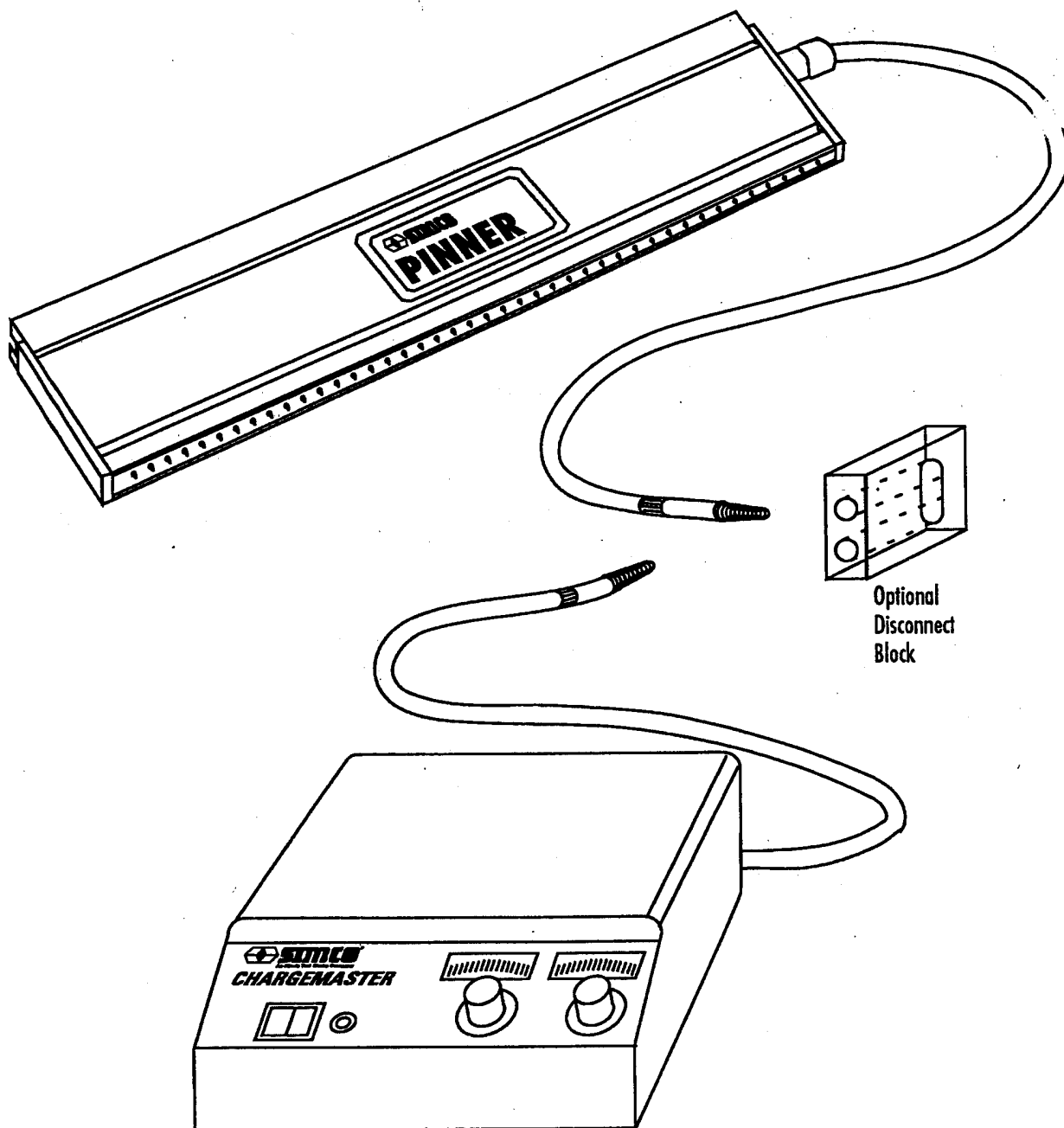


INSTRUCTION, OPERATION, AND MAINTENANCE MANUAL

Chargemaster® Pinner™ Arc Resistant Charging Bar



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Table of Contents

Section 1	
<i>Description</i>	2
Section 2	
<i>Applications</i>	4
Section 3	
<i>Features</i>	6
Section 4	
<i>Specifications</i>	6
Section 5	
<i>Safety</i>	7
Section 6	
<i>Installation</i>	7
Section 7	
<i>Operation</i>	8
Section 8	
<i>Maintenance</i>	8
Section 9	
<i>Replacement Parts</i>	10
Section 10	
<i>Warranty</i>	10

■ NOTE

SIMCO recommends that these instructions be read completely before installation or operation is attempted. Failure to do so could result in personal injury and/or damage to the equipment.

Simco's Pinner Charging Bar is part of the Chargemaster Electrostatic Generating System. The Pinner is energized with a Simco Chargemaster CH or BP Series DC Power Supply which provides the high voltage necessary for operation. This system is used to produce electrostatic adhesion for temporarily bonding or pinning materials.

The Pinner Bar is a resistor-limited bar which provides arc-resistant operation. Arc-resistant operation lowers radiated electrical noise which affects sensitive equipment in the surrounding area and eliminates physical damage to materials and equipment.

Section 1 Description

The Pinner Charging Bar is supplied with insulated mounting bolts and nuts that can be adjusted along the length of the bar. The pinner bar is available in a straight connector or right angle connector configuration. The high voltage cable is covered by a flame-resistant, flexible tubing which provides superior abrasion resistance. The glass-filled vinylester body and silicone high voltage cable allow use in temperatures up to 200° F. The ionizing pins are mounted in sockets and can be replaced when the pins become dull from erosion.

The Chargemaster system uses ionization to create the static charge necessary for electrostatic adhesion. CH or BP Series Power Supplies generate the necessary high voltage, typically 20 to 50 kilovolts, which is current limited for safety. BP power supplies provide both a negative and a positive power source. The success of the process depends on the insulating qualities of the material being charged. Good insulators such as plastic films work particularly well with this process.

The Pinner Bars avoid hard arcing that can occur with the use of non-current limited bars. As the Pinner Bar approaches an arcing condition, the air is stressed greater and greater however, current limiting prevents a hard arc

from occurring. A soft arc is noticeable and increases as the bar approaches the ground reference. A soft arc is apparent by the purple glow that increases as the bar approaches ground.

Non-current limited bars are less expensive and can be used successfully in many applications. These applications include those where the distance to ground references can be controlled. However, non-current limited bars will hard arc when the air insulation between the emitter pin and ground reference is broken down. The current drawn from the power supply also exceeds capacity. Hard arcs present the following problems:

1. Voltage flow is prevented and pinning action is suspended.
2. Arcs generate tremendous EMI/RFI which can disturb sensitive electronic components such as PC's.
3. The energy created in an arc can eat away at some plastics and other materials causing additional damage and failure.

For these reasons it is crucial to prevent the arcing condition from occurring. At the least, the energy created should be kept to a minimum.

Simco has solved this problem by creating an arc resistant bar. The Pinner Bar limits the amount of current drawn. It is this advancement that prevents all three of the above problems. The Pinner Bar does exhibit a soft arcing which can be useful in setting up the application and also in keeping the systems operational.

As the Pinner Bar reaches the point of arcing, the current limit prevents the arcing condition. This means an instantaneous reduction of pinning voltage - only to the point of arc prevention, voltage will not be suspended across the bar. This condition is described as a soft arc and exhibits the following clues to help identify and use this condition to advantage.

The Pinner Bar will exhibit the first signs of electrical stress, not as an arcing condition

but as a stress on the emitter pins. The pins will start to glow with a purple haze. In quiet surroundings, you will notice the purple haze is accompanied by a sizzling sound as the bar stresses the air molecules. As the stress is increased, by decreasing the distance between the emitters and ground reference, the resulting purple haze and sizzling sound will increase. These symptoms are to be used to help provide the ultimate system setup.

In all applications the pinner bar should not be operated continuously in an overstressed condition. Continuous operation in this condition will cause premature aging of the Pinner Bar. Once the power supply and bar are in position and operational, insure that there is no purple glow at the emitter pin point. It is this purple glow that indicates the overstressed condition. This is also an indication that the bar is not providing the maximum pinning voltage possible. Please refer to Section 7 on Operation for greater detail.

High Voltage Connector

A high voltage connector block kit is available from SIMCO, P/N 4006320. The purpose of this kit is to provide a disconnect at or near the Pinner Bar so the bar can be removed for service without disturbing the cables running to the remotely located Chargemaster power supply. Installation instructions are provided with the connector kit.

CAUTION:

ELECTRICAL SHOCK HAZARD

Always shut off the Chargemaster power supply when connecting or disconnecting the high voltage cables.

Section 2 Applications

There are three common methods of application of the Pinner charging bar. These methods are suitable for a wide variety of applications.

2.1 Charging Bar with Grounded Surface

This application illustrates the use of a pinner bar facing a grounded surface. The material to be charged should rest on the grounded surface. In Figure 2-1A, the charging bar is located facing an empty core in a roll-to-roll changeover application. The empty core is mounted on a grounded metal shaft. The plastic film is between the charging bar and empty core. The negative ions created by the charging bar are driven toward the grounded metal shaft by the electric field between the charging bar and grounded shaft.

The plastic film blocks the travel of the ions and becomes electrostatically charged in the process. The electrostatic charge in the plastic film causes adhesion of the film to the empty core.

In Figure 2-1B, the charging bar is located facing a production fixture that moves beneath the charging bar (or the charging bar could also move over the fixture). The materials to be pinned together are positioned on the fixture. As the fixture moves beneath the charging bar, the negative ions created by the charging bar are driven towards the grounded metal fixture by the electric field between the charging bar and fixture. The top material blocks the travel of the ions and becomes electrostatically charged in the process. The electrostatic charge in the top material causes adhesion of the top material to the lower material and to the fixture. This bar arrangement emulates an interleaving application where paper or film is pinned to metal prior to cutting and stacking.

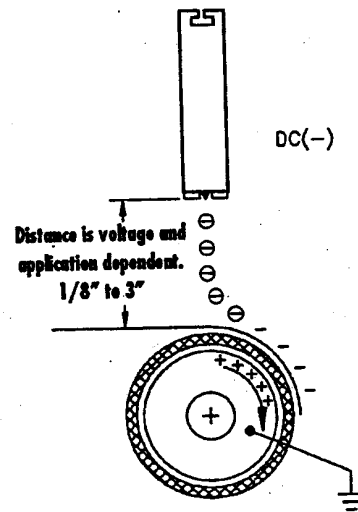


Figure 2-1A
Pinner Bar against Grounded Surface

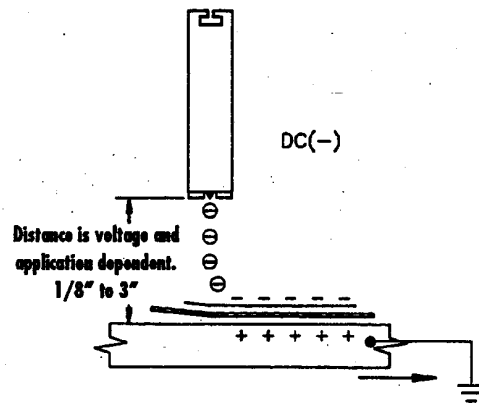


Figure 2-1B
Pinner Bar against Grounded Surface

2.2 Charging Bar with Static Bar

The second application for the Pinner charging bar uses the charging bar facing a static eliminating bar. The materials to be pinned together are guided between these bars. In Figure 2-2, the charging bar is facing an insulative film while a static bar faces a sheet of insulative material on the opposite side (glass, plastic, light particle board, etc.). As the materials pass between the bars, the negative ions charge the film and the static eliminating bar attempts to neutralize the apparent charge on the sheet. This deposits a positive charge on the lower sheet. The use of the static bar improves the process of pinning two insulating materials together and increases the electrostatic pinning adhesion dramatically.

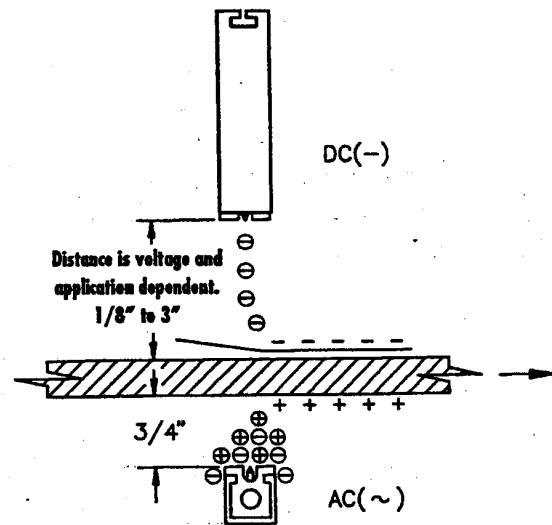


Figure 2-2
Pinner Bar with Static Bar

2.3 Two Charging Bars

The third application for the Pinner charging bar uses two charging bars with opposite polarity facing each other. The materials to be pinned together are guided between the charging bars. In Figure 2-3, decorative sheets are being pinned to heavy particle board prior to laminating. The ions created by each charging bar are attracted towards each other due to their opposite polarity. The decorative sheets block the ions and become electrostatically charged in the process. With this arrangement, the voltage differential between the charging bars can be substantial. The substantial voltages cause higher levels of charge to be deposited on the decorative sheets which results in the highest level of electrostatic adhesion. This method of charging materials is generally used in the most difficult pinning applications. Dual polarity BP series power supplies are designed for this application.

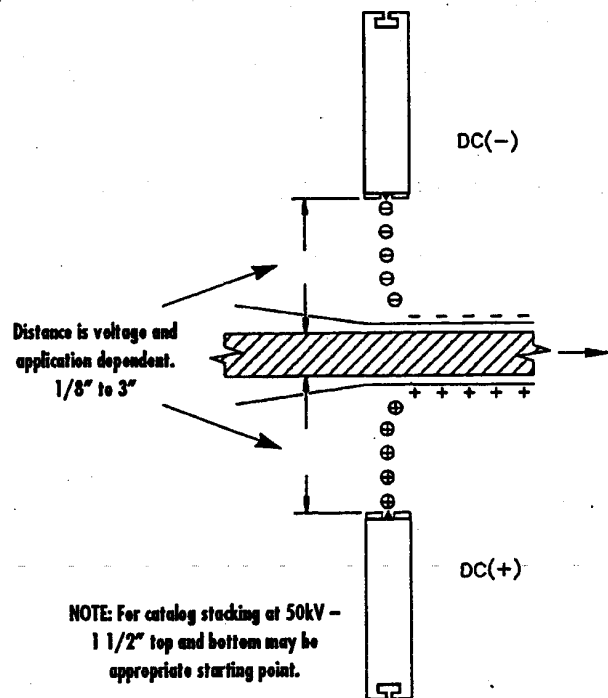


Figure 2-3
Two Pinner Bars

Section 3

Features

- Rugged construction, impact resistant housing
- Replaceable emitter pins for easy maintenance
- Easy to clean inner bar (cleaning brush included)
- Straight connector or optional right angle connector
- Optional disconnect block allows cable disconnect close to bar
- High voltage connector components are all stainless steel
- Flexible, abrasion-resistant high voltage cable
- Current limited for operator safety

Section 4

Specifications

Operating Temperature

to 200° F (93° C)

Color

Light Gray

Design

- Pins on ¼" centers, potted (Removable/replaceable emitter pins)
- Arc suppressive, resistor limited, 125 MOhm
- Pin to ground short, no damage, 3 second maximum with 30 kV applied

Pin Current at Short Circuit

30 kV input, 240 µA
50 kV input, 400 µA

Profile

3 ¼" H x ¾" W

Effective Length

6" to 144" standard sizes, 3" increments

Overall Length

Effective length plus 2"

Operating Voltage

± 30 kV maximum
± 50 kV with special mounting and insulation precautions

High Voltage Cable

40 kV rated silicone cable
Silicone flame-retardant protective sleeving to increase high voltage rating to 50 kV
10' standard length
½" minimum bend radius
Operating temperature to 200° F (93° C)

High Voltage Connectors

SIMCO type SLCC 50 kV and 30 kV are supplied. Bar is shipped with 50 kV connector installed

Weight

2 lb 2 oz per foot

Ion Output

20 µa / inch

Operating Distance

3.0 inches

1/8" - 3" application and voltage dependent

Standard Mounting

5/16" - 18 nylon bolts, opposite pin side; fully adjustable bolt head channel

Chemical Resistance

Recommend isopropyl alcohol as cleaning solution.

Maintenance

Nylon brush shipped with each bar

Section 5 Safety

1. Read instruction manual before installing or operating device.
2. Installation and repairs must be done by qualified service personnel.
3. Ground frame of machine on which charging bar is mounted and all metal parts in vicinity of charging bar or electrical shock could result.
4. Turn off power supply before cleaning charging bar or disconnecting high voltage cable in order to eliminate threat of electrical shock.

CAUTION:

ELECTRICAL SHOCK HAZARD

Do not touch charging bar during operation or electrical shock could result.

DANGER:

FIRE HAZARD

Do not install or operate the charging bar in close proximity to flammable solvents or ignition could occur.

Section 6 Installation

CAUTION:

ELECTRICAL SHOCK HAZARD

Installation must be done by qualified service personnel.

NOTE: The Pinner Bar is shipped from the factory with the 50 kV connector installed on the cable. 30 kV connector is supplied and must be installed for use on all SIMCO Chargemaster power supplies with ratings of 30 kV and lower.

6.1 Clamp Configuration

The Pinner Bar can be mounted with or without standoff. Use of the standoff, is recommended for mounting the charging bar on metal (conductive) frames and/or at 50 kV DC, see Figure 6-1A. Configuration with the nylon bolt only, see Figure 6-1B, is recommended for mounting the charging bar on nonmetallic

(nonconductive) frames such as fiberglass reinforced structural frames and is usable to 50 kV. This configuration can be used with a conductive mounting surface at 30 kV and lower applied voltage.

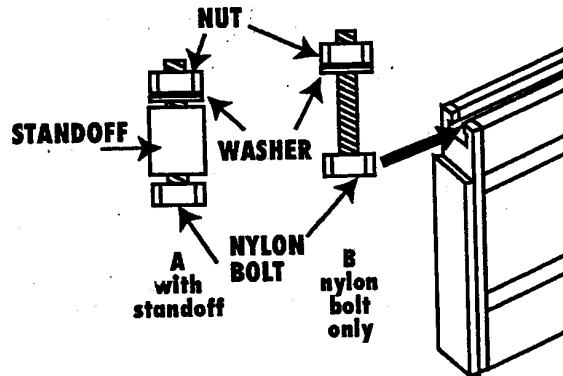


Figure 6-1 Mounting Configurations

6.2 Bar Installation

CAUTION:

ELECTRICAL SHOCK HAZARD

Frame of machine on which charging bar is mounted and all metal parts in vicinity of charging bar must be electrically grounded or electrical shock could result.

DANGER:

FIRE HAZARD

Do not install the charging bar in close proximity to flammable solvents or ignition could occur.

1. Determine location for pinner bar using Section 2, Applications, above as a guide.
2. Drill clearance holes for 5/16 - 18 nylon bolts on frame for mounting the charging bar. If the bar is over 4 feet long, use intermediate supports centered on the bar. Extra mounting kits supplied.
3. Determine if standoffs are needed using section 6.1 as a guide.
4. Install long nylon bolt and standoff. See Figure 6-1A. Note orientation of bolt head flats.

5. Install charging bar on machine frame using standoffs.

6. Tighten nylon nuts by hand.

NOTE: Do not use metal bolts to secure bar clamps. Metal bolts may cause damage to the bar or clamp due to high voltage.

7. Check the nylon nut to be sure it is finger tight.

8. Tighten nylon nut 1/4 turn with wrench.

9. Install second nylon nut and finger tighten.

10. Hold first nylon nut with a wrench and tighten second nylon nut 1/4" turn. Second nylon nut acts as a jam nut to prevent loosening.

6.3 Cable Installation

CAUTION:

ELECTRICAL SHOCK HAZARD

Turn off power supply before connecting high voltage cable or electrical shock could result.

1. Mount cable support and press split plastic bushing out of support eye. Cable supports (see Figure 6-3) are used to guide high voltage cable from the charging bar along the machine frame to the power supply. Cable should always be kept at least 1/4" away from metal surfaces such as machine frames and metal panels.

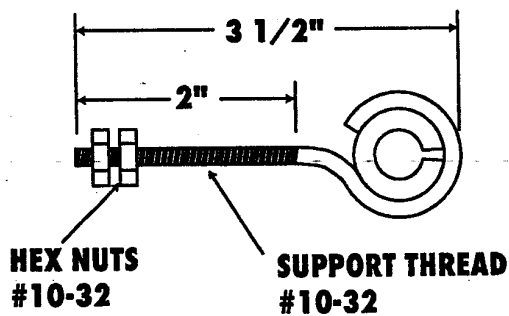


Figure 6-3
Cable Supports

2. Apply split plastic bushing to cable at desired location and press bushing back into cable support eye. Make certain that cable supports remove strain from cable where the bar and power supply are connected.

3. Close eyes of cable supports with pliers to clamp the cable.

4. Screw spring loaded connector into output of Chargemaster power supply, finger tighten only.

Section 7

Operation

CAUTION:

ELECTRICAL SHOCK HAZARD

Do not touch charging bar during operation or electrical shock could result.

DANGER:

FIRE HAZARD

Do not operate the charging bar in close proximity to flammable solvent or ignition could occur.

Refer to the applicable power supply instructions for detailed operating procedures on the power supply.

7.1 Setting Pin Strength

The strength of electrostatic adhesion can be adjusted with the voltage adjustments on the power supply.

1. If adhesion or pinning strength is not adequate, increase operating voltage from power supply. If adhesion or pinning strength is too great, reduce operating voltage from power supply. If charging bar is operated in electrical stress, evident by purple glow on pins and sizzling sound, the operating voltage is set too high and should be reduced.

2. Always turn the power supply off when the system is not in use. For safety and ease of operation, it is recommended to connect the power supply line cord to the electrical system of the user's machine in such a manner that the power supply is only energized when the machine is in operation. This will insure the charging bar will not accidentally remain energized when the machine is not in use.

NOTE: Sustained operation in electrical stress will interfere with operation of the charging system. The bar may not charge materials while in electrical stress. Electrical stress reduces output voltage from the power supply and suppresses the charging process. Sustained stressed operation may damage the bar and/or power supply. See Section 8 for troubleshooting information.

Section 8 Maintenance

CAUTION:

ELECTRICAL SHOCK HAZARD

Maintenance must be performed by qualified service personnel. Turn off power supply before cleaning charging bar or disconnecting high voltage cable or electrical shock could result.

8.1 Cleaning Charging Bar

The cleaning brush furnished with the charging bar should be used to keep the ion emitter points clean. Periodic use of the brush will prevent deposits from accumulating on the points. **Do not attempt to scrape the points with any hard or sharp object which may damage the points.** The points must remain sharp for optimum operation.

1. Remove ink and resistant coatings by wiping the bar with isopropyl alcohol or mineral spirits applied to a clean cloth. Do not pour or soak the bar or any components in the alcohol or mineral spirits.
2. Wipe the bar and supports with a clean, dry cloth. **Do not apply power to the bar until all trace of alcohol or mineral spirits have been removed. Do not use harsh solvents such as lacquer thinner, naphtha or acetone; they will destroy the bar housing.**

8.2 Troubleshooting Low Pinning Strength

If pinning strength is not adequate and power supply is at maximum output voltage, pinning strength can be increased by moving the bar closer to the material being charged. The bar to material distance should be decreased until pinning strength is adequate. At the new distance it may be necessary to adjust the operating voltage of the power supply.

Low pinning strength may also be due to erosion of the emitter pin points. Sharp points promote the best ionization of the air molecules. Inspect the emitter pin points. If the points are visibly eroded or corroded, follow these steps to bring the bar back to full pinning potential:

1. Brush the pins with a non-metallic brush to clean away corrosion caused by heavy or extended use.
2. Test the bar for effectiveness. If the performance does not improve —
3. Remove the emitter pins with a needle nosed pliers.
4. Install new emitter pins (p/n 5050690) in each socket.

If performance is not yet returned to full, contact SIMCO Customer Service at (215) 822-6401.

8.3 Troubleshooting Electrical Stress Between Bar to Material Being Charged

Electrical stress can occur between the bar and ground reference beneath material being charged. This stress typically occurs at edges of material being charged and comes from ion emitter points at end of the bar. To eliminate this stress, reduce operating voltage from the power supply.

8.4 Troubleshooting Arcs from Bar to Machine Frame

1. If electrical stress occurs between the bar and the frame member on which the bar is mounted, the bar may be improperly mounted, see Mounting Configuration in Section 6.1.
2. If electrical stress occurs from the end of the bar to the side frame of the machine, slide the bar away from the side frame if possible. If it is not possible to slide the bar away from the frame, it may be necessary to install an arc shield. Call Simco for details.

Section 9 Replacement Parts

Cable Support, 7/16" dia. cable	4104481
Spring Loaded Cable Connector 30kV	4100286
Spring Loaded Cable Connector 50kV	5050328
Point Cleaning Brush	4670204
Replacement Pin Kit (110 pins per kit)	5050690
Connector Block Kit (30 or 50 kV)	4006320
High Voltage Cable	4810031
High Voltage Cable Sleeving	4800293

Section 10 Warranty

SIMCO equipment has been carefully tested and inspected at the factory and is warranted to be free from any defects in material or workmanship.

SIMCO will, under this warranty, repair or replace any equipment which proves, upon our examination, to have become defective within the Warranty period from the date of purchase. A one year Warranty applies to the Pinner Charging Bar. The equipment is to be returned by the purchaser to SIMCO, 2257 North Penn Road, Hatfield, Pennsylvania, 19440, transportation prepaid and insured for its full purchase price. Prior to returning goods for any reason, contact SIMCO Customer Service at (215) 822-6401 for an Return Authorization Number. This number must accompany all returns.

This Warranty does not apply when the equipment has been tampered with, misused, improperly installed, altered, has received damage through abuse, carelessness, accident, connected to improper line voltage, or has been serviced by anyone other than an authorized factory representative. The warranty does not apply when SIMCO parts and equipment have been energized by other than the appropriate SIMCO power supply or generator, or when SIMCO power supplies or generators have been used to energize other than SIMCO parts and equipment.

SIMCO makes no warranty, expressed or implied, nor accepts any obligation, liability or responsibility in connection with the use of this product other than the repair or replacement of parts as stated herein.