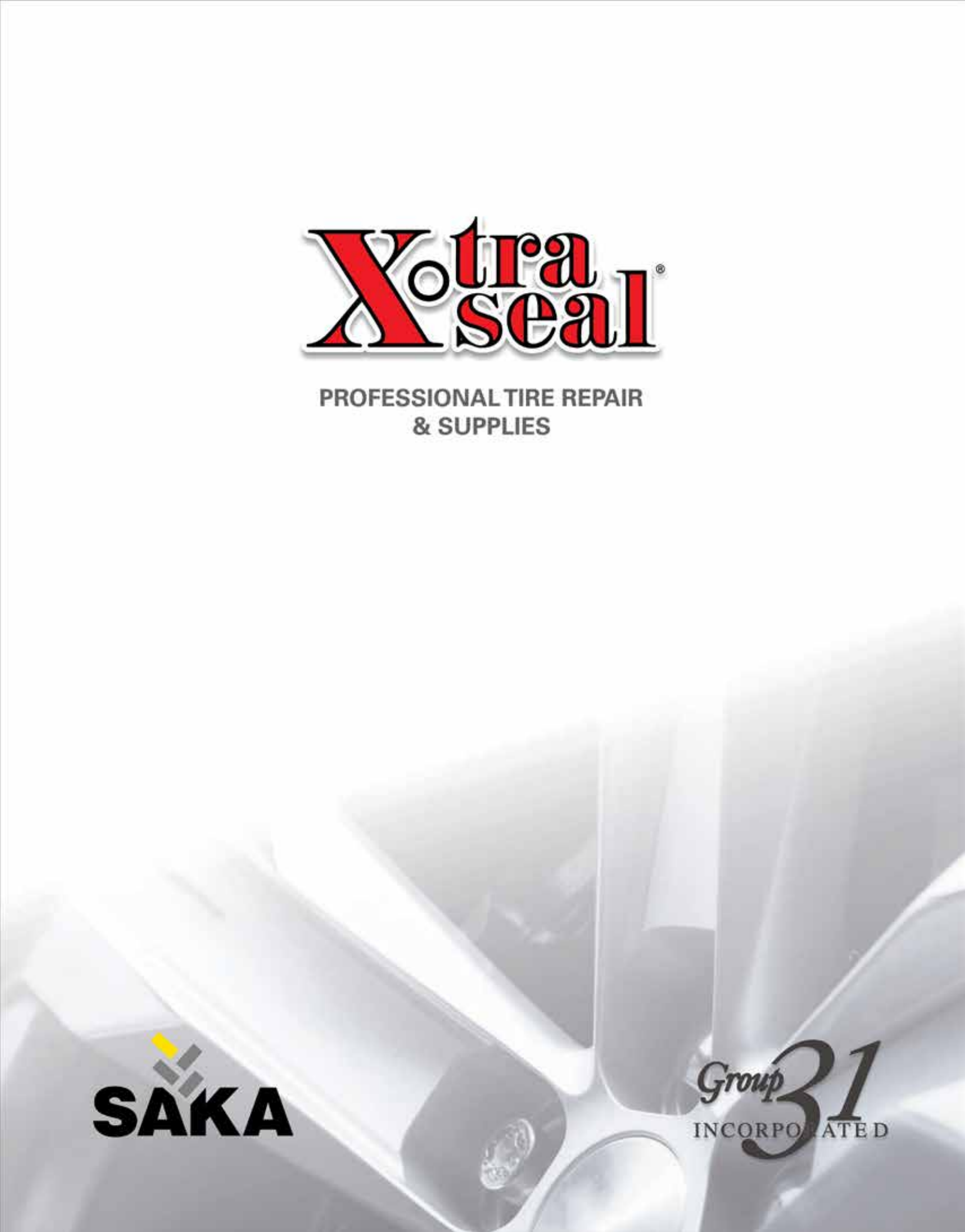
Xtra seal®

PROFESSIONAL TIRE REPAIR
& SUPPLIES



SAKA

Group 31 INCORPORATED

EURO–STYLE RADIAL REPAIR UNITS

Heavy-Duty Radial Repairs are designed for use in puncture, reinforcement, and section repairs in any repairable area of a passenger, truck, agricultural, or earthmover radial tire. Radial Repairs are extremely strong yet very flexible.

See page 12 for COI Radial Application Chart

- Each reinforcing ply is specifically end-cut and wrapped to "float" inside the patch to prevent end cracking or breakout common in competitive products
- Designed to vulcanize chemically, in low temperature, or high heat curing systems
- Premium blue vulcanizing gum, white backing

EURO-STYLE HEAVY-DUTY RADIAL REPAIR UNITS

Part Number	Description	Size (mm)	Box Qty
11-708	Radial 10, 1 Ply	45 x 73	20
11-710	Radial 10, 1 Ply	50 x 75	20
11-711	Radial 12 1 Ply	65 x 95	20
11-712	Radial 12, 1 Ply	57 x 102	10
11-712A	Radial 12, 1 Ply	70 x 118	10
11-713	Radial 12, 1 Ply	75 x 90	10
11-714	Radial 14, 1 Ply	87 x 100	10
11-720	Radial 20, 2 Ply	70 x 125	10
11-720A	Radial 20, 2 Ply	90 x 135	10
11-722	Radial 22, 2 Ply	76 x 150	10
11-724	Radial 24, 2 Ply	73 x 215	10
11-725	Radial 25, 3 Ply	115 x 125	10
11-725A	Radial 25, 3 Ply	115 x 145	10
11-726	Radial 26, 3 Ply	75 x 265	10
11-728	Radial 28, 3 Ply	76 x 325	10
11-733	Radial 19, 3 Ply	100x 125	10
11-735	Radial 35, 3 Ply	128 x 181	10
11-740	Radial 40, 3 Ply	98 x 187	10
11-742	Radial 42, 4 Ply	123 x 250	10
11-744	Radial 44, 4 Ply	121 x 330	10
11-745	Radial 45, 4 Ply	191 x 230	5

AR Series:
These repair units
Are reinforced with
Aramid Cord.

- Stronger than steel (pound for pound)
- Safer and easier to Install than steel
- Easier to use in low profile tires
- Lightweight-no Balancing distortion
- Reduces sidewall bulging

NOTE

Injury MUST be within repairable limits. Refer to page 21 for repair limitations.

Quality Repairs, Supplies and Tools

Group 31 INCORPORATED

Makers of

Xtra seal

TIRE REPAIR, TPMS AND SUPPLIES

31 Incorporated was founded in 1961 by Bob Cornell, a former employee of Tech International. In 1985 Bob Hendry and Chuck Muhs joined the company to run sales and operations. In 1987 Bob and Chuck acquired the company from Mr. Cornell when he was ready to retire from the business. From humble beginnings, 31 Inc. has grown to become well-known internationally as a leading manufacturer of professional tire repair, TPMS, and supplies. Primary manufacturing is still operated in rural Newcomerstown, OH USA, as well as a secondary manufacturing operation in Zhejiang, China.

OUR CORE VALUES

WE MANUFACTURE TIRE REPAIR MATERIALS AS IF IT IS DESTINED FOR OUR OWN FAMILY VEHICLE

31 Inc., having a quality management system certified to ISO 9001:2008 with design, is dedicated to manufacturing high-quality tire repair materials and supplies. From the raw material stage to finished product, production is monitored and examined to ensure we meet or exceed rigorous quality standards. We also utilize third party standards and testing companies to qualify the products we make.

WORLD CLASS CUSTOMER SERVICE WITH A PERSONAL TOUCH

There is no phone answering system at 31 Inc. Your call is always answered with a friendly voice on the other end. We take personal ownership and pride in being available to assist our customers all around the world.

TRAINING AND EDUCATION IS PARAMOUNT TO OUR SALES PROGRAM

31 Inc. is committed to training and educating our customers and industry personnel on the proper application of our tire repair materials, TPMS, and supplies in accordance with industry standard procedures. We not only conduct on-site hands-on training, but also make available detailed repair videos, web support, and other forms of training resources.

HUMBLE SERVANT FOR TIRE INDUSTRY

The folks at 31 Inc. are happy to help all those with stake in our industry. We actively participate in the Tire Industry Association and Tread Rubber and Repair Materials Group (TIA & TRMG).

31 Inc. – At Your Service!

Group 31 INCORPORATED

Manufacturer Of Professional Tire Repair Supplies

Our Products Are Used On a Daily Basis Through Major Tire Service Outlets in USA, Canada & around the World

Makers of Xtra seal

And Many Other Private Label Brands Globally

- ✓ CHEMICALS
- ✓ STRINGS INSERTS
- ✓ PATCH-PLUGS
- ✓ TUBE & UNIVERSAL PATCHES
- ✓ RADIAL & BIAS PATCHES
- ✓ TIRE REPAIR TOOLS
- ✓ PRODUCT INFORMATION
- ✓ REPAIR PROCEDURES

XTRASEAL TIRE SERVICE CHEMICALS

We manufacture the widest array of tire service chemicals in the industry today. Most chemicals are available in 1, 5 and 55 gallons. Ask for details.

Tire Repair Chemicals

Vulcanizing Cement

- Our most popular, fast drying
- For chemical or heat vulcanization
- For use with any XtraSeal repair unit or insert

VULCANIZING CEMENT	
Part Number	Description
14-004	Vulcanizing Cement (118ml)
14-008	Vulcanizing Cement (236ml)
14-032	Vulcanizing Cement (945ml)
14-026	Vulcanizing Cement (30ml)

14-008 14-032 14-511

14-026

Heavy-Duty Super-Blu Vulcanizing Cement

Contains more rubber solids than our regular cement for a stronger bond.

HEAVY-DUTY SUPER-BLU VULCANIZING CEMENT	
Part Number	Description
14-511	HD Supr-Blu Cement (236ml)
14-512	HD Supr-Blu Cement (945ml)

Inner Liner Sealer

For sealing the over-buff area around a finished repair.

INNER LINER SEALER	
Part Number	Description
14-128A	Inner liner sealer (472ml)

Rubber Prep

For removing dirt, debris and mold lubricants from the repair area prior to buffing.

RUBBER PREP PRE-BUFF SOLUTION	
Part Number	Description
14-100	Buffing Solution Squirt Top (945ml)
14-103	Buffing Solution Aerosol (472ml)

Bead Sealer

For sealing small air leaks between the tire bead and the wheel.

BEAD SEALER	
Part Number	Description
14-101	Bead Sealer (945ml)
14-101A	Heavy Duty Bead Sealer (945ml)

BLACK RETREADERS CEMENT	
Part Number	Description
14-515	Black Retreaders Cement (945ml)

14-100 14-101 14-515 14-103

TIRE MOUNTING / DEMOUNTING COMPOUNDS & ACCESSORIES

To prevent damage to tire beads and to ease the mounting and demounting process, choose the compounds used by tire professionals worldwide.

Euro-paste

A wax paste lubricant that works great with low pro, run flat, and alloy wheel applications.

- Very slippery
- No mixing
- No water

EURO-PASTE	
Part Number	Description
14-702E	White Euro Paste (1 kg)
14-700E	White Euro Paste (3 kg)
14-701	White Euro Paste (5 kg)

14-701

14-753PM

Liquid Mount/Demount Lubricants

Ready to use and lube packet concentrate.

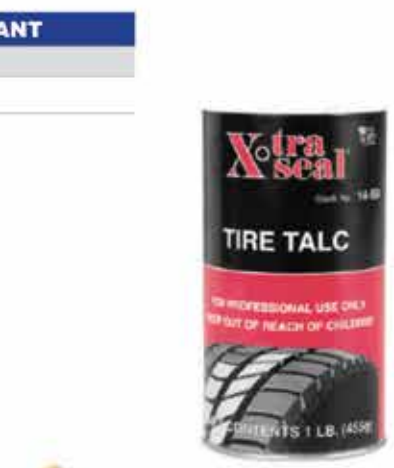
- Xtra-Slik is ready to use
- Dries quickly
- Prevents slippage on the bead
- Rust inhibitor

TIRE MOUNTING/DEMOUNTING LUBRICANT	
Part Number	Description
14-753PM	Mounting/Demounting Lubricant (3.8L)

OTHER XTRASEAL SOLUTIONS	
Part Number	Description
14-550	Tire Talc(0.45kg)
14-755	Leak Seeker Concentrate (236ml)
14-760	Air Tool Oil (945ml)
14-955	Standard Test Tank(31"x15.5"x17")

Mounting / Demounting Accessories

APPLICATORS	
Part Number	Description
14-378	11" (279mm) Cotton Tire Swab
14-711	Euro-Paste Applicator Brush, 1" Diameter



14-550

14-755

14-760

14-378

14-711

14-955

Xtra seal

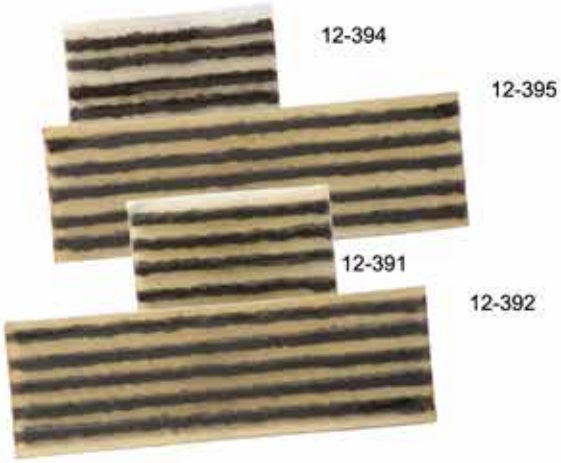
UNIVERSAL STRING INSERTS

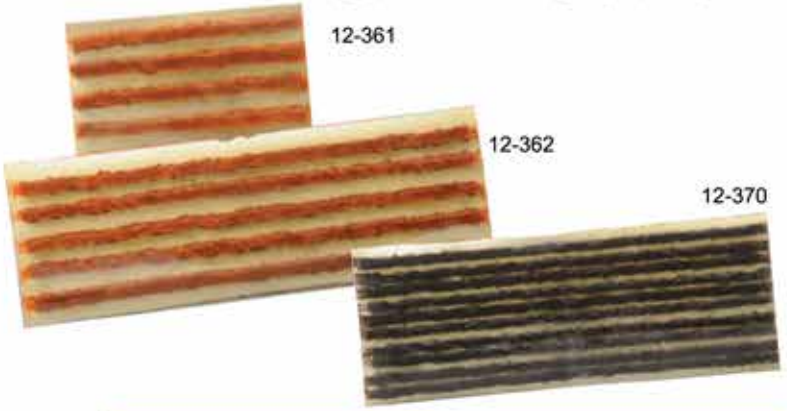
Part Number	Description	Box Qty
12-360	102mm Fat Brown String	30
12-360/60	102mm Fat Brown String	60
12-361	102mm Fat Brown String	50
12-362	204mm Fat Brown String	25
12-370	184mm Thin Black String	50
12-371	305mm Thin Black String	50
12-380	230mm Thin Black String	25
12-390/60	102mm Fat Black String	60
12-391	102mm Fat Black String	50

UNIVERSAL STRING-TYPE INSERTS

Universal string-type Inserts are an excellent emergency repair when a full service repair facility is unavailable. Made of a butyl rubber, these inserts are very strong, allowing easy insertion through steel belted radials. Perfect for repairing lawn tractor, golf cart, ATV, and other off-road tires.

- Temporary repairs sealing by compression only
- For use in radial and bias ply tires
- Excellent for golf carts, lawn mowers, and ATV's
- Install 12-370 and 12-371 using any closed-eye needle
- Install all other string type inserts using any split-eye needle





POLY TOTE SERIES

Part Number	Description	
12-361TOTE	Passenger String Tote Kit	50 pcs. 12-361
12-362TOTE	Truck String Tote Kit	25 pcs. 12-362

STRING-TYPE POLY TOTES ALSO INCLUDE
1 ea. 14-204, 1 ea. 14-216, 1 jar lubricant, 1 razor knife and repair booklet

HEAVY DUTY METAL SERIES

Part Number	Description	
12-355	HD Passenger Kit – Metal T-Handles	50 pcs. 12-361
12-356	HD Passenger Kit – Chrome T-Handles	
12-357	HD Truck Kit – Metal T-Handles	25 pcs. 12-362
12-358	HD Truck Kit – Chrome T-Handles	

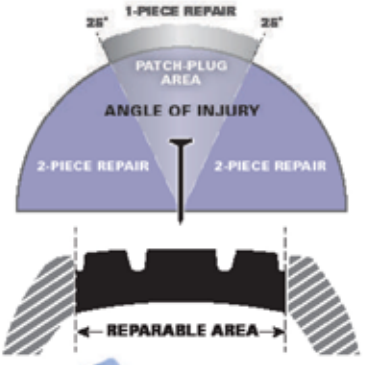
12-356 | 12-358
Chrome T-Handles

12-355 | 12-357
Metal T-Handles

POLY TOTES
12-361TOTE
shown

COMBINATION REPAIR UNITS

Combination repair units fulfill the industry recommended repair requirements of “filling the injury” and “patching the innerliner” for a one-piece repair system. Use when the injury angle is less than 25 degrees. Refer to page 21 for repair limitations and follow the installation procedures on page 22.



LEAD-WIRE COMBINATION UNITS – DIPPED STEM

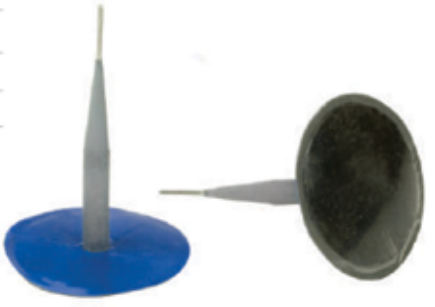
Part Number	Description	Box Qty
13-670	3mm Injury Size Patch Plug	24
13-672	4.5mm Injury Size Patch Plug	24
13-673	6mm Injury Size Patch Plug	24
13-674	8mm Injury Size Patch Plug	24
13-675	10mm Injury Size Patch Plug	16

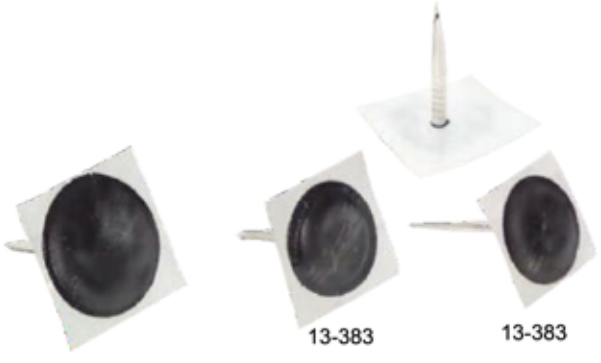
LEAD-WIRE COMBINATION UNITS – WRAPPED STEM

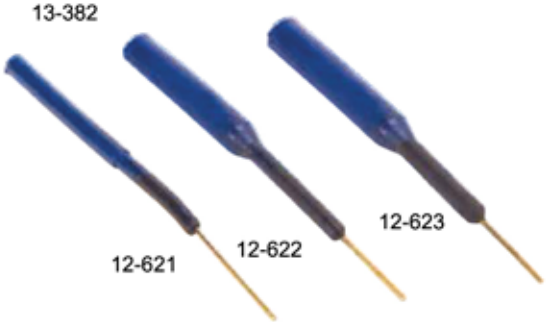
Part Number	Description	Box Qty
13-672C	4.5mm Injury Size Patch Plug Wrapped Stem	24
13-673C	6mm Injury Size Patch Plug Wrapped Stem	24
13-674C	8mm Injury Size Patch Plug Wrapped Stem	24
13-774C	10mm Injury Size Patch Plug - Square Head	5
13-775C	13mm Injury Size Patch Plug - Square Head	5

LEAD-WIRE COMBINATION UNITS - GRAY GUM

Part Number	Description	Box Qty
13-672G	4.5mm Injury Size Patch Plug Dipped Stem	24
13-673G	6mm Injury Size Patch Plug Dipped Stem	24
13-674G	8mm Injury Size Patch Plug Dipped Stem	24
13-675G	10mm Injury Size Patch Plug Dipped Stem	16







UNIVERSAL QUILLED COMBINATION UNITS

Part Number	Description	Injury Size	Box Qty
13-381	42mm Round	3mm	20
13-383	47mm Round	4.5mm	20
13-382	57mm Round	6mm	15

LEAD-WIRE INSERTS – DIPPED STEM

Old Part Number	Injury Size	Box Qty
13-621	4.5mm	20
13-620	6mm	20
13-622	8mm	20

PROFESSIONAL PUNCTURE REPAIR | TUBE REPAIR

These **tube repair units**, designed principally for use on inner tubes, are twice as strong as the tube being repaired and have a feather-edge design to prevent chaffing. When repairing inner tubes, buttonhole the ends of the injury and select a repair unit at least twice as large as the injury being repaired.

FEATHER-EDGE TUBE REPAIR UNITS		
Part Number	Description	Box Qty
11-000	32mm Mini Round	100
11-001	43mm Small Round	40
11-002	57mm Medium Round	30
11-003	79mm Large Round	20
11-004	35mm x 60mm Small Oval	30
11-005	48mm x 95mm Medium Oval	20
11-006	64mm x 146mm Large Oval	20
11-007	127mm Giant Oval	10
11-008	102mm x 159mm Giant Oval	10

FOIL-BACK TUBE REPAIR UNITS		
Part Number	Description	Box Qty
11-032	32mm Mini Round	80
11-038	38mm X-tra Small Round	70
11-045	45mm Small Round	50
11-055	55mm Medium Round	40
11-060	60mm Medium Round	40
11-070	70mm Medium Round	20
11-075	75mm Large Round	20
11-079	79mm Large Round	20
11-0100	100mm Large Round	10
11-0115	115mm Large Round	10

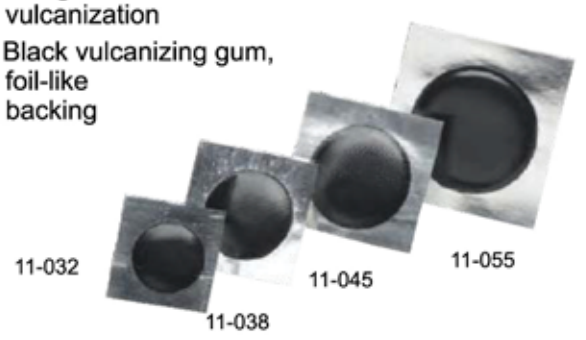
EURO-STYLE TUBE REPAIR UNITS		
Part Number	Description	Box Qty
11-632	32mm Mini Round	100
11-638	38mm X-tra Small Round	50
11-645	45mm Small Round	40
11-655	55mmMedium Round	30
11-679	79mm Large Round	20
11-690	90mm X-tra Large Round	10
11-6115	115mm Giant Round	10
11-672	28mm x 42mm Mini Oval	50
11-673	38mm x 64mm X-tra Small Oval	50
11-674	48mm x 72mm Small Oval	40
11-675	55mm x 115mm Medium Oval	30
11-676	60mm x 145mm Large Oval	20

Feather-Edge Tube Repair Units

- Designed for chemical vulcanization
- Black vulcanizing gum, white poly backing
- Gray vulcanizing gum with blue poly also available. Use part number 11-001BG, 11-002BG, etc.

Foil-Back Tube Repair Units

- Designed for chemical or heat vulcanization
- Black vulcanizing gum, foil-like backing



Euro-Style Tube Repair Units

- Designed for chemical or heat vulcanization
- Premium blue vulcanizing gum, white backing

UNIVERSAL REPAIR UNITS

Universal repair units follow industry recommended repair requirements for "patching the innerliner" as part of a two-piece repair system. These repair units are rubber reinforced and ideal for puncture repair in tubeless radial and bias ply tires. Refer to page 21 for repair limitations and follow the installation procedures on page 22 .

USA-Style Universal Repair Units

- Our most popular universal repair designed for chemical vulcanization
- Black vulcanizing gum, blue poly backing

USA-STYLE UNIVERSAL REPAIR UNITS		
Part Number	Description	Box Qty
11-306	45mm Small Square	50
11-306SB	Small Bucket	250
11-308	55mm Medium Square	25
11-308SB	Medium Bucket	200
11-310	74mm Large Square	15
11-321	45mm Small Round	30
11-321 SB	Small Bucket	300
11-321 LB	Large Bucket	700
11-322	57mm Medium Round	25
11-323	79mm Large Round	15

Euro-Style Universal Repair Units

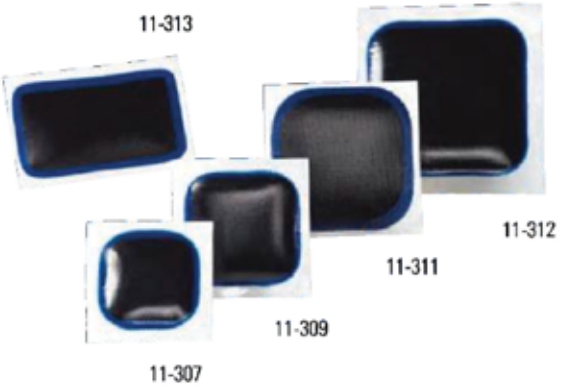
- Extra thick yet flexible, heavy-duty nail hole repair
- Designed for chemical or heat vulcanization
- Premium blue vulcanizing gum, white backing

EURO-STYLE UNIVERSAL REPAIR UNITS		
Part Number	Description	Box Qty
11-307	38mm Mini Square	50
11-309	48mm Small Square	50
11-309 SB	Small Bucket	150
11-309 LB	Large Bucket	350
11-311	57mm Medium Square	50

Square Universal Repair Units

- Designed for chemical vulcanization
- Gray vulcanizing gum, red or blue poly backing

SQUARE UNIVERSAL REPAIR UNITS		
Part Number	Description	Box Qty
11-115	47mm Small, Red Poly	30
11-115 SB	Small Bucket	300
11-115LB	Large Bucket	600
11-115B	47mm Small, Blue Poly	30
11-116	54mm Medium, Red Poly	30
11-116 SB	Small Bucket	200



USA-STYLE RADIAL REPAIR UNITS

- Each reinforcing ply is individually end-wrapped to deflect tire flexing stresses in a unique manner
- Tie-gum construction eliminates the potential for delamination common in competitive products
- Designed to vulcanize chemically or in low temperature systems
- Gray vulcanizing gum, blue poly backing

See page12 for COI Radial Application Chart

USA-STYLE HEAVY-DUTY RADIAL REPAIR UNITS

Part Number	Description	Size (mm)	Box Qty
11-808	Radial 10, 1 Ply	42 x 75	20
11-810	Radial 10, 1 Ply	60 x 75	20
11-810HD	Radial 10, 1 Ply	65 x 80	20
11-812	Radial 12, 1 Ply	57 x 100	10
11-814	Radial 14, 1 Ply	95 x 100	10
11-820	Radial 20, 2 Ply	72 x 125	10
11-822	Radial 22, 2 Ply	75 x 150	10
11-824	Radial 24, 2 Ply	75 x 215	10
11-825	Radial 25, 3 Ply	115 x 125	10
11-826	Radial 26, 3 Ply	76 x 278	10
11-828	Radial 28, 3 Ply	76 x 355	10
11-835	Radial 35, 3 Ply	133 x 180	10
11-840	Radial 40, 3 Ply	100 x 188	10
11-842	Radial 42, 4 Ply	125 x 254	10
11-844	Radial 44, 4 Ply	125 x 330	10
11-845	Radial 45, 4 Ply	190 x 240	5

R SERIES:

(Part numbers 11-824R, 11-826R, 11-840R, etc.)

These repair units are designed to be used
in high heat (mold cure) systems.

*** Curing Information for R Series**

Heat Chamber:
240˚F (116˚C) for 72 min., 270˚F - 320˚F (132˚C - 160˚C) for 30 min.

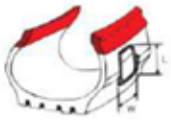
Spotter:
270˚F - 320˚F (132˚C - 160˚C), 10 min. per 1/8" (3mm)

NOTE

Injury MUST be within repairable limits. Refer to page 21 for repair limitations.

COI RADIAL APPLICATION CHART

SIDEWALL INJURY



L= Length of injury
W=Width of injury

TREAD INJURY

PASSENGER

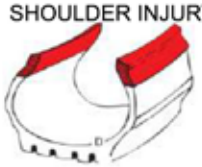
LIGHT TRUCK

HEAVY TRUCK

EARTHMOVER

Maximum Width	Maximum Length	Maximum Diameter	Speed Ratings U,V,W,X,Y and Z		6.50 - 12.50	7.50 - 10.00	11.00 - 14.00	14.00 - 40.00
			125 - 195	205 - 255	215/85 - 255/85 215/75 - 285/60	8 - 11 235/80 - 275/80 225/75 - 295/75	12 - 16.5 295/80 - 315/80 305/75-495/45	15.5 - 50.5 20/65 - 65/65
		1/8" (3mm)	10	10	10	10	10	42
1/8"(3mm)	1/8" (3mm)				10	12	12	42
		1/4" (6mm)	10	10	12	12	12	42
	1/4" (6mm)					22	22	42
1/4"(6mm)	5/16" (8mm)					22	22	42
	1 1/2" (40mm)				20	22	22	
1 cable	3 1/8" (80mm)				22	22	22	
	4 3/4" (120mm)					24	24	
	6" (150mm)					26	26	
	3/4" (19mm)				20	22	22	
2 cables	1 1/2" (40mm)				20	22	24	
	2 3/8" (60mm)				22	24	26	
	5 1/8" (130mm)					26	28	
		3/8" (10mm)			20	20	20	42
	1 1/2" (40mm)				20	26	40	
3/8" (10mm)								44
	2 3/8" (60mm)				22	26	40	
	3 1/8" (80mm)				26	40	42	
	5 1/8" (130mm)					42	44	
		1/2" (12mm)			22	25	25	44
	1 1/2" (40mm)				22	40	40	
								44
1/2" (12mm)	2 3/4" (70mm)				22	40	42	
	3 3/4" (95mm)				40	42	42	
	5 1/8" (130mm)					44	44	
		3/4" (19mm)			22	25	*35/40	44
	1" (25mm)				22	40	40	
								44
3/4" (19mm)								
	2 1/2" (65mm)				24	42	42	
	4 3/8" (110mm)					42	44	
	5 1/8" (130mm)					44	44	
		1" (25mm)			25	*35/42	*35/42	44
1" (25mm)	2" (50mm)				40	42	44	
	3 1/8" (80mm)					42	44	
	4" (100mm)					44	44	
		1 1/4" (30mm)				*35/42	*35/42	
	2" (50mm)					42	44	
1 1/4" (30mm)	3 1/8" (80mm)					44	44	
	4" (100mm)							

SHOULDER INJURY



D = Diameter of injury

		1/4" (6mm)			22	24	24	42
		3/8" (10mm)			24		40	
		1/2" (12mm)				24	40	44
		3/4" (19mm)			24	40		
		1" (25mm)			40	44	44	

*35 are for crown (tread) only repairs

HEAVY-DUTY AGRICULTURAL RADIAL REPAIR UNITS

Euro-Style Radial Agricultural Repair Units

- Each reinforcing ply is specifically end-cut and wrapped to "float" inside the patch to prevent end cracking or breakout common in competitive products
- Designed to vulcanize chemically, in low temperature, or high heat curing systems
- Premium blue vulcanizing gum, white backing

EURO-STYLE RADIAL AGRICULTURAL REPAIR UNITS

Part Number	Description	Size (inches)	Size (mm)	Box Qty	Case Qty
11-780	Radial 80, 2 Ply	5 7/8 x 7 3/4	150 x 197	5	1
11-782	Radial 82, 3 Ply	7 3/8 x 10	188 x 254	5	1
11-784	Radial 84, 3 Ply	8 3/8 x 11 3/8	213 x 290	5	1
11-786	Radial 86, 3 Ply	9 5/8 x 13 3/8	245 x 340	5	1

USA-Style Radial Agricultural Repair Units

- Each reinforcing ply is individually end-wrapped to deflect tire flexing stresses in a unique manner
- Tie-gum construction eliminates the potential for delamination common in competitive products
- Designed to vulcanize chemically or in low temperature systems
- Gray vulcanizing gum, blue poly backing

USA-STYLE RADIAL AGRICULTURAL REPAIR UNITS

Part Number	Description	Size (inches)	Size (mm)	Box Qty	Case Qty
11-880	Radial 80, 2 Ply	5 7/8 x 7 3/4	150 x 197	5	1
11-882	Radial 82, 3 Ply	7 1/2 x 10	190 x 254	5	1
11-884	Radial 84, 3 Ply	8 1/2 x 11 1/2	216 x 292	5	1
11-886	Radial 86, 3 Ply	9 3/4 x 13 3/8	248 x 340	5	1

RADIAL AGRICULTURAL APPLICATION CHART

SIDEWALL INJURY		TREAD INJURY	AGRICULTURAL	
 L= Length of injury W=Width of injury				
Maximum Width	**Maximum Length**	**Maximum Diameter**	**8 - 11 / 8.3 - 12.4**	**12 - 15 / 13.6 - 30.5**
1/4" (6mm)	1/4" (6mm)		12	12
3/8" (10mm)	3/8" (10mm)	3/8" (10mm)		
	1 1/2" (40mm)		20	20
3/4" (19mm)	3/4" (19mm)	3/4" (19mm)		
	3" (75mm)		22	80
1 1/2" (40mm)	4" (100mm)	1 1/2" (40mm)	80	82
2" (50mm)	3 1/4" (80mm)			
2 1/2" (65mm)	3" (75mm)			
	4" (100mm)			
2 3/4" (70mm)	2 3/4" (70mm)	2 3/4" (70mm)	80	
3 1/4" (80mm)	3 1/4" (80mm)			
	5 1/4" (130mm)			84
3 1/2" (90mm)	4 1/2" (115mm)	3 1/2" (90mm)		
4" (100mm)	4" (100mm)			
	6 1/2" (165mm)			86
5 1/4" (130mm)	5 1/4" (130mm)	5 1/4" (130mm)		

USING THIS CHART

1)Measure the injury being repaired across the largest area of broken or removed cord. If injury is in the sidewall, measure width (across the cords) and length (along the cords). If injury is in the tread or shoulder area, measure the diameter of the injury.

2)Locate these measurements under the appropriate injury column. If actual injury size is between measurements on the chart, go up to the next largest measurement.

3)When you locate the correct injury size on the chart, go to the appropriate tire size column. Where the injury size row and the tire size column intersect is the correct COI Radial repair unit to use.

REPAIRtips

When installing repair units in agricultural tires that will contain calcium, coat the entire repair unit with 14-128A Inner Liner Sealer after installation.

HEAVY-DUTY AGRICULTURAL BIAS-PLY REPAIR UNITS

Bias-ply repair units are designed for use in nailhole, reinforcing, or section repairs and can be applied in any repairable area of a tube or tubeless bias ply tire.

CP CROSS-PLY-BIAS AGRICULTURAL					
Part Number	Description	Size (inches)	Size (mm)	Box Qty	Case Qty
11-386	CP0, 1 Ply	2 1/8	55	20	12
11-387	CP1, 1 Ply	3	77	10	12
11-388	CP2, 2 Ply	3 5/8	92	10	12
11-453	CP3, 2 Ply	4 3/8	112	10	10
11-454	CP4, 4 Ply	5 1/2	140	10	10
11-455	CP5, 4 Ply	6 3/4	172	10	10
11-456	CP6, 6 Ply	9 5/8	250	5	6
11-457	CP7, 6 Ply	11 3/8	290	5	6
11-458	CP8, 6 Ply	13 3/8	341	5	6

BN BIAS-PLY AGRICULTURAL					
Part Number	Description	Size (inches)	Size (mm)	Box Qty	Case Qty
11-488	BN1, 1 Ply	2 1/8	55	30	12
11-489	BN2, 2 Ply	3	75	20	12
11-490	BN3, 2 Ply	3 1/2	89	20	10
11-491	BN4, 2 Ply	4 1/4	110	10	10
11-492	BN5, 2 Ply	5 1/4	135	10	10
11-493	BN7, 3 Ply	6 1/2	165	10	10
11-494	BN8, 3 Ply	7 1/2	190	10	10
11-495	BN9, 4 Ply	8 5/8	220	10	5
11-496	BN10, 6 Ply	9 7/8	250	5	5
11-497	BN12, 6 Ply	12	305	5	5
11-498	BN15, 8 Ply	15	380	3	6

AG Bias Ply

- Designed primarily for use in agricultural bias ply
  tube or tubeless tires
- Designed for chemical vulcanization
- Black vulcanizing gum, blue poly backing

11-472

11-471

11-470

CP Cross-Ply-Bias / CPT Cross-Ply-Bias Agricultural

- Each reinforcing ply is protected and encased in a molded ply package making each unit strong while remaining flexible
- Designed to vulcanize chemically or in low temperature systems
- Gray vulcanizing gum, blue poly backing

AG BIAS PLY REPAIR UNITS					
Part Number	Description	Size (inches)	Size (mm)	Box Qty	Case Qty
11-470	AG3, 2 Ply	3 1/2	90	20	10
11-471	AG4, 2 Ply	4 1/2	115	10	10
11-472	AG5, 2 Ply	5 1/2	140	10	10
11-473	AG6, 3 Ply	6 1/2	165	10	10
11-474	AG7, 4 Ply	7 1/2	190	10	10
11-475	AG8, 4 Ply	8 1/2	215	10	5
11-476	AG10,6 Ply	10 1/2	265	5	5
11-477	AG12, 6 Ply	12 1/2	317	5	5

BIAS PLY REPAIR APPLICATION CHART

Ply Rating	INJURY SIZE																
	3mm 1/8"	6mm 1/4"	10mm 3/8"	15mm 1/2"	20mm 3/4"	25mm 1"	40mm 1 1/2"	50mm 2"	65mm 2 1/2"	75mm 3"	100mm 4"	125mm 5"	150mm 6"	175mm 7"	200mm 8"	225mm 9"	250mm 10"
PASSENGER, TRUCK & EARTHMOVER																	
4	CP0	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CP6								
	BN1	BN1	BN2	BN3	BN4	BN4	BN4	BN7	BN9								
6	CP0	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CP6								
	BN1	BN2	BN3	BN4	BN5	BN5	BN8	BN9	BN10								
8	CP0	CP0	CP2	CP3	CP3	CP4	CP4	CP5	CP6								
	BN1	BN2	BN3	BN4	BN5	BN5	BN8	BN9	BN10								
10	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CP6	CP6	CP7	CP8						
	BN1	BN3	BN4	BN5	BN7	BN9	BN9	BN10	BN10	BN12	BN12						
12	CP0	CP1	CP2	CP4	CP4	CP4	CP5	CP6	CP6	CP7	CP8						
	BN1	BN3	BN4	BN5	BN7	BN9	BN9	BN10	BN10	BN12	BN12						
14	CP0	CP1	CP3	CP4	CP4	CP5	CP6	CP6	CP7	CP7	CP8	CP10					
	BN1	BN3	BN4	BN5	BN8	BN10	BN10	BN12	BN12	BN12	BN15	BN20					
16	CP0	CP1	CP4	CP4	CP5	CP5	CP6	CP6	CP7	CP7	CP8	CP10					
	BN1	BN3	BN4	BN5	BN8	BN10	BN10	BN12	BN12	BN12	BN15	BN20					
18	CP0	CP1	CP4	CP5	CP5	CP6	CP6	CP7	CP8	CP8	CP9	CP10					
	BN2	BN3	BN5	BN7	BN9	BN10	BN12	BN15	BN15	BN15	BN15	BN20					
20	CP0	CP1	CP4	CP5	CP5	CP6	CP7	CP8	CP8	CP9	CP9	CP10					
	BN2	BN3	BN5	BN7	BN9	BN10	BN12	BN15	BN15	BN15	BN15	BN20					
22	CP0	CP1	CP4	CP6	CP6	CP7	CP8	CP8	CP8	CP9	CP10						
	BN2	BN3	BN5	BN8	BN10	BN10	BN12	BN15	BN15	BN15	BN20						
24	CP0	CP1	CP4	CP6	CP6	CP7	CP8	CP8	CP8	CP9	CP10						
	BN2	BN3	BN5	BN8	BN10	BN10	BN12	BN15	BN15	BN15	BN20						
FARM, TRACTOR, SKIDDER																	
4	CP0	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CPT0	CPT0	CPT1	CPT2	CPT2	CPT3	CPT3		
	BN3	BN4	BN4	BN5	BN7	BN8	BN8	BN9	BN9	BNT20	BNT20	BNT21	BNT21	BNT21	BNT22		
6	CP0	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CPT0	CPT0	CPT1	CPT2	CPT2	CPT3	CPT3		
	BN3	BN4	BN4	BN5	BN7	BN8	BN8	BN9	BN9	BNT20	BNT20	BNT21	BNT21	BNT22	BNT22		
8	CP0	CP1	CP2	CP2	CP3	CP4	CP4	CP5	CPT0	CPT0	CPT1	CPT2	CPT2	CPT3	CPT3	CPT6	CPT7
	BN3	BN4	BN5	BN7	BN8	BN8	BN9	BN9	BNT20	BNT20	BNT20	BNT21	BNT21	BNT22	BNT25	BNT25	BNT25
10	CP0	CP1	CP2	CP3	CP3	CP4	CP5	CP6	CPT1	CPT1	CPT4	CPT5	CPT5	CPT6	CPT6	CPT7	CPT7
	BN3	BN4	BN5	BN7	BN8	BN8	BN9	BN9	BNT20	BNT20	BNT23	BNT24	BNT24	BNT25	BNT25	BNT25	BNT25
12	CP0	CP1	CP2	CP4	CP4	CP4	CP5	CP6	CPT4	CPT4	CPT4	CPT5	CPT5	CPT6	CPT7	CPT7	CPT7
	BN3	BN4	BN5	BN7	BN8	BN8	BN9	BN9	BNT23	BNT23	BNT23	BNT24	BNT24	BNT25	BNT25	BNT25	BNT25
14	CP0	CP1	CP4	CP4	CP4	CP5	CP6	CP6	CPT4	CPT5	CPT5	CPT5	CPT6	CPT7	CPT7	CPT7	
	BN4	BN5	BN7	BN8	BN8	BN9	BN10	BN10	BNT23	BNT24	BNT24	BNT24	BNT24	BNT25	BNT25	BNT25	
16	CP0	CP1	CP4	CP4	CP5	CP5	CP6	CP6	CPT5	CPT5	CPT5	CPT6	CPT6	CPT7	CPT7		
	BN4	BN5	BN7	BN8	BN8	BN9	BN10	BNT23	BNT24	BNT24	BNT24	BNT24	BNT25	BNT25	BNT25		
18	CP0	CP1	CP4	CP5	CP5	CP6	CPT2	CPT3	CPT5	CPT6	CPT6	CPT6	CPT6	CPT7	CPT7		
	BN5	BN7	BN8	BN9	BN9	BN10	BNT23	BNT24	BNT24	BNT24	BNT24	BNT25	BNT25	BNT25	BNT25		
REINFORCEMENT REPAIRS																	
8-12	CP0	CP0	CP1	CP2	CP3	CP3	CP4	CP4	CP5	CP6	CP7	CP8					
	BN1	BN2	BN3	BN3	BN4	BN4	BN5	BN8	BN9	BN10	BN12	BN15					
	AG3	AG3	AG3	AG3	AG4	AG5	AG5	AG7	AG8	AG10	AG12	AG15					
14-18	CP0	CP0	CP1	CP2	CP4	CP4	CP5	CP5	CP6	CP6	CP7	CP8					
	BN1	BN3	BN4	BN4	BN5	BN5	BN7	BN9	BN10	BN10	BN12	BN15					
	AG3	AG3	AG4	AG4	AG5	AG6	AG6	AG8	AG10	AG10	AG12	AG18					
20-24	CP0	CP0	CP2	CP4	CP5	CP5	CP6	CP6	CP7	CP7	CP8	CP9					
	BN2	BN3	BN4	BN5	BN7	BN8	BN9	BN10	BN12	BN12	BN15	BN15					
	AG3	AG3	AG4	AG5	AG6	AG7	AG7	AG10	AG12	AG12	AG15	AG18					

USING THIS CHART:

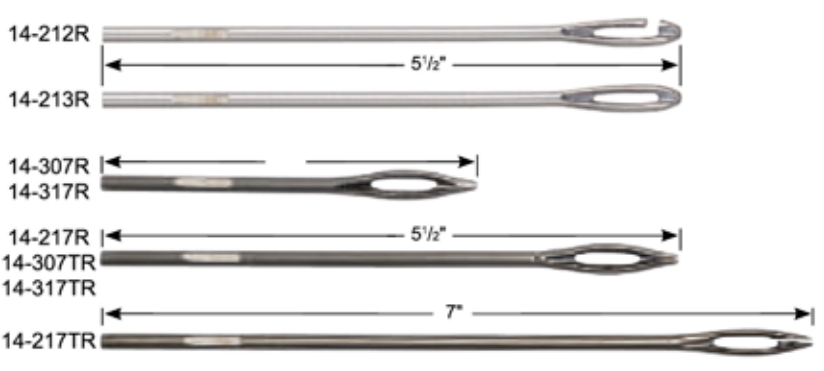
1. Use the appropriate section of this chart for the repair being performed.
2. Note the ply rating of the tire being repaired and locate this in the left hand column of appropriate section.
3. Measure the injury being repaired across the largest area of broken or removed cord.Locate this injury size, or next largest size listed, along the top row.

NOTE

Injury MUST be within repairable limits. Refer to page page 21 for repair limitations

PART NO.	DESCRIPTION
TIRE REPAIR TOOLS	
14-212	Pistol-Grip Open-Eye Needle
14-213	Pistol-Grip Closed-Eye Needle
14-216	Pistol-Grip Split-Eye Needle
14-217	Die-Cast T-Handle Split-Eye Needle
14-317	Chrome T-Handle Split-Eye Needle
14-219	Heavy Duty Pistol Grip Composite Split-Needle
14-238	Pistol Grip Split-Eye Needle, 5.5 " Needle
14-310	Power-Awl
14-204	Pistol-Grip Spiral Cement Probe
14-204S	Pistol-Grip Spiral Cement Probe, Knurled
14-218	Die-Cast T-Handle Spiral Cement Probe
14-317P	Chrome T-Handle Sprital Cement Probe
14-303S	6mm Stickle Back Probe, Short
14-303L	6mm Stickle Back Probe, Long
14-211	Pistol Grip 2-Stage Rasp
14-305	Flexible Skiving Knife

PART NO.	DESCRIPTION
BRASS BRUSHED,STITCHERS,SCRAPERS,AND CRAYONS	
14-301	Small Brass Tire Brush
14-314	Wood Handle Stitcher
14-315H	Inner Liner Scraper,Hoe Style
14-551	Markal Yellow Paint Stick .Pack of 12
14-554	Markal White Paint Stick .Pack of 12
14-552	Yellow Crayon.Pack of 12
14-553	White Crayon.Pack of 12



PART NO.	DESCRIPTION
REPLACEMENT NEEDLEDS	
14-317R	Split-Eye Needle for 14-317, Passenger
14-217R	Split-Eye Needle for 14-217H , Passenger
14-307TR	Split-Eye Needle for 14-307, Truck
14-317TR	Split-Eye Needle for 14-317, Truck
14-217TR	Split-Eye Needle for 14-217H, Truck
14-211R	2-Stage Rasp for 14-218H
14-218R	Spiral Cement Probe FOR 14-218H
14-317S	Spiral Cement Probe FOR 14-371H

PART NO.	DESCRIPTION
AIR TOOLS & ACCESSORIES	
14-319LSQ	Low Speed Buffer 2500RPM Quick Change
14-319LST	Low Speed Buffer 2500RPM Jacob's Chuck
14-324	Long Arbor Adapter 10mm Threads
14-330	Short Quick Change Adapter 10mm Threads
14-332	Quick Change Adapter for 3mm Shank
14-333	Quick Change Adapter for 4.5mm Shank
14-334	Quick Change Adapter for 6mm Shank
14-335	Quick Change Adapter for 8mm Shank
14-340	3mm Carbide Cutter
14-345	4.5mm Carbide Cutter
14-346	6mm Carbide Cutter
14-347	8mm Carbide Cutter
14-348	10mm Carbide Cutter
14-349	13mm Carbide Cutter
14-298	Complete PMA Puncture Repair Tool Case
14-399	Air Powered Vacuum

14-298
Puncture Repair Tool Kit

- Sturdy, blow-molded case keeps everything organized and get the carbide!
- Also Includes:

  RMA Wall Chart & XtraSeal Puncture Repair Guide/Catalog

14-399

14-989A

PART NO.	DESCRIPTION
TIRE SPREADERS	
14-987	Vertical Manual Tire Spreader
14-988	M-1Stule Manual Truck Tire Sreader
14-989	Top Post Mounting Tire Spreader
14-989A	Rim Clamp Adapter Plate for Top Post Spreader

14-921
X-Light Clamp-On LED Work Light

- Designed For Hands-Free Lighting During Tire Service and Other Work Applications
- 12" Adjustable Spring-Tube For Optimum Light Positioning Within Tight Spaces
- Compact High-Power LED Light Provides Up To 300 LUX For Intense Focus And Optimum Visibility
- Lithium-Ion Rechargeable Battery

X-Light Video

14-989

14-987

14-988

RETAIL PACKAGING & **DISPLAYS**

We are your complete source!

- Tire Repair
- Tire Gauges
- Valve Hardware
- Air Accessories
- Commercial Tire Repair & Supplies

Let our experienced, retail/commercial experts design the set that's right for you!

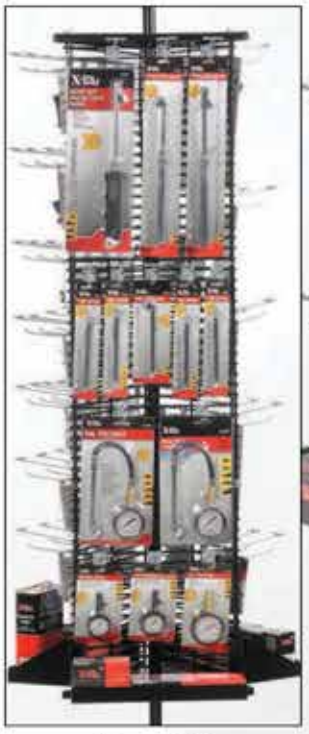
Xtra seal®

QUALITY YOU DEPEND ON!
THE NAME YOU TRUST!

15-9825
Floor Spinner Display

- Prominently display tire repair kits and air accessories
- High impulse activity generates profitable sales
- Contains the fastest moving items in both retail and commercial tire repair and accessories
- Durable display rack is made of high quality steel with ball bearing swivel base
- Comes with peg hooks with flip-scan label holders and header card
- Rack dimensions: 63" x 14.5" x 14.5" (with peg hooks & header card 71.5" x 21" x 21")

Panel 1



Panel 2

Panel 3

QUALITY YOU DEPEND ON!
THE NAME YOU TRUST!

Items manufactured by 31 Inc.

XtraSeal tire repair materials are guaranteed for fitness and merchantability. No returns will be accepted for items that are defective due to misuse or improper storage of repair materials.

Items distributed but no manufactured by 31 Inc

31 Incorporated, manufacturers of XtraSeal tire repair, makes no guarantee or other warranty, express or implied, of goods sold or distributed hereunder, or of their merchantability, fitness, or suitability for a particular purpose or condition. 31 Inc. warrants that it has made no alteration or other change to the product manufactured by others and distributed by 31 Inc., and that the original manufacturer's warranties, if any, are the only warranties applicable to the goods. 31 Inc. shall not be responsible or liable for any claim, loss, damage, liability, or expense of any kind or nature, including, but not limited to, special, incidental, or consequential damages or loss of profits, whether actual or anticipated, caused directly or indirectly by the goods sold.

PRODUCT INFORMATION

Recommendations for Storage of Repair Materials

XtraSeal tire repair materials should be stored in an area with a maximum ambient temperature of 80°F (27°C) and a maximum humidity of 75%. If these conditions are exceeded, use an air conditioned storage room at 65°F (18°C) for best results. All materials should be stored in a clean, dry area and surface contamination should be prevented. Always rotate stock so that the oldest materials are consumed first.

Technical Data for XtraSeal Tire Repair Materials

REPAIR UNITS (PATCHES)

Physical Properties Face Gum (Gray, Blue, & Black):

Tensile:	2800 psi
300% Modulus:	1100 psi
Elongation:	550%
Hardness, Shore A:	32

Rheometer @ 310°F (154°C):

Max. Torque:	12.64 - 13.20
Min. Torque:	06.58 - 07.10
Scorch Time:	02.90 - 03.37
T-90:	10.00 - 10.62

Shelf Life:

24 months if stored at 65°F (18°C) and avoiding direct sunlight
18 months if stored at "normal room temperatures" (Max. 80°F (27°C))

VULCANIZING GUM AND PENNY PATCHES

Physical Properties:

15' motor @ 280°F (138°C):

Tensile:	3260 psi
300% Modulus:	780 psi
Elongation:	650%
Hardness, Shore A:	50

Rheometer @ 300°F (149°C):

30' motor, 100 range, 3° arc:

Max. Torque:	41.40
Min. Torque:	07.90
Scorch T-2:	01.32
T-80:	08.60
T-90:	10.75

Shelf Life:

6 months if stored at 65°F (18°C) and avoiding direct sunlight
3 months if stored at "normal room temperatures" (Max. 80°F (27°C))

CHEMICALS

Physical Properties:

Cure Rates of Cements (Using Xtra Seal repair units):

Chemical Cure (Cold Cure):	72 - 96 hours @ 70°F (21°C)
Heat Cure:	20 minutes @ 300°F (149°C)

Two-Way Cure:

Chemical Cure:	36 - 48 hours @ 70°F (21°C) to 100°F (38°C)
Heat Cure:	20 minutes @ 300°F (149°C)

Shelf Life:

Cement and Bead Sealer:
24 months if stored at 65°F (18°C) and avoiding direct sunlight
18 months if stored at "normal room temperatures" (Max. 80°F (27°C))

Buffing Solution:
36 months if stored at 65°F (18°C) and avoiding direct sunlight
36 months if stored at "normal room temperatures" (Max. 80°F (27°C))

Inner Liner Sealer:
24 months if stored at 65°F (18°C) and avoiding direct sunlight
18 months if stored at "normal room temperatures" (Max. 80°F (27°C))

Puncture Repair

An injury in the tread (crown) area only (see diagram below) caused by a small, sharp object penetrating the innerliner of the tire. The injury can be a maximum of 1/4" (6mm) in passenger tires and 3/8" (10mm) in light and medium truck tires. (See page 22 for puncture repair procedures.)

Spot Repair

A rubber only repair that penetrates less than 25% of the body plies. An area to be spot repaired must not exhibit any cord damage except in the case of bias ply tires which may have up to 25% of the cord plies injured.

Reinforcement Repair

An injury which penetrates between 25% and up to 75% of the body plies. A cord reinforced repair unit is required on the innerliner of the tire.

Section Repair

An injury that penetrates 75% or more of the body plies and exceeds the puncture repair limits. (See page 25 for section repair procedures.)

SECTION REPAIR LIMITS FOR RADIAL TIRES

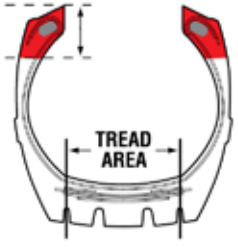
TIRE SIZE	CROWN LIMITS	SIDEWALL LIMITS
PASSENGER		
P195R and Smaller	1/2" (13mm)	3/8" (9mm) x 2" (50mm) or
		3/4" (19mm) x 1 1/2" (38mm)
P205R and Larger	3/4" (19mm)	3/8" (9mm) x 2 3/4" (70mm) or
		3/4" (19mm) x 2" (50mm)
LIGHT TRUCK		
	1" (25mm)	3/8" (9mm) x 3 1/8" (80mm) or
		1" (25mm) x 2" (50mm)
TRUCK		
8.25R - 14.00R	1 1/2" (38mm)	3/4" (19mm) x 5 1/8" (130mm) or
		1 1/4" (32mm) x 4" (102mm) or
		1 1/2" (38mm) x 3 1/8" (80mm)

* Wider repairs must be shorter in length

SECTION REPAIR LIMITS FOR BIAS PLY TIRES

PLY RATING	CROWN LIMITS	SIDEWALL LIMITS
HIGHWAY SERVICE DRIVE OR TRAILER APPLICATIONS		
Up to 8	1" (25mm)	1" (25mm)
10-14	2" (51mm)	1" (25mm)
16-20	2 1/2" (64mm)	1 1/4" (32mm)
LOCAL SERVICE TRAILER OR P&D APPLICATIONS		
Up to 8	2" (51mm)	1 1/2" (38mm)
10-14	3" (76mm)	1 1/2" (38mm)
16-20	3 1/2" (89mm)	1 3/4" (45mm)

Non-Repairable Bead Area+



MEASURE FROM TOE OF BEAD DOWN INNERLINER.

NON-REPAIRABLE BEAD AREA

TIRE TYPE (BIAS OR RADIAL)	TIRE CROSS SECTION	NON-REPAIRABLE BEAD AREA*
Passenger	All	1 1/2" (38mm)
Light & Medium Truck	Up to 7.5	3" (76mm)
Tube Type	8.25 and above	3 1/2" (89mm)
Light & Medium Truck	Up to 8.8	3" (76mm)
Tubeless	9 and above	3 1/2" (89mm)

*Rubber and spot repair only in this area. Repair to body ply and/or bead structure in this area is not permitted.

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PUNCTURE REPAIR PROCEDURES
INDUSTRY STANDARD PROCEDURES

NON-REPAIRABLE CONDITIONS+

Prior to repairing any tire, a careful inspection should be conducted using a grazing light method on both the inside and outside of the tire. According to the "Industry Standards for Tire Repairing", any tire exhibiting the following conditions should not be accepted for repair.

EXTERNAL

- Exposed cords beyond repairable limits
- Separations beyond repairable limits
- Broken belts
- Excessive oxidation (weather checking) extending to the body plies
- Damage which exceeds the size of a repairable injury or requires the repairs to overlap in radial tires or that are in the same quadrant in bias tires
- Broken or kinked beads
- Damaged bead exposing bead wire
- Injuries beyond the repairable limits
- Tire with less than 2/32" (2mm) nonskid remaining unless retreading is planned. (Some states may require a thicker tread for a tire to remain in service.)
- Previously installed repairs found to be defective and unrepairable
- Radial tires with rust or corrosion beyond repairable limits

INTERNAL

- Injuries beyond repairable limits
- Porous or loose liners
- Open liner splices beyond repairable limits
- Loose cords on the inside ply or evidence of having been run underinflated or overloaded
- Injury to the ply cord beyond repairable limits

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TIRE INSPECTION

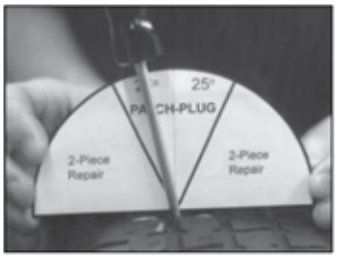
EXTERNAL EXAMINATION

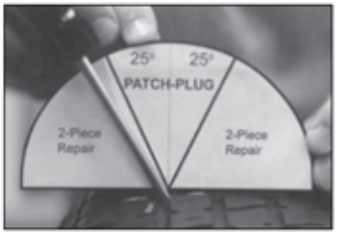
1. Carefully remove the wheel from the vehicle following industry recommended practices.
2. Inflate the tire to the manufacturer's recommended operating pressure (found on the sidewall of the tire).
3. Immerse the tire in a test tank to find the damaging leak. In some cases there may be a high pressure leak (one which has its greatest effect when under the full load of the vehicle) and it may be necessary to use leak detector to find the damaging object. Be certain to inspect for the possibility of more than one leak.

4. Review the non-repairable external conditions above. If the tire has been determined to be repairable, mark the location of the injury on the outside of the tire using a tire marking crayon. If you have any doubts as to the repairability of the tire, do not proceed with the repair.

INTERNAL EXAMINATION

5. Demount the tire from the wheel and place it on the floor in front of you.
6. Review the non-repairable external conditions above. If the tire has been determined to be repairable, mark the location of the injury on the inside of the tire using a tire marking crayon.
7. Remove the object causing the injury and carefully probe the injury to make sure it is 1/4" or less in diameter in passenger tires and 3/8" or less in light and medium truck tires. If these limits are exceeded, take the tire to a full service repair facility to be considered for section repair.
8. Using a probe, push it into the injury from the outside of the tire until the probe extends 1/4" through the innerliner. Be careful not to create a new hole.
9. With the probe extending through the injury channel and the injury at the 12 o'clock position, place the Patch-Plug Gauge across the tread next to the probe, with the center of the gauge placed at the center point of the injury.
10. If the shaft of the probe is within the gray area (25° or less), a one-piece repair may be used (patch-plug combination unit).
11. If the shaft of the probe is within the red area (greater than 25°), a two-piece repair is required (separate repair unit and insert).
12. Place the tire on a spreader with the injury in the 4 or 8 o'clock position. Do NOT spread the beads too far, as this will distort the final repair.





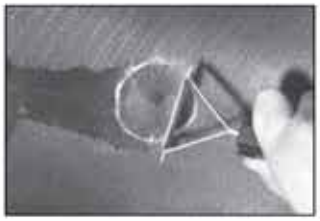
13. For remaining **one-piece repair procedures** follow steps on page 23.
For remaining **two-piece repair procedures** follow the steps beginning on page 24.

ONE-PIECE REPAIR PROCEDURES

INJURY PREPARATION

13. Once the size of the injury has been determined, select the appropriate repair material based on the size of the injury and the type of tire being repaired. Center the patch head over the injury on the inside of the tire and outline an area 1/4" larger than the patch to define the repair area.

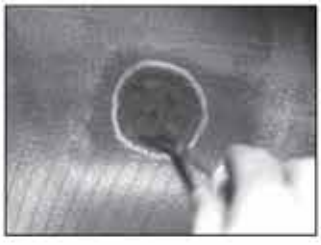
14. Using pre-buff rubber cleaner and an innerliner scraper, thoroughly clean the outlined area, removing all mold lubricants, dirt and debris.



15. Using a low speed buffer operating at no more than 5,000 rpm, buff the outlined area to an even, velvety RMA #1 textured finish (see below). Be careful not to buff through the innerliner and expose the cord body plies of the tire.

16. Using a 500 rpm low speed air drill and the appropriate carbide cutter, clear and prepare the injury channel by drilling it 3 times from the inside of the tire and then 3 times from the outside of the tire. This will clear away any damaged cables and prepares the injury channel to receive the vulcanizing insert (stem portion of the repair unit). Vacuum away any buffing debris.

17. Using a cement dipped probe, coat the wall of the injury channel with chemical vulcanizing cement. Using the brush applicator, apply cement to the prepared area of the innerliner in a stippling motion being careful not to puddle the cement. Allow the cement to dry thoroughly before installing the repair unit.



REPAIR UNIT APPLICATION

18. Relax the tire beads to their normal position. Remove the protective covering from the patch head and stem portions of the repair unit being careful not to touch the gum surfaces of the patch or stem.

19. Place a drop of cement at the leading edge of the stem portion of the repair unit being careful not to puddle. This lubricates the repair unit as it is pulled through the injury channel.
20. Insert the lead wire into the injury channel from the inside of the tire and pull it from the outside of the tire with a pair of pliers. Pull the repair unit steadily from the outside of the tire until the patch head is seated. Do not dimple the patch head by pulling too far.

21. Using a roller stitcher, stitch the patch down firmly to the innerliner by working from the center outward making sure to remove all trapped air.
22. Keeping the stem in a relaxed position, cut the stem about 1/8" above the tread surface of the tire. Do not pull the stem while cutting.

FINISHING THE REPAIR

23. Remount and inflate the tire following industry recommended procedures.
24. Carefully inspect the repair for leaks and the tire for additional leaks or damage using the tire manufacturer or RMA guidelines. If all inspection criteria are met and no leaks are detected, the tire is ready to be put back into service.

RMA BUFFING TEXTURES

RMA #1 RMA #2 RMA #3 RMA #4 RMA #5 RMA #6

TWO-PIECE REPAIR PROCEDURES

INJURY PREPARATION

13. Once the size of the injury has been determined, select the appropriate repair material based on the size of the injury and the type of tire being repaired.
14. Using a 500 rpm low speed air drill and the appropriate carbide cutter, clear and prepare the injury channel by drilling it 3 times from the inside of the tire and then 3 times from the outside of the tire. This will clear away any damaged cables and prepares the injury channel to receive the vulcanizing insert. Vacuum away any buffing debris.
15. Using a cement dipped probe, coat the wall of the injury channel with chemical vulcanizing cement and allow the cement to dry thoroughly.

INSTALLING THE VULCANIZING INSERT

16. Place a drop of cement on the leading edge of the lead wire insert.
17. Insert the lead-wire into the injury channel from the inside of the tire and pull it from the outside of the tire with a pair of pliers until the body of the insert is centered in the injury channel.
18. Using a flexible skiving knife, cut the insert just above the inner liner of the tire.

INSTALLING THE REPAIR UNIT

19. Center the repair unit over the injury on the inside of the tire and outline an area 1/4" larger than the patch to define the repair area.

20. Using pre-buff rubber cleaner and an inner liner scraper, thoroughly clean the outlined area, removing all mold lubricants, dirt and debris.
21. Using a low speed buffer at no more than 5,000 rpm, buff the outlined area to an even, velvety RMA #1 textured finish (see bottom of page 23). Be careful not to buff through the innerliner and expose the cord body plies of the tire. Vacuum away any buffing debris.
22. Using the brush applicator in a stippling motion, apply chemical vulcanizing cement to the prepared area of the inner liner being careful not to puddle the cement. Allow the cement to dry thoroughly before installing the repair unit.
23. Relax the tire beads to their normal position. Remove the protective backing from the repair unit being careful not to touch the gum surface.
24. Place it on the inner liner centered over the insert.

25. Using a roller stitcher, stitch the repair unit down firmly to the tire inner liner by working from the center outward making sure to remove all trapped air.

FINISHING THE REPAIR

26. Keeping the lead-wire insert in a relaxed position, cut the stem about 1/8" above the tread surface of the tire. Do not pull the stem while cutting.
27. Remount and inflate the tire following industry recommended procedures.
28. Carefully inspect the repair for leaks and the tire for additional leaks or damage using the tire manufacturer or RMA guidelines. If all inspection criteria are met and no leaks are detected, the tire is ready to be put back into service.

INDUSTRY STANDARD SECTION REPAIR PROCEDURES

INITIAL TIRE INSPECTION

1. An injury that penetrates 75% or more of the body plies and exceeds puncture repair limits requires a section repair. DO NOT attempt to repair this type of damage with nail hole repair units. Demount the tire from the wheel and locate the injury.
2. Remove any injuring object and make a careful visual inspection to determine the size, angle, and extent of the injury. Use a probing awl to probe for unseen internal damage. Determine whether the injury is within repairable limits. (See page 21 for section repair limits and page 22 for non-repairable conditions.)

FILLING THE INJURY AREA

Preparing the Outside of the Tire

3. Using a low speed buffer and a carbide cutter, begin removing all damaged rubber, both inside and outside the tire, and steel cord in the injury area. All broken cords and loose strands of cable must be removed leaving only solid, undamaged rubber at the sides of the opening. If in the tread area, use an appropriate buffing wheel to buff at a 45° angle down to the cord and 90° through the cord.
4. Using a high speed buffer with a pencil stone, polish the exposed cord ends being careful not to scorch the rubber. Clean away any rubber or steel dust left behind both inside and outside the tire. Using a low speed buffer and an appropriate buffing wheel, round over the edges of the prepared area.

Preparing the Inside of the Tire

5. Clean the inner liner around the injury area with a pre-buff chemical rubber cleaner. Using an inner liner scraper, remove dirt, mold lubricants, and other contaminants.
6. Using a low speed buffer with an appropriate buffing wheel, buff an area about 1" larger than the injury area to an RMA #1 texture (see bottom of page 25). As on the other side, round over the edges of the prepared area. Use a vacuum cleaner to remove buffing dust.
7. Measure the thickness of the tire at the injury area and note this measurement for future reference. Also measure and record the dimensions of the repair area.
8. Spread a generous coating of Black Retreader's Cement over the prepared injury area both inside and outside the tire.

Filling the Injury

9. Secure a backing plate on the inner liner. Fill the injury area with an appropriate filling material.Stitch and pack material so as to avoid creating any gaps or air pockets, working from the center outward, making sure to stitch rubber over the edges. Filling material should be about 1/8" (3mm) above the outside of the tire when finished packing. Remove the backing plate and cure the filling material following manufacturer's cure time recommendations.

REPAIR UNIT APPLICATION

10. Select the appropriate repair unit and center it over the injury on the inner liner. Mark an area about 1/2" (13mm) larger than the selected repair unit. Clean the selected area completely with a pre-buff rubber cleaner. Using an inner liner scraper, remove all dirt, mold lubricants, and other contaminants.
11. Using a low speed buffer and an appropriate buffing wheel, buff the selected area to an RMA #1 texture (see bottom of page 23). Remove all buffing dust with a vacuum.
12. Using a chemical vulcanizing cement recommended by the repair manufacturer, apply a thin, even coating to the prepared and buffed surface. Allow cement to dry thoroughly!
13. While beads are in a relaxed position, remove backing from repair unit and center the repair over the injury. Stitch repair down thoroughly with a stitching tool, working from the center out, removing all trapped air and making sure to stitch the edges.
14. Once the repair unit has been stitched down, apply a generous coating of Inner Liner Sealer to the edges of the repair unit.

FINISHING THE REPAIR

15. Using a low speed buffer and an appropriate buffing wheel, lightly buff the outside of the repaired area until the rubber is flush with the surrounding area, presenting a smooth finished appearance.
16. For tread area repairs, use a regroover to replace original tread design. For sidewall repairs, apply a Section ID Patch on the outside of the tire next to the repaired area to indicate the location of the section repair.

MOUNTING PRECAUTIONS

Courtesy of the Rubber Manufacturers Association

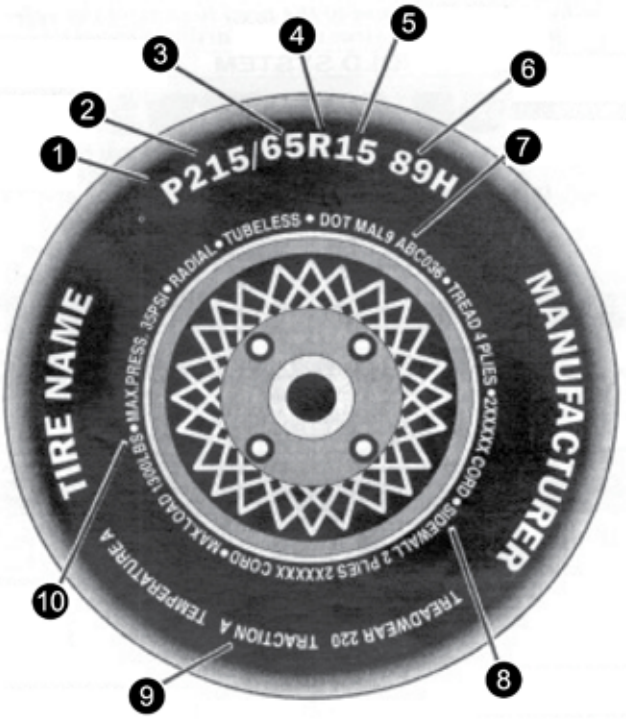
WARNING

NEVER inflate beyond 40 pounds pressure to seat beads.

NEVER stand, lean or reach over the assembly during inflation.

Inspect both sides of the tire to be sure that the beads are evenly seated. If tire is mounted on a machine that does not have a positive lock-down device to hold the wheel, inflation should be done in a safety cage or other restraining device. If both beads are not properly seated when pressure reaches 40 psi, completely deflate the assembly,

reposition the tire and/or tube on the rim, relubricate and reinflate. Inflating beyond 40 psi air pressure when trying to seat the beads is a DANGEROUS PRACTICE that may break the tire bead (or even the rim) with explosive force, possibly resulting in serious injury or death. After the beads are fully seated, pressure may be increased above 40 psi to operating pressures, not to exceed the maximum pressure molded on the tire sidewall.



HOW TO READ A TIRE SIDEWALL

1. Passenger car tire
2. Width of tire in millimeters
3. Ratio of height to width (aspect ratio)
4. Radial
5. Diameter of wheel in inches
6. Load index & speed symbol
7. U.S. DOT safety standard code
8. Tire ply composition and materials used
9. Treadwear, traction & temperature grades
10. Maximum cold inflation & load limit

Xtra seal

TIRE REPAIR

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