StreetHeat SR-60

Troubleshooting Guide

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Troubleshooting Guide Contents

1. Electrical Troubleshooting

Caution: Electrical shock hazard

Electrical repairs should be made by qualified personnel only. Due to sensitivity of the electronics on the SR-120, it is critical that a generator with a built in inverter or power conditioning is used. These type of generators supply stable, clean power needed to run electrical components. They respond to the small voltage fluctuations needed by the SR-120 and are engineered to not spike voltage.

Most common generators do not have these benefits which can result in downtime of the SR-120, due to component failure, when they are used.

A Honda EU3000 (3000 w) generator with a built in inverter is recommended to run this equipment.

PROBLEM OR SYMPTOM	**CHECKS**	**FIX**
No Power	Check generator / electrical outlet connection	Repair or replace
	Reset button on the yellow ground fault interrupt (located on the right side of the handle bar) has not been pushed	Push reset button
	If the green light on the yellow Ground Fault Interrupt (GFI) is ON, check the fuse	Replace fuse
Have power, but when the green button is pushed the motor and heaters do not start	Check that the pilot lights are lit. When the pilots are lit the red lights on the Temperature Controllers should be OFF	Light pilots
	If pilots are lit and the red light on either of the Temperature Controllers is ON, then likely the Pilot Thermocouple is faulty. To be sure, switch the temperature controllers around; if the light is still ON - on the same side - then it is the thermocouple. If not, then the Temperature Controller is faulty.	If indications are that the thermocouple is faulty, check that there is no moisture in the connection (under the hood nearest to the heater banks). Replace Thermocouple Assembly or Temperature Controller if needed.
	Check Sequence Controller: When you push the green button I1 (Start), Q1 (Motor Forward) & Q3 (Open Valves) should come on. Q2 (Motor Reverse) should come on when the carriage reverses direction *(see Sequence Controller page in the ELECTRICAL SECTION)*	If I1 did not come on, green start button or controller may be faulty. If Q1 or Q2 on, Forward or Reverse contactor may be faulty
		(to determine if it is the start button or controller, place jumper between L1 and I1 on the controller. If the motor starts up, the button is faulty)
		If Q3 is on, Valve(s) may be faulty
	Check that the light on the rear proximity sensor (located near the rails nearest the operator) is lit up	Adjust metal bracket that reads the sensor until light comes on
	Check Sequence Controller: If I6 is on…*(see Sequence Controller page in the ELECTRICAL SECTION)*	Push reset button on the cycle counter. If this continues to happen, counter relay may need to be replaced

1. Electrical Troubleshooting – Cont'd

PROBLEM OR SYMPTOM	CHECKS	FIX
Motor makes a "buzzing" sound but won't start without manually pushing the carriage	Most likely the Current Sensing Relay in the junction box on the motor has failed. This relay is designed to: - Switch ON the starter winding when the motor starts up. If it doesn't the motor starts very sluggishly, - And switch OFF the starter winding after the motor has started. If it doesn't the motor uses too much electrical current, resulting in overheating	Replace with a new Current Sensing Relay (located inside the motor junction box)
Motor Overheating		Replace power supply with a 3000w generator with built in inverter
Machine suddenly stops and the burners go out	Check if power is restored by resetting the yellow ground fault interrupt (GFI) on the right side of the handle bar Using a generator that doesn't have power conditioning or a built in inverter can damage the GFI	If so, there may be a loose wire that is causing a short. Unplug the power completely then check all wire connections
		If power is not restored when the ground fault interrupt (GFI) is reset then likely either GFI is faulty or the fuse may be blown or loose.
When heating a slope the motor appears to strain or stop altogether	Generator may not be supplying sufficient voltage	Ensure generator is 3000w with built in inverter. Use larger generator or transfer to wall socket
	Generator is being used for other purposes at the same time	Stop all power sharing when the machine is running
The heater carriage bangs into either end	Check the position of the proximity sensor (at either end of the rails) or the bracket on the truck that reads it	Adjust proximity sensor or bracket until desired position is achieved
You have stopped the heater carriage in mid cycle and pushing the green button won't restart it	CAUTION: Even though the heater carriage is not moving, the heaters may be lit	After Pushing the Green button, push the Front Short Cycle button.
Heater Carriage won't change direction at the front end (farthest from the operator)	Check that the light on the front proximity sensor comes on	Sensor bracket on the center heater carriage may be positioned too far above the Proximity sensor. Adjust bracket
	Check Sequence Controller: I4 must come on. *(see Sequence Controller page in the ELECTRICAL SECTION)*	If I4 did NOT come on, then the front proximity sensor may be faulty
Heater Carriage won't change direction at the back end (nearest to the operator)	Check that the light on the rear proximity sensor comes on	Sensor bracket on the center heater carriage may be positioned too far above the Proximity sensor. Adjust bracket
	Check Sequence Controller: I5 must come on *(see Sequence Controller page in the ELECTRICAL SECTION)*	If I5 did NOT come on, then the rear proximity sensor may be faulty
Counter not counting	Check Sequence Controller: I5 must come on when the carriage reaches the rear (closest to the operator) *(see Sequence Controller page in the ELECTRICAL SECTION)*	If I5 comes on, then the counter relay may be faulty

2. Electrical Components List

No.	*ELECTRICAL COMPONENTS LIST*	*QTY*
30	Main Electrical Control Box Assembly	1
30A	Sequence Controller	2
30B	Aromat Counter	1
30C	Temperature Controller	2
30D	Contactor Block & Reversing Interlock Assembly	1
30E	Counter Relay	1
30F	Current Sensing Relay (in motor junction box)	1
30G	Push / Pull E-Stop Assembly	1
30H	Green Push Button Assembly	1
30J	Black Push Button Assembly	2
30K	Heat Soak Switch/Push Button Assembly	1
30L	10 amp Fuse	1
31	Ground Fault Interrupt	1
32	Electrical Junction Box	1
33/34	Front and Rear Proximity Sensors	2
35	Thermocouple Assembly	2

Electrical Components: Control Panel

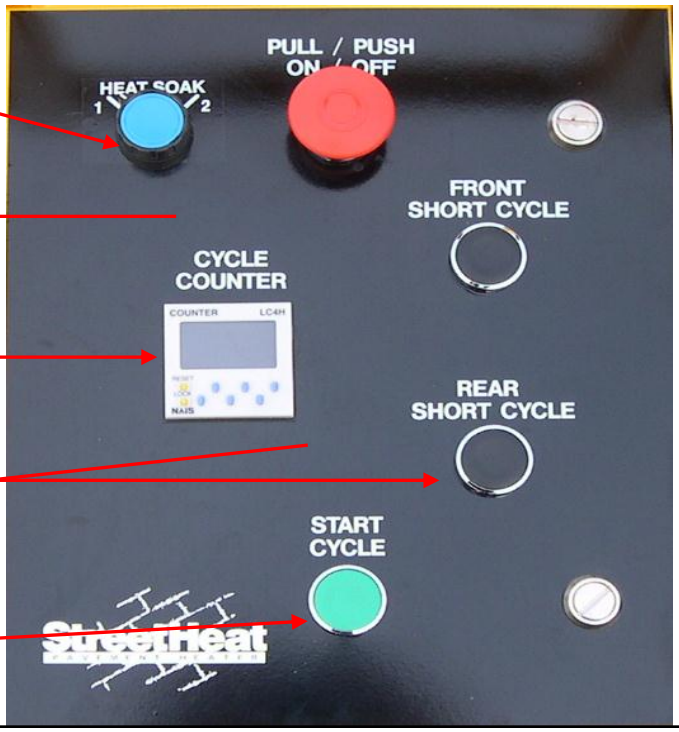
30K - HEAT SOAK BUTTON: Select and initiate Heat Soak sequence

30G - E-STOP BUTTON: Pull On / Push Off and Emergency Stop

30B - COUNTER: Sets and counts down heating cycles

30J - SHORT CYCLE BUTTONS: Manual override to shorten heating stroke at the front and back of the heating area

30H – START BUTTON: Starts the motor and opens valves to the heaters



2. Electrical Components List - Con't

31 - Ground Fault Interrupt (or GFI

35 - Pilot Thermocouple (one strapped to each pilot)

33/34 - Proximity Switch (only forward one shown)

30C - Temperature Controllers – receive input signal from the **Pilot Thermocouples** when pilot is lit. Ensure that these are set to at least 200°C. If there is no input signal, the red light will be on, and you will not be able to start the machine.

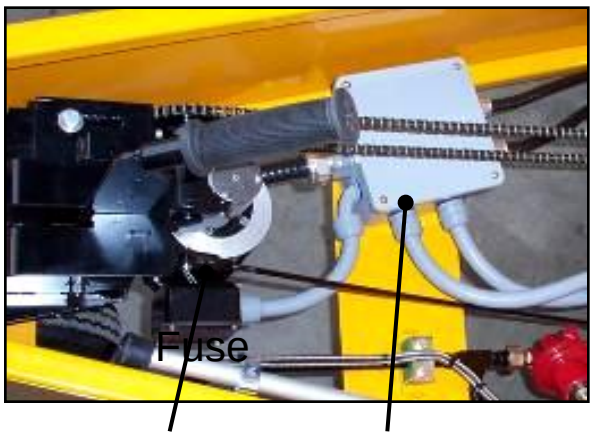
30E - Counter Relay

30A - Sequence Controller (See *Sequence Controller Page* for more details)

30D - Forward /Reverse Contactor Block and Interlock Assembly

30L - 10 Amp Fuse

45 - Solenoid Valves ("normally closed" – i.e. electrical power is needed to open them)



1 - Electric Motor and **Junction Box**

3. Electrical Sequence Controller Input and Output Screens

The **Sequence Controller (30A)** is the main "computer" that automates and controls all electrical functions on the SR60 machine. It is located inside the main electrical control box.

Input (I) and Output (Q) information is a useful diagnostic tool to determine the cause of many problems you may encounter

Display shows INPUT screen: I6 is "on"

Press Right button to scroll to Input (I) screen. Note: some early machines have the I/O display on the main screen

I6 is on

INPUTS SCREEN	
I1	Temp Controllers/Start
I2	Front Short Cycle
I3	Rear Short Cycle
I4	Front Proximity
I5	Rear Proximity
I6	Counter Out
I7	Heat Soak 1
I8	Heat Soak 2

Display shows OUTPUT screen: Q1 and Q3 are "on"

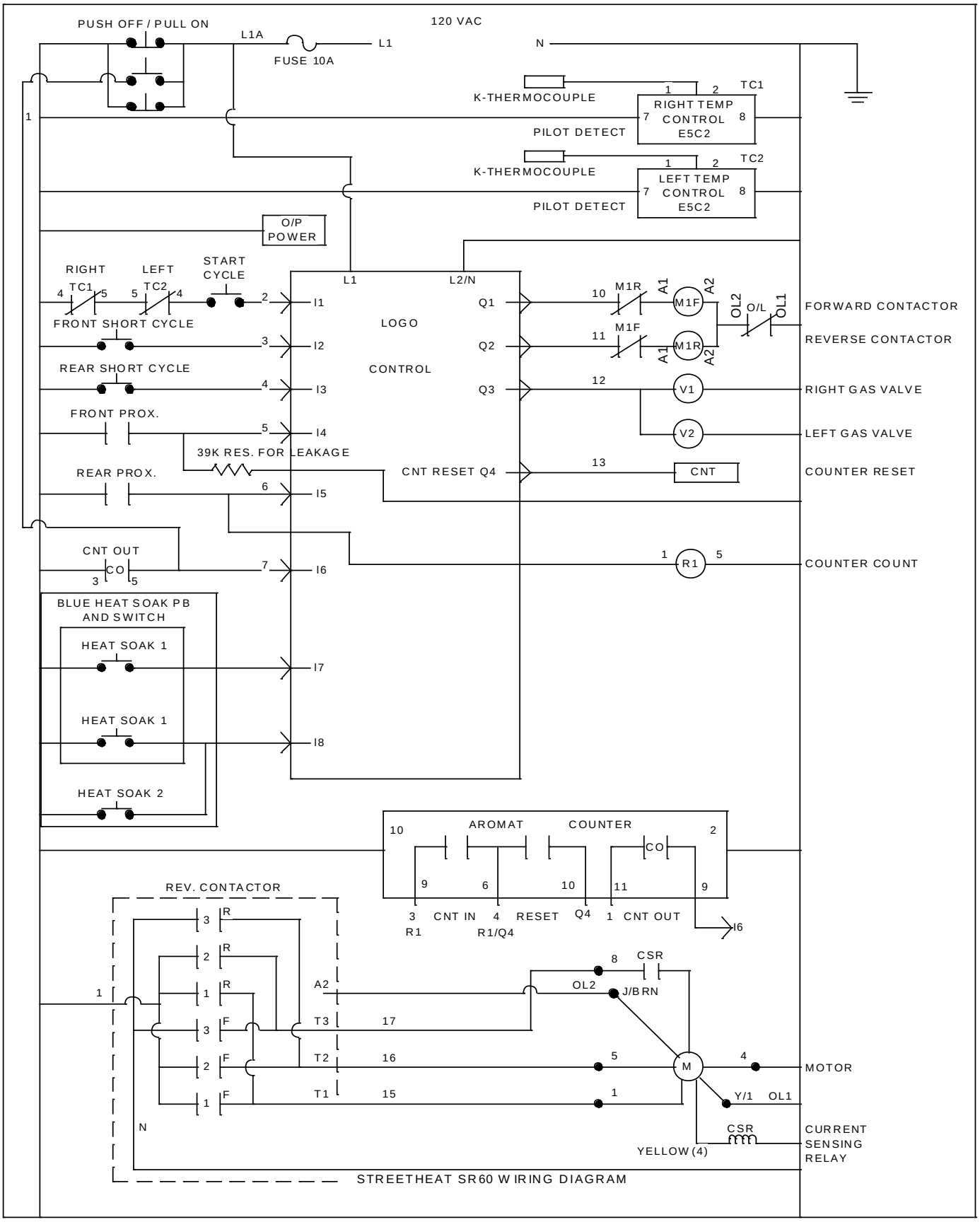
Press Right button to scroll to Output (Q) screen

Q1 & Q3 are on

OUTPUTS SCREEN	
Q1	Forward Contactor
Q2	Reverse Contactor
Q3	Gas Valves
Q4	Counter Reset

Press Left button to return to Input (I) screen

4. Electrical Wiring Diagram

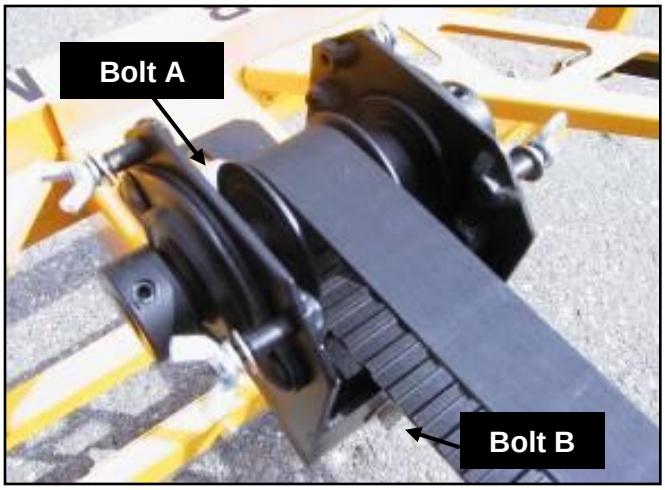


5. Mechanical Troubleshooting

MECHANICAL ISSUES		
PROBLEM OR SYMPTOM	**CHECKS**	**FIX**
Chain is loose *(see MECHANICAL SECTION below for instructions)*		Tighten Chain. CAUTION: Do not over tighten.
Belt is slipping *(see MECHANICAL SECTION below for instructions)*	Check that the belt is not too loose	Loosen the bolt on the belt pulley bracket at the front of the rails (away from the operator) and use the other bolt to tighten belt. Retighten bolt. (CAUTION: don't over tighten)
Belt keeps breaking *(see MECHANICAL SECTION below for instructions)*	Check that the black "stiffener bracket" has been installed over the aluminum grooved plate that holds the belt in place (see manual). Without it the belt is held in place by only one tooth on each side	Reinstall the belt with the stiffener bracket and tighten belt mounting bracket firmly
	Check that the "U" shaped bracket welded to the underside of the truck where the belt is attached has not be bent in any way	Detach the belt, straighten the bracket and reinstall
	Check that the edges on the "grooves" in the aluminum attachment bracket are not sharp and cut into the belt	Use a file to remove sharp edges
	Check that the belt is not too tight	Loosen the belt
Brake is only working on one side	Check tire pressure	Set tire pressure to 40 psi
Heaters too close to the ground in "home" position, or machine difficult to push	Check tire pressure	Set tire pressure to 40 psi

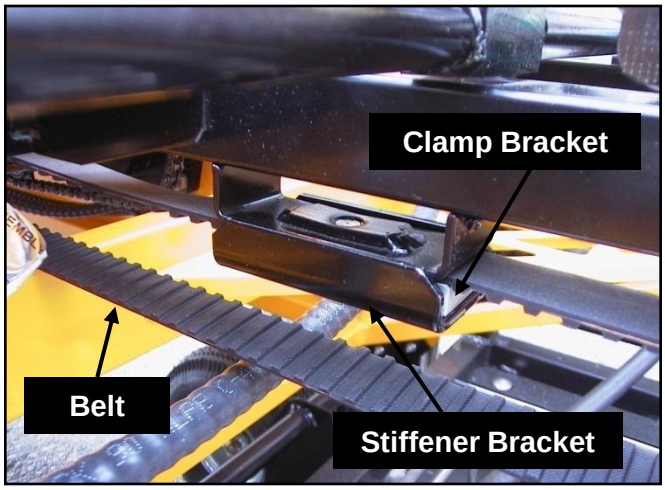
6. Mechanical - Drive Belt (Changing and Adjustments; Preventing Breakage)

Adjusting or Changing the Belt



Detail View of the Belt Pulley Bracket.

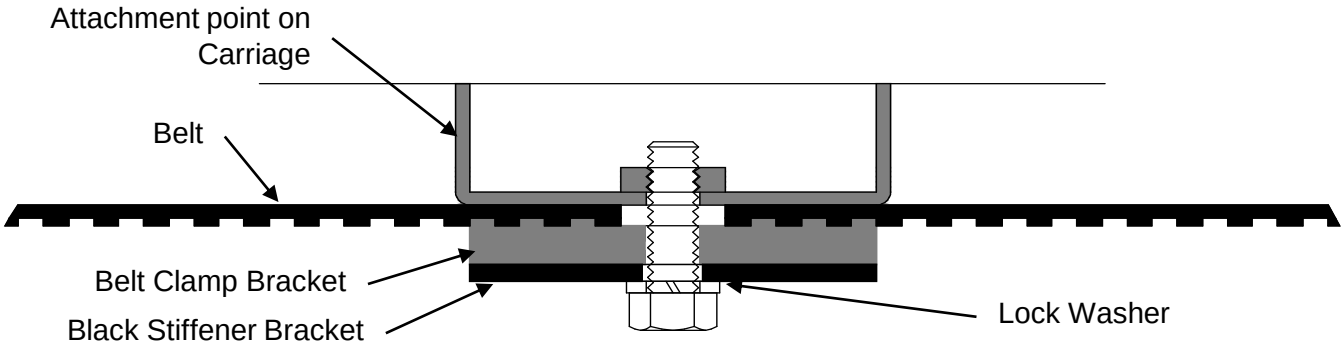
To adjust belt, use a 9/16” wrench to loosen Bolt A, tighten the belt with bolt B, then retighten Bolt A.



To replace belt, loosen belt as shown at left, then undo the bolt holding the aluminum **clamp bracket** and the **stiffener bracket**. Remove belt. Install new belt with at least two teeth under belt bracket on each side.

Preventing Belt Breakage

Almost all belt breakage occurs at the attachment point on the carriage. The correct installation configuration is shown below. If you are experiencing frequent belt breakage do these simple checks and make the recommended corrections.

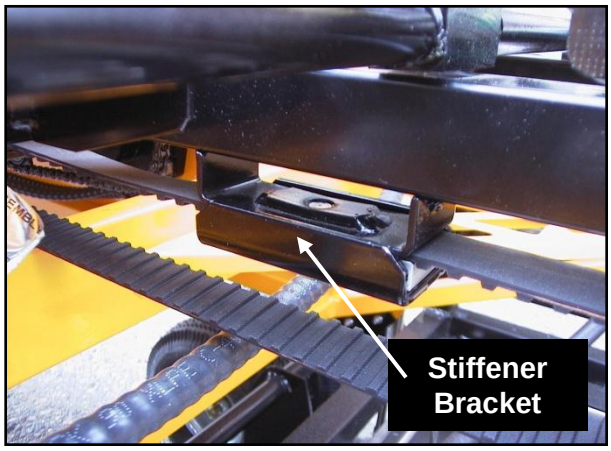


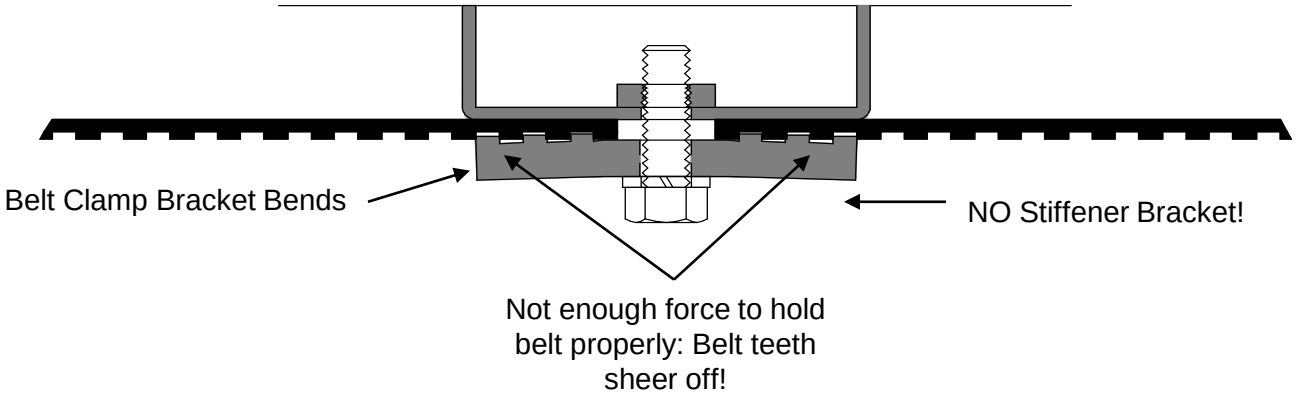
Correct Installation

6. Mechanical - Drive Belt (Changing and Adjustments; Preventing Breakage) – Cont'd

1. The Stiffener Bracket has not been installed

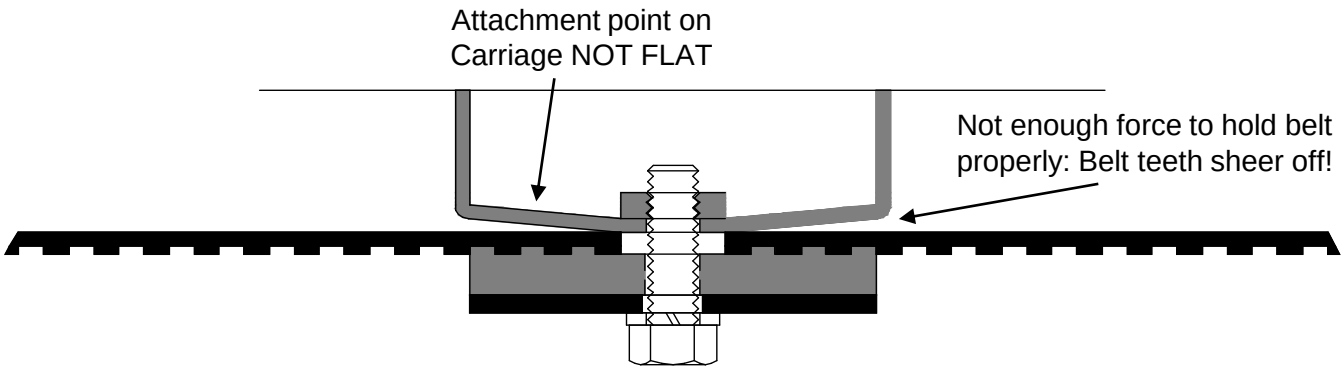
The Stiffener Bracket is a heavy gauge steel bracket that in necessary to apply even force along the length of the aluminum clamp bracket. Without the stiffener bracket the aluminum clamp bracket is likely to become bent. As a result the teeth on the belt are likely to be sheered off after a short time. Always make sure the stiffener bracket is installed.





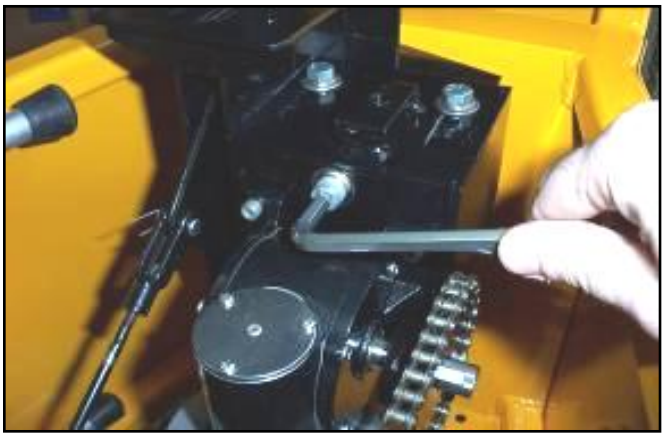
2. The Attachment Point on the carriage is not flat

It is very unlikely, but possible that the metal belt attachment point on the carriage is bent down under some extreme force and is no longer flat. Again, the belt is held only on the very ends and is likely to have teeth sheered off. Use a hammer to carefully flatten out the attachment point, then reattach the belt.



7. Mechanical - Chain, Carriage Travel and Brake

Adjusting Chain Tension



1. Remove the safety cover from on top of the motor

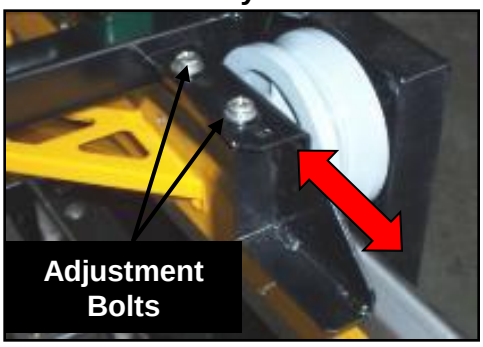
2. Loosen the two bolts on the top, as shown, using a 9/16” wrench.

3. Chain can be loosened or tightened using a 5/16” Allan wrench. CAUTION: Do not over-tighten the chain.

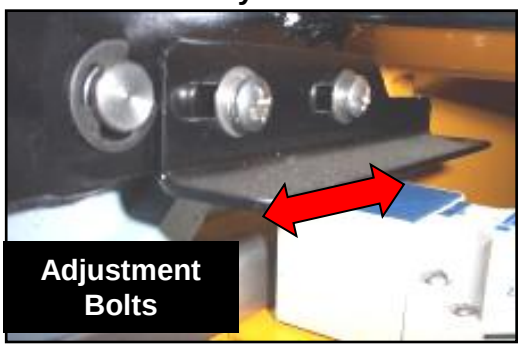
4. Replace safety cover on motor.

Adjusting Carriage Travel

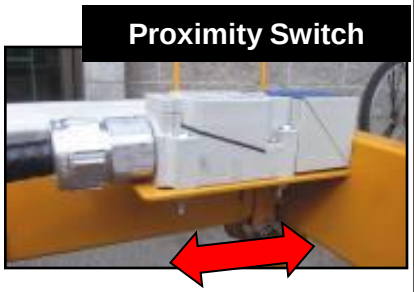
Front Proximity Sensor Bracket



Rear Proximity Sensor Bracket

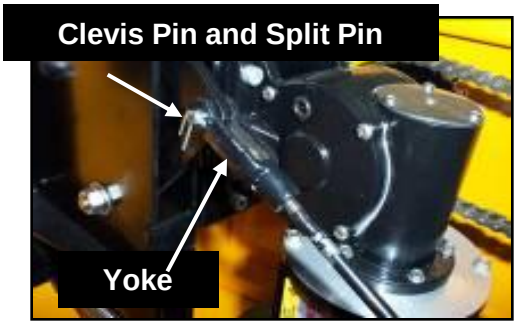


There are two ways to adjust how close the Center Carriage comes to the end of each stroke: adjust the position of the proximity sensor Brackets on the center carriage….



Or, if that is not enough, the position of the proximity switches themselves can be adjusted

Adjusting Brake Tension



NOTE: Sometimes the brake is loose because the tires are a little flat. Check that the tire pressure is set to 40 PSI before adjusting the brake

To adjust the brake: remove the split pin and clevis pin on the Brake Rod

Screw Yoke on to tighten brake or off to loosen brake.

Reassemble.

8. Pilot Light - Troubleshooting

PILOT LIGHT ISSUES		
PROBLEM OR SYMPTOM	CHECKS	FIX
Pilot(s) won't light	Check to ensure main propane valve is open	Open valve
	Ensure Pilot valve(s) is wide open	Open valve
	It takes about 10 seconds for the system to bleed out the air before they will ignite	Allow the pilot the bleed for 10 seconds and then try lighting it
Pilot light is weak and burns with an orange flame	Check just downstream from the Pilot Valve and make sure that the nozzle has not worked loose and is choking the air intake	Use a sharp object to screw it back in again.
	Check that there is no debris blocking the pilot tubes	Remove debris
Pilot valve leaking propane out the top of the knob	Shut off valve diaphragm has been perforated from opening the valve too vigorously	Replace pilot valve. To prevent from happening again, don't turn the valve all the way open

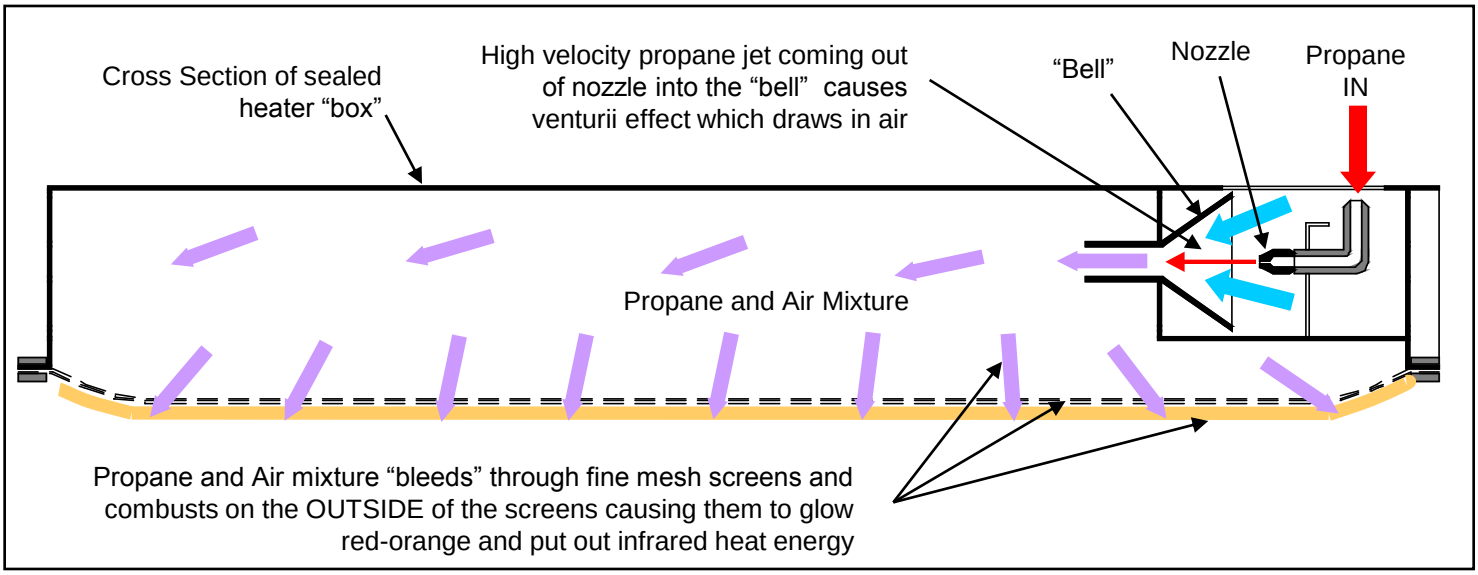
8. Heaters – Troubleshooting

HEATER ISSUES		
PROBLEM OR SYMPTOM	**CHECKS**	**FIX**
Heater bank(s) won't light	Check to ensure main propane valve is open	Open valve
	Check to ensure heater bank propane valve(s) is open	Open valve(s)
	Check propane pressure regulator under the hood	New machines, and retrofitted machines with RED high pressure nozzles: set to 6-7 psi. Other machines with UNPAINTED nozzles: set to between 5 and 6 psi. Too high pressure causes gas to leak out of the bell, fall to the ground and ignite inside the heater.
The heater is making a "jet" sound and / or the top is turning blue *(see PROPANE HEATER SECTION below for more information)*	A. Is flame burning inside the heater? This is known as 'Flashback". This usually starts with a loud "popping" sound followed by a "jet" sound. If so:	
	1. Check that the propane pressure is not too high or too low.	New machines, and retrofitted machines with RED high pressure nozzles: set to 6-7 psi. Other machines with UNPAINTED nozzles: set to between 5 and 6 psi. Too high pressure causes gas to leak out of the bell, fall to the ground and ignite inside the heater.
	2. Check for leaks in the tube running from the manifold to the heaters using soapy water and compressed air in the system (DO NOT USE PROPANE; EXPLOSION HAZARD!)	Tighten or reseat and tighten flare fittings until leaks are sealed
	3. Check that all the nuts and bolts around the perimeter of each heater are tightened.	Tighten Bolts. There is a ceramic gasket around the perimeter that must be sealed
	4. Check for build up of dirt or asphalt on the screen	Use a pressure washer to clean the screen
	5. Check that there is no blockage in the nozzle (tip).	Use the supplied tip cleaner to clean out the nozzle. Attach compressed air to the system and run tip in and out (DO NOT USE PROPANE; EXPLOSION HAZARD!)
		If it is still blocked there may be a larger piece that necessitates the removal of the whole nozzle assembly so it can be cleaned.
Some heaters not lighting, or burning "black" instead of "red" *(see PROPANE HEATER SECTION below for more information)*	Check that the propane pressure is not too low	New machines, and retrofitted machines with RED high pressure nozzles: set to 6-7 psi. Other machines with UNPAINTED nozzles: set to between 5 and 6 psi. Too high pressure causes gas to leak out of the bell, fall to the ground and ignite inside the heater.
	Check that there is no blockage in the nozzle (tip).	Use the supplied tip cleaner to clean out the orifice. Attach compressed air to the system and run tip in and out (DO NOT USE PROPANE; EXPLOSION HAZARD!)
		If it is still blocked there may be a larger piece that necessitates the removal of the whole nozzle assembly so it can be cleaned.
	This rarely occurs when the ambient temperature is particularly cold	Manually light the heater(s) that won't light using a StreetHeat gun. Next time the heater should light normally
There is a Blue Flame "licking" up the side of one heater	This occurs when there is too much propane and not enough oxygen so that combustion takes place when sufficient air is present	A smaller nozzle will likely fix the problem. Call the IPC support line for more information.
The heaters make a high pitched whistling sound		This is normal when the heaters are first heating up, or when there is a high wind. The equipment will not be harmed but your ears might, so wear ear plugs.

9. Heaters - Improving Heater Performance

During operation, your SR-60 should have all nine heaters glowing in a dull red-orange color. If not, YOU ARE NOT GETTING THE FULL POTENTIAL OUT OF YOUR SR-60.

Below is a cross section of a heater showing how it works:



There are two problems that affect heater performance:

1. Propane may be combusting inside the heater instead of on the outside of the screens ("Flashback").
2. There are blockages that prevent the propane from adequately reaching the heaters.

1. Propane Is Combusting Inside the Heater ("Flashback")

"Flashback" happens when the propane and air mixture INSIDE the heater box ignites. Usually there is a loud "popping" sound followed by a continuous "whooshing" sound and the top of the heater is turning blue or glowing red. If you look into the "bell" you will be able to see a flame inside.

Not only is the heater putting out only a fraction of the infrared heat, but, after some time running this way, the inside mesh layers will be destroyed (see picture below) and the heater must be rebuilt or replaced long before its normal life cycle.

Inside Screen Destroyed by Continuous "Flashback"

9. Heaters - Improving Heater Performance – Cont'd

1. Repairing or Preventing "Flashback":

1.A - Check that the regulated pressure (under the hood) is not too high or too low.

• **New or retrofitted SR-60 machines with RED high pressure nozzles**: set pressure between 6 and 7 psi
• **Machines with standard unpainted nozzles**: set pressure between 5 and 6 psi

If pressure is too high it can cause gas to leak out of the bell, and become a point of ignition inside the heater, and it is more susceptible to "flashback" in windy conditions.

1.B - Check for leaks where the propane enters the heaters

If leaks are present, gas will accumulate outside the bell and become a point of ignition, causing internal combustion.
Unhook the quick couplers that attach the heaters to the carriage and blow compressed air into the system. Check for leaks around all fittings up to the quick coupler by spraying soapy water. Reseat and tighten fittings until leaks are sealed.

1.C - Check that all the nuts and bolts around the perimeter of each heater are tightened.

Tighten any loose bolts, ensuring that the ceramic gasket around the perimeter between the screens and the heater box is sealed.

1.D - Check for build up of dirt or asphalt on the screen

If build up is present, use a pressure washer to clean the screen. Allow to dry before igniting.

1.E – Heaters or heater screens may be nearing the end of their life cycle. The heaters and screens will eventually wear out and need to be replaced. Life expectancy varies greatly depending on things like how well they have been maintained; what propane pressure has been set at; local weather conditions – especially wind; amount of "flashback" allowed; local propane supply (mix and quality).

If all or most heaters begin to "flashback" on a continual basis, even in non-windy conditions, it is probably time to either purchase new heaters or rebuild them with new Screen Kits. Call the Order Desk for info.

Repairing or Preventing Blockages in the Propane flow:

If your burners are not glowing red and there is no "flashback" occurring, likely there is a blockage in the propane system. THIS IS THE NUMBER ONE CAUSE OF HEATER PERFORMANCE PROBLEMS.

2.A - Check that the pressure is set correctly

New or retrofitted SR-60 heaters with RED high pressure nozzles: set pressure between *6 and 7 psi.*
Heaters with standard UNPAINTED nozzles: set pressure between *5 and 6 psi*

2.B - Check that there is no blockage in the nozzle (tip)

The nozzle is the small tip that injects the propane into the heater. Use the supplied tip cleaner to clean out the orifice.
To do this, hook compressed air into the quick coupler that attaches the heater banks to the carriage. Run the tip cleaner in and out of the tip while air is blowing out. This may need to be done regularly.
DO NOT USE PROPANE; EXPLOSION HAZARD!

2.C – If nozzle still blocked, Remove nozzle assembly to clean out debris.

1. First, disconnect the braided hose (or stainless tube on earlier machines) using an 11/16" wrench. Then use a standard 9/16" ratchet to remove the heater from the frame.

2. Using a 3/4" wrench, loosen the backing nut on the elbow. One turn is all that is needed. Then unscrew the whole nozzle/elbow assembly to remove it.

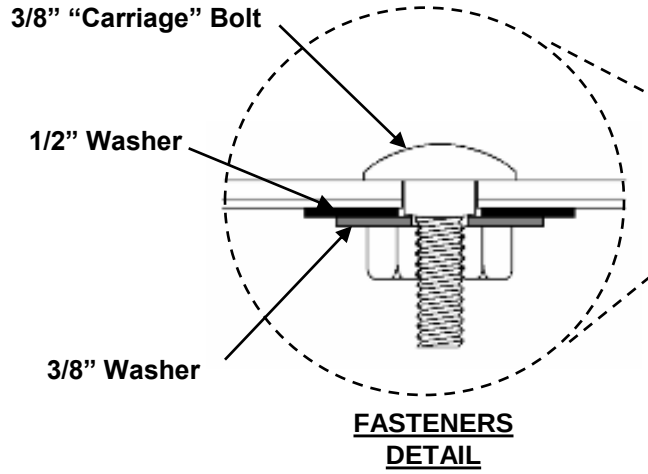
3. Using the tip cleaner or a welding tip cleaner, clean the nozzle and dislodge any debris. Then blow compressed air <u>through the nozzle</u> to remove all debris from the elbow.

Reverse steps for re-assembly. See next page for instruction on reinstalling the heaters. When fully assembled, check for leaks by using soapy water and compressed air.

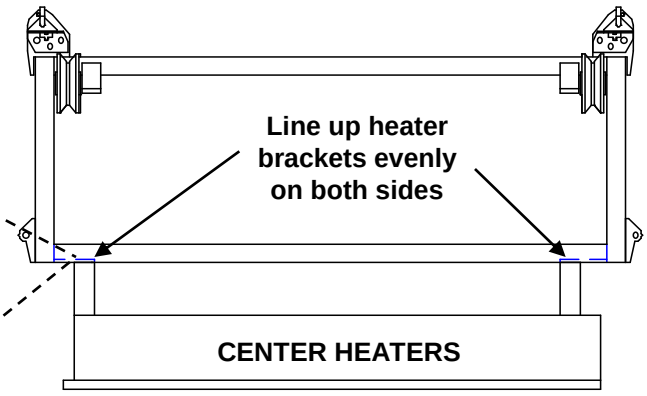
9. Heaters - Improving Heater Performance – Cont'd

2. Repairing or Preventing Blockages in the Propane flow (Cont'd):

2.C (cont'd) - Remounting Heaters:



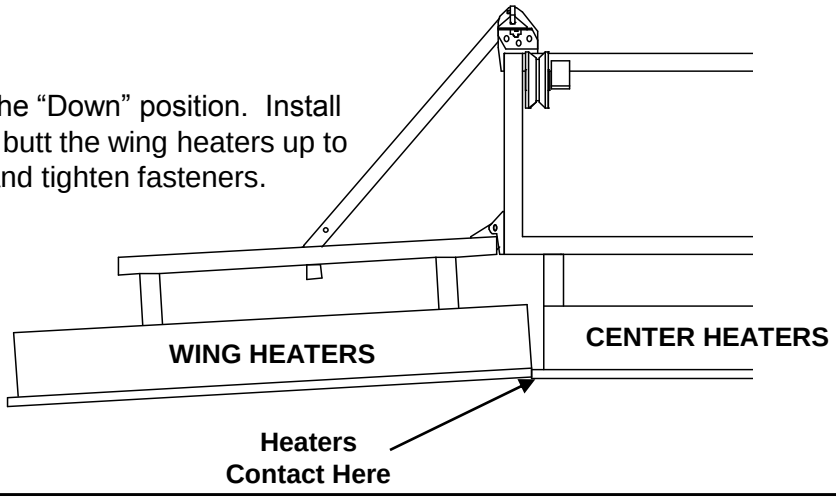
FASTENERS DETAIL



1. Mount the Center Bank heaters first. Center heaters and install bolts, washers and nuts as shown, then tighten fasteners using a standard ratchet.

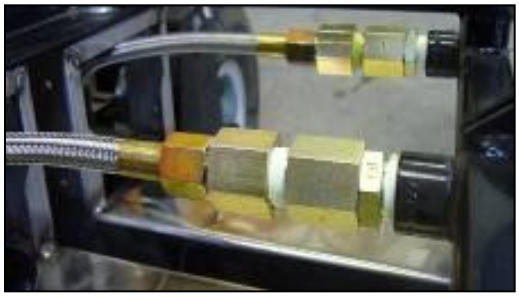
2. Put the wings in the "Down" position. Install the heaters loosely, butt the wing heaters up to the center heaters and tighten fasteners.

3. When re-installing the pilot lights, make sure they are positioned as close to the underside of the heaters as possible so that they are less vulnerable to being damaged.



2.D - Check for blockages at the Quick Disconnect Fittings. Very rarely debris gets caught by the choke valve on the quick disconnect fittings. Remove the fitting and blow out any contaminants. When reinstalling, make sure that a pipe sealant is used and that there are no leaks.

2.E - Check for blockages in the propane filters. New and some retrofitted SR-60s have a debris filter assembly between the heater bank manifold and the heaters. A fine mesh screen is held in place by a spring. To clean, disconnect the stainless braided hose, open the screen assembly, clean it out and reinstall. Make sure all leaks are sealed.



Integrated Paving Concepts Inc. is committed to providing the best possible after-market service. If you require parts or service, or have any other questions please call our Technical Assistance line at 1-800-688-5652 or +001 604 574-7510.