

# Tire Repairs



Repair  
Manual  
RM-7

Bias Ply  
Truck Section  
Repair Using  
The Tech BP<sup>®</sup>  
Repair Method

# T

## TECH BP®

### Bias Ply tire repairs

Tech BP tire repairs can be used on tubeless or tube-type tires. They offer excellent flexibility, greater strength, superior construction and have been proven safe and dependable by millions of on-the-road miles. All Tech bias repairs are manufactured with a ply of rubber between the fabric and cushion gum which acts as a float or shock absorbing ply. Repair unit construction allows for easy application and enables repairs to be made closer to the tire bead, eliminating the need for a separate sidewall repair unit. These repairs are also designed to have excellent air retention when used in tubeless tires.

#### TECH BP REPAIRS (low temperature chemical cure)

Cat. No.	Description	Box Qty.	Dimensions (Inches)	Dimensions (mm)	Piles
310	0 OT	50	1 1/4	30	1
311	1 OT	25	2 1/4	60	1
311T	1 OT in plastic tub	80	2 1/4	60	1
312	2 OT	20	3	75	1
313	3 OT	10	3 3/4	90	2
314	4 OT	10	5	125	2
603	BP-3	10	4 x 4	100 x 100	2
604	BP-4	10	5 1/8 x 5 1/8	130 x 130	4
605	BP-5	10	6 1/2 x 6 1/2	165 x 165	4
606	BP-6	5	9 1/8 x 9 1/8	240 x 240	6
607	BP-7	5	11 1/4 x 11 1/4	290 x 290	6
608	BP-8	5	13 1/2 x 13 1/2	340 x 340	6
609	BP-9	3	15 1/2 x 15 1/2	380 x 380	8
610	BP-10	3	17 1/2 x 17 1/2	430 x 430	8
620	BP-T0	10	8 x 8	200 x 200	4
621	BP-T1	5	9 x 9	225 x 225	4
622	BP-T2	5	11 x 11	275 x 275	4
623	BP-T3	5	15 x 15	375 x 375	4
624	BP-T4	5	9 x 9	225 x 225	6
625	BP-T5	5	11 x 11	275 x 275	6
626	BP-T6	5	15 x 15	375 x 375	6



1 Inspect the tire on the inside and the outside to determine the reparability of the casing. The tire should not be repaired if it shows signs of being run under-inflated, if it has ply separation, or if it has bead damage beyond repairable limitations.

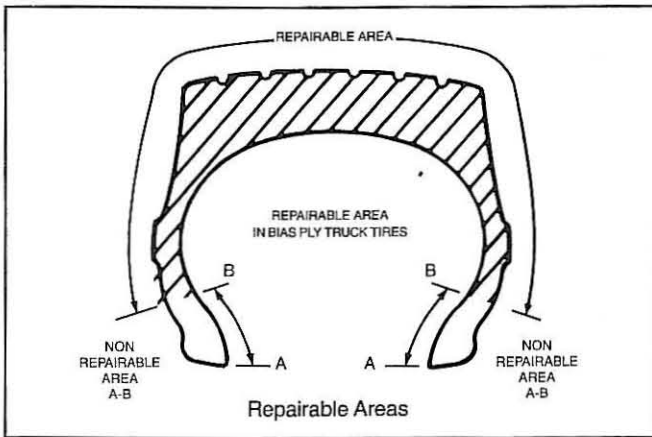
- The inspection area should have good lighting inside and outside of the tire.

#### TECH BP REPAIRS (uncured)

Cat. No.	Description	Box Qty.	Dimensions (Inches)	Dimensions (mm)	Piles
311U	U-10T	25	2 1/4	55	1
312U	U-20T	20	3	75	1
313U	U-30T	10	3 3/4	90	2
314U	U-40T	10	5	125	2
603U	U-BP-3	10	3 3/4 x 3 3/4	85 x 85	2
604U	U-BP-4	10	4 7/8 x 4 7/8	115 x 115	4
605U	U-BP-5	10	5 5/8 x 5 5/8	140 x 140	4
606U	U-BP-6	5	8 3/4 x 8 3/4	220 x 220	6
607U	U-BP-7	5	10 3/4 x 10 3/4	265 x 265	6
608U	U-BP-8	5	12 3/4 x 12 3/4	315 x 315	6
609U	U-BP-9	3	14 3/4 x 14 3/4	355 x 355	8
610U	U-BP-10	3	16 3/4 x 16 3/4	405 x 405	8
620U	U-BP-T0	10	7 x 7	175 x 175	4
621U	U-BP-T1	5	8 x 8	200 x 200	4
622U	U-BP-T2	5	10 x 10	250 x 250	4
623U	U-BP-T3	5	14 x 14	350 x 350	4
624U	U-BP-T4	5	8 x 8	200 x 200	6
625U	U-BP-T5	5	10 x 10	250 x 250	6
626U	U-BP-T6	5	14 x 14	350 x 350	6

## BIAS PLY TRUCK REPAIR USING THE BP® REPAIR METHOD

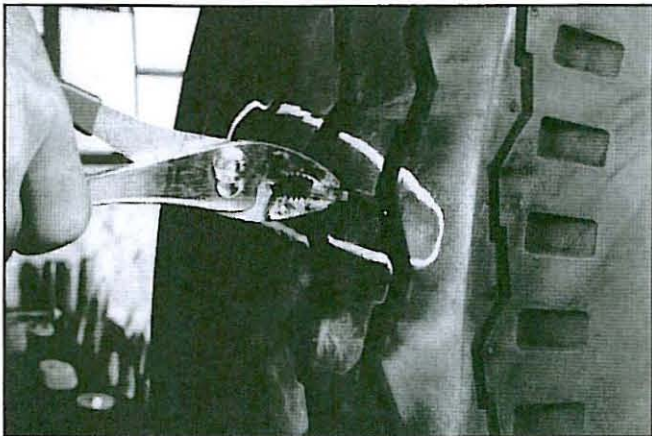
The following is a section repair of a bias truck tire using a Tech BP repair unit. The curing procedure is what is recommended if the curing system being used is a spotter. In this type of curing system, the repair is applied after the skive fill has been cured with a spotter. TECH BP low temperature repairs can be used chemically or in a heat cure system such as a section mold or retread process. BP repairs are also available in uncured form for use in section molds.



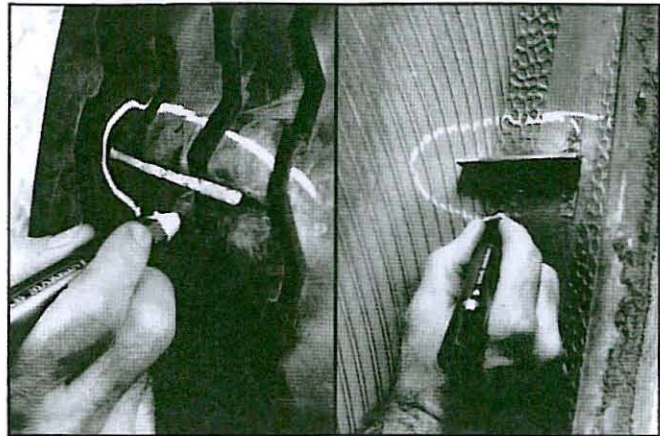
**2** If the injury falls in the non-repairable area, the tire can not be repaired. Measure the distance between the bead toe and the end of the injury on the inside of the tire to determine the non-repairable area.

$$7.00 (8) - 8.75 (9) = 3\frac{1}{4}" (81\text{mm})$$

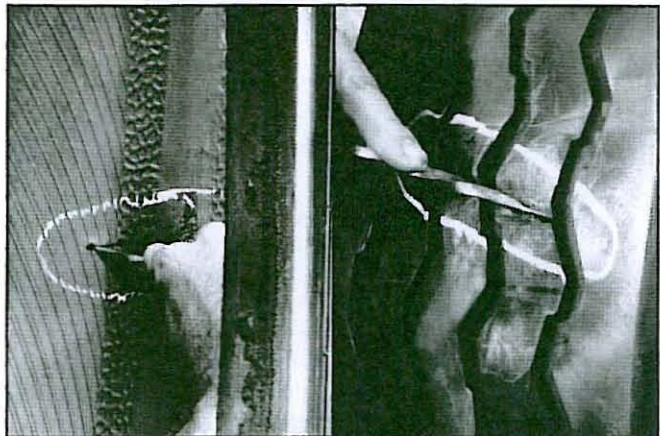
$$9.00 (10) - 14.00 (15) = 4" (100\text{mm})$$



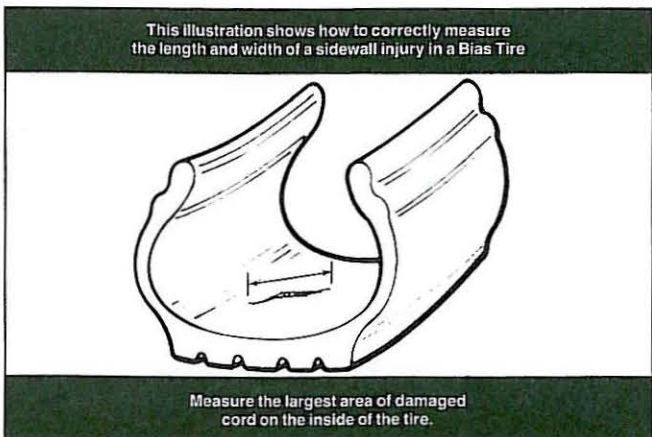
**4** Remove any injuring objects.



**3** Locate and mark all injuries on the outside and inside of the tire.



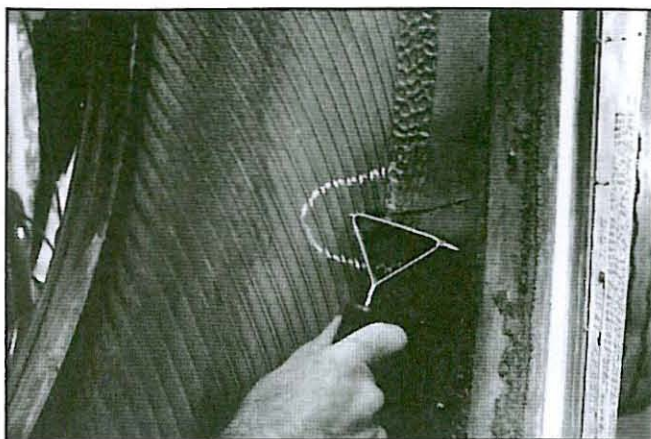
**5** To determine the extent of damage and any possible ply separation, probe the injury using a blunt point awl or a spiral cement tool (#915), from inside and outside of the tire.



**6** On the inside of the tire, measure the largest area of damaged cord, then refer to the BP Limitations Chart to determine if the injury is repairable.

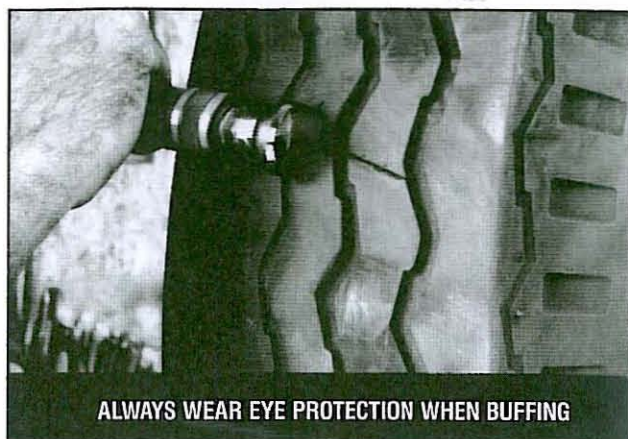


**7** When determined repairable, pre-clean the innerliner by applying Tech Rub-O-Matic Aerosol (#704-A) to the injured area.



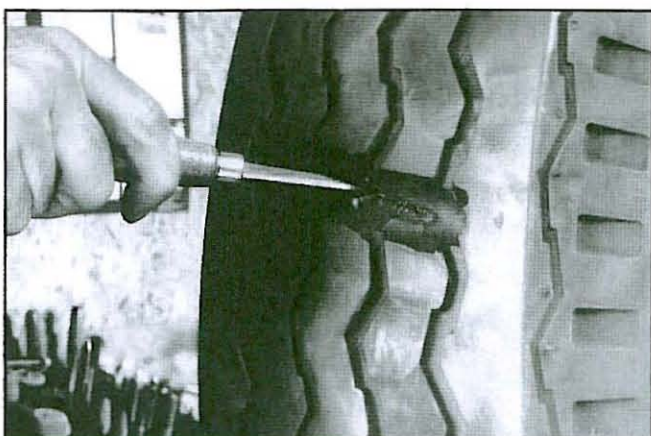
**8** While the area is still moist, use the Tech Scraper (#933) to remove contaminating substances.

\*Also remove contaminating substances from the outside of the tire.

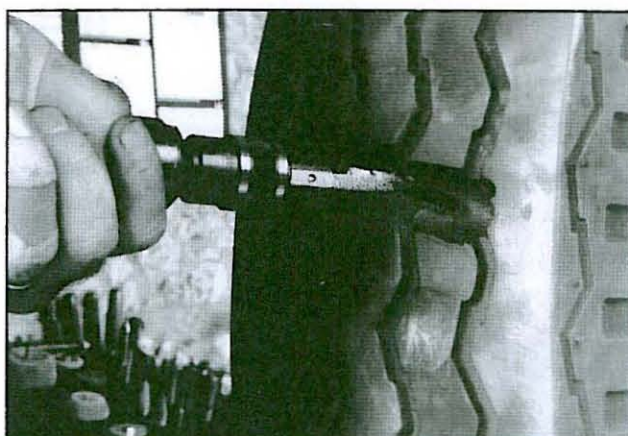


**ALWAYS WEAR EYE PROTECTION WHEN BUFFING**

**9** Using a low r.p.m. (max. 5,000 r.p.m.) buffer, such as the Tech #S-1032 or #S-1036 air buffers, and using a rotary gouge #S-2045 or #S-2046, remove the outer rubber around the perimeter of the injury ju: above the construction plies of the tire.\*



**10** Using a Tech Skiver (#940 or #941), remove only damaged material from the tire. This should be removed at a 90° angle to the tire.



**11** Use a RUBBERHOG Rasp (#230 SSG) on a Tech low r.p.m. air buffer to remove any irregularities and to round off the skive ends. This prevents injury growth after repair. To keep the size of the injury as small as possible, it is important to use a Y-skive whenever possible.



**12** If repairing a tread injury, use a pencil rasp (#RH-625) on a low r.p.m. air buffer, and lightly buff the tread grooves for good adhesion of the filler rubber.

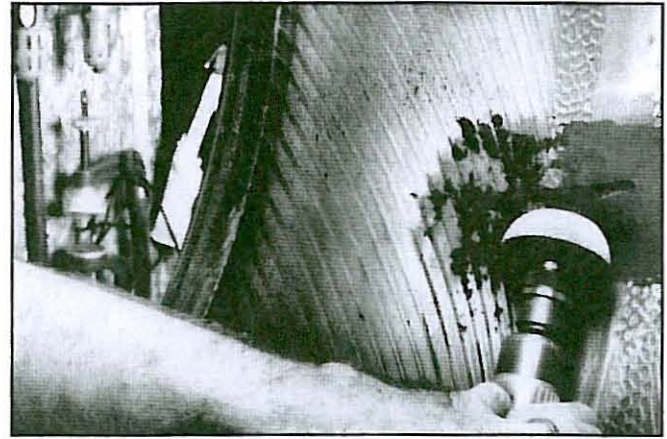


**13** Switch to a RUBBERHOG rasp (#230 SSG) on a low r.p.m. air buffer. Dress the rubber of the skive at a 45° angle.

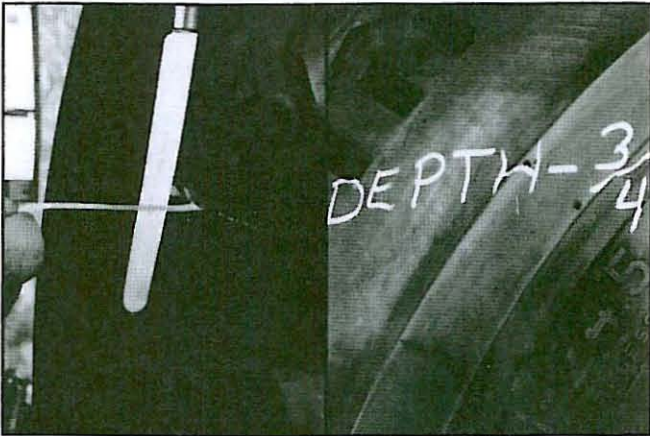
\* (Another method of quickly removing surface rubber is to use a coarse gritted RUBBERHOG Rasp (#390 SSG) on a low r.p.m. air buffer.)



**14** With the same rasp or an innerliner wheel (#RH-106), lightly buff a perimeter around the skive area approximately 1½" (40mm).



**15** Using the Rubberhog innerliner wheel (#RH-106) on a low r.p.m. air buffer, buff a perimeter on the innerliner approximately 1½" (40mm) to receive a platform of filler rubber.



**16** When using a spotter or section mold, you will need to know the thickness of the rubber to be cured. Measure the section depth at the thickest part of the skive. Write the measurement on the outside of the tire for future reference.



**17** Take a measurement of the largest overall cord damage to determine the proper size repair unit. Do not measure across the 45, only measure the cord damage of the fabric area. You also need to know the ply rating of the tire to properly use the chart.

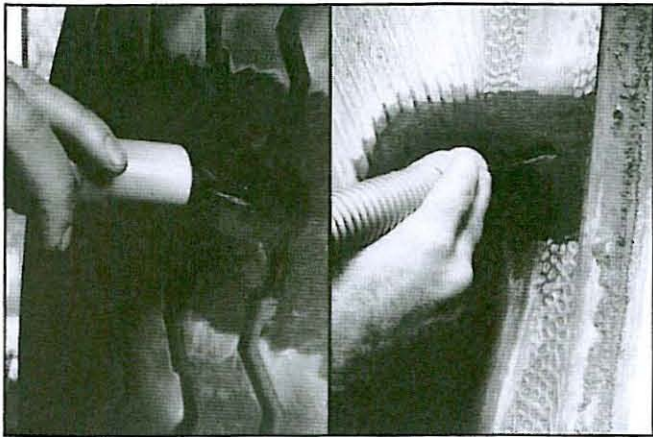
**CAR, TRUCK AND EARTHMOVER SIZE OF INJURY—TREAD, SHOULDER AND SIDEWALL**

PLY RATING	mm	3	5	10	15	20	25	40	50	65	75	100	125
	inches	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"
4	0 OT	1 OT	2 OT	3 OT	BP 3	BP 3	BP 4	BP 5	BP 5				
6	0 OT	1 OT	2 OT	3 OT	BP 3	BP 3	BP 4	BP 5	BP 6				
8	0 OT	2 OT	3 OT	3 OT	BP 3	BP 4	BP 4	BP 5	BP 6				
10	0 OT	2 OT	3 OT	BP 3	BP 3	BP 4	BP 5	BP 6	BP 6	BP 7	BP 8		
12	0 OT	2 OT	3 OT	BP 4	BP 4	BP 4	BP 5	BP 6	BP 6	BP 7	BP 8		
14	1 OT	2 OT	BP 3	BP 4	BP 4	BP 5	BP 6	BP 6	BP 7	BP 7	BP 8	BP 10	
16	1 OT	2 OT	BP 4	BP 4	BP 5	BP 5	BP 6	BP 6	BP 7	BP 7	BP 8	BP 10	
18	1 OT	2 OT	BP 4	BP 5	BP 5	BP 5	BP 6	BP 6	BP 7	BP 8	BP 9	BP 10	
20	1 OT	2 OT	BP 4	BP 5	BP 5	BP 5	BP 6	BP 7	BP 7	BP 8	BP 9	BP 10	
22	1 OT	2 OT	BP 4	BP 6						BP 9	BP 9	BP 10	
24	1 OT	2 OT	BP 4	BP 6						BP 9	BP 9	BP 10	

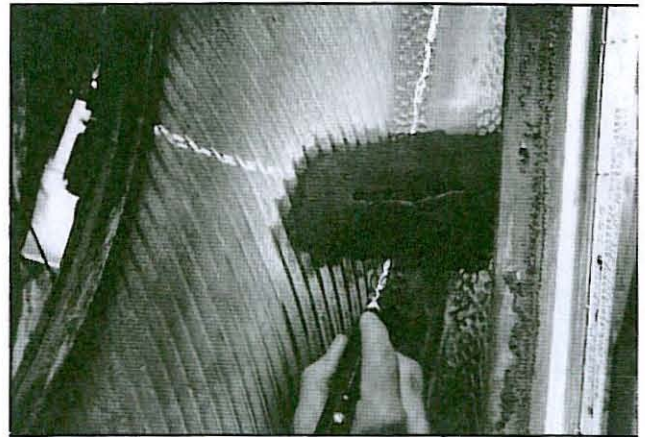
**18** Instructions for using the chart are as follows:  
**A.** Locate the ply rating on the B.P. chart. (The ply ratings are listed down the left hand side of the chart).  
**B.** Locate the injury size on the chart (listed across the top of the chart).  
**C.** Join the two columns and you will find the proper repair unit where the columns meet.



**19** Write the size of repair unit needed on the outside of the tire.



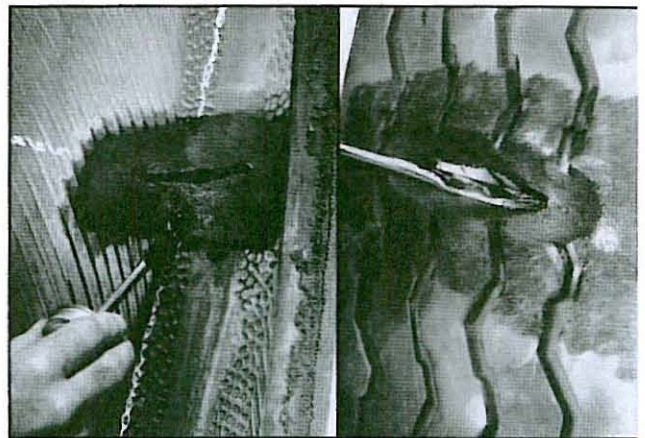
**20** Vacuum the exterior skive area and the innerliner of the tire to remove all buffing debris.



**21** Draw crayon index lines at right angles from the skive on the inside of the tire to aid in centering the spotter and repair unit.



**22** Clean the skive area thoroughly on the inside and outside of the tire with Tech Rub-O-Matic (#704) and a clean, lint-free cloth. Allow approximately 3 to 4 minutes for drying time. Double drying time if there is any exposed cord body.

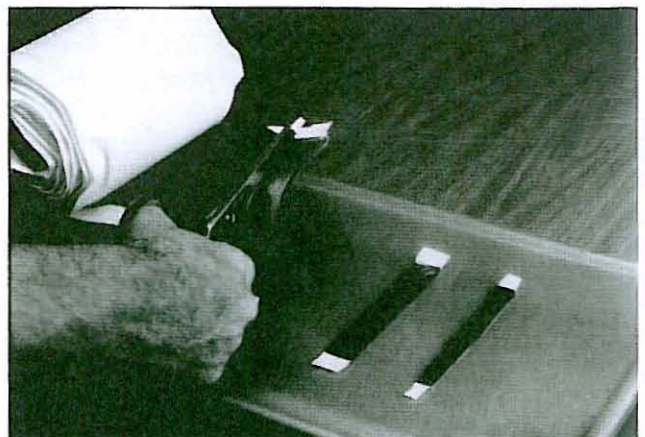


**23** Apply an even coat of cement to the entire skive area, inside and out with either Tech Temvulc (#1082) or Tech Chemical Vulcanizing Fluid (#760) and allow to dry thoroughly.\*



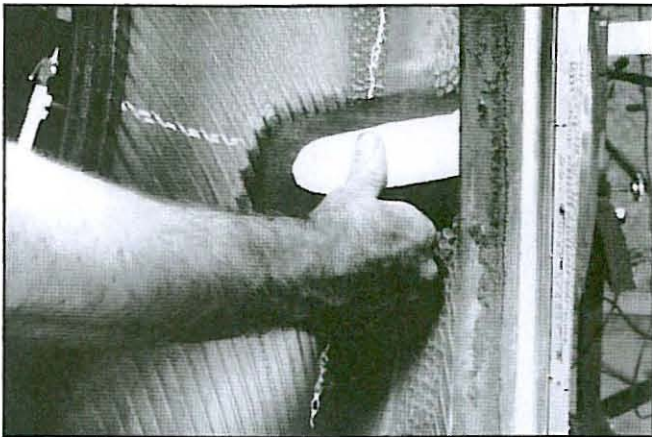
**24** Using Tech Vul-Gum 1/8" (3mm) thick, cut a platform of Vul-Gum 1" (25mm) larger than the skive opening on the innerliner of the tire. Center the platform over the injury.

**\*A.** Tech Temvulc (#1082) — When applying Tech Temvulc black retread cement, allow approximately 15 to 20 minutes drying time (longer in humid climates). Double the drying time if the vulcanizing fluid is being applied to exposed cord body.



**25** Using 1/8" (3mm) thick Vul-Gum, cut enough strips to fill the skive and preheat to approximately 120° to 130° F (49° to 55° C).

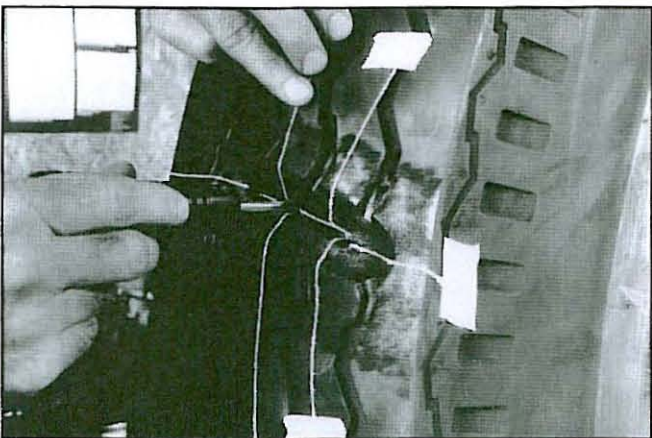
**\*B.** Tech Chemical Vulcanizing Fluid (#760). When using Tech Chemical Vulcanizing Fluid, allow approximately 3 to 5 minutes for drying time (longer for humid climates). Apply two coats and double the drying time when used in tube type tires.



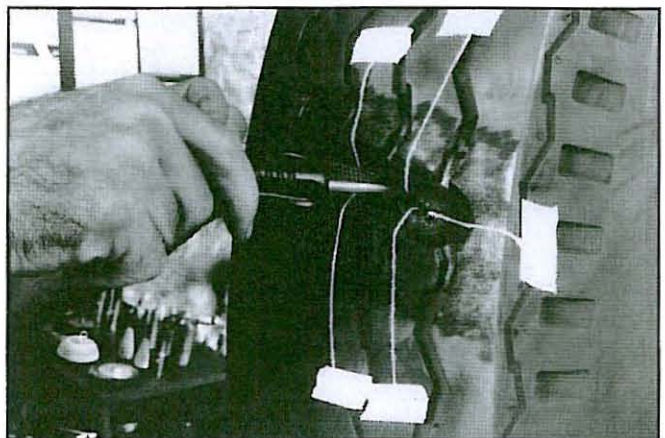
**26** Press the platform down with your thumb.



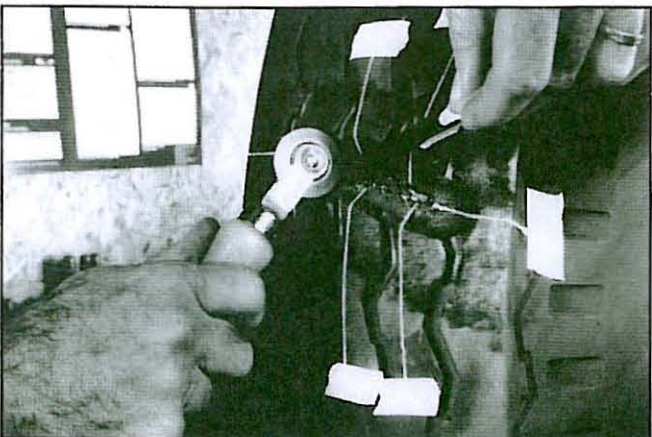
**27** Stitch the platform into place using a Tech sticher.



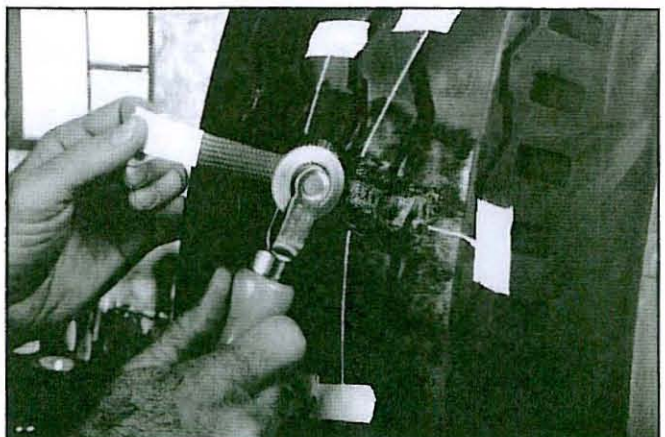
**28** On the outside of the tire, place vent strings down into the injury to release inner ply pressure (air trapped within the cord body of the tire during manufacturing). Tape the ends of the strings to the outside of the tire approximately 3" (75mm) away from the skive.



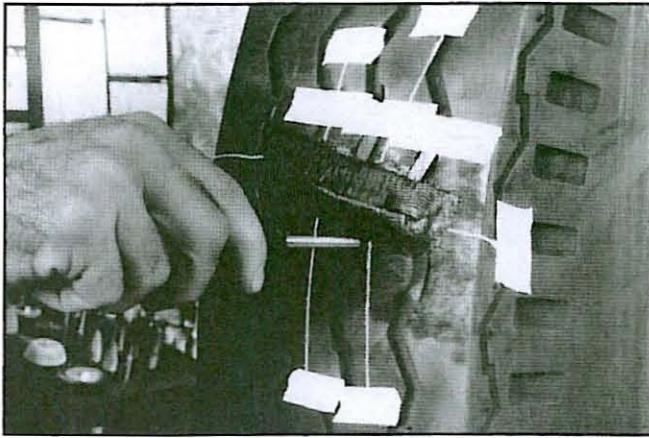
**29** Pack the Vul-Gum into the skive with a blunt object, such as a skive packing tool (#986). Do not try to fill too large an area at once due to the fact that you might trap air in the rubber. Fill the skive up with this tool until you can switch to a sticher.



**30** Finish the filling process with Tech sticher.  
Note: Avoid stretching the Vul-Gum during the filling process.



**31** Fill to a point where the rubber is approximately 1/8" to 1/4" (3mm to 6mm) above the tire's surface, and at the highest point in the center of the skive fill.



**32** When filling a tread section and there is a tread groove in the skive, the groove must be blocked to prevent the rubber from flowing out of the skive while curing. The blocks can be made of scrap regrooved rubber. In large lugs, you may use plaster as a blocking material.

#### EXAMPLE

Platform	= 1/8" or 3mm
Section Depth	= 1 1/2" or 38mm
Overbuild	= 1/4" or 6mm
Total Vul-Gum	= 1 7/8" or 47mm

$$1\frac{7}{8}" = 1\frac{5}{8}"$$

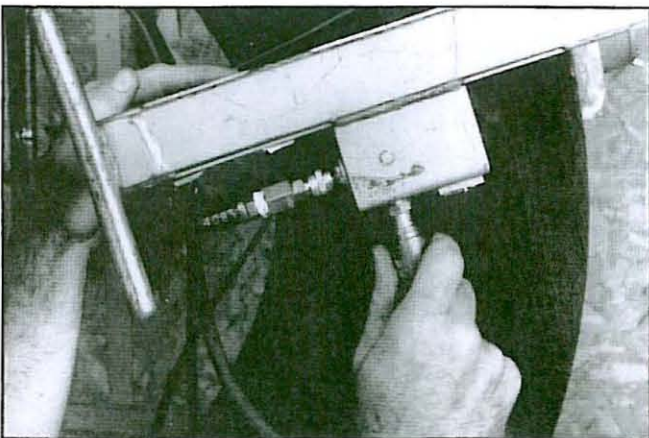
$$15 \times 10 = 150 \text{ minutes}$$

Vul-Gum cure rate

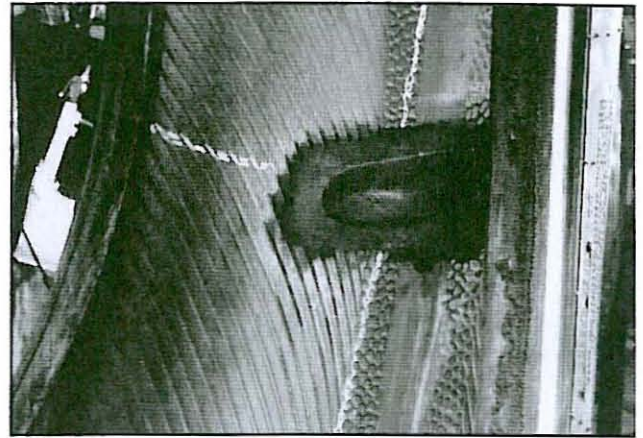
10 minutes for every 1/8" (3mm)  
of thickness at 300°F (149°C)

Plus manufacturer's required warm up time

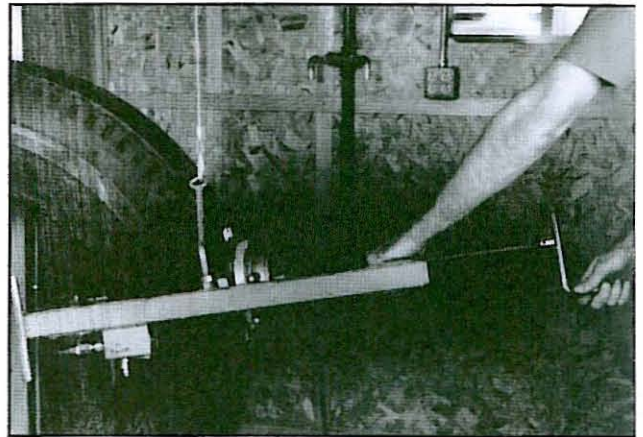
**34** Determine the cure time needed to vulcanize the uncured Vul-Gum. The cure rate for Tech Vul-Gum is 10 minutes for every 1/8" or (3mm) of rubber. When using a cold spotter, you will have to also determine the manufacturer's recommended warm-up time.



**36** Connect the air line and set the pressure on a Tech Spotter to no higher than 35 p.s.i. If you are using a manual type spotter, it will be necessary to retighten the spotter after 5 to 10 minutes.



**33** Remove the white polyethylene protective covering.

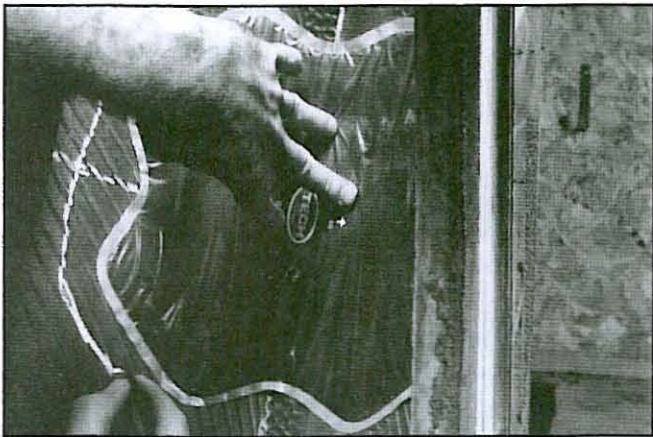


**35** Place the spotter over the skive fill with proper contour plates. Make sure the heating elements are working properly.

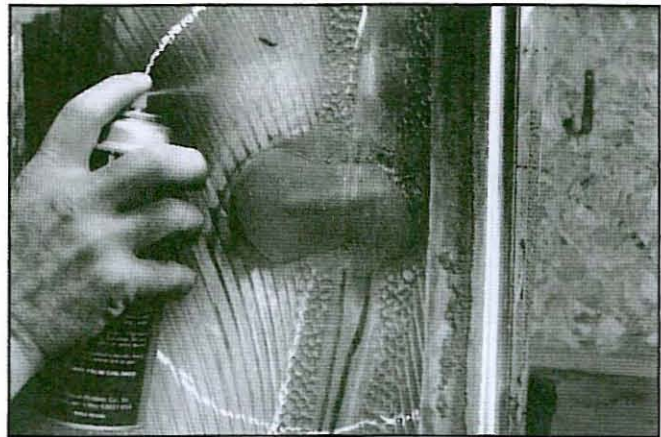


**37** After the allotted cure time, disconnect the air line and remove the spotter from the tire. Allow the tire to cool down, then, using a skiving knife, cut any over-flow away from the tire. This step is usually not necessary when using an air spotter.

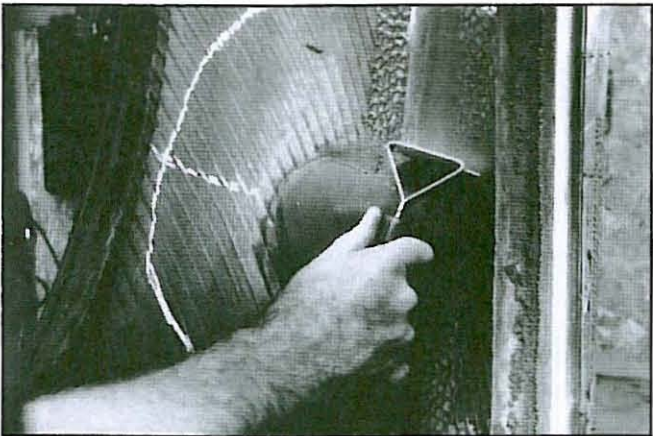




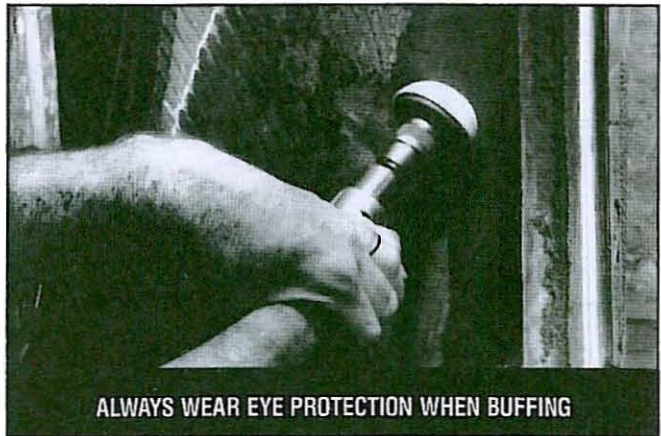
**38** Using the index lines, center the previously determined repair unit over the injury and draw a perimeter approximately 1" (25mm) around the circumference of the repair unit. This is to be used as a guide for mechanical buffing.



**39** Pre-clean within the marked area by applying Tech Rub-O-Matic Aerosol (#704A).

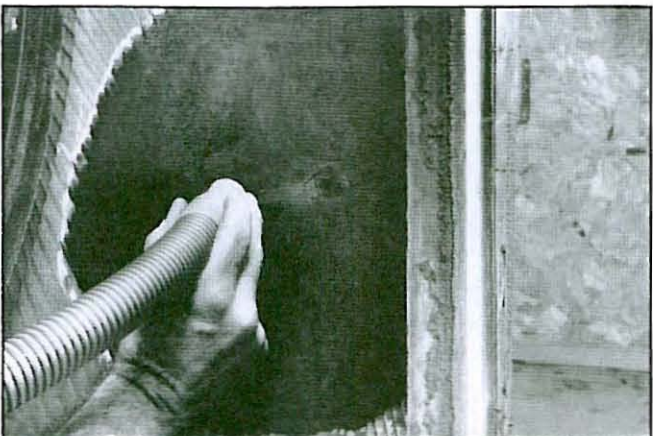


**40** While the area is still moist, remove contaminating substances using a Tech Scraper (#933).



**ALWAYS WEAR EYE PROTECTION WHEN BUFFING**

**41** Using the low r.p.m. air buffer (5,000 r.p.m. maximum), mechanically buff the area with the Tech Rubberhog (#RH-106). Buff away the platform. Also remove any vent ribs and/or embossed surfaces to an even velvet texture.



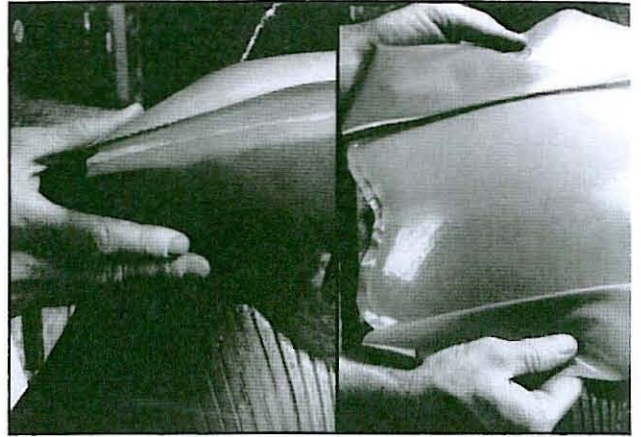
**42** Vacuum the entire buffed area and surrounding area to remove debris from the tire.



**43** Clean with Tech Rub-O-Matic and a clean, lint-free cloth. Always clean from the center, out. Make sure the surface is cleaned thoroughly. Allow 3 to 4 minutes for the solvents to evaporate. (Double the time for tube type tires if there is exposed fabric.)



**44** Apply a thin, even coat of Tech Chemical Vulcanizing Fluid (#760) to the prepared area of the innerliner. Allow approximately 3 to 5 minutes for drying time, two coats for tube type tires and double the drying time. It is important that the Vulcanizing Fluid is completely dry.



**45** Break the perforation and roll the blue poly backing approximately half way back. This will allow you to handle the repair unit without contaminating the gray cushion gum of the repair.

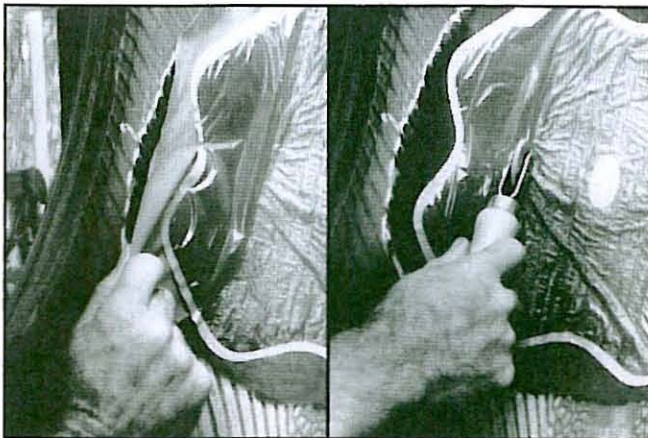
Note: Make sure that the beads of the tire are in a relaxed position before applying the repair unit.



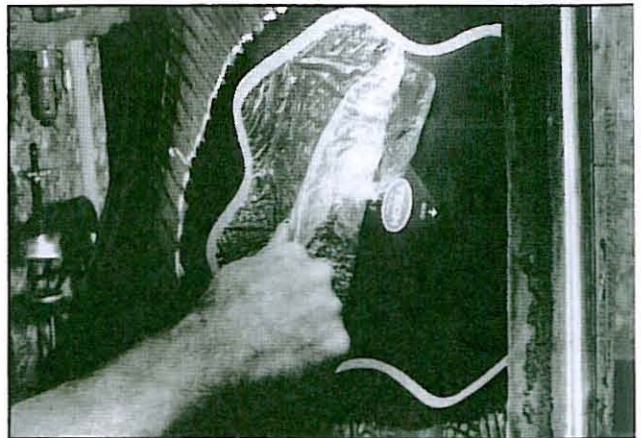
**46** Center the repair unit over the injury using the index lines. Be sure that the bead arrow is aligned with either bead of the tire. Press down the center of the repair with your thumb or the side of your hand.



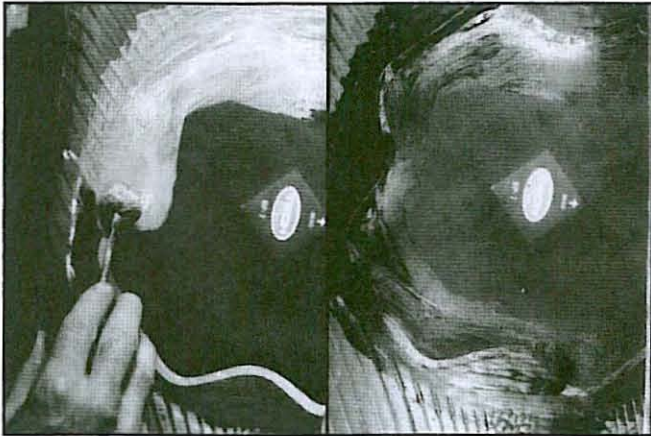
**47** Stitch the repair unit into place from the center outward. Exert firm pressure on the stitcher during this process to promote increased adhesion.



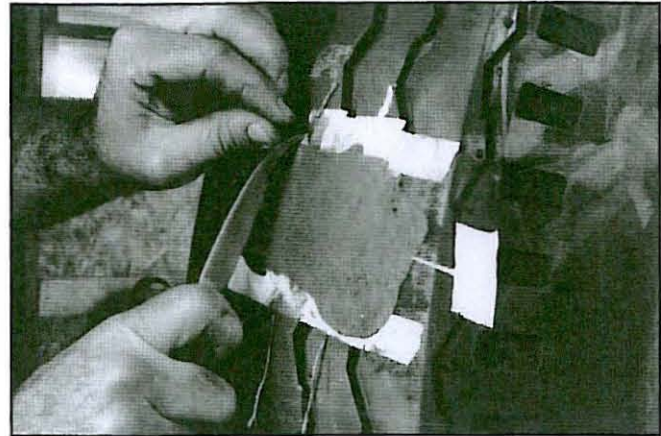
**48** Remove the blue poly the rest of the way out as you stitch.



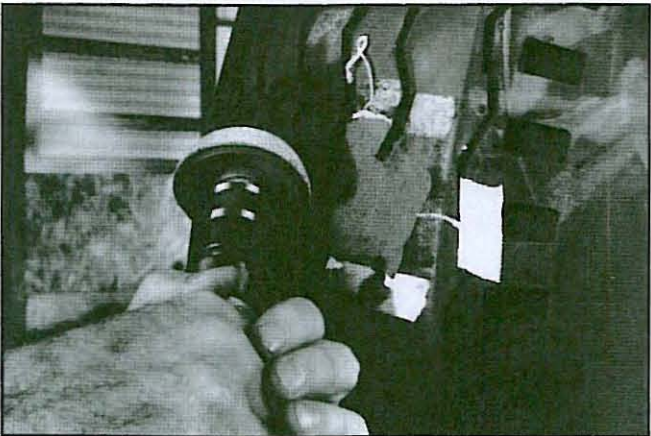
**49** Remove the protective clear poly from the top of the repair unit.



**50** If the tire is tubeless, apply a coat of Tech Security Coat (#738) to the outer edge of the repair unit and to the buffed surface beyond the repair unit's edge to assure good air retention. If tube type you must cover the repair with Tech Talc (#706).



**51** Cut away damming material if there was any used.



**52** Mechanically buff the section on the outside of the tire down even with the original tire's surface. The buffing wheel should be turning from the center of the section to the tire's surface to prevent the buffing wheel from attacking the edge of the filler rubber.



**53** If this section is in the tread, you must regroove the tread lugs back into the tire. This will allow the section to flex properly with the tire and not develop a hot spot. First mark in the tread design of the tire with a marking crayon.



**54** Using a Tech regroover, regroove the skive no deeper than the present tread depth of the tire.



**55** The tire is now ready to be returned to service. If all of the procedures in this manual have been followed correctly, the repair will last the life of the casing even if tire receives several retreads.

**NOTE:** Use the following as a trouble shooting guide:

**A. Porosity (Tiny air bubbles, pits or gummy)**

1. Lack of pressure
2. Lack of heat
3. Not enough cure time

**B. Large Air Pockets**

1. Skive was improperly filled (trapped air)
2. Check to see if venting strings were used.

**C. Poor Bond to the Skive Area of Cured Rubber**

1. Wet cement
2. No cement
3. Contaminated surface
4. Uncured rubber was defective

If you have  
any questions  
regarding this  
repair process,  
call Tech's repair  
hotline

1-800-433-TECH

or

1-800-336-TECH.

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