SHRINK®

by

AMTI PRODUCTS

OPERATING INSTRUCTIONS SHRINK

READ CAREFULLYBEFORE OPERATING YOUR MACHINE

Published by:
AMTI PRODUCTS

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AMTI Products reserves the right to make technical changes in the system depicted and indicated in these instructions if such changes are necessary to improve the machine.

A Safety Note:

Your good manufacturing practices should insure that a written safety program is in place, which includes the assessment of all processes that take place in house, for potential risks.

The employer response to this assessment is to establish specific instructions for the safe use of all machines, safe use of certain chemicals, etc. in your work place.

For instance, any user of electrical machinery, SHRINK included, must be instructed that **never, under any circumstances**, should a machine be left on while attempting to clear a jam, if it should occur.

This written rule, along with other directives, should be translated into either a training document that is signed or work instruction that is also signed and dated by all operators and that ideally remains with the equipment as a reminder of safe operation.

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Important Safety Precautions:

Always turn off the machine AND unplug the unit before opening the front panel.

Table of Contents

REFERENCE DOCUMENTS

1. Introduction

The “SHRINK” oven complies with CSA 88, meets CE power requirement specifications and meets FCC class B emission standards. The oven is constructed of Aluminum and Stainless Steel.

The oven is designed to operate over a range of temperatures from 100°F to 350°F. Temperature is settable in 1°F. Conveyor speeds are settable by increments of 0.1 inches. The range is from 0.8 inches per minute to 100 inches per minute.

The internal heat chamber is 52 inches long. Heat is provided by 4 heating elements of 2500 watts each. Air flow is provided by two cross flow blowers with air flow from the top and bottom of the plenum exiting on the side. The air flow system is self contained in that the only heated air that escapes from the system exits from the doors on either end. For maximum efficiency it is advisable to only open the doors high enough for the material running through the oven. The effective door opening for material is 12 inches wide by 6” high.

Programs may be set for various types of jobs that may be run in your manufacturing facility. There are 99 programs available (1-99) each recording convey speed and temperature. Loading a program will automatically set temperature and speed.

Start up and shutdown times may also be set as well as the days of the week that the unit is to be in operation. The oven takes about 30 minutes max. to reach temperature and stabilize.

2. General Operation

Connect the Shrink to a power line of 213 V min. – 225 V max., 20 A. Voltages outside this range may cause damage and/or performance issues and void your Warranty. Turn on the switch on the right side of the control box. The electronics will initialize and the date and time of day will come up on the first line. The word “Ready” will appear on the second line. The unit has been shipped from the factory set for inches and degrees Fahrenheit.

To start the conveyor push the “start/stop” key on the matrix switch. The conveyor starts running at a slow speed. Speed may be changed by pushing the “speed” key followed by the desired speed in inches per minute. Such as 45.1. The “Enter” key must complete all commands. The following is an example:

“SPEED”, 45.1 ,“ENTER”

The conveyor is a digital system using a stepper motor. The system has been precalibrated and will be very accurate and exactly repeatable.

Temperature is entered in the same way. Press the “Temperature” key followed by the required temperature and then the “Enter” key. The following is an example:

“TEMPERATURE”, 305 , “ENTER”

To shut down the system set the temperature to zero.

“TEMPERATURE”, 0, “ENTER”
The unit will go through a cool down procedure and then shut off the blowers and the conveyor. To start up, simply enter a temperature greater than zero. It is not necessary to turn off the power switch on the side of the unit.
When the auto start-up mode is set, the unit will start up and run at the program number set when start-up was enabled. Do not turn off the power on the side of the control box if you want the unit to restart automatically for the next shift.

3. Temperature Control

To set temperature push the “Temperature” key followed by the desired temperature and then the “enter”. The following is an example:

“TEMPERATURE”, 295, “ENTER”

When starting up at the beginning of a shift, allow at least 30 minutes for the oven to come up to temperature and stabilize.
In reality, the oven will be in a constant state of restabilizing, due to the material flow through the system. The system operates by measuring the return air temperature and pieces evenly spaced on the conveyor), the system will hold the temperature stable. If the work flows through intermittently, expect that the oven temperature will be moving up and down constantly trying to restabilize. The amount of temperature variation will depend greatly on what is being processed by the system.

There are two high limit safety switches set for 425°F. These switches are in series with the main contactor’s energizing coil. One switch is over each heater. If for some reason air flow stops, when temperature reaches 425°F above the heater, the switch will open and shut off the contactor. The control board will sense that this has happened and will not allow the unit to come back up to temperature unless the system is totally shut down, using the switch on the side of the control box. Clearly, if a high limit switch shuts off, the system should not be run again until the cause has been found and corrected. An example of this might be that a fan belt has stretched, is slipping and the cross flow blower is no longer running up to speed.

There is an upper temperature limit of 350°F. If you enter a number higher than 350°F, the system will recognize this as an entry of 350°F. For example: an entry of 450°F will be actually entered and shown as 350°F.

4. Conveyor speed control

When the unit is first turned on the conveyor may be started using the start/stop key. The conveyor will run at the default speed of 8 inches per minute. To set a new speed, press the **“Speed”** key and enter a number such as **45.5** followed by the **“enter”** key. The following is an example:

SPEED, 25.7, ENTER

The conveyor will ramp up or ramp down to the new set speed. The control system drives a 1.8° stepper motor through a 32:1 precision gear box. The sprockets on the

conveyor are 2.7 inches in diameter. Each step of the stepper motor moves the conveyor forward .001325 inches. There is an upper limit allowable of 100 inches per minute. If you input a number for speed higher than 100, it will be accepted but entered as 100.

Resonances in stepper drive systems:

Stepper motors are relatively noisy. You may not notice it if your environment is also noisy. However, at certain speed you may pick up resonance in the structure, which will increase the sound. We have done our best to insulate the stepping noise. Unfortunately, you might find some speed that may be undesirable to use because of sound. Loading the conveyor with material will greatly reduce this noise. It is suggested that when not in use, you drop the conveyor speed down to one that produces an acceptable sound level. Slowing down the conveyor when not in use will also increase its life span. Remember, the belting, even if it is stainless steel, has a definite life span and must be considered a replaceable item. Conveyor life span is affected by user care during operation, as well as by conveyor speed and the weight of the material that is being run.

5. Finding the best settings for your job

Certainly, you will want to process material as fast as you can. This may be achieved by cranking the temperature up to 350°F, running the job through and adjusting the speed until the heat shrink tubing has constricted to produce acceptable results. Unfortunately, there may be some materials that in your assembly that may not tolerate higher heats. It also depends on the mass and geometry of the product that you are working with.

A transformer assembly, where terminal wires have heat shrink tubing on them, can run through fairly quickly. The terminals are exposed to the air flow of the system and the transformer is such a larger mass that it will barely heat up when the heat shrink tubing is correctly constricted. However, please also note that the large transformer will absorb a lot of heat energy from the system and affect temperature stability.

Small wire assemblies should run through at high temperatures at speeds in excess of 60 inches per minute. Experience will enable you to get quite close on a new job the first time.

6. Programs

After you have spent some time getting a job to run just perfectly you may want to record these numbers for future runs. The SHRINK allows you to store up to 99 prerecorded programs. Each program contains the program number, the oven temperature and the conveyor speed.

To record a program, press the "**program**" key followed by a number of your choice between 1 and 99 and then the "**enter**" key. The control will look up that program number and place the settings for that program on your screen. If there is nothing entered, it will prompt you for the settings. The following is a sequence of operations:

PROGRAM 23 ENTER

Assuming the space for program number 23 is empty, the control will post on the LCD display:

“Speed = “

You enter

60.0, “ENTER”

The control displays

“Temperature”

You enter

310, “ENTER”

The control now shows both entries on the LCD module and further displays:

“Press **ENTER** to start, **CLEAR** to exit”

Pressing the **“ENTER”** key starts the machine running with the new parameters.

7. Programmable Settings

To change any settings it is first necessary to enter the programming mode. This is accomplished by the key sequence:

“PROGRAM”, “PROGRAM”, “ENTER”

The LCD will now scroll through all the options for programming.

“1. Set Date, Time and Day of Week.”
“2. Set start up time.”
“3. Set shut down time.”
“4. Set week days of auto on/off.”
“5. Activate/de-activate auto on/off.”
“6. Display total running time in hours.”
“7. Set units of measure in inches or cm.” (currently not used)
“8. Activate/De-activate SCHEME.”
“9. Exit”
Select the task and press the numbered key as indicated. The sections that follow will indicate how to proceed.

8. Set time of day, weekday and date

To change any settings it is first necessary to enter the programming mode. After entering the programming mode review the scrolling and select:

"1. Set Date, Time and day of week."

Press the **"1"** key**.** The LCD will display:

"Hr:Mn:Sc Dy:Mn:Yr Day(Monday=1)"

- ***Time is recorded using a 24-Hour Clock. Two digits must be entered for each number. Enter time as: 04:55:00 (for AM) or 16:55:00 for PM) followed by the ENTER key (the computer will add the colons automatically).***
- ***Next enter the date as day month year. Two digits must also be entered for date. 23:03:01 (March 23, 2001) followed by the ENTER key.***
- ***Next enter the day of the week. If it is Wednesday press the 3 key. The display should now read:***
  04:55:00 23:03:01 Wednesday
- ***If this is acceptable, press the ENTER key once more and the time and date are recorded.***

9. Set start-up time

To change any settings it is first necessary to enter the programming mode. After entering the programming mode, review the scrolling and select:

"2. Set start up time."

Press the **"2"** key**.** The LCD will display:

"Hr:Mn:Sc"

Time is recorded using a 24-Hour Time Clock. Two digits must be entered for each number. Enter time as: **04:55:00** for AM, or **16:55:00** for PM, followed by the **ENTER** key (the computer will add the colons automatically).

10. Set shut down time

To change any settings it is first necessary to enter the programming mode. After entering the programming mode review the scrolling and select:

"3. Set shut down time."

Press the **"3"** key**.** The LCD will display:

"Hr:Mn:Sc"

Time is recorded using a 2400 type clock. Two digits must be entered for each number. Enter time as: **04:55:00** (or 16:55:00 for PM) followed by the **ENTER** key (the computer will add the colons automatically).

11. Set week days of auto on/off

To change any settings it is first necessary to enter the programming mode. After entering the programming mode review the scrolling and select:

"4. Set week days of auto on/off."

Press the **"4"** key**.** The LCD will display:

"Select days to auto on/off. (Monday = 1)"

12. Activate/Deactivate auto on/off

To change any settings it is first necessary to enter the programming mode. After entering the programming mode review the scrolling and select:

"5. Activate/Deactivate auto on/off"

Press the **"5"** Key. The unit will display:

"set start up (1) or shut down (2)?"

Start up
If startup is selected (the **"1"** key) and the start up is already enabled, then the unit will further display:

"Enable (1)/Disable (2) Start up"
"Auto start up enabled. Program No XX"

If start up is disabled, the unit will display:

"Enable (1) / Disable (2) Start up"
"Auto start up disabled. Program No XX"

If you wish to enable start-up, press the **"1"** key. The program number will alternate between blanks and the currently-entered program number. If this number is correct, press the **"ENTER"** key. If you wish to change the program number, simply enter the new number now. Then press the **"ENTER"** key. Check the number you have entered. If it is correct, press the **"ENTER"** key again.

The unit will start up at the prescribed time on the prescribed days of the week and run the program number you have entered.

Shut down
If you wish to disable auto shut down after pressing the **"5"** key (at the top of this page) press the **"2"** key. The following screen will be displayed:

"Enable (1)/ Disable (2) shut down"

Press the desired key followed by the **"ENTER"** key

13. Total machine running hours

The total machine running hours is clocked to the conveyor system. If the conveyor is not running, no machine time is recorded. Enter the programming mode and select from scrolling item 6:

"6. Display total running time in hours."

The total running hours will be displayed. The last digit represents 1/10 of a minute (6 seconds). To exit press the **"CLEAR"** key

14. Set English or Metric - discontinued, no longer a part of the program

15. Activate/De-activate – SCHEME

SCHEME – Speed Controlled Heat Energy Management Enviroment

No one loads a conveyor oven uniformly. As a result, the oven temperature varies as the oven struggles to control temperature.

The Shrink ™, with **SCHEME**™ automatically varies the speed of the conveyor to compensate for changing temperatures. The result is a constant heat - time product that insures superior uniformity of output product at speeds to 100 inches per minute. There is little or no waiting to load the conveyor. High velocity air flow makes through put 2 - 3 times higher than most ovens currently available.

When **SCHEME**™ is enabled, the device delivers this benefit automatically, without any need for operator input or interfacing.

To change any settings, it is first necessary to enter the programming mode. After entering the programming mode, review the scrolling and select:

"8. Activate/De-activate - SCHEME."

Select Option 8 by pressing the **"8"** key.

The display will indicate:

SCHEME - Enable press 1, Disable press 2 Current setting - SCHEME enabled

After selecting what you want, press **"ENTER"**. If you decide to exit without changing anything, press **"CLEAR"**.

16. Care and maintenance

DO NOT PERFORM MAINTENANCE ON THE OVEN WHEN THE POWER IS CONNECTED!

The SHRINK is constructed of aluminum and stainless steel. Bearings are all sealed and stainless steel. There are dual drive belts that drive the blowers. These belts (4 in total) are the most likely candidates for wear and adjustment. These belts may be tightened. However, this requires removal of the main cover for the oven belts and removal of the controller cover for the motor drive belts. If you believe that the belts are slipping, you can check this by reaching into the oven **(when it is off and cold please!!)** and rotating the blowers by hand. The blowers will have a good deal of resistance to turning if the belts are tight, since you will be turning the whole motor pulley system. If the belts are slipping **big time**, the heater elements will overheat and trip the safety over limit switches (set at 425°F)

The next thing that may need periodic attention is the gearing system for the conveyor. Grease has been applied at the factory. Periodically the input housing should be removed and high-quality grease applied to the gears. The gears are Stainless Steel and are pinned in place.

The conveyor itself is made from stainless steel wire. The life expectancy of the conveyor cannot be predicted since it is dependent upon care taken by operators during use and how heavily it is loaded while it is running. For instance, if you are running transformer assemblies all day, expect less life than if you are running cable assemblies. Accordingly, the stainless steel belting is the very best we could pick for this application but it is a perishable and therefore not part of the system guarantee.

17. Safety systems

The oven has been tested under CSA 88.

There are two snap action high limit switches (one above each heater) that limit the temperature at that point to 425°F. If they drop out, the unit will shut down and cannot be restarted unless the main power switch has been turned off and back on. Should a high limit shut down occur, the cause should be found and corrected before the oven is turned back on.

There is a fuse in series with the motor to protect the motor in the event of a locked rotor condition. If this fuse blows, it also shuts down the entire oven and the oven cannot be restarted unless the main power has been turned off and back on. Causes of this type of failure may be a bearing that has locked up or foreign material has entered the blower system and locked up a blower.

In the event of a problem, the main switch on the side of the unit will shut down the conveyor and the electronics.

If all safety systems fail, the blowers are not running and the solid-state relays are locked on, the heaters will overheat and fail in the open (off) condition.

18. Fuses

The fuses in the unit are based on the requirements of the agency specifications and the tests that have been satisfied. Any changes to the fuse sizes will void the listing validation as well as the warranty on the oven.

The main fuses are 25 amp. The electronic fuses are 2 amp. The motor locked rotor safety fuse is 0.75 amps.

Please note that these fuses should not fail. Repeated blowing of fuses is an indication that something is wrong with the system and should be investigated.

There are 3.15 amp fuses located on the conveyor motor driver board. One fuse for each phase. They are designated F1, F2, F3 and F4 on the board.

19. Trouble-shooting

Motor conveyor motor does not run.

In the event of power turning off and on, such as occurs during a lightning storm, the fuses on the conveyor motor driver board may blow. Indication of this is if the motor hums but does not move the conveyor. Usually two out of the four fuses will fail so look for both of them. Do not replace the screws in the cover until you have turned the unit back on and you are satisfied that the motor is running. **Do not increase the size of these fuses.** They are designed to protect the motor and the driver transistors. A fuse is by far less expensive that fixing the driver board or replacing a motor.

No heat

If the temperature sensor (RTD) becomes disconnected or fails, the unit will not heat up. The display will likely indicate the temperature is 352°F. This problem can only be corrected by fixing the connections or replacing the RTD. The RTD, however, is a resistive element with a low probability of failing. It can be checked by measuring it with an ohm meter. At room temperature it will measure approximately 108.5 Ohms at 70°F.

If the blower is also not running, check the motor safety fuse.

If the blowers are running, and the temperature reads 100°F (this is the lowest it reads) and you have the temperature set for at least 150°F, check the voltage on the DC side of the 50 amp SSR. This voltage should be over 4 volts DC (after about 5 minutes of on time). If this is true, shut down the system and check the heaters for continuity. They

should be about 6-7 Ohms each. If they have failed, they will measure higher (10+ Ohms) in an open circuit.

20. Service policy and warranty

Two years on electronics

One year on mechanical components

(With the exception of the stainless steel conveyor belt, bearings)

We will provide parts, repair or replace, at our option, the unit that malfunctions due to defects in workmanship or materials. We will ship parts under warranty at our cost UPS ground.

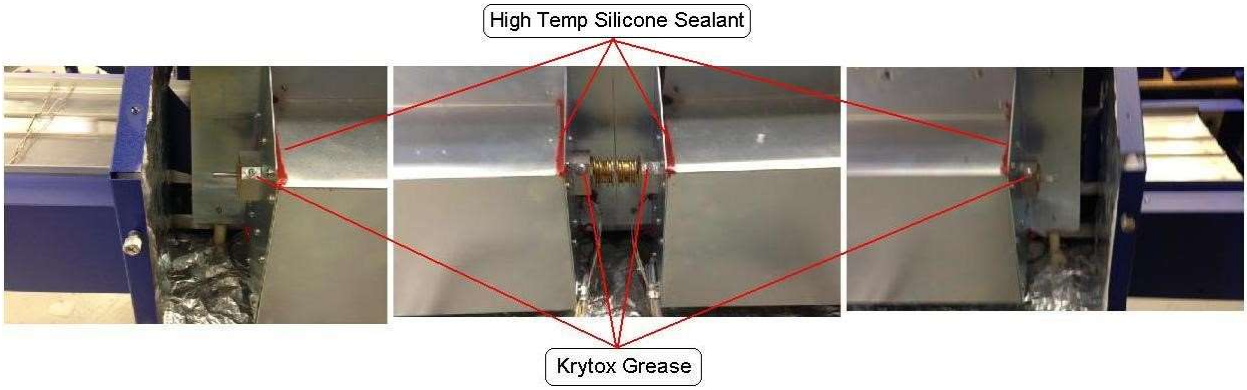
If the unit is returned for repair, customer pays freight to AMTI and AMTI will pay standard delivery freight on return shipment.

Use of this device outside the parameters of its stated capabilities will void the warranty. AMTI reserves the right to make that evaluation.

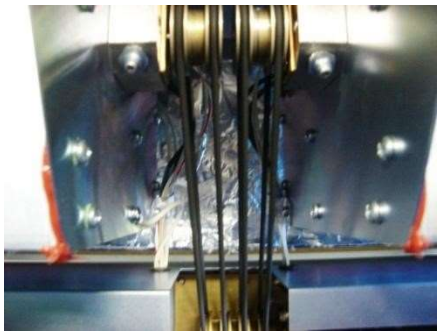
SHRINK Maintenance

1. Every 250 hours of use, the blower shafts and bearings blocks should be greased with Krytox high temperature grease [withstands temperature up to 550 degrees Fahrenheit].

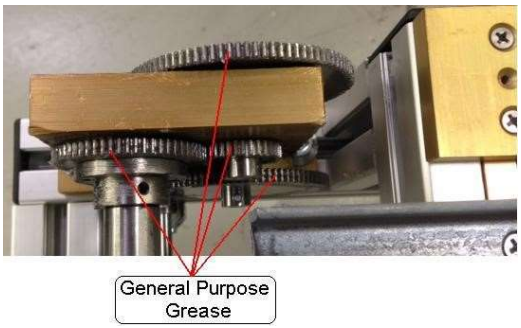
    - On older ovens [bearing blocks without grease fittings], remove bearing blocks, pack blocks with grease and coat shafts.
    - On newer ovens (bearing blocks with grease fittings), pack bearing blocks with grease through fittings.



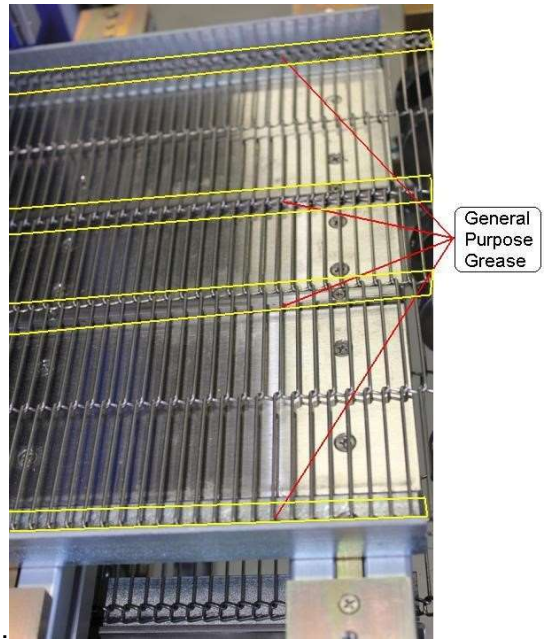
2. Check if the red silicone sealant is in good condition, replace it if not. *See #1 picture.*
3. Routinely check the blower drive belts for their condition, noting any possible need to replace them.



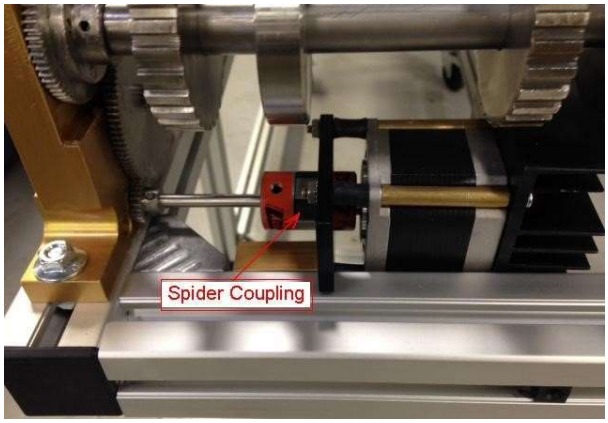
4. Depending on the level of use of the device, from time to time, you should shut down the SHRINK, allow it to cool **and unplug it**. Then, a vacuum can be run in the conveyor area to remove any small particles that may accumulate. *See #6 picture.*
5. Review the conditions of the conveyor. It may need tightening after extended use and processing of heavy assemblies.
6. The gears in the gearbox [which connects to the motor that drives the conveyor belt] should be greased every 400 hours.



7. The areas of contact between the conveyor belt and its guide should be greased as needed for noise or 500 hours [only if the belt is stainless steel].

i. 

8. Spider coupling [SUP3281] should be inspected and replaced if worn. Time to replace the spider depends on the weight of the material on the belt.

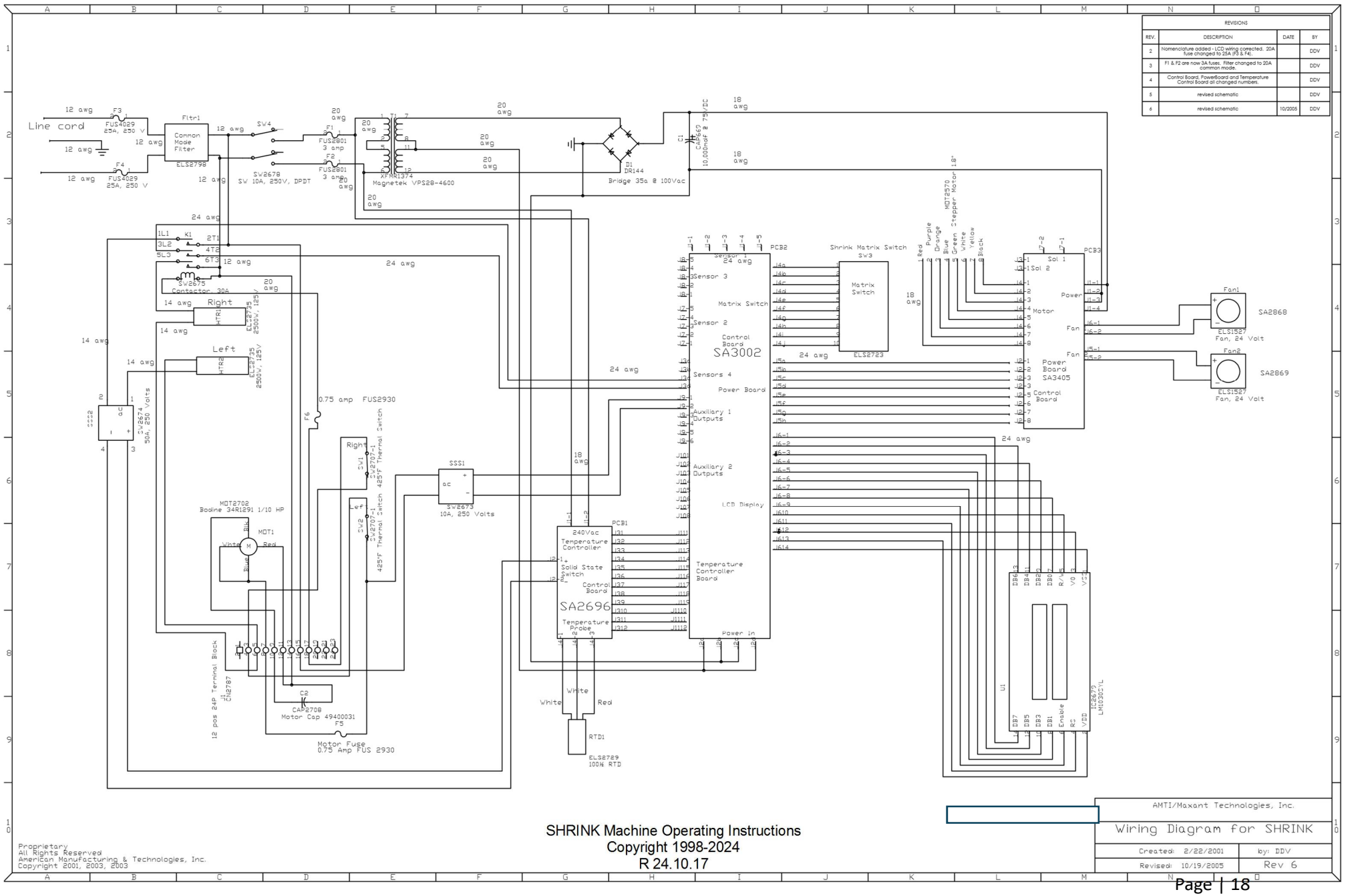


RECOMMENDED FOR MAINTENANCE:

BLOWER HOUSING SEALANT		
McMaster-Carr#7644A12		High Temp Silicone Sealant - Red
BLOWER BEARING GREASE		
McMaster-Carr#10195K37		Krytox GPL 227 2 oz.
McMaster-Carr#10195K57		Krytox GPL 227 8 oz.
GEARBOX AND BELT GREASE		
McMaster-Carr#1378K34		General Purpose Grease

SHRINK RECOMMENDED SPARE PARTS

PART NAME	PART NUMBER	# PER MACHINE
Highly recommended		
spider coupling	SUP3281	1
blower belt	SUP3320	4
25A fuse	FUS402	2
2A fuse	FUS2801	2
3.15A fuse	FUS1349	5
blower bearing	SUP3265	8
Others		
blower	MFB2550	2
conveyor belt	SUP2598	1
rtd probe	SA2937	1
temp. limit switch	SW2707	2
long heater element	ELS3983	2
short heater element	ELS3984	2
blower motor	MOT2702	1
stepper motor	SA3788	1
LCD display	SA2858	1
temp. contr. board	SA2696	1
control board	SA3002	1
power board	SA3405	1
gear - gearbox	GR2580	2
gear - gearbox	GR2581	2
gear - gearbox	GR2582	1
gear - gearbox	GR2583	1
gearbox bearing	SUP1598	6
wear bar, noise red.	MFB4104	1



SHRINK Machine Operating Instructions
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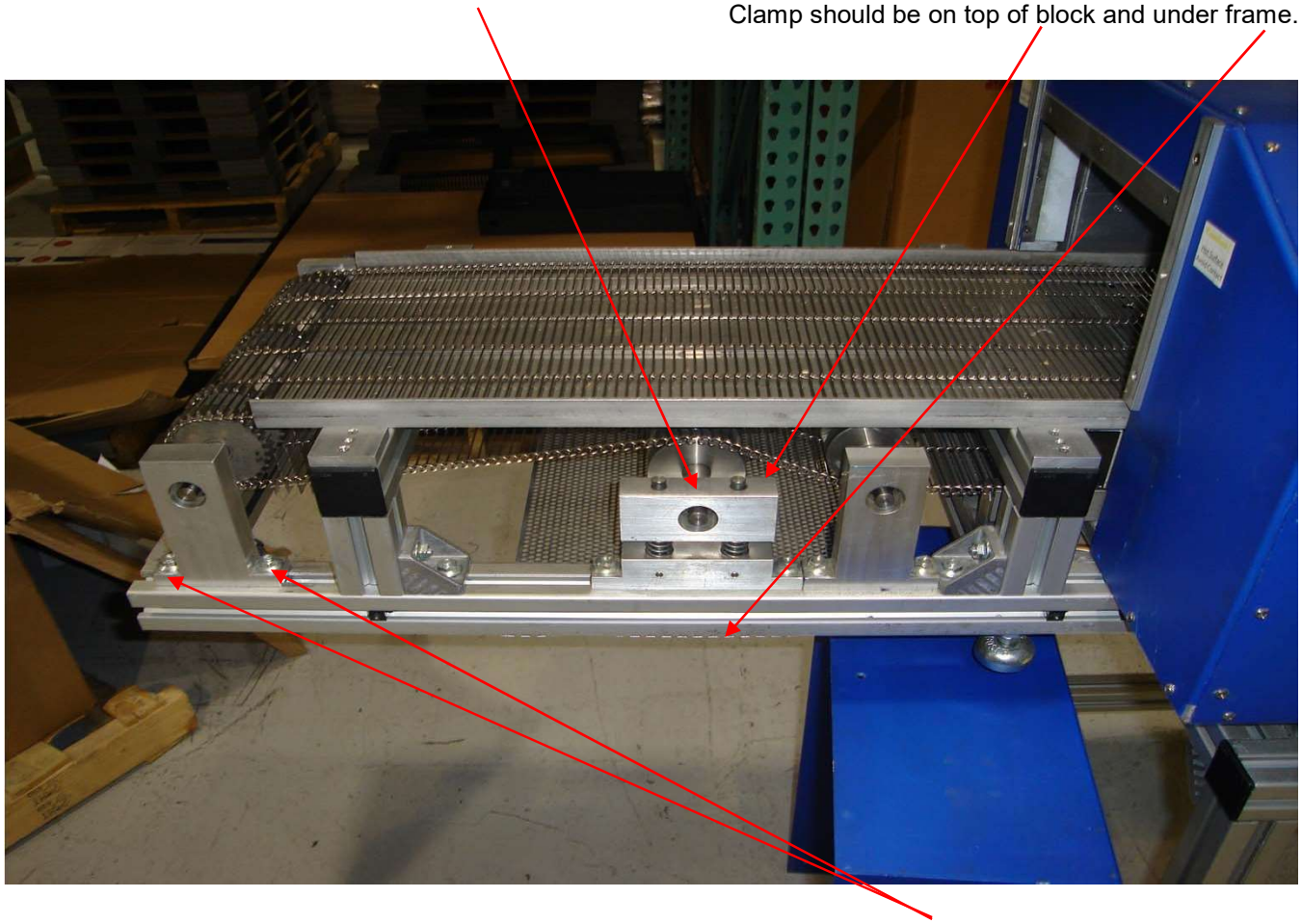
SHRINK - Instructions to Tighten or Replace Belt

1. Shut power off to unit.
2. Remove blue covers around belt on input and output side of unit.
3. Using C-clamps, clamp block down to base block on each side of unit, relieving belt tension.

Clamp should be on top of block and under frame.



4. On **OPPOSITE SIDE OF MACHINE (output side, not bolts in picture)**, loosen bolts from pillow blocks at end of machine so pillow block will slide in, relieving additional tension.
5. Cut 1 link out of belt.
6. Pull belt tight overlapping ends. Cut away excess belt so there is a 1 link overlap.
7. Cut 1 link out of the excess, this will be used to splice belt back together.
8. 2 pairs of needle nose pliers will be needed to splice belt together. See following pages for instructions.
9. Pull pillow blocks on output side as tight as the belt allows while keeping them parallel, tighten bolts.
10. Remove C-clamps so tensioner is released into belt.
11. Replace covers.
12. Belt is tightened and ready to run.

SPLICING THE FLEXX FLOW BELT

STEP 1—Position belt on your equipment as shown in figure I and refer to the belt as Section "A" and Section "B" (Note direction of travel).

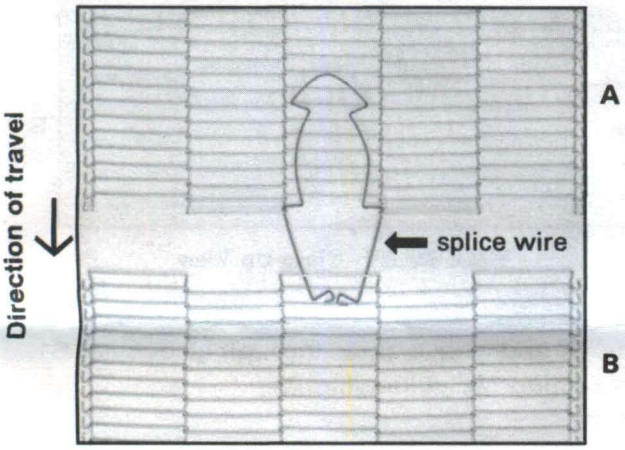


FIGURE I

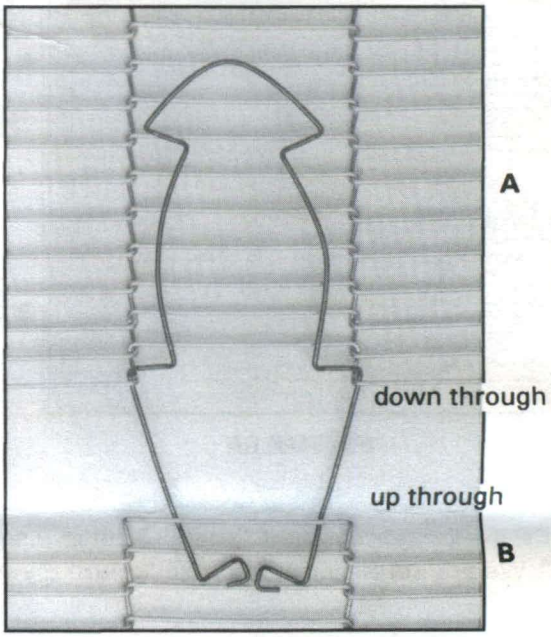


FIGURE I - Close Up View

STEP 2—Carefully bend the center span of the splice wire, as shown in figure I, trying not to distort the "Z" bends. Insert the splice wire down through the top of section "A" and up through the bottom of section "B".

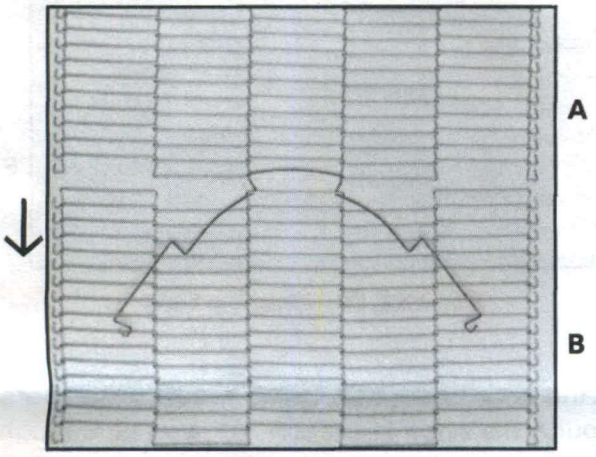


FIGURE II

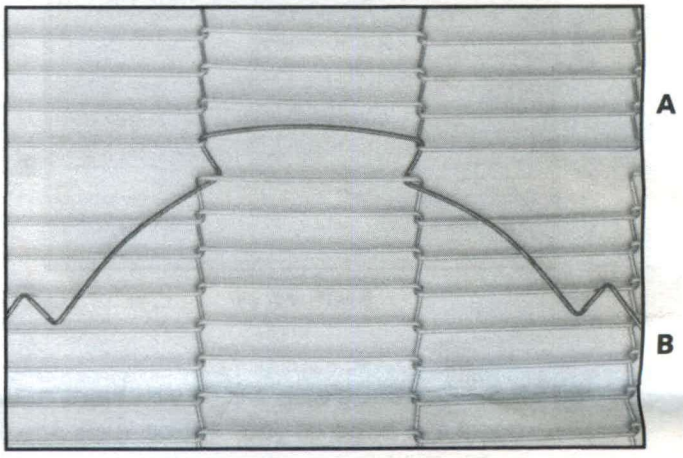


FIGURE II — Close Up View

STEP 3—Pull splice wire through until belt comes together as shown in figure II.

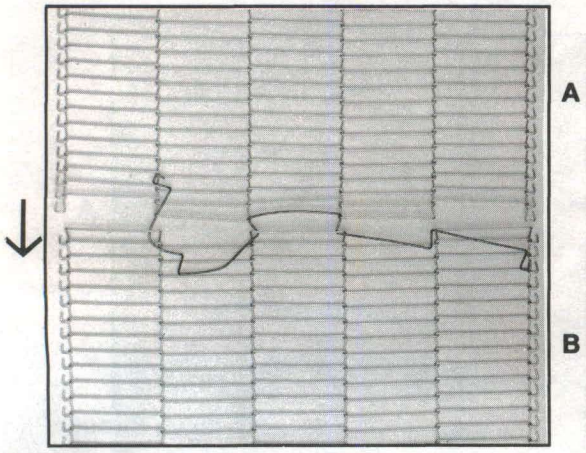


FIGURE III

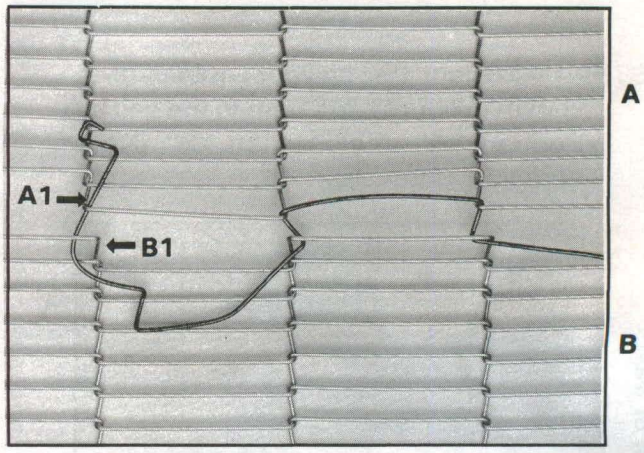


FIGURE III - Close Up View

STEP 4—Locate the next "open" Z bend in section "B" and weave down through at location B1. Weave up through the next "open" Z bend in section "A" at location A1.

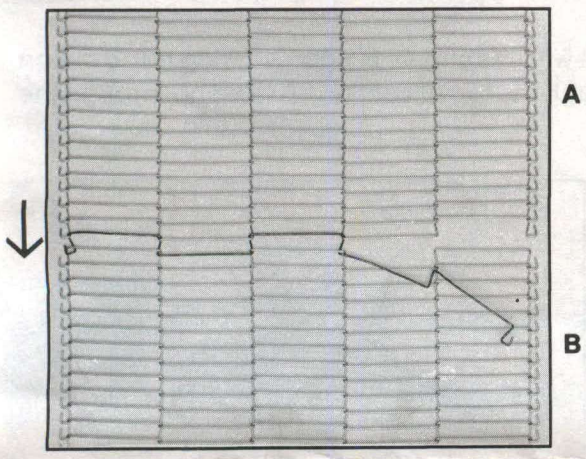


FIGURE IV

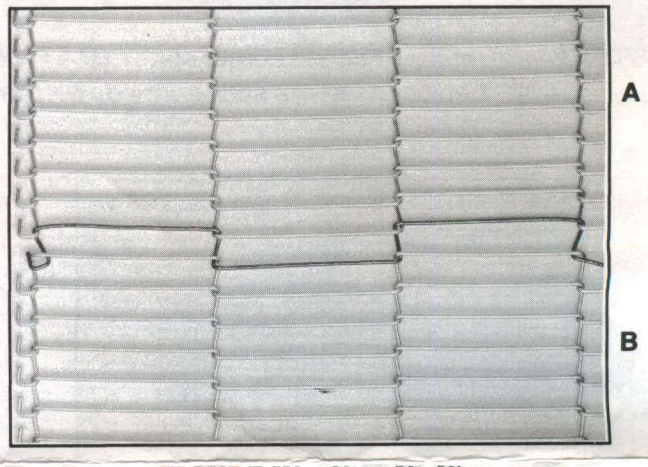


FIGURE IV - Close Up View

STEP 5—Continue step 4 until you have reached the edge of the belt. Using needle nose pliers bend the edge of your splice wire down through the edge in section "A", and up through section "'B".

NOTE: It is best to start weaving from the center of the belt and work towards one edge.

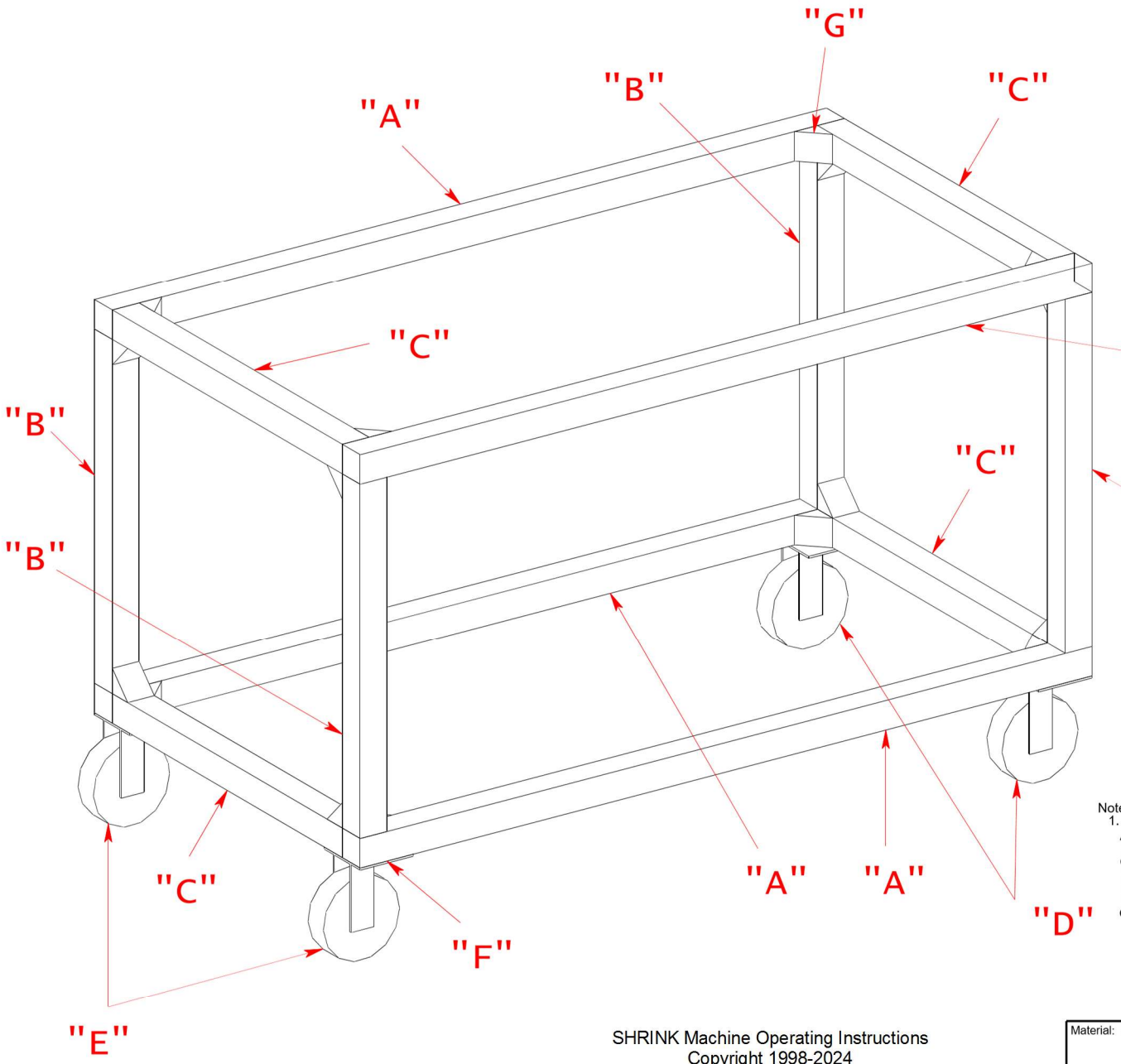
Once completed, weave the other side of the belt.

STEP 6—Repeat steps 4 and 5 to complete the other side of the belt.

STEP 7—Straighten the splice strand as much as possible.

NOTE: For temporary emergency splicing, splice clips are available for all belts. In addition, stainless steel splice tubes are available for the .092 diameter wire (Part # T92). Both splice methods are temporary and should be replaced with a full width strand when time permits.

Revision History			
Rev	Description	Date	By



Notes:
1. Materials used:
   A. Bosch extrusion 45 x 45 cut to 48" 8981-004-773 - [4]
   B. Bosch extrusion 45 x 45 cut to 21" 8981-004-773 - [4]
   C. Bosch extrusion 45 x 45 cut to 22.5" 8981-004-773 - [4]
   D. Bosch fixed caster 3842-259-793 - [2]
   E. Bosch swivel caster 3842-259-791 - [2]
   F. Bosch caster hardware for mounting casters 3842-259-794- [4]
   G. Bosch gusset kit 3842-523-561 - [16]

SHRINK Machine Operating Instructions
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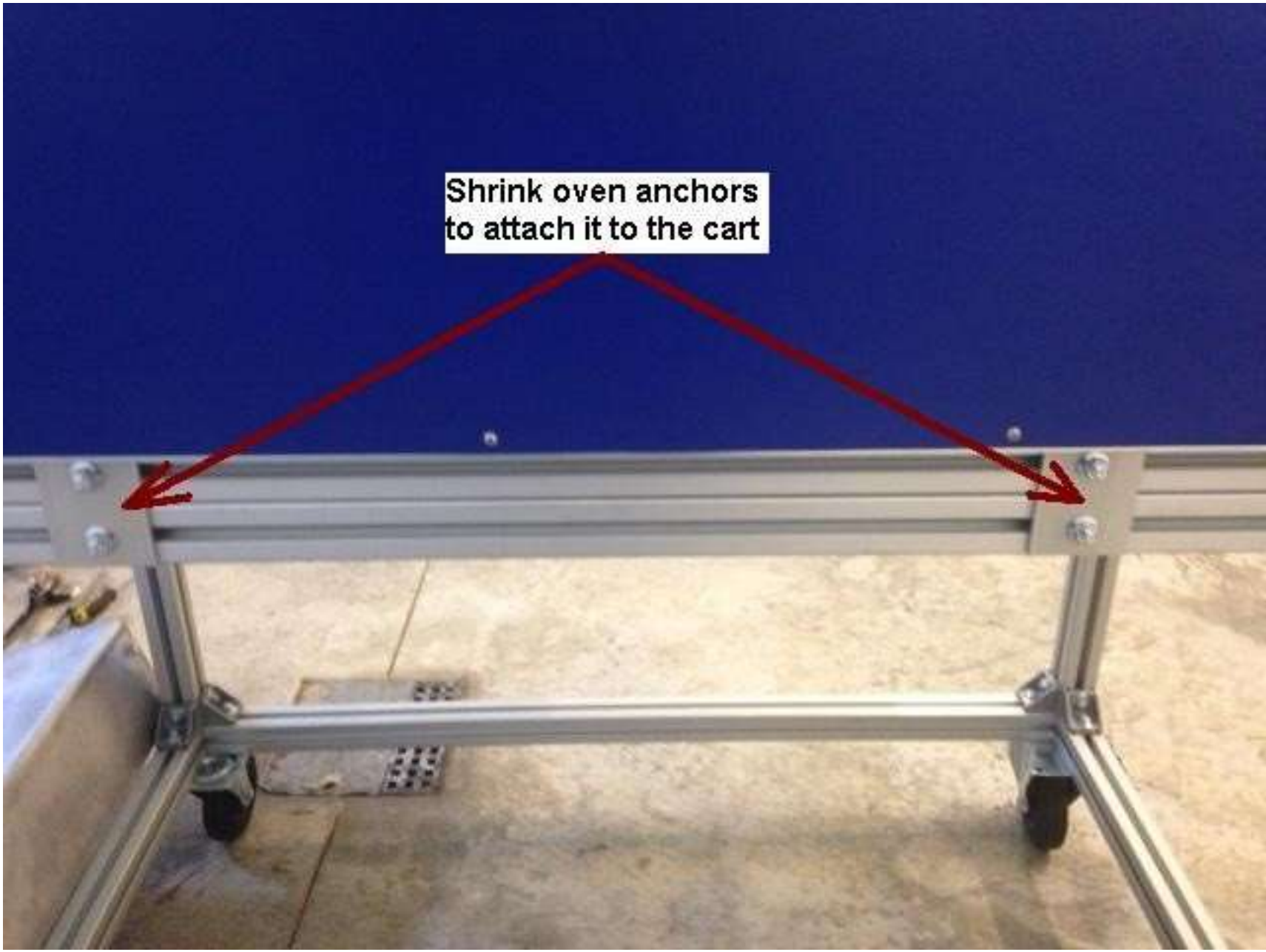
R 24.10.17

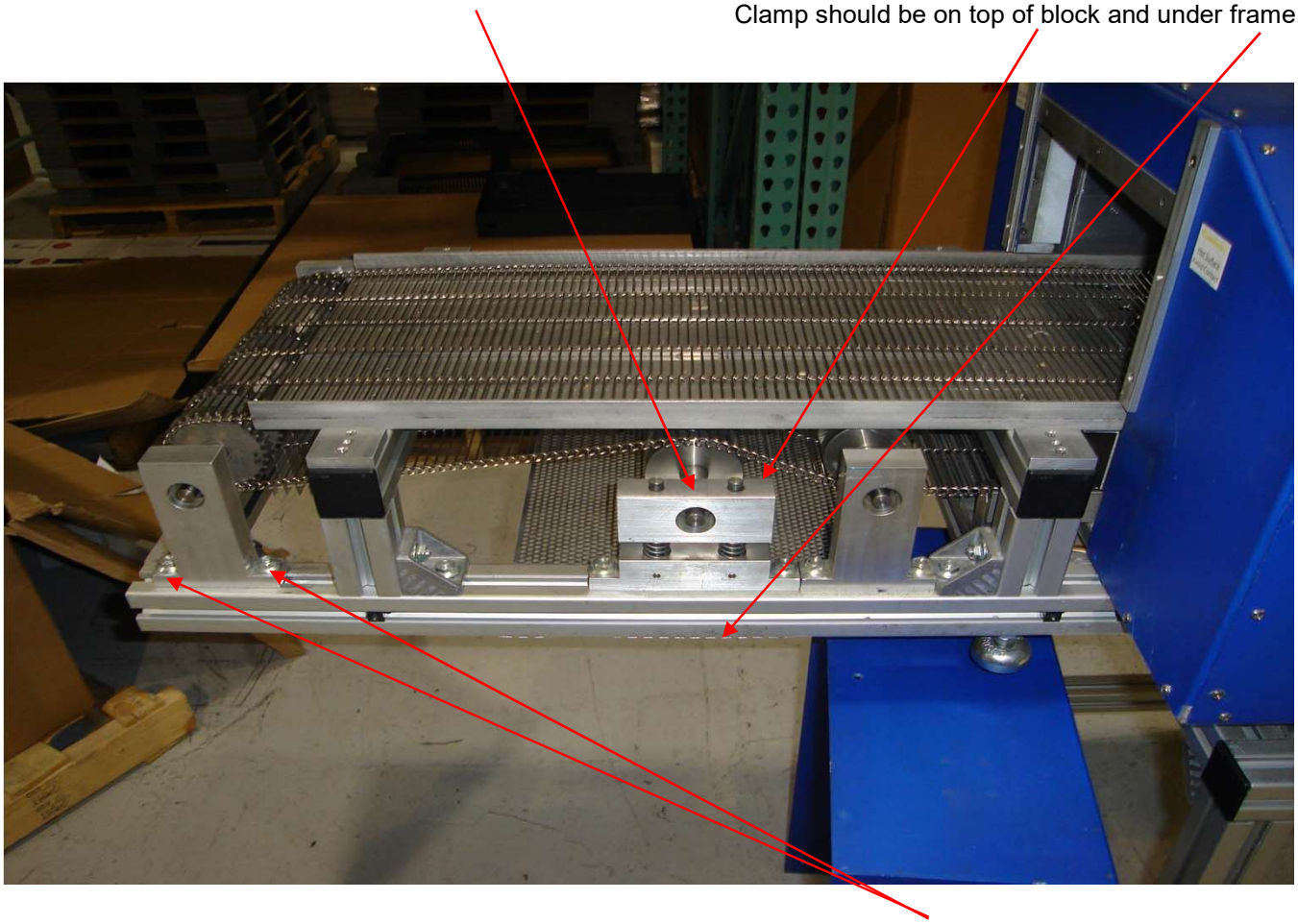
Material: See notes.		
Tolerances: Fraction ± 1/64 .xx ± 0.010 .xxx ± 0.005 .xxxx ± 0.0005 Angular ±0¦30' [unless otherwise noted]	Shrink Cart Assembly Scale: 1/4 SA3366	
Drawn by: PJM	Approved by:	Date: 11/8/02


Shrink oven anchors
to attach it to the cart

SHRINK - Instructions to Tighten or Replace Belt

1. Shut power off to unit.
2. Remove blue covers around belt on input and output side of unit.
3. Using C-clamps, clamp block down to base block on each side of unit, relieving belt tension.

Clamp should be on top of block and under frame.



4. On **OPPOSITE SIDE OF MACHINE (output side, not bolts in picture)**, loosen bolts from pillow blocks at end of machine so pillow block will slide in, relieving additional tension.
5. Cut 1 link out of belt.
6. Pull belt tight overlapping ends. Cut away excess belt so there is a 1 link overlap.
7. Cut 1 link out of the excess, this will be used to splice belt back together.
8. 2 pairs of needle nose pliers will be needed to splice belt together. See following pages for instructions.
9. Pull pillow blocks on output side as tight as the belt allows while keeping them parallel, tighten bolts.
10. Remove C-clamps so tensioner is released into belt.
11. Replace covers.
12. Belt is tightened and ready to run.