor that has a plate, which contacts the under side of the rollers. This causes the products to accelerate and therefore creates a gap between each product.

Seal:

The ARPAC method of sealing uses two narrow seal bars separated by an embedded hot knife. The hot knife separates the film and a seal remains on each side of the separation.

Glossary of Terms

Seal Bar:

There are two seal bars. One is called the hot bar and the other is called the cold bar. The seal bars are located on the seal frame. They are used to fuse and cut the film between products.

Seal Conveyor:

The conveyor that is located between the seal jaws and the shrink tunnel conveyor. This is where the product being wrapped sits while the film is being cut and sealed. The seal conveyor is sometimes replaced with a dead plate.

Seal Frame:

The assembly that holds and operates the seal bars.

Seal Gap:

The area where a space between the products on the conveyor allows the seal bars to come together, make the seal and cut the film.

Seal Gap Bridge:

An air-operated device that spans the gap so that unsupported products or multi-packs can span the gap without falling in or toppling over.

Servo Motor:

A servo motor is a digitally controlled “smart” motor. Servo motors have programming capability for achieving extremely high speeds, acceleration, deceleration, rapid and frequent starts and stops and precision positions.

Shrink Film:

Extruded plastic with properties that cause shrinkage when exposed to heat. Common shrink films include: Low density polyethylene (LDPE), Polypropylene (PP) and Polyvinyl Chloride (PVC). Shrink film is available in various thickness, called mil gauges (i.e., 0.002 inch = 2 mil.)

Glossary of Terms

Shrink Multi-packing:

The wrapping of a group of products which have been assembled or collated into a specific pattern with no supporting substrate.

Shrink Sleeve Wrapping/Shrink Bundle Wrapping:

This is the process of wrapping an open-ended sleeve of film around a product or group of products, then shrinking the sleeve to fit tightly.

Shrink Tunnel Zones:

This is the area that is heated and controlled by a single element drawer. This area has its own temperature controller and thermocouple feedback probe. Shrink tunnels can have multiple zones. All tunnels less than 83-inches long will have a single zone and 83-, 93-, 110- and 140-inch tunnels will have two zones.

Side Mounted Film Racks:

The film roll rack is mounted on the floor adjacent to the wrapper. The film is threaded around a 45-degree air bar and then through the pinch roller wrapper. The side-mounted film racks are designed for film roll loading with a 36-inch maximum lift.

Side Seal:

Is the closure of the open ends of the sleeve formed by a sealing device. ARPAC offers systems equipped with a U-Bar side seal, a side seal with and without trim, a side fold and tack and a side fold and multi-tack seal.

Solenoid Valve:

This electrically controlled mechanical device controls the airflow to the pneumatic cylinders on the machine. These are typically located together at the base of the wrapper, on the control side.

Glossary of Terms

Stacker:

Refers to the device that stacks the product. The stacker may either be a freestanding unit prior to the infeed of the system or an integral part of the machine located just prior to the seal bar.

Starwheel:

A star shaped device that reorients the position of the product. Star Wheels may also be used for product pacing purposes.

Static Seal:

A device that applies high voltage to the film overlap in bottom lap seal applications. This makes the film adhere to itself with static electricity.

Table Top Chain:

This is a plastic conveyor material that is available in a wide range of surface configurations. It is normally used in Multi-packing applications.

Telescoping Conveyor:

A special modification to a fabric belt conveyor that allows the conveyor to extend or retract without affecting belt length or tracking. This can be used on Models 45, 50 and 60 or as a transition bridge on some inline wrappers.

Torque Limiter:

A mechanical device that disengages the drive input from its driven output when a specific amount of torque is applied that is above starting and normal operating torque values. When its torque limit is reached or exceeded, the limiter will disengage and spin freely.

Thermocouple:

This is the device that detects the temperature of a specific area or device. These are typically located in the hot seal bar and in the heater bank chamber of the tunnel.

Glossary of Terms

Tray:

A corrugated or paperboard substrate with low sidewalls and end panels. Trays are required in order to sleeve wrap a product on an inline tray wrapper. They are also required for use of our tray loading systems.

Tunnel Blower:

The tunnel blower is mounted to the top of the tunnel directly over the heater elements. The number of blowers used depends on the application. The blower circulates the air through the tunnel, pulling the air from the tunnel up through the heater elements. The heated air then travels into the tunnel through an enclosed duct system. It enters the tunnel from the sides and the bottom. The air that is inside the tunnel is then pulled back up through the heater elements.

Tunnel Louver:

These are the mechanical controls located at the exit end of the tunnel and sometimes also located at the infeed end. These control the amount of force and the direction of the side airflow within the tunnel. Adjusting these will change the way the film shrinks around the product.

Venturi:

A short tube with a constricted passage used to lower the pressure of fluids that travel through it. Used to create a vacuum for suction cups.

Uponder:

The upender reorients the product 90° by using a type of lift method.

Z Flow Wrapper:

Also known as an offset infeed system employs two rams. The first ram moves the product left or right and the second ram, the main ram, advances the multi-pack through the web of film. The Z Flow wrapper is normally used for collating applications or to facilitate an inline flow where the product must be advanced through the film with a ram.