



VUL-CON™

ASP Model

INSTRUCTION MANUAL



Check us out at
www.asgco.com

Customer Service
800-344-4000



24 Hour Emergency
Service and Parts
610-821-0210

ASGCO Mfg., Inc.
301 Gordon Street
Allentown, PA 18102
610-821-0216
FAX 610-778-8991

Operating & Maintenance

For use with VUL-CON™ VULCANIZER – ASP Models. This catalogue has been prepared to present the correct methods and procedures of operating and maintaining your VUL-CON™ SECTIONAL/MODULAR SECTIONAL VULCANIZER.

At the time of writing, the data contained herein was completely updated. However due to continual improvements in design, it is possible that some of the information or appearance of the component parts may vary slightly from the vulcanizer delivered to you. This merely indicates that the unit has been improved to better fulfill your requirements.

Index

Functional Diagram.....	3
1.0 Unpacking Instructions.....	4
2.0 Erection and Assembly.....	4-5
3.0 Pressurizing.....	6
3.1 Using Compressed Air.....	6
3.2 Using Hydraulic Pump Unit.....	7
4.0 Platen Heating.....	8
5.0 Platen Cooling.....	8
6.0 Troubleshooting.....	9
6.1 Not Heating Properly.....	9-10
6.2 Loss of air pressure.....	11
6.3 Loss of Temperature Control.....	11
7.0 Maintenance.....	12
7.1 Replacing Heating Elements.....	12-13
7.2 Replacing Contactors/ SSR.....	13
7.3 Changing pt-100/rtd probes.....	13
8.0 Safety Considerations.....	14
8.1 General.....	14
8.2 Handling.....	14
8.3 Electrical & Heat.....	15
8.4 Set-up/ Mechanical.....	15
8.5 Pressure.....	16-17
8.6 Regular Inspection.....	17
9.0 Warranty.....	18
10.0 Return of Goods.....	18

Functional Diagram



There are two essential requirements for perfect splicing of conveyor belting. These are, Uniform Pressure and Uniform Temperature. Both these requirements are satisfied in the Vul-Con™ Sectional/Modular Vulcanizer.

Uniform Pressure

Full platen size inflatable Pressure Rubber Blanket (Pressure Bag) applies uniform pressure over the entire platen area.

Uniform Temperature

The Heating Rubber Blanket is a silicone rubber element which covers and provides uniform temperature over the total platen surface.

The unique Vul-Con™ platen requires support over its entire =STOP=area or permanent distortion of the platen may occur. Fill any unused portion of the platen area with scrap belting or shims the same thickness as the belting being cured.

1.0 Unpacking Instructions

Carefully remove the crating from around the vulcanizer and inspect for shipping damage. Any damage should be reported to the carrier immediately. Check the packing list, and if present, any shortage should be reported to the carrier and/or Vul-Con™

WARNING: It is very important to know and observe the vulcanizer's pressure limits. Do not exceed the maximum operating pressure, and never leave the vulcanizer unattended.

2.0 Erection and Assembly

IMPORTANT

It is advisable to install hose connectors to the cooling coil blocks prior to positioning the platens, as it is often difficult to install them with the vulcanizer assembled. (See Platen Cooling on page 8)

CAUTION

ALWAYS lift platen in a horizontal position. If using a mechanical hoist, DO NOT connect lifting hooks to the platen handles. Use a rope sling around the platen.

2.1 Locate wooden set-up template on splice location. The templates for most units are in two sections.

2.2 Position bars in the recessed spaces on the set-up template. Correct bar spacing is automatically established.

NOTE: On steeply inclined conveyors, clamp the template to the conveyor structure to keep the bars from sliding.

2.3 Install the 4 (four) platen carrying handles into the outermost threaded holes on the edges of the lower platen by turning the handles in a clockwise direction, until they are hand tight. Ensure that the handle is parallel to the edge of the platen before attempting to lift.

2.4 Lift lower platen into position on the lower bars, ensuring that it is centered in both directions over the bars. Remove handles. For multiple platen sets, lift lower platens into position on the lower bars and butt edges together (see detail, page 7, and G.A. drawing).

2.5 The vulcanizer assembled to this point provides an ideal worktable for preparing the splice. If so desired, a plywood deck may be built up around the platen to increase the size of the worktable. Install belt splice according to belt manufacturer's recommendations.

CAUTION

Care must be taken to ensure that the platen surface is not damaged when using tools for splice preparation. A suitable release agent is recommended for use between belting and platens or stainless steel plates to prevent the belt from sticking.

CAUTION

Since the platens are flexible, all unused portions must be filled with scrap belting or plywood the SAME thickness as the belt. PERMANENT distortion of the platen may occur if this is not done.

2.0 Erection and Assembly

CAUTION

Always ensure circuit breaker on electrical control box is OFF before trying to remove the connectors.

NOTE: The upper platen will contour to minor irregularities in belt thickness without 'shimming' or the use of 'pads'.

2.6 Again using the platen lifting handles, lift upper platen(s) into position over the prepared splice and carefully align with lower platen(s). Ensure both electrical receptacles are at the same end, and remove handles by turning in a counterclockwise direction.

2.7. Install pressure rubber blanket over upper platen with hose coupler located at whichever side (or end) is most convenient for connection to the air control or hydraulic pressure pump.

NOTE: For multiple platen sets, always assemble pressure blankets and platens so that the joints between pressure blankets are not located vertically over the joints between platens (see detail, page 7). Be sure hose couplers are all located on same side of the vulcanizer.

NOTE: For easier assembly (and to lessen chance of fluid getting onto electrical connections) always ensure that the hose connection does not emerge directly over the platen connectors.

2.8 Carefully place pressure blanket tray (cover) over the pressure blanket. Check alignment. For multiple platen sets, be sure the double-layer trays overlap properly.

2.9 Install platen cable connectors (platen end) into the platen receptacles on each platen. Press connectors firmly into the receptacles and screw on, making sure they are inserted to the full depth of the receptacle. When removal of the connectors is necessary unscrew and pull out with a straight pull; otherwise damage may result to the pins.

2.10 Set upper bars into position directly above lower bars, ensuring that the Vul-Con™ label is upright.

3.0 Pressurizing

3.1 Using Compressed Air

CAUTION: Do not leave the air control assembly connected to the air supply once operating pressure is reached.

CAUTION: Do not stand in line with the ends of the traverse bars when the vulcanizer is being operated or pressurized.

3.1.1 Make sure the shut-off valve, figure 3 # 2, is located in the lower (pressurize) position in order to allow air to enter the pressure blanket.

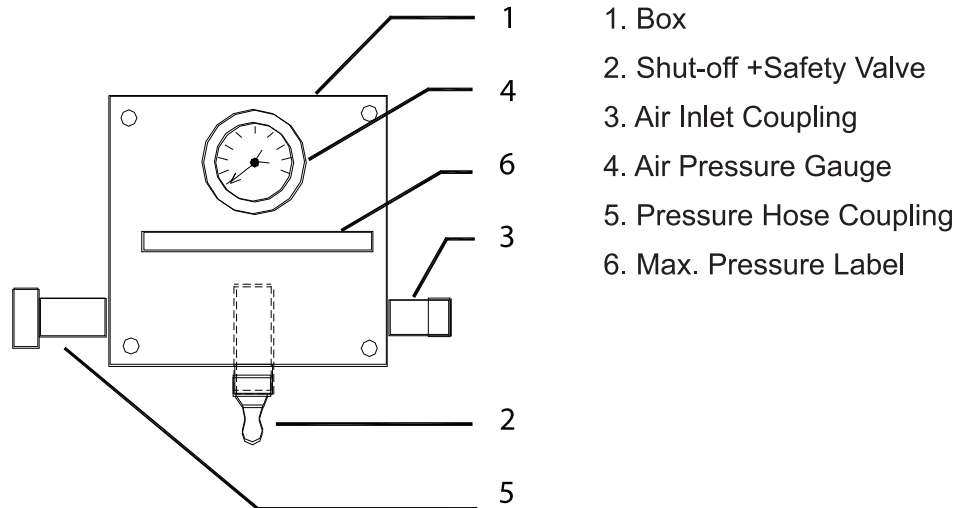
3.1.2 Connect the air supply through the air inlet coupling, figure 3 # 3, to achieve the desired pressure. When the desired pressure is reached, disconnect the air supply from the coupling.

Note: The safety blow-off valve, combined with shut-off valve, is factory set for just above the operating pressure of the vulcanizer.

Pressure is indicated on the air pressure gauge, fig. 3 # 4. Maximum operating pressure is indicated on the warning label on the air control box, as well as on the serial plate located on the back of the electrical control box.

Air Control Assembly

Figure 3



4.0 Platen Heating ***CAUTION***

If the temperature rises above 200 deg C there will be a danger of the element burning out.

Note: The vulcanizer must be pressurized whenever it is being heated.

4.1 To set the timer

(A push wheel type timer is provided. Use push wheels to set the required cure time. Cure time is the time required to cook the belt after reaching the final set temperature in controllers.)

4.2 Place the Upper and Lower platen selector switches, fig 1 #'s 4 & 3 in the "AUTO" position to begin heating the vulcanizer.

4.3 When the controller set point is reached, the timer begins. When the timer times out, the alarm will sound, and power to the platens will automatically be cut. Move the platen selector switches to the 'OFF' position and switch off the miniature circuit breaker. Then, switch the MCB on to read the platen temperature, allowing the operator to monitor the temperature during the cooling cycle.

Note: The selector switches must be turned to the 'AUTO' position to re-heat the vulcanizer.

5.0 Platen Cooling 5.1 Supply air or water through the inlets near the corners of the platens.

5.2 Release the pressure on the vulcanizer by: a) moving the shut-off valve (fig. 3 # 2) of the air control assembly into the upper (pressure release) position, or if water, b) slowly opening the pressure release valve (fig. 4 # 6) of the pump unit.

5.3 When platens have attained suitable cool down temperature, loosen the pressure bolts and disassemble the unit reversing steps detailed in 'ERECTION & ASSEMBLY'.

5.4 If water is used for cooling, pressurized air should be blown through the inlets until there is no moisture coming out of the outlets. This purging should be done before any heat-up of the vulcanizer to avoid internal damage to the platen.

3.0 Pressurizing

3.2 Using Hydraulic Pump Unit

CAUTION:

Do not stand in line with the ends of the traverse bars when the vulcanizer is being operated or pressurized.

3.2.1 Plug pump electrical supply cord into suitable power outlet. Fill pump reservoir with water and suitable mix of glycol. We recommend a 60%/40% water/glycol mixture.

3.2.2 Using quick coupler provided, connect pump hose to the pressure rubber blanket hose.

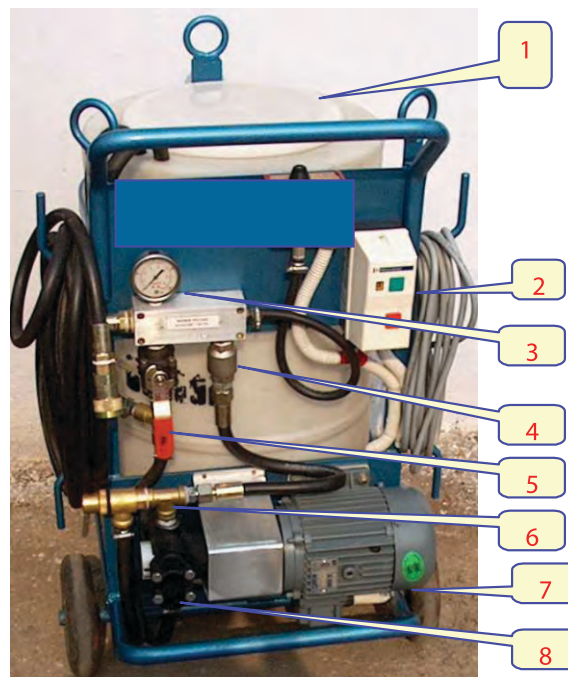
3.2.3 Close pressure release valve (figure 4 # 6), start pump and pressurize to the desired pressure. The pressure relief valve (figure 4 # 8) is preset to the pressure shown on the warning label on the pump unit and on the serial plate located on the electrical control box. If pump should fail to pressurize, check the fluid level in the reservoir.

NOTE: Make sure the fluid is actually entering the pressure rubber blanket before commencing to heat the platens.

3.2.4 After the splice has been completed, release the pressure by opening the pressure release valve (figure 4 #, 6). Release pressure slowly so that undue pressure is not built up in the reservoir.

Hydraulic Pump

Figure 4



1. Reservoir
2. Motor Starter
3. Pressure Gauge
4. Check valve (nrv)
5. Release valve
6. Releaf valve
7. Motor
8. Pump

6.0 Trouble Shooting

CAUTION

Before attempting repairs, make certain that the vulcanizer is disconnected from the power source.

6.1 Not Heating Properly

CONDITION - Vulcanizer does not heat; or sudden drop in temperature

Probable Fault	Maintenance Required
1. Improperly set temperature.	1. Check to assure proper temperature setting on both set points.
2. Improperly positioned selector switches.	2. Both selector switches should be in the 'AUTO' position.
3. Lack of continuity between source and platens.	3. Check power source, fuses, breaker, cable connections. Check main supply cable for broken or damaged connections. Replace if necessary.
4. Loose connection in remote control box.	4. Remove control box back (and front, if necessary) cover carefully and check for loose wire connections and adjust where needed.
5. Loose wiring in platen cable connector.	5. Remove the four screws from the platen cable plug insert, and loosen the cable gland. Slowly pull insert and cable out of hood until wire connections are accessible. Check connections and tighten if necessary.
6. Loose connection between connector plugs.	6. Check that the platen cable connector plug and receptacle are pushed tightly together and secured in position by the lock bar.

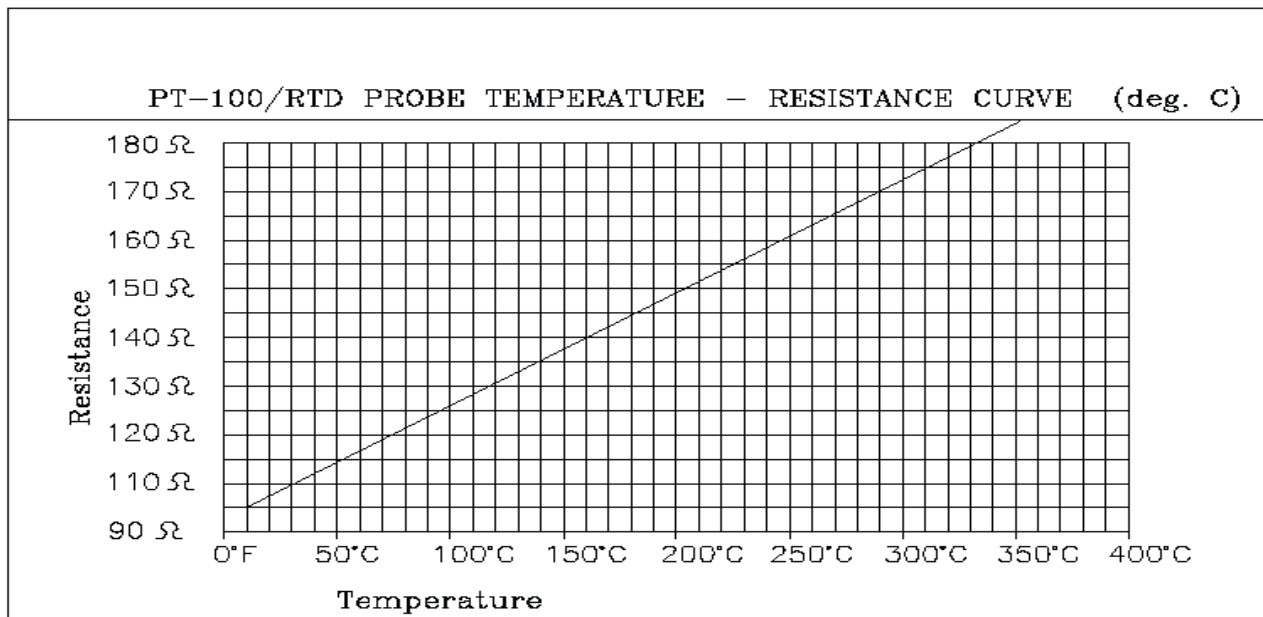
7. ELEMENT FAILURE

If element wires are properly connected and element is not heating, use an OHM meter to take readings between pin connections as per the MWD (Main Wiring Diagram) supplied. Check the Record of Purchase for correct Ohms reading per coil. When using a digital meter and NO reading is obtained it indicates a broken element wire, or a faulty element. An Analog Ohm meter will indicate infinity. If wires are in a good condition then the element is faulty and must be replaced. See 'Replacing Heating Elements'.

8. Faulty PT 100/ RTD probes.	8. Remove platen cable connector from platen connector mounting. Using an Ohm meter take a reading at the platen receptacle between terminals 4 & 6 and 5 & 6. There should be a 'zero' reading between 4 & 5. Also check continuity of the cable. Then check the readings at the control box platen receptacle, and note that platen connector terminals 4, 5 and 6 correspond to control box receptacle pins). Check the resistance rating shown in the appropriate graph. If the rating does not compare to the chart then the probes must be replaced.
9. Faulty Temperature Controller.	9. Refer to Trouble-shooting section of temperature controller manual from controller manufacturer.

6.1 Not Heating Properly

An Ohm meter reading taken across the PT-100/RTD probe pins will vary according to the temperature of the probe. The following graph which shows the resistance of the probe in relation to the temperature, can be used to check whether the probe is functioning correctly. Both probes should give an identical reading.



6.2 Loss of Air Pressure

CONDITION - Dropping air pressure or no air pressure

Probable Fault	Maintenance Required
1. No air supply.	1. Check air supply source.
2. Broken air line or leaking air line connection.	2. Check air line for breaks. Repair or replace.
3. Blockage in air line.	3. Check air lines for blockages. Repair or replace.
4. Air release/pressure relief is leaking. (Warranty is void if pressure is set above pressure indicated on the serial plate.)	4. If unable to detect audibly, use soap and water solution to find leak. The air release/pressure relief valve is factory set to the pressure indicated on the serial plate. If cleaning of valve is necessary it MUST be reset to original blow-off setting.
5. Leaking Pressure Rubber Blanket	5. Remove and inspect the blanket(s) for leaks. If leak is difficult to locate, inflate to 5 psi (.35kg/cm ²) and apply soap and water solution. Bubbling indicates escaping air. If the blanket is leaking it must be replaced.

Troubleshooting...

6.3 Loss of Temperature Control (Overheating)

CONDITION - Temperature continues to increase or will not shut off at the desired temperature.

Probable Fault	Maintenance Required
1. Improperly adjusted temperature set points. Refer also to 6.1 #'s 8 & 9	1. Re-adjust set-points to the desired temperature.

7.0 Maintenance

7.1 Replacing Heating Elements

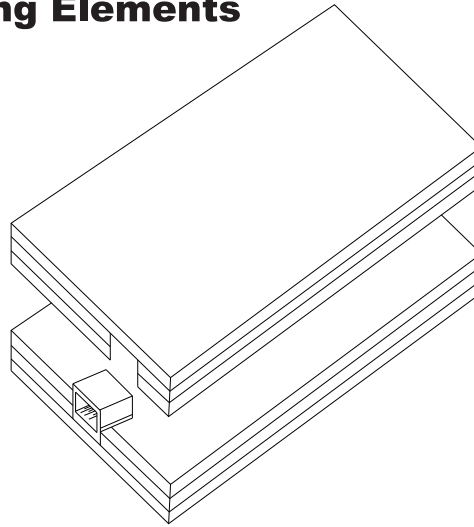


Figure 8

1. Platen connector mounting
2. Platen
3. Element
4. Insulation package

CAUTION - Remove necessary rubber **EVENLY** from both ends.

CAUTION

Ground wires must be connected to ground pin of plug, and grounded at the platen end.

- a. Disconnect vulcanizer from power supply.
- b. Disconnect platen cables from remote control box and platen receptacle mounting.
- c. Remove assembly screws and insulation package (#4), exposing element (#3).
- d. Remove the four screws which hold the platen receptacle insert in the molded base (figure 8 #1), and withdraw the insert until the element & probe wire connections are exposed. Disconnect only the element wires from terminals, noting the sequence.
- e. Carefully remove faulty element from platen.
- f. Place new element on platen and carefully mark holes for platen bolts, also if necessary carefully trim element edges to obtain a proper fit.
- g. Using a leather punch or similar tool, punch holes in the element.
- h. Cut element leads approx. 3" longer than required to be flush with the platen edge. Strip the insulation from the ends about 5-10 mm, and tin the exposed ends with electrical solder.
- i. Insert the leads into the receptacle terminals and tighten set screws. Be sure the leads are connected as the previous element. Refer to MWD (Main Wiring Diagram) supplied for proper wire and pin locations in connector plug.

7.1 Replacing Heating Elements

- j. Replace platen receptacle insert into the molded base, carefully fitting element wires into the space behind the insert.
- k. Ensure element and aluminium element backsheet are completely clean, then re-assemble them and reconnect ground wire.
- l. Replace insulation package, etc.
- m. Turn platen over onto cover and grind flush any protruding screws.

7.2 Replacing Contactors

CAUTION

Incorrect wiring could result in damage to contactor(s) and controller(s).

1. Remove screws from control box back cover and lift off.
2. Remove wires from faulty contactor(s), noting colour code.
3. Remove faulty contactor(s) and install new one(s). Replace wires to contactor(s).

7.3 Changing PT-100/RTD Probe

Follow steps a - c from Section 7.1 on page 12.

- d. Remove the four screws which hold the platen receptacle insert in the molded base (figure 8 #1), and withdraw the insert until the element & probe wire connections are exposed. Disconnect only the RTD probe wires (terminals 4, 5 and 6), noting the sequence.
- e. Then using the 4 mm screw provided, pull out the sensor block that is located immediately behind the molded base.
- f. Remove the PT-100/RTD probe from the sensor block and replace with a new probe. Use a Heat Sink Compound while inserting the new probe. Re-install reversing above steps..

8.0 Safety Considerations

Please read carefully

8.1 GENERAL

The following safety precautions should be read carefully and understood thoroughly before setting up or operating your vulcanizer. Failure to follow these precautions may result in personal injury and/or equipment damage. All operating personnel should be trained in the proper method of handling, setting up and operating the vulcanizer.

8.2 HANDLING

This includes safe moving, rigging and staging of the press not unlike any other piece of field equipment whatever it's function. A review of checkpoints for safe handling of a vulcanizer would include the following, starting right at load up onto a truck at the technician's home base.

1. Always use protective gloves when manually moving a vulcanizer or it's components. Hard hat and protective footwear are also recommended.
2. Be aware of the weight of the vulcanizer (or components) before lifting in order to have sufficient manpower or lifting capacity.
3. When loading onto a truck, be sure that the vulcanizer is securely lashed, anchored or prevented from shifting in some manner. It is usually recommended to partially inflate the vulcanizer to make it more stable over the road.
4. Be sure that the combined weight of the vulcanizer and all associated equipment is within the truck capacity.
5. Observe the above steps also when off loading the vulcanizer at the job site. It is often worthwhile to include a vulcanizer cart of some sort as standard equipment for internal transportation at the worksite.
6. If moving and lifting of the vulcanizer is to be done by customer personnel or a mixed team at the job site, arrange a work plan and signal system that will be understood by all involved especially where there is much extraneous noise.
7. For elevated work areas, use appropriate hoisting procedures and practices established at that particular plant.
8. If vulcanizers (or components) are to be handled manually, be sure that any personnel unfamiliar with the equipment are made aware of the weights and handling problems of each piece, especially climbing stairways or moving along galleries, scaffolds, etc.
9. If work area includes a steep incline, make provisions for stabilizing the vulcanizer and restricting slideback of all related equipment.
10. In general, safe handling of a belt vulcanizer requires primarily some forethought and a little common sense. In this way potential bumps, pinches, muscle pulls, back strains and possibly more serious injuries can be avoided.

8.3 Electrical & Heat

1. Be sure the vulcanizer's heating system and controls are in good working order especially before moving into a field job site. From a safety standpoint this means inspecting all connectors, cords and other related components for wear, corrosion or other damage that could result in or permit short circuits, arcing or similar electrical hazards.
2. Check carefully that the correct electrical voltage and phase will be supplied to the vulcanizer, that the supply has sufficient current capacity, and ensure that the supply is properly grounded.
3. Always have a provision for quick, convenient power cut off independent of the vulcanizer controls themselves.
4. Avoid using equipment in wet surroundings.
5. DO NOT remove plug-in cables with power supply under load.
6. Despite automatic controls of various types, an operating vulcanizer should never be left unmonitored. At least one trained attendant should be present at all times. In addition to the safety implications, an unobserved vulcanizer electrical malfunction can have adverse effects on the curing process itself.
7. As well as the electrical precautions noted above, there is the obvious safety risk in dealing with the elevated temperatures of vulcanizing. The chances of burn injuries from the press itself and items heated by the press to the cure temperature or more can be reduced by wearing gloves and other protective clothing. Even after the curing cycle has been completed and the press cooled down enough to open, care must be taken to avoid burns from unexpected residual heat in various components.

8.4 Set-Up Mechanical

1. Ensure correct traverse bar layout is made using the templates supplied with the press.
2. Centre platens over all bars.
3. Ensure entire platen surface is filled to prevent platen damage.
4. Secure all pressure bolt nuts evenly HAND TIGHT ONLY.
5. Install restraining bars. The restraining bars, brackets and safety chains must be in use to eliminate the hazards which might result in the event of a bolt failure.
6. Install pins in traverse bar ends.

NOTE: Refer to "Erection and Assembly" section for the six points mentioned above.

8.5 Pressure

1. It is very important on all vulcanizers to know and observe the pressure limits. This pressure is indicated on the serial plate affixed to the electrical control box.

Example:

If your vulcanizer is 500 mm x 1600 mm in size and is operated at a pressure of 7 kg/cm², the total force developed is approx. 56 tonnes!!. An increase of only 1 kg/cm² from 7 kg/cm² to 8 kg/cm² increases the total force developed in the vulcanizer by approx. 8 tonnes. PLEASE BE CAREFUL NEVER TO EXCEED THE PRESSURE LIMITS OF YOUR VULCANIZER.

2. DO NOT connect to a continuous pressure supply. In the event of a component failure, the restraining system will allow the operating pressure to drop to a safe level, and all components will be contained. A continuous pressure supply will preclude this feature.

3. When pressurizing and during the cure cycle, DO NOT stand within two meters of the press. DO NOT stand, sit or lie on top of the vulcanizer. Since high stress levels are resident in traverse bars and pressure bolts during operation, any failure can result in components moving suddenly within the confines of the restraining system.

4. The platen design requires support over it's entire area or permanent distortion of the platen may occur when the vulcanizer is pressurized. Ensure that the entire platen surface is filled with scrap belting or shims the same thickness as the belt being cured.

5. Be sure all related components such as bars, bolts, clamps, edge irons, etc. are properly seated and aligned before introducing pressure.

6. At a relatively safe level, approximately (25 psi) 1.75 kg/cm², stop pressurizing and recheck all components mentioned above.

7. Be sure all pressure gauges, whether air, water, or oil are registering accurately.

8. If special safety clamps or pins, etc. are provided be sure they are used.

9. Do NOT lock out or disarm safety relief valves or signals.

IMPORTANT

Ensure that all components are correctly assembled before pressurizing the vulcanizer. If a failure occurs, and all components were not in use, no product warranty will be considered.

CAUTION:

DO NOT EXCEED THE PRESSURE RATING indicated on the serial plate.

8.5 Pressure

10. Train splice technicians to become familiar with the customary amount of deflection in properly operating presses so that any malfunction will be quickly recognized and corrected.

11. Make a continuous procedure, every cure cycle, to visually examine welds, bolts, bolt seats and other stress areas for signs of deterioration or fatigue.

12. Continuously check pumps, lines, hoses, connectors, couplings, etc. for wear or deterioration that could endanger personnel. Replace as necessary.

13. As with electrical functions of the press, automatic pressure controls do not preclude all hazards. This is especially true from the pressure hazard standpoint since thermal changes during heat-up and cure can cause stress transfers within the various components. Again, in addition to the safety implications, an unobserved pressure malfunction can adversely affect the vulcanization results, so **THE VULCANIZER SHOULD NEVER BE LEFT UNMONITORED.**

Historically, the use of belt splicing and repair vulcanizers has not been marked by a pattern of frequent or severe injuries. However, the observation of good safety practices is worthwhile to help reduce even minor injuries and ward off the potential of an uncommon but serious accident.

8.6 Regular Inspections

1. Every 60 days or following each 30 cures, inspect the following pressure-bearing components to ensure they are in good condition.

2. Inspect the pressure bolt for straightness. If the bolt shaft exhibits any permanent bend the bolt **MUST BE REPLACED.**

3. Clean and visually inspect the threads at the upper end of the bolt. Ensure there are no cracks at the base of any of the threads. If there are cracks remove the bolt(s) from service and contact Vul-Con™.

4. Apply a small amount of anti-seize compound to the threads.

5. Visually inspect the lower end of the bolt to ensure the rectangular nut is securely in place. The bottom surface of the nut must be flush with the end of the bolt, +/- 1 mm.

6. If the rectangular nut is not in the correct position it must be corrected. It must then be locked in place.

Contact Vul-Con™ for assistance with the best procedure for doing this.

7. The bolts should be subjected to a non-destructive test at regular intervals to ensure that no cracks have developed in the threads at either end of the bolt (cracks which are not detectable by visual inspection). As a general guideline, bolts which are used once or more each week should be tested every two years.

8. Inspect the bolt retaining lugs (plates welded to the webs at the end of each bar on which the bolt's lower nut bears) to ensure no cracks are evident in these areas. If cracks are visible, remove the bar from service and contact Vul-Con™.

9. Inspect the bars for straightness. Any bar which has developed a permanent bend **MUST BE REPLACED.**

9.0 Warranty

See 'CERTIFICATE OF WARRANTY' for full details and conditions concerning the warranty.

10.0 Return of Goods

The Service department of Vul-Con™ MUST be contacted prior to returning goods to the factory for the necessary authorization and documentation.