BOLT-IN VALVES, FLUSH MOUNT

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-416	416	Nickel Plated Brass	1.44"	–	–	.453"/.625"	50
17-416L		Nickel Plated Brass	2.25"	–	–	.453"/.625"	50
17-417	417	Brass	0.38"	2.50"	70°	.453"	50
17-559		Chrome Plated Brass	1.00"	–	–	.453"/.625"	50

17-416 and 17-416L: Recommended torque at installation: 25-45 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-416-10.*

17-416 17-416L 17-417 17-559

CHROME VALVES, INNER MOUNT

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-560		Chrome Plated Brass	0.75"	–	–	.453"	50
17-560A		Chrome Plated Brass	1.25"	–	–	.453"	50
17-560L		Chrome Plated Brass	1.75"	–	–	.453"	50
17-561		Chrome Plated Brass	0.25"	1.00"	45°	.453"	50
17-562		Chrome Plated Brass	0.75"	1.13"	90°	.453"	50

** 10 count bag available. Add "-10" to the part number. Example: 17-560-10.*

17-560 17-560A 17-560L 17-561 17-562

BOLT-IN VALVES FOR FORD TRUCKS

Part Number	TR Number	Material	(A) Height	Valve Hole	Bag Qty*
17-428		Chrome Plated Brass	1.50"	.453"	50
17-429		Brass	2.25"	.453"	50

APPLICATION: For Ford "F" Series Trucks with 16" Dual Wheels
Recommended torque at installation: 25-45 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-428-10.*

17-428 17-429

MOTORCYCLE VALVES

Part Number	TR Number	Description	Bag Qty*
17-430	430	Tubeless Motorcycle Valve	10

Application: For motorcycle wheels with 0.327"/0.339" valve hole;
Recommended torque at installation: 25-45 in-lbs.

17-430

Valve Replacement Parts

PASSENGER/LIGHT TRUCK

Part Number	TR Number	Description	Bag Qty*
17-494		Long Chrome Sleeve for TR 418	50
17-495		Short Chrome Sleeve for TR 413/414	100
17-495L		Long Chrome Sleeve for TR 413	100
17-546	RG-54	Small Grommet for 17-416, 17-428, 17-429 and 17-559	25
17-550	RG-39	Large Grommet for 17-416 and 17-559	25
17-553		Top Grommet for 17-560 Series	10
17-554		Bottom Grommet for 17-560 Series	10
17-555	RW-13	Nickel Plated Washer for 17-416 and 17-416L	25

17-494 17-495 17-495L

17-546 17-550 17-553 17-554

17-555

HEAVY TRUCK VALVES

Using inferior tire valves can expose you to huge liability issues. Protect yourself by using only quality tire valves from XtraSeal. We offer a full range of **heavy truck valves** for both steel and aluminum wheels.

Brass Heavy Truck Valves

RADIAL COMMANDER VALVES

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-500A		Brass	1.13"	0.87"	23°	.625"	50
17-500AL		Brass	1.38"	1.37"	23°	.625"	50
17-500B		Brass	1.13"	0.87"	21°	.625"	50

** 10 count bag available. Add "-10" to the part number. Example: 17-500A-10.*

17-500A 17-500AL 17-500B

BRASS VALVES

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-500T	500	Brass	2.00"	–	–	.625"	50
17-501T	501	Brass	1.50"	–	–	.625"	50
17-501-OV		Brass	1.50"	–	–	oval	50
17-570C	570C	Brass	1.38"	1.88"	90°	.625"	50
17-570T	570	Brass	3.13"	–	–	.625"	50
17-571T	571	Brass	3.38"	–	–	.625"	50
17-572T	572	Brass	3.75"	–	–	.625"	50
17-573T	573	Brass	4.38"	–	–	.625"	50
17-574T	574	Brass	5.00"	–	–	.625"	50
17-575T	575	Brass	1.13"	–	–	.625"	50

Application: For steel wheels with 0.625" valve hole; Recommended torque at installation: 35-55 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-500T-10.*

17-570C

17-500T 17-501T 17-501-OV 17-570T 17-571T 17-572T 17-573T 17-574T 17-575T

BRASS VALVES (UNASSEMBLES)

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Case Qty
17-572T-U	572	Brass	3.75"	–	–	.625"	250
17-572-B19	572-B19	Brass	1.38"	2.37"	11°	.625"	250
17-572-D12	572-D12	Brass	2.25"	1.50"	21°	.625"	250
17-572-F19	572-F19	Brass	1.38"	2.37"	31°	.625"	250
17-573T-U	573	Brass	4.38"	–	–	.625"	250
17-574-C26	574-C26	Brass	1.75"	3.25"	16°	.625"	250
17-574-E16	574-E16	Brass	3.00"	2.00"	26°	.625"	250
17-574-E28	574-E28	Brass	1.50"	3.50"	26°	.625"	250

Application: For steel wheels with 0.625" valve hole; Recommended torque at installation: 35-55 in-lbs.

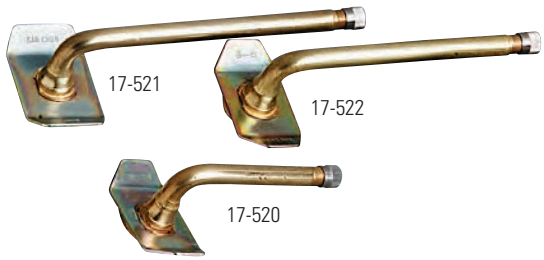
Sold in case quantities of 250 pcs. only.

Comes with grommet and valve core installed. Washers, nuts and caps bagged separately.

SCREW-ON REPAIR VALVES

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty
17-520	1075A	Brass	0.88"	3.00"	88°	.625"	1
17-521	1078A	Brass	0.88"	5.00"	88°	.625"	1
17-522	1175A	Brass	0.88"	4.50"	88°	.625"	1

Application: Truck and bus tube-type tire. Screws onto a tube spud with .482"-26 threads.



17-521 17-522 17-520

HIGH TEMPERATURE BRASS VALVE FOR WASTE HAULERS

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-573A		Brass	4.38"	–	–	.625"	50

Application: For steel wheels with 0.625" valve hole;
Recommended torque at installation: 35-55 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-573A-10.*

17-573A

BRASS VALVES, METRIC

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-41MS-00	V3-20-1	Brass	1.38"	–	–	9.7mm	50
17-60MS-27		Nickel	1.00"	1.19"	27°	9.7mm	50
17-70MS-27	V3-20-5	Brass	1.00"	1.56"	27°	9.7mm	50
17-80MS-27	V3-20-7	Brass	1.00"	2.00"	27°	9.7mm	50
17-90MS-27	V3-20-4	Brass	1.00"	2.38"	27°	9.7mm	50
17-115MS-27	V3-20-6	Brass	1.00"	3.38"	27°	9.7mm	50

Application: For aluminum wheels with 9.7mm (0.382"/0.394") valve hole and rim thickness of .218"-.330" at valve hole.
Recommended torque at installation: 80-125 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-41MS-00-10.*

17-41MS-00

17-70MS-27 17-80MS-27 17-90MS-27 17-115MS-27

NICKEL-PLATED BRASS VALVES

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-509	509	Nickel-plated	0.45"	4.75"	90°	.625"	50
17-510	510	Nickel-plated	0.45"	5.50"	90°	.625"	50
17-511	511	Nickel-plated	0.45"	4.25"	90°	.625"	50

Application: For aluminum wheels with 0.625" valve hole;
Recommended torque at installation: 100-125 in-lbs.

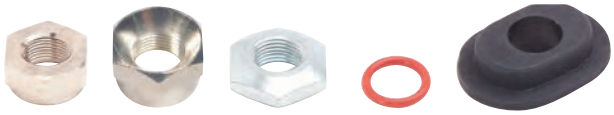
** 10 count bag available. Add "-10" to the part number. Example: 17-509-10.*

17-509 17-510 17-511

Valve Replacement Parts

HEAVY TRUCK

Part Number	TR Number	Description	Bag Qty
17-547	HN-21	Nut for TR 540 Series	10
17-547A	HN-22	Long Nut for TR 540/550 Series	10
17-548	HN-17	Nut for TR 509 Series	10
17-549	RG-60	O-Ring for TR 540 Series	25
17-551		EPDM Grommet for 17-501-OV	10
17-558		Grommet for TR 550 Series	25
17-576	HN-13	Brass Nut for TR 500 Series	10
17-576A	RW-8	Brass Washer for TR 500 Series	10
17-577	RG-15	EPDM Grommet for TR 500 Series	50
17-577G	RG-15	Green Silicone Grommet for TR 500 Series	25
17-577H	RG-15	Red Silicone Grommet for TR 500 Series	25
17-578	RG-46	EPDM Grommet for TR 509 Series	25
17-169T		Grommet Removal Tool for Truck Valves	1



17-547 17-547A 17-548 17-549 17-551

17-558 17-576 17-576A 17-577

17-577G 17-577H 17-578

17-169T

Nickel Plated Brass Valves – METRIC

NICKEL PLATED BRASS VALVES – WITH O-RINGS*

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-542	542	Nickel-plated	1.26"	–	–	9.7mm	50
17-543	543	Nickel-plated	2.31"	–	–	9.7mm	50
17-543C	543C	Nickel-plated	0.93"	1.38"	45°	9.7mm	50
17-543D	543D	Nickel-plated	0.98"	1.38"	60°	9.7mm	50
17-543E	543E	Nickel-plated	0.98"	1.38"	75°	9.7mm	50
17-544	544	Nickel-plated	2.86"	–	–	9.7mm	50
17-544C	544C	Nickel-plated	0.98"	1.94"	45°	9.7mm	50
17-544D	544D	Nickel-plated	0.98"	1.94"	60°	9.7mm	50
17-545	545	Nickel-plated	3.50"	–	–	9.7mm	50
17-545D	545D	Nickel-plated	0.98"	2.60"	60°	9.7mm	50
17-545E	545E	Nickel-plated	0.98"	2.60"	75°	9.7mm	50
17-546V	546	Nickel-plated	4.27"	–	–	9.7mm	50
17-546-36	546-36	Nickel-plated	0.98"	3.35"	36°	9.7mm	50
17-546D	546D	Nickel-plated	0.98"	3.35"	60°	9.7mm	50
17-546E	546E	Nickel-plated	0.98"	3.35"	75°	9.7mm	50
17-547D	547D	Nickel-plated	0.98"	3.78"	60°	9.7mm	50

APPLICATION: For aluminum wheels with 9.7mm (0.382"/0.394") valve hole and rim thickness of .218"-.330" at valve hole.
Recommended torque at installation: 80-125 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-542-10.*

17-542 17-543 17-544 17-545

17-543C 17-543E

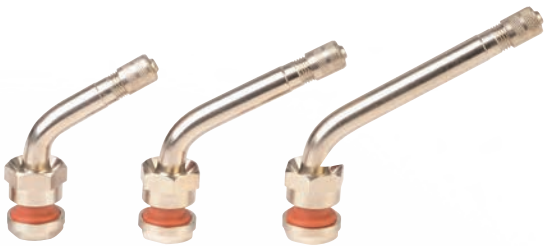
NICKEL PLATED BRASS VALVES – WITH GROMMET*

Part Number	TR Number	Material	(A) Height	(B) Length	Angle	Valve Hole	Bag Qty*
17-552V	552	Nickel-plated	1.26"	–	–	9.7mm	50
17-553V	553	Nickel-plated	2.31"	–	–	9.7mm	50
17-553C	553C	Nickel-plated	0.93"	1.38"	45°	9.7mm	50
17-553D	553D	Nickel-plated	0.98"	1.38"	60°	9.7mm	50
17-553E	553E	Nickel-plated	0.98"	1.38"	75°	9.7mm	50
17-554V	554	Nickel-plated	2.86"	–	–	9.7mm	50
17-554C	554C	Nickel-plated	0.98"	1.94"	45°	9.7mm	50
17-554D	554D	Nickel-plated	0.98"	1.94"	60°	9.7mm	50
17-555V	555	Nickel-plated	3.50"	–	–	9.7mm	50
17-555C	555C	Nickel-plated	0.98"	2.60"	45°	9.7mm	50
17-555D	555D	Nickel-plated	0.98"	2.60"	60°	9.7mm	50
17-555E	555E	Nickel-plated	0.98"	2.60"	75°	9.7mm	50
17-556V	556	Nickel-plated	4.27"	–	–	9.7mm	50
17-556-36	556-36	Nickel-plated	0.98"	3.35"	36°	9.7mm	50
17-556D	556D	Nickel-plated	0.98"	3.35"	60°	9.7mm	50
17-556E	556E	Nickel-plated	0.98"	3.35"	75°	9.7mm	50
17-557D	557D	Nickel-plated	0.98"	3.78"	60°	9.7mm	50

APPLICATION: For aluminum wheels with 9.7mm (0.382"/0.394") valve hole and rim thickness of .218"-.330" at valve hole.
Recommended torque at installation: 80-125 in-lbs.

** 10 count bag available. Add "-10" to the part number. Example: 17-552V-10.*

17-553V 17-554V 17-555V



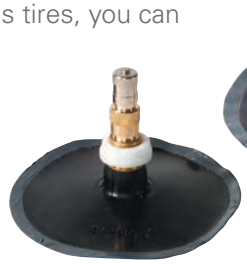
17-553D 17-554D 17-555D

AGRICULTURAL & MISC. VALVE HARDWARE

Every shipment of tire valves is thoroughly inspected to ensure our valves conform to the specifications set by the Tire and Rim Association. Whether you need air tank valves or **agricultural valves** for tube or tubeless tires, you can rely on us to provide only the highest quality valves.

TUBE TYPE AGRICULTURAL VALVES, AIR/LIQUID

Part Number	TR Number	Description	Bag Qty
17-585	218A	3.25" Base with Core Housing	1
17-585/110		4.33" Base (Spud Only)	1



17-585

17-585/110

AGRICULTURAL VALVES, AIR/LIQUID

Recommended Torque at Installation: 45-75 in-lbs.
Fits 0.625" Rim Holes

Part Number	TR Number	Description	Bag Qty
17-586	618A	Tubeless Valve, Straight	50
17-586-10	618A	Tubeless Valve, Straight	10
17-586A	621A	Tubeless Valve with 65˚ Bend	10
17-586B	622A	Tubeless Valve with 90˚ Bend	10
17-586C	623A	Tubeless Valve with 65˚ Bend	10
17-586S		Snap-In Tubeless Valve	10

17-586

17-586A

17-586B

17-586C

17-586S

TRACTOR FRONT WHEEL VALVE

Part Number	TR Number	Description	Bag Qty
17-591		9/16" Low Profile Valve, Brass	50
17-591C		9/16" Low Profile Valve, Chrome	50

**** 10 count bag available. Add "-10" to the part number. Example: 17-591-10.***

17-591

17-591C

Includes grommets to fit both 0.453" and 0.625" valve holes.

VALVE REPLACEMENT PARTS, AGRICULTURAL

Part Number	TR Number	Description	Bag Qty
17-552	RG-7	Grommet for TR 618A Series	10
17-584	LN-10	Nylon Rim Nut	50
17-584B	LN-10	Brass Rim Nut	25
17-587	CH-3	Core Housing	25
17-587A	CH-1	Core Housing, "Old Style"	10
17-587S	–	Core Housing, Short	1

17-552

17-584

17-584B

17-587

17-587A

17-587S

VALVE ACCESSORIES, AGRICULTURAL

Part Number	TR Number	Description	Bag Qty
17-588	B-6	Valve Hole Reducer Bushing	100
17-590		5/8" Rim Hole Plug	10
17-660		Air/Water Adapter Set (3 Pieces)	1

17-588

17-590

17-660

TANK VALVES

Part Number	Description	Bag Qty
17-593	1/8" NPT, Brass	10
17-593L	1/8" NPT Nickel-Plated, Long	10
17-594	1/4" NPT, Brass	10
17-595	1/4" NPT Nickel-Plated	10

17-593

17-593L

17-594

17-595

HALTEC LARGE BORE SOLUTIONS

As the vehicle and tire sizes of off-road, grader, and mining equipment continue to increase, Haltec continues to be a leader in the development and manufacturing of tire valve systems. Whether you need l**arge bore, super large bore, z-bore, or mega bore valves and accessories**, Haltec offers solutions to meet your needs.

Any Haltec item not listed is available by special order. Ask for details.

Large Bore Valves and Accessories

SINGLE BEND SWIVEL VALVES

Part Number	TR Number	Description	(A) Height	(B) Length	Bag Qty
17-645-4		90° Swivel Valve	1 5/64" (27.4mm)	4" (101.6mm)	1
17-645-4 1/2	J-4000-4 1/2	90° Swivel Valve	1 5/64" (27.4mm)	4 1/2" (114.3mm)	1
17-645-6	J-4000-6	90° Swivel Valve	1 5/64" (27.4mm)	6" (152.4mm)	1
17-645-9	J-4000-9	90° Swivel Valve	1 5/64" (27.4mm)	9" (228.6mm)	1
17-650	J-650	80° Swivel Valve	1 5/64" (27.4mm)	3 1/8" (79.4mm)	1
17-650C	J-650	J650 with Spud	1 5/64" (27.4mm)	3 1/8" (79.4mm)	1
17-651	J-651	90° Swivel Valve	1 5/64" (27.4mm)	4 11/16" (119mm)	1
17-653	J-653	80° Swivel Valve	1 5/64" (27.4mm)	2 1/2" (62.7mm)	1
17-658	J-658	80° Swivel Valve	1 5/64" (27.4mm)	5 1/2" (139.7mm)	1


17-645 Series


17-650 Series

STRAIGHT VALVE AND TUBELESS SPUDS

Part Number	TR Number	Description	(B) Length	Bag Qty
17-662	SP-2	Tubeless Spud (13/16" Rim Hole)	11/16" (15.8mm)	1
17-670	J-670-2	Straight Valve	1 1/2" (38.1mm)	1
17-670C	J-670-3	J-670-2 with Spud	1 5/8" (41.3mm)	1


17-662

17-670

17-670C

AIR CHUCKS AND GAUGES

Part Number	TR Number	Description	Bag Qty
17-685		Large Bore Swivel Gauge, 10-150 psi	1
17-687		Lock-On Air Chuck (Long) with 1/4" NPT Female Threads	1
17-688		Clip-On Air Chuck with 1/4" NPT Female Threads	

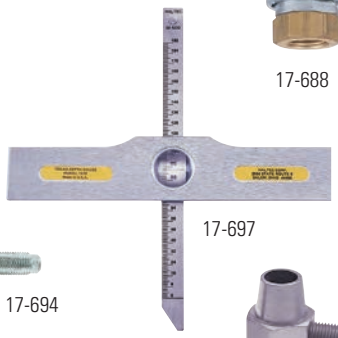

17-685

17-687

17-688

VALVE TOOLS

Part Number	TR Number	Description	Bag Qty
17-694		Large Bore 4-Way Valve Tool	1
17-697		OTR Tread Depth Gauge	1
17-698		Large Bore Tube Deflator/Aspirator	1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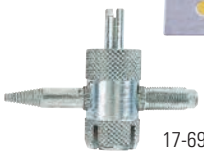

17-694


17-698

CAPS, CORES AND ADAPTERS

Part Number	TR Number	Description	Bag Qty
17-589	AD-1	Nut Style Large to Standard Bore Adapter	10
17-840	C-2	Large Bore Valve Core, Long	1
17-850	C-2	Large Bore Valve Core, Short	10
17-856	–	Cap Style Large to Standard Bore Adapter	10
17-859	VC-6	Large Bore Screwdriver Valve Cap	10
17-860	VC-7	Large Bore Hex-Head Valve Cap	10


17-589


17-840


17-850


17-856


17-859


17-860

VALVE TOOLS & ACCESSORIES

With the introduction of TPMS and nitrogen inflation systems in recent years, tire and wheel service isn't as simple as it used to be. As we keep up with the changing needs in the aftermarket, 31 Inc. continues to make available the most popular **valve tools and accessories**.

Valve Caps & Cores

VALVE CAPS & CORES FOR TPMS

Part Number	Description	Box Qty
17-490T	TPMS Nickel-Plated Valve Core, Red	100
17-490TY	TPMS Nickel-Plated Valve Core, Yellow	100
17-492L-1	Long Skirted Black Plastic Cap with Seal	100
17-492T-1	Gray Plastic Cap with Seal	100
17-492LG-1	Long Skirted Green Plastic Cap with Seal	100

17-490T | 17-490TY | 17-492L-1 | 17-492T-1 | 17-492LG-1

VALVE CAPS (TPMS COMPATIBLE)

Part Number		Description	Box Qty
17-489		Nitrogen ID Ring	100
17-492	VC-8	Black Plastic Cap	100
17-492-1	VC-8	Black Plastic Cap with Seal	100
17-492B-1	VC-8	Blue Plastic Cap with Seal	100
17-492G	VC-8	Green Plastic Cap	100
17-492G-1	VC-8	Green Plastic Cap with Seal	100
17-493BP		Chromed Plastic Cap, Long Skirted	100
17-493NP	–	Chromed Plastic Cap, Green Top with Seal	100
17-493NPB	–	Chromed Plastic Cap Blue N_2 Top with Seal	100
17-493P	–	Chromed Plastic Cap with Seal	100

17-489

17-492 | 17-492-1 | 17-492B-1 | 17-492G | 17-492G-1

17-493BP | 17-493NP | 17-493NPB | 17-493P

VALVE CAPS & CORES

Warning: Do NOT use with TPMS Valve Stems*

Part Number		Description	Box Qty
17-490	C-1	Short Valve Core	100
17-490HT	C-1	Short Valve Core, High Temperature	100
17-490L	C-1	Long Valve Core, High Temperature	100
17-491D	VC-3	Long Metal Dome Cap with Seal	100
17-491E		Short Metal Dome Cap with Seal	100
17-491S	VC-2	Metal Screwdriver Cap with Seal	100
17-491T		H.D. Metal Dome Cap with Seal	100
17-493		Chrome Hex Cap with Seal	100
17-493B		Long Skirted Chrome Hex Cap with Seal	100
17-493G		Domed Chrome Hex Cap with Seal	100
17-493N		Chrome Hex Cap, Green Top with Seal	100
17-579		Double Seal Valve Cap	–

17-490 | 17-490HT | 17-490L

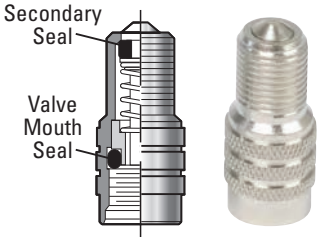
17-491D | 17-491E | 17-491S | 17-491T

17-493 | 17-493B | 17-493G | 17-493N

* If a brass valve cap is installed on an aluminum valve, corrosion will occur and the cap may not be able to be removed without breaking the valve.

17-579
Double Seal Valve Cap

The double seal valve cap is designed for high pressure truck tire service.



17-579

- Inflate directly through sealing cap
- Reduces time and labor
- No lost valve caps

Overall length 7/8"
Temperature rated seal -40˚F to 250˚F

Valve Extensions

PLASTIC, PASSENGER			
Part Number		Description	Bag Qty
17-496	3/4"	Plastic	100
17-497	1 1/4"	Plastic	100
17-498	1 1/2"	Plastic	10
17-499	2"	Plastic	50

METAL, PASSENGER			
Part Number		Description	Bag Qty
17-496B	3/4"	Metal	25
17-497B	1 1/4"	Metal	25
17-557	6"	Chrome, 15° bend	1
17-563	1 3/8"	Chrome, 135° bend	10
17-564	1 3/8"	Chrome, 90° bend	10
17-565	1 3/8"	Chrome, 45° bend	10

PLASTIC, TRUCK			
Part Number		Description	Bag Qty
17-581BP	2 1/4"	Plastic	10
17-581P	3 3/4"	Plastic	10
17-582P	5 1/4"	Plastic	10
17-583P	6"	Plastic	10

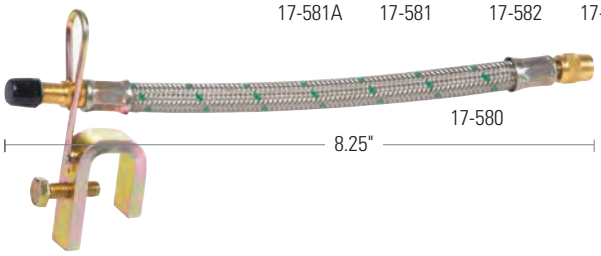
METAL, TRUCK			
Part Number		Description	Bag Qty
17-580	8 1/4"	Metal Braided Flexible	6
17-580-14	14"	Metal Braided Flexible	1
17-581A	1 13/32"	Metal	10
17-581	3 1/16"	Metal	10
17-582	5 1/16"	Metal	10
17-583	6 1/16"	Metal	10

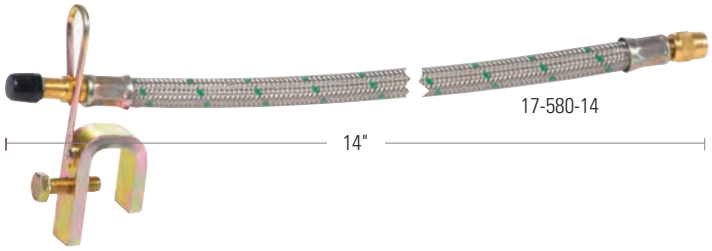
STABILIZER KITS		
Part Number	Description	Bag Qty
17-582-AS1	For Alcoa 22.5" with 2" Center Hole	2
17-582-AS2	For Alcoa 24.5" with 2.19" Off-Center Hole	2

Stabilizer kits include
2 – 17-582 and
2 rubber stabilizers.


17-582-AS1


17-582-AS2





17-181
Valve Capper Pro Tool

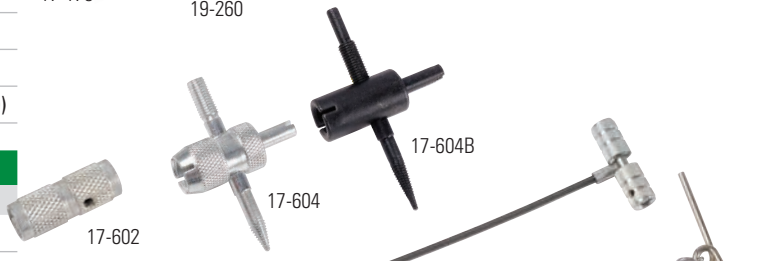
Now easier to check inside dual tire. No more lost caps, holds onto caps for removing and replacing. Designed for use with metal and plastic valve caps. Works with DS-1 flow through cap. Length 11 3/4 in.

VALVE CORE REMOVER TOOLS

Part Number	Description
17-171	Metal Core Tool
17-172	Large and Standard Bore Core Tool
17-173	TPMS Valve Core Torque Tool, 4 in-lbs
17-174	Core Tool
17-175	Screwdriver Handle Core Tool
17-176	Screwdriver Handle Core Tool, Long
17-177	Screwdriver Handle Core Tool, Recessed
17-178	Core Lock Valve Core Tool
17-181	Valve Capper Pro Tool
19-260	Pocket Screwdriver with Core Tool (Bag of 50)

VALVE TOOLS & ACCESSORIES

Part Number	Description
17-602	2-Way Valve Tool
17-604	4-Way Valve Tool
17-604B	4-Way Valve Tool, Black Hardened
17-605	Cable-Type Valve Fishing Tool
17-605-24	24" Cable-Type Fishing Tool
17-605C	Chain-Type Valve Fishing Tool
17-608	Tube Deflator Tool



VALVE INSTALLATION TOOLS

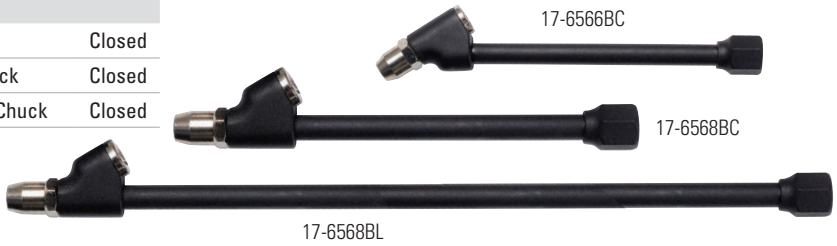
Part Number	Description
17-606	Valve Installation Tool, Screw-On Type
17-606P	No-Mar Installation Tool with Hardened Steel Rod, Screw-On Type
17-606R	Valve Installation Tool with Rubber Boot
17-606T	Valve Installation Tool with Rubber Block
17-609	Valve Installation Tool, Clamp-On Type
17-609P	Valve Installation Tool, Clamp-On Type
17-610	Pull-a-Stem Valve Installation Tool

AIR CHUCKS

We offer a large selection of the most popular air chucks for standard bore tire valves. Whether you need "open" chucks for tire changers and inflator gauges or "closed" chucks for live air lines, count on 31 Inc. to have what you need.

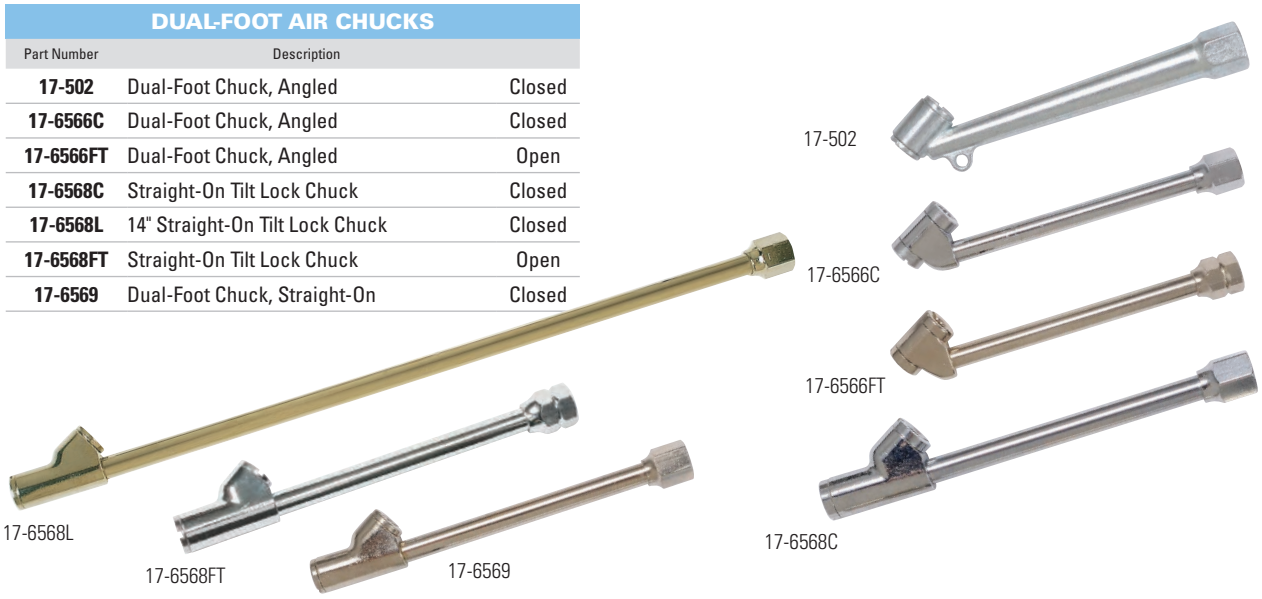
PREMIUM DUAL-FOOT AIR CHUCKS

Part Number	Description	
17-6566BC	Premium Dual-Foot Chuck, Angled	Closed
17-6568BC	Premium Straight-On Tilt Lock Chuck	Closed
17-6568BL	Premium 14" Straight-On Tilt Lock Chuck	Closed



DUAL-FOOT AIR CHUCKS

Part Number	Description	
17-502	Dual-Foot Chuck, Angled	Closed
17-6566C	Dual-Foot Chuck, Angled	Closed
17-6566FT	Dual-Foot Chuck, Angled	Open
17-6568C	Straight-On Tilt Lock Chuck	Closed
17-6568L	14" Straight-On Tilt Lock Chuck	Closed
17-6568FT	Straight-On Tilt Lock Chuck	Open
17-6569	Dual-Foot Chuck, Straight-On	Closed



EASY LOCK AIR CHUCK
SEALS EASY & LOCKS TIGHT THE FIRST TRY!

- Easy on/off application, custom coupler lock with slide release
- Automatic locking-design chuck
- Hardened steel pins for increased service life
- Improves seal on 17-579 (DS-1) double seal valve caps
- Extended reach for dual wheels
- Available open or closed
- Made in USA

"EASY LOCK" AIR CHUCKS

Part Number	Description	
17-6301	12" Extended Air Chuck with 180° Reverse Angle	Open
17-6306	12" Extended Air Chuck, Straight	Open
17-6308	8" Chuck with 15° Reverse Angle	Open

Maximum Operating Pressure = 150 psi

BALL FOOT AIR CHUCKS

Part Number	Description	Type
17-501	Ball Foot Chuck	Closed
17-501N	Nitrogen Ball Foot Chuck	Closed
17-503	Ball Foot Chuck with Clip	Closed
17-503FT	Ball Foot Chuck with Clip	Open
17-5565	Brass Ball Foot Chuck	Closed
17-5567	Brass Ball Foot Chuck with Clip	Closed
17-506	Replacement Clip for Ball Foot Chucks	

17-501

17-501N

17-503

17-503FT

17-5565

17-5567

17-506

EURO STYLE AIR CHUCKS

Part Number	Description	Type
17-504	Euro Style Chuck with Hose Barb	Open
17-504C	Euro Style Chuck with Hose Barb	Closed
17-504F	Euro Style Chuck with 1/4" NPT	Open
17-504FC	Euro Style Chuck with 1/4" NPT	Closed

17-504

17-504C

17-504F

17-504FC

LOCK-ON AIR CHUCKS

Part Number	Description	Type
17-505	Lock-On Chuck	Closed
17-505F	Lock-On Chuck	Open

17-505

17-505F

Air Chuck Repair Kits

AIR CHUCK REPAIR KITS

Part Number	Description
17-5565RK	Repair Kit for Ball Foot Chuck
17-5565RS	Replacement Seal for Ball Foot Chucks
17-6566RK	Repair Kit for 17-6566C
17-6568BRK	Repair Kit for 17-6568B
17-6568RK	Repair Kit for 17-6568C/17-6569
17-6568RS	Replacement Seal for Dual-Foot Chucks

17-5565RK

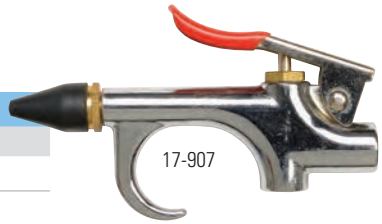
17-6566RK

17-6568BRK

17-6568RK

AIR BLOW GUNS

Part Number	Description
17-907	Lever-Type Air Blow Gun with Rubber Tip
17-907M	Lever-Type Air Blow Gun with Metal Tip
17-907R	Rubber Tip for 17-907 Blow Gun



17-907

17-907M

17-907R

AIR GAUGES

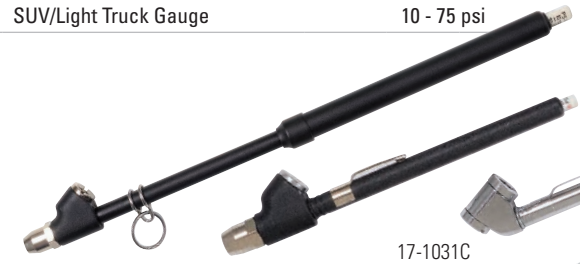
PENCIL AIR GAUGES

Part Number	Description	Range
17-900	Air Gauge Counter-Top Display Contains: 5 – 17-909C, 30 – 17-910C, 15 – 17-911C	
17-908C	Air / Liquid Gauge	5 - 45 psi
17-909C	Low Pressure Gauge	1 - 20 psi
17-910C	Standard Gauge	10 - 50 psi
17-910S	Standard Gauge, Straight-On	10 - 50 psi
17-911C	High Pressure Gauge	20 - 120 psi
17-911S	High Pressure Gauge, Straight-On	20 - 120 psi
17-912C	SUV/Light Truck Gauge	10 - 75 psi

17-900

17-910S and 17-911S

17-908C to 17-912C



17-1045BC

17-1317BC

17-1031C

17-1045C

17-1045RCL

17-1047

17-1075

17-1085

17-1313C

17-1317C

PREMIUM DUAL-FOOT AIR GAUGES

Part Number	Description	Range
17-1045BC	Premium Straight-On, 2-Sided Nylon Bar	10 - 150 psi
17-1317BC	Premium Dual-Foot Gauge, Straight-On	20 - 120 psi

DUAL-FOOT AIR GAUGES

Part Number	Description	Range
17-1031C	Dual-Foot Pocket Gauge, Angled	20 - 120 psi
17-1045C	Straight-On, 2-Sided Metal Bar	10 - 150 psi
17-1045RCL	Recalibratable Gauge, Straight-On, 2-Sided Metal Bar	10 - 150 psi
17-1047	Straight-On, 4-Sided Metal Bar	10 - 150 psi
17-1075	Master Test Gauge, 2-Sided Nylon Bar	10 - 150 psi
17-1085	Straight-On 180˚ Reverse, 2-Sided Metal Bar	10 - 150 psi
17-1313C	Angled, 2-Sided Metal Bar	10 - 150 psi
17-1317C	Dual-Foot Pocket Gauge, Straight-On	20 - 120 psi

17-910E

17-914

DIAL AIR GAUGES

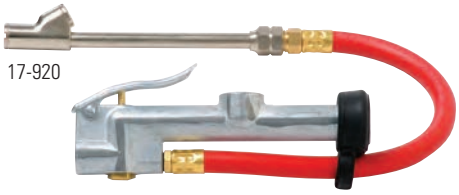
Part Number	Description	Range
17-910E	Economy Dial Gauge	0 - 55 psi
17-914	Dial Gauge, Straight-On	0 - 160 psi
17-916	Dial Gauge with 18" Whip Hose	0 - 170 psi
17-917	Dial Gauge with 12" Whip Hose	0 - 160 psi

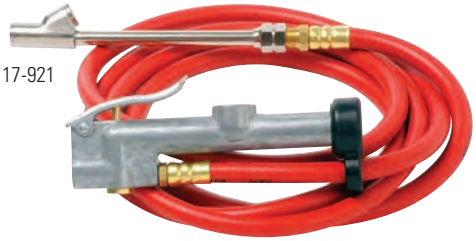
17-916

17-917

INFLATOR GAUGES

Part Number	Description	Range
17-920	Inflator Gauge (Sight Glass) with 12" Hose	20 - 120 psi
17-920H	Replacement Hose for 17-920 & 17-922	
17-921	Inflator Gauge (Sight Glass) with 9' Hose	20 - 120 psi
17-922	Inflator Gauge (Nylon Bar) with 12" Hose	20 - 120 psi
17-926	Premium Inflator Gauge with 20" Hose	0 - 138 psi
17-927	Premium Safety Inflator Gauge with 9' Hose	0 - 138 psi
17-935	Digital Inflator Gauge, Rubber Encased	0 - 174 psi
17-935H	Replacement Hose for 17-935	
17-936	Digital Inflator Gauge	0 - 174 psi
17-936H	Replacement Hose for 17-936	


17-920


17-921


17-922

17-926 Premium Inflator Gauge

- **0-138PSI, ¼" NPT Inlet**
- **Die-Cast Rugged Body**
- **20" Hose with Dual Lock-On Chuck**

17-927 Premium Safety Inflator Gauge

- **0-138PSI, ¼" NPT Inlet**
- **Die-Cast Rugged Body**
- **9' Hose with Lock-On Chuck**


17-926


17-927

17-935 and 17-936 Key Features

- Inflates and deflates
- High inflation and deflation rates
- Clear and easy-to-read digital display with backlight
- PSI, KPA, BAR, KGF units can be selected by the user
- Long-life battery with low battery warning light


17-935

17-936

GAUGES FOR TIRE CHANGERS

Part Number	Description
17-991	Air Gauge for Coats Rim Clamp Tire Changers, Flange Mount
17-992	Air Gauge for FMC/John Bean and Snap-On
17-993	Replacement Lens for 17-991 and 17-992


17-991


17-992


17-993

AIR HOSES & ACCESSORIES

HYBRID AIR HOSE

300 psi max. operating pressure

Part Number	Description	Thread Size
17-941	Professional Grade 50' x 3/8" Hybrid Air Hose Taco Shell Package	1/4" NPT
17-942	50' x 3/8" Hybrid Air Hose	1/4" NPT
17-942T	50' x 3/8" Hybrid Air Hose Taco Shell Package	1/4" NPT

17-941 17-942 17-942T

RUBBER AIR HOSE

300 psi max. operating pressure

Part Number	Description	Thread Size
17-944	25' x 3/8" Rubber Air Hose	1/4" NPT
17-945	50' x 3/8" Rubber Air Hose	1/4" NPT

17-944 17-945 17-945USA

RUBBER AIR HOSE – PROFESSIONAL GRADE

300 psi max. operating pressure

Part Number	Description	Thread Size
17-944USA	25' x 3/8" Rubber Air Hose	1/4" NPT
17-944-3/8USA	25' x 3/8" Rubber Air Hose	3/8" NPT
17-945USA	50' x 3/8" Rubber Air Hose	1/4" NPT
17-945-3/8USA	50' x 3/8" Rubber Air Hose	3/8" NPT
17-946USA	25' x 1/2" Rubber Air Hose	3/8" NPT
17-947USA	25' x 1/2" Rubber Air Hose	1/2" NPT
17-948USA	50' x 1/2" Rubber Air Hose	3/8" NPT
17-949USA	50' x 1/2" Rubber Air Hose	1/2" NPT

PVC AIR HOSE

300 psi max. operating pressure

Part Number	Description	Thread Size
17-966	25' x 3/8" PVC Air Hose	1/4" NPT
17-967	50' x 3/8" PVC Air Hose	1/4" NPT
17-967N	50' x 3/8" Nitrogen PVC Hose	1/4" NPT
17-968	300' x 3/8" Bulk PVC Air Hose	
17-969	50' x 1/2" PVC Air Hose	1/2" NPT
17-970	50' x 1/2" PVC Air Hose	3/8" NPT

17-967 17-967N 17-966

RECOIL AIR HOSE

200 psi max. operating pressure

Part Number	Description	Thread Size
17-763	12' x 1/4" Recoil Air Hose	1/4" NPT
17-764	25' x 1/4" Recoil Air Hose	1/4" NPT
17-765	50' x 1/4" Recoil Air Hose	1/4" NPT
17-774	25' x 3/8" Recoil Air Hose	1/4" NPT
17-774-3/8	25' x 3/8" Recoil Air Hose	3/8" NPT
17-775	50' x 3/8" Recoil Air Hose	1/4" NPT
17-775-3/8	50' x 3/8" Recoil Air Hose	3/8" NPT
17-775N	50' x 3/8" Nitrogen Recoil Air Hose	1/4" NPT

17-775 17-764 17-765 17-774-3/8 17-775N

REPLACEMENT AIR HOSE FOR TIRE CHANGERS

300 psi max. operating pressure

Part Number	Description
17-990	Coats Hose, 1/4" x 56" (open chuck)
17-990F	FMC Hose, 1/4" x 56" (open chuck)

17-990

17-990F

17-952
Hose Reel

- Heavy-duty all-steel construction hose reel features a corrosion resistant powder coat finish for longer life and durability
- Premium grade 3/8-inch x 50-foot rubber air hose included
- Permits wall, ceiling, or floor mounting
- 4-roller guide arm adjusts to (9) different potential positions

17-952

FERRULES

Part Number	Description	I.D.	Bag Qty
17-971	Ferrule for 1/4" PVC Hose	0.520"	10
17-972	Ferrule for 3/8" PVC Hose	0.650"	10
17-972R	Ferrule for 3/8" Rubber Hose	0.750"	10
17-977	Ferrule for 1/2" PVC Hose	0.775"	10
17-977R	Ferrule for 1/2" Rubber Hose	0.900"	10

17-971 17-972 17-972R 17-977 17-977R

HOSE BARBS

Part Number	Description	Bag Qty
17-9735	1/4" Hose Barb, 1/4" Female	10
17-973	1/4" Hose Barb, 1/4" Male	10
17-9731	5/16" Hose Barb, 1/4" Male	10
17-974	3/8" Hose Barb, 1/4" Male	10
17-9743	3/8" Hose Barb, 3/8" Male	10
17-9784	1/2" Hose Barb, 1/4" Male	10
17-978A	1/2" Hose Barb, 3/8" Male	10
17-978	1/2" Hose Barb, 1/2" Male	10

17-9735 17-973 17-9731 17-974

17-9743 17-9784 17-978A 17-978

HOSE SPLICER

Part Number	Description	Bag Qty
17-975	1/4" Hose Splicer	10
17-9751	5/16" Hose Splicer	10
17-976	3/8" Hose Splicer	10

17-975 17-9751 17-976

17-979
Crimping Die Sizes – .63", .58", .53", .48", .68"

AIR HOSE CRIMPING TOOL

Part Number	Description
17-979	Air Hose Crimping Tool

PREMIUM BRASS COUPLERS

THESE POINTS APPLY TO OUR 1/4" BRASS COUPLERS

Solid Brass Construction
Purchased from pure grade raw bar-stock and machined to provide consistent quality and the optimum blend of strength, durability, sealing and corrosion resistance.

6-Ball Design
Heat treated carbon steel locking balls for superior life and stronger connection strength.

Nitrile (BunaN) Seal
Superior resistance to oil and temperature changes providing optimal sealing for longer life.

Stainless Steel Spring
Superior life and corrosion resistance. High tension strength reduces accidental disconnection and increases life under extreme use.

Disconnection Protection Ring
Machined into body to prevent accidental disconnection under pressure for greater safety and reliability.

High Flow Couplers

Allow more than twice the amount of airflow to your tool, ensuring your tools will give their maximum torque, maximum RPM, and the bottom line best performance your air system can provide.

- High flow 70CFM (when used with high flow plug)
- Extremely light weight (50% lighter than brass or steel)
- Push-to-connect six ball design
- Heavy-duty T6 aluminum for durability
- Anodized aluminum for extreme corrosion resistance
- Stainless steel balls, springs and valve
- Laser etched for easy identification
- Compatible with other ¼" Industrial style plugs

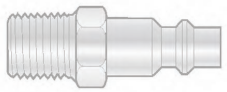
15-7170
High Flow Coupler
Push-To-Connect
1/4" Body
1/4" NPT F

15-7171
High Flow Coupler
Push-To-Connect
1/4" Body
1/4" NPT M

15-7180
High Flow Plug
1/4" Body
1/4" NPT F

15-7181
High Flow Plug
1/4" Body
1/4" NPT M

Industrial Style is also referred to as MILTON style. It is by far the most popular style used in North America, as was adopted by the US military as their standard pneumatic style per US Military Specification – Mil-C-4109.



- Usually designated by two thin rings on the sleeve of the coupler.
- Also identified by "I/M" stamped in the hex body.

6-Ball Design

1/4" INDUSTRIAL SERIES

COUPLER						PLUG					
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI	
17-322	Female	1/4"	Brass	300	TYPE D	17-232	Female	1/4"	Steel	300	
17-323	Female	3/8"	Brass	300		17-233	Female	3/8"	Steel	300	
17-332	Male	1/4"	Brass	300		17-222	Male	1/4"	Steel	300	
17-333	Male	3/8"	Brass	300		17-223	Male	3/8"	Steel	300	
17-3222	Female	1/4"	Steel	300							
17-3322	Male	1/4"	Steel	300							

1/4" INDUSTRIAL RECAPPER SERIES

COUPLER						PLUG					
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI	
17-320	Female	1/4"	Brass	2000	TYPE D	17-246	Female	0.305-32"	Steel	300	

1/4" INDUSTRIAL PUSH-TO-CONNECT SERIES

COUPLER						PLUG					
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI	
17-322P	Female	1/4"	Steel	300	TYPE D						
17-332P	Male	1/4"	Steel	300							

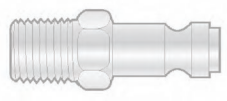
3/8" INDUSTRIAL SERIES

COUPLER						PLUG					
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI	
17-324	Female	1/4"	Steel	1000	TYPE E	17-254	Female	1/4"	Steel	300	
17-325	Female	3/8"	Steel	300		17-255	Female	3/8"	Steel	300	
17-334	Male	1/4"	Brass	300		17-256	Male	1/4"	Steel	300	
17-335	Male	3/8"	Steel	300		17-253	Male	3/8"	Steel	300	

1/2" INDUSTRIAL SERIES

COUPLER						PLUG					
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI	
17-355	Female	3/8"	Steel	500	TYPE H	17-252	Female	1/2"	Steel	300	
17-356	Female	1/2"	Steel	300							
						17-251	Male	1/2"	Steel	300	

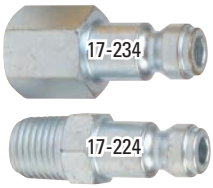
Automotive Style also referred to as TRU-FLATE style is the second most popular style, and is preferred in certain areas of North America.



- More popular style for 3/8" body couplers.
- Usually designated by one thin ring on the sleeve of the coupler.
- Also Identified by "T" stamped in the hex body.

1/4" AUTOMOTIVE SERIES

COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-326	Female	1/4"	Brass	300	TYPE C	17-234	Female	1/4"	Steel	300
17-336	Male	1/4"	Brass	300		17-224	Male	1/4"	Steel	300
17-3262	Male	1/4"	Steel	300						



1/4" RECAPPER SERIES (AUTOMOTIVE SERIES)

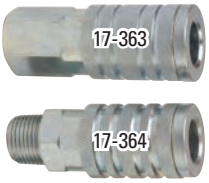
COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-340	Female	1/4"	Steel	300	TYPE C	17-241	Female	0.305-32"	Steel	300
						17-242	Male	1/4" *	Steel	300

** Has 0.305-32" internal threads*

3/8" AUTOMOTIVE SERIES

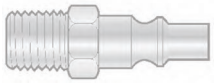
COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-327	Female	1/4"	Steel	300	TYPE G	17-235	Female	1/4"	Steel	300
17-328	Female	3/8"	Steel	300		17-236	Female	3/8"	Steel	300
17-337	Male	1/4"	Steel	300		17-225	Male	1/4"	Steel	300
17-338	Male	3/8"	Steel	300		17-226	Male	3/8"	Steel	300

1/2" AUTOMOTIVE SERIES



COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-361	Female	3/8"	Steel	300	TYPE F	17-262	Female	3/8"	Steel	300
17-363	Female	1/2"	Steel	300		17-264	Female	1/2"	Steel	300
17-364	Male	1/2"	Steel	300		17-261	Male	3/8"	Steel	300
						17-263	Male	1/2"	Steel	300

ARO Style is the third most popular style, and is preferred in certain areas of North America and Canada.



- Usually designated by one thick ring on the sleeve of the coupler.
- Also identified by "A" stamped in the hex body.

1/4" ARO SERIES

COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-342	Female	1/4"	Brass	300	TYPE B	17-231	Female	1/4"	Steel	300
17-343	Female	3/8"	Brass	150		17-237	Female	3/8"	Steel	300
17-347	Male	1/4"	Brass	300		17-221	Male	1/4"	Steel	300
17-348	Male	3/8"	Brass	150		17-227	Male	3/8"	Steel	300
17-3421	Female	1/4"	Steel	300						
17-3471	Male	1/4"	Steel	300						

3/8" ARO SERIES

COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-345	Female	3/8"	Steel	250	TYPE B	17-239	Female	3/8"	Steel	300
17-349	Male	3/8"	Steel	250		17-228	Male	1/4"	Steel	300
						17-229	Male	3/8"	Steel	300

Lincoln Style is the fourth most popular style, and is preferred in certain areas of North America and Canada.

- Easily identified by its long, slender body and also identified by one thick ring and one thin ring on the sleeve.

1/4" LINCOLN SERIES

COUPLER						PLUG				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI		31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-312	Female	1/4"	Steel	300	TYPE A	17-213	Female	1/4"	Steel	300
17-313	Male	1/4"	Steel	300		17-212	Male	1/4"	Steel	300

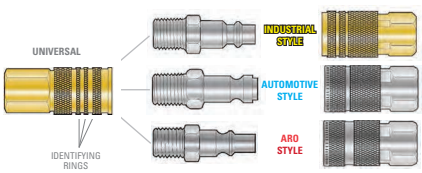
Universal Couplers can attach to the three most popular style plugs in the North American Market – Industrial, Automotive and ARO.

- Sometimes called 3-Way couplers.
- Also feature "Push-to-Connect" style – meaning user does not have to pull back sleeve to engage.
- Identified by three thin rings in the sleeve and a "U" stamped in the hex body.

1/4" UNIVERSAL SERIES

COUPLER				
31 Inc. Part Number	Thread Type	Thread Size	Metal Type	Max PSI
17-452	Female	1/4"	Brass	150
17-454	Male	1/4"	Brass	150
17-4521	Female	1/4"	Steel	150

Works with 1/4" Aro, Automotive and Industrial Interchange (Types B, C and D) Nipples (Plugs).



COUPLER & PLUG CROSSOVER

31 Inc. Part No.	31 Inc. Carded	Amflo Part No.	Camel Part No.	Dill Part No.	Haltec Part No.	Hansen Part No.	Milton Part No.	NAPA Part No.	Rema Part No.	Schrader Part No.	Tech Part No.	Tru-Flate Part No.
17-212	15-7461	CP27	61-550	126	NI-702		791	90-648	2235	3531	VHC91	12-424
17-213	15-7465	CP28	61-551	125	NI-704		792	90-650	2236	3532	VHC92	12-434
17-221	15-7521	CP37	61-528	8891	NI-502	2608	777	90-618	2231	3529	VHC77	12-324
17-222	15-7122	CP21	61-578	110	NI-202	10	727	90-674	2239	5138-11	VHC27	12-224
17-223		CP21-03	61-535			14	733	90-677		5263-11		12-226
17-224	15-7324	CP1	61-538	D-2C	NI-102	21AP25M	783	90-624	2221	3506	VHC83	12-124
17-225	15-7325	CP7	61-480	D-0E		31AP25M	1809	90-685		3519	VHC809	12-602
17-226	15-7326	CP5	61-558	D-2E	NI-108	31AP37M	1807	90-658	2261	3517	VHC807	12-604
17-227		CP37-03				20AP37M		90-619				
17-228						22239						
17-229		CP35	61-162			3804	1877	90-598				
17-231	15-7531	CP38	61-529	8889	NI-504	2609	778	90-620	2232	3530	VHC78	12-334
17-232	15-7132	CP20	61-579	109	NI-204	11	728	90-676	2240	5139-11	VHC28	12-234
17-233		CP20-23	61-107			15	732					12-236
17-234	15-7334	CP2	61-539	D-3C	NI-104	21AP25F	784	90-626	2222	3507	VHC84	12-134
17-235	15-7335	CP8	61-481			31AP25F	1810	90-687		3520	VHC810	12-610
17-236	15-7336	CP6	61-559	D-3E	NI-110	31AP37F	1808	90-660	2262	3518	VHC808	12-612
17-237		CP38-23				20AP37F		90-621				
17-239		CP36				3806	1878	90-599				
17-241		CP12	61-544	D-6C	NI-106		779		2226	3508		
17-242								90-636		3533		
17-246		CP22	61-023				731					
17-251	15-7151	CP17	61-134			54	1857	90-578				12-752
17-252	15-7152	CP18	61-137			55	1858	90-588				12-762
17-253	15-7153	CP25	61-484	122	NI-206	42	1837	90-683		3542		12-526
17-254	15-7154											
17-255	15-7155	CP26	61-485	121	NI-208	43	1838	90-681		3543		12-536
17-256		CP25-02	61-117			40	1839	90-605				12-525
17-261	15-7340	CP9-03	61-474	D-0F			1819		2257	3537		12-702
17-262		CP10-23	61-475				1820	90-691				12-710
17-263	15-7341	CP9	61-568	D-2F	NI-112		1817	90-666	2255	3513	VHC817	12-704
17-264	15-7342	CP10	61-569	D-3F	NI-113		1818	90-668	2256	3514	VHC818	12-712
17-312	15-7430	C28	61-548	123	CO-701		790	90-644	2136	3528	VHC90	13-434
17-313	15-7472	C27	61-486				794	90-645	2135	3527		13-424
17-320						1000						
17-322	15-7150BR	C20	61-573	102	CO-201		715	90-670	2140	5142-12	VHC15	13-234
17-3222	15-7150	C20	61-573	102	CO-201		715	90-670	2140	5142-12	VHC15	13-234
17-322P		C40	61-013		CO-301		755	90-615		5138-12		13-753
17-323		C20-23	61-103			1200	718	90-667		5263-12		13-236
17-324		C26-22	61-112			400	1833	90-632				
17-325	15-7125	C26	61-482	117	CO-204	420	1835	90-680		3541		13-536
17-326	15-7320BR	C2	61-523	D-13	CO-103		785	90-600	2122	3504	VHC85	13-134
17-3262	15-7320	C2	61-523	D-13	CO-103		785	90-600	2122	3504	VHC85	13-134
17-327	15-7327	C8	61-476	D-15C		400	1803	90-686		3521	VHC803	13-610
17-328	15-7328	C6	61-553	D-15	CO-109	420	1805	90-654	2162	3516	VHC805	13-612
17-332	15-7130BR	C21	61-574	103		1100	716	90-672	2139	5141-12		13-224

Continued on next page.

31 Inc. Part No.	31 Inc. Carded	Amflo Part No.	Camel Part No.	Dill Part No.	Haltec Part No.	Hansen Part No.	Milton Part No.	NAPA Part No.	Rema Part No.	Schrader Part No.	Tech Part No.	Tru-Flate Part No.
17-3322	15-7130	C21	61-574	103		1100	716	90-672	2139	5141-12		13-224
17-332P		C41	61-011		CO-303		756	90-617		5139-12		13-754
17-333		C21-03	61-101			1300	719	90-657		5140-12		13-226
17-334		C25-02	61-110			410	1834	90-625				13-525L
17-335	15-7126	C25	61-483	118		430	1836	90-682				13-526
17-336	15-7321BR	C1	61-524	D-12	CO-101		786	90-610	2121	3503		13-124
17-337		C7	61-478			410	1804	90-684				13-602
17-338	15-7338	C5	61-554		CO-107	430	1806	90-656	2161	3515		13-604
17-340		C2R	61-487	D-13R	CO-105		787	90-609	2124	3505		13-136
17-342	15-7510BR	C38	61-526	8888	CO-501		775	90-612	2132	3526	VHC75	13-334
17-3421	15-7510	C38	61-526	8888	CO-501		775	90-612	2132	3526	VHC75	13-334
17-343		C38-23	61-961			B23AS37F		90-603				
17-345		C36	61-161			310	1875	90-597				
17-347	15-7511BR	C37	61-527				776	90-614	2131	3525		13-324
17-3471	15-7511	C37	61-527				776	90-614	2131	3525		13-324
17-348		C37-03				B23AS37M		90-601				
17-349		C35	61-160			310313		90-596				
17-355	15-7157	C10-23				500	1813					
17-356	15-7156	C10	61-563			520	1815	90-662				13-712
17-361		C10-23	61-472				1813	90-690		3516		13-710
17-363	15-7329	C10	61-563	D-17	CO-111		1815	90-662	2156	3512	VHC815	13-712
17-364	15-7339	C9	61-564	D-16	CO-112		1816	90-664	2155	3511		13-705
17-452	15-7052BR	C60	61-488		CO-800	B23AS25F	745	90-639			VHCEZ14	13-511
17-4521	15-7052	C60	61-488		CO-800	B23AS25F	745	90-639			VHCEZ14	13-511
17-454	15-7054BR	C61	61-491		CO-801	B23AS25M	746	90-946				13-509

Xtra seal®

RETAIL TIRE REPAIR AND SUPPLIES

TIRE REPAIR

TOOLS

AIR ACCESSORIES

TPMS

VALVE HARDWARE

COUPLERS & PLUGS

WE CAN DESIGN THE SET

that's right for you!

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!

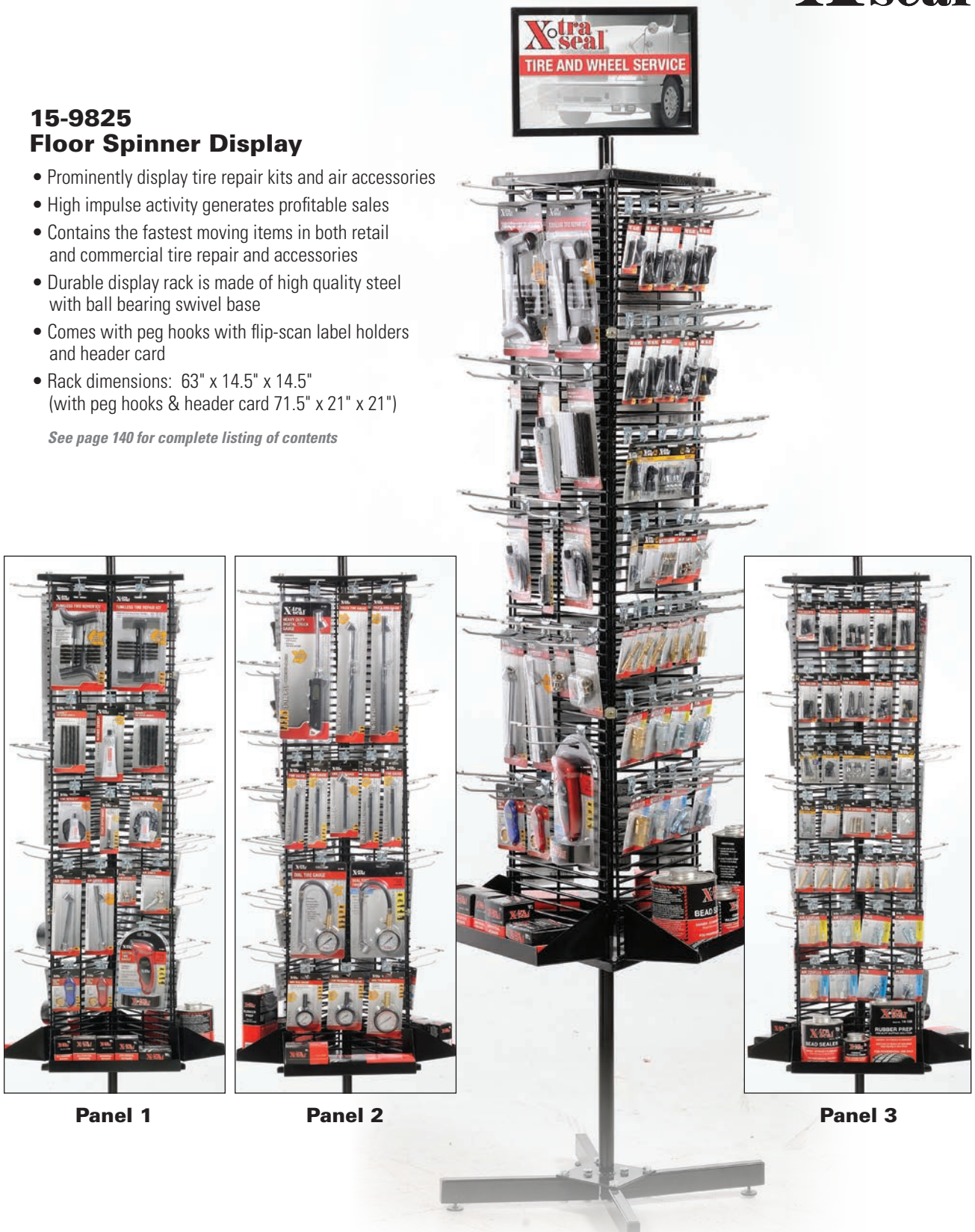
THE NAME YOU TRUST!

RETAIL **DISPLAYS**

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")

See page 140 for complete listing of contents



Panel 1 **Panel 2** **Panel 3**

QUALITY YOU DEPEND ON!
THE NAME YOU TRUST!

REPAIR **KITS & PATCHES**

15-012
Cold Patch Repair Kit

3 – 1" x 1" Patches
1 – 1 3/4" x 3" Patch Strip

15-018
Bike Patch Kit

2 mini Round Patched
2 Small Round Patches

15-019
Radial Tire Repair Kit

2 Medium Round Patches
2 Small Oval Patches

15-020
All Purposee Patch Kit

1 Medium Round Patch
2 Mini Round
2 Small Round Patches

15-0383
Plug-Patch Kit

PROFESSIONAL SERIES
1 Small & 1 Medium
Combination Repair Unit

15-0472
Agricultural Tire Repair

Bias-Ply Tire Repair
1 each – 4 1/2" & 5 1/2"

15-0474
Agricultural Tire Repair

Bias-Ply Tire Repair
1 each – 6 1/2" & 7 1/2"

REPAIR **CHEMICALS**

14-008-1
Vulcanizing Cement
with Hang Tab

For Rubber Repairs
8 oz. Flammable

15-026
1 oz. Rubber Cement

For Rubber Repairs
1 oz. Flammable

15-0708
Tire Sealant

Seals Punctures
8 oz.

15-0716
Tire Sealant

Seals Punctures
16 oz.

15-0732
Tire Sealant

Seals Punctures
32 oz.

REPAIR **KITS & INSERTS**

15-001
Tubeless Tire Repair Kit

7 Piece Kit with Pistol-Grip Handles

15-003
Tubeless Tire Repair Kit

7 Piece Kit with T-Handles

15-004
Truck Tubeless Tire Repair Kit

7 Piece Kit with Pistol-Grip Handles

15-005
Tubeless Tire Repair Kit

7 Piece Kit with Pistol-Grip Handles

15-011
Tubeless Tire Repair Kit

7 Piece Kit with Screwdriver-Style Handles

15-014
Tire Repair Kit

6 Piece Kit with Closed-Eye Insertion Needle

15-016
Tire Repair Kit

5 Sawtooth Insert Plugs with Screwdriver-Style Insertion Needle

15-390
Premium 4" Tire Repar Inserts

For Tubeless Radial & Bias-Ply Tires
BULK PACK – 30 Inserts

15-394
Premium 4" Tire Repar Inserts

For Tubeless Radial & Bias-Ply Tires
5 Inserts

15-045
Tire Repair Service Case

Plastic Case

15-050
Deluxe Tire Repair Service Kit

Plastic Case & Bonus Tire Gauge

REPAIR **TOOLS & MISCELLANEOUS**

Rasp

Split-Eye

Closed-Eye

Open-Eye

15-0211
Professional Tire Repair Probe

2 Stage Knurled Probe with Pistol Grip

15-0212
Professional Open-Eye Insertion Tool

Pistol Grip

15-0213
Professional Closed-Eye Insertion Tool

Pistol Grip

15-0216
Professional Split-Eye Insertion Tool

Pistol Grip

15-0308
Buffer Stitcher

Buffing Handle/Patch Stitcher

15-0314
Patch Stitcher

Wood Handle
Ball Bearing Roller

15-0317
Professional Split-Eye Insertion Tool

Heavy-Duty
Chrome Metal Handle

15-552
Yellow Tire Marker

Marks Tires for Rotation and Repair

15-553
White Tire Marker

Marks Tires for Rotation and Repair

15-0320
Buffing Wheel

2 1/2" Diameter
Arbor Hole 3/8"

15-0324
Adapter

3/8" – 24 Threads
Adapter for Jacobs Style Tools

15-0378
Cotton Tire Swab

11" Long

AIR **GAUGES – STANDARD**

15-905
Tire Gauge
Standard 2-Sided Bar
5-50 PSI

15-908
Tire Gauge
Tractor, For Liquid or Air Filled Tires
5-45 PSI

15-909
Tire Gauge
Low Pressure
1-20 PSI

15-910
Tire Gauge
Deluxe
10-50 PSI

15-9105
Tire Gauge
Standard
Straight-On
10-50 PSI

15-911
Tire Gauge
High Pressure
20-120 PSI

15-1031
Tire Gauge
Pocket
Dual Foot
20-120 PSI

15-905CD
Tire Gauge
Counter Display
Standard 5-50 PSI

15-1045
Truck Tire
Gauge
Dual Foot
Straight-On
10-150 PSI

15-1045B
Premium
Truck Tire Gauge
Black Dual Foot
Straight-On
10-150 PSI

15-1313
Truck Tire
Gauge
Dual Foot
10-150 PSI

15-1313B
Premium
Truck Tire Gauge
Dual Foot
10-150 PSI

AIR **GAUGES – DIGITAL & DIAL**

15-1021
Digital Tire Gauge
0-100 PSI

15-1022
Digital Tire Gauge
Sport Model
0-100 PSI

15-1023
Digital Tire Gauge
Keychain – Red and Blue Mixed Colors/Pack
5-100 PSI

15-1027
Heavy-Duty
Digital Truck Tire Gauge
Dual Foot
3-180 PSI

15-906
Dial Tire Gauge
For Large and Standard Bore with Bleeder
5-60 PSI

15-9061
Dial Tire Gauge
For Standard Bore with Bleeder
5-60 PSI

15-951
Mini Dial Gauge
0-60 PSI

15-952
Low Pressure
Dial Tire Gauge
0-20 PSI

15-955
Mini Dial Gauge
5-60 PSI

15-1075
Dial Tire Gauge
Dual Foot
5-75 PSI

15-1078
Dial Tire Gauge
High Pressure, Dual Foot
0-160 PSI

AIR **GAUGES – INFLATOR**

15-5920
Inflator Gauge

Dual Foot with 12" Hose
1/4" NPT
20-120 PSI

15-5922
Inflator Gauge

12" Hose
1/4" NPT
20-120 PSI

15-5923
Pistol Tire Inflator with Gauge

12" Hose Dial Gauge
1/4" NPT
10-160 PSI

15-501
Air Chuck

Ball Foot
1/4" NPT

15-503
Air Chuck

Lock-On Closed
1/4" NPT

AIR **CHUCKS**

15-7566
Air Chuck

Dual Foot
Closed Type
1/4" NPT

15-7568
Air Chuck

Dual Foot
Straight-On Tilt Lock
Closed Type
1/4" NPT

15-7568B
Air Chuck

PREMIUM
Straight-On Tilt Lock
Dual Foot Chuck
Closed Type
1/4" NPT

15-7569
Air Chuck

Dual Foot
Straight-On
Auto Shut Off
Closed Type
1/4" NPT

15-5504
Air Chuck

Euro Style
Flow Thru Design

15-5505
Air Chuck

Lock-On Closed
1/4" NPT

AIR **BLOW GUNS & ACCESSORIES**

15-507
Inflator Needles

15-5601
Deluxe Blow Gun Kit
With Assorted Tips

15-5602
Safety Blow Gun
Safety Tip

15-5603
Siphon Blow Gun
8' Plastic Tubing, Extracts Fluids from Hard to Reach Areas

15-5605
High Flow Blowgun
High Flow & Rubber Tip
1/4" NPT

15-5606
Blow Gun
Industrial Style Pocket Blow Gun

15-5607
Blow Gun
Rubber Tip

15-5608
Blow Gun
4" Pistol Grip

15-5610
Blow Gun Accessory Kit
6 Piece Assorted Kit

15-5611
Blow Gun
Automotive Style Pocket Blow Gun

15-5612
Blow Gun
Aro Style Pocket Blow Gun

AIR **BLOW GUNS & ACCESSORIES**

15-5613
Clip-on Blow Gun
Clips on Standard Air Chuck

15-5620
17 Piece Air Accessory Kit
Compatible with 1/4" Industrial Style Accessories

15-5318
Lead-In Hose
24" x 3/8" PVC
Swivel Lead Hose

AIR **TANK ACCESSORIES**

15-593
Tank Valve
1/8" NPT

15-594
Tank Valve
1/4" NPT

AIR **HOSE**

15-5324
PREMIUM
Hybrid Whip Hose
24" Length

15-5336
PREMIUM
Hybrid Whip Hose
36" Length

15-5925
Recoil Air Hose
25' X 1/4" Nylon
With 1/4" NPT

15-5925-3
Recoil Air Hose
25' x 3/8" Nylon
With 1/4" NPT

15-5926
Premium Recoil Air Hose
25' X 1/4" Polyurethane
With 1/4" NPT

15-5950
Recoil Air Hose
50' X 1/4" Nylon
With 1/4" NPT

15-5950-3
Recoil Air Hose
50' X 3/8" Nylon
With 1/4" NPT

17-941
Hybrid Air Hose
50' x 3/8"
Premium Hybrid, 1/4" NPT

17-942
Hybrid Air Hose
50' x 3/8"
Hybrid, 1/4" NPT

17-942T
Hybrid Air Hose
50' x 3/8"
Hybrid, 1/4" NPT

17-944
Rubber Air Hose
25' x 3/8"
1/4" NPT

17-945
Rubber Air Hose
50' x 3/8"
1/4" NPT

17-966
PVC Air Hose
25' x 3/8"
1/4" NPT

17-967
PVC Air Hose
50' x 3/8"
1/4" NPT

AIR **HOSE ACCESSORIES**

15-5730
Hose Clamps
General Purpose

15-5733
Hose Barb
1/4" Barb
1/4" NPT F

15-5734
Hose Barb
1/4" Barb
1/4" NPT M

15-5735
Hose Barb
5/16" Barb
1/4" NPT M

15-5743
Hose Barb
3/8" Barb
1/4" NPT F

15-5744
Hose Barb
3/8" Barb
1/4" NPT M

15-5745
Hose Barb
1/2" Barb
1/4" NPT M

15-5746
Hose Barb
3/8" Barb
3/8" NPT M

15-5754
Hose Mender
1/4" Barb

15-5755
Hose Mender
5/16" Barb

15-5766
Hose Mender
3/8" Barb

15-5767
Hose Mender
1/2" Barb

15-5771
Hose Fitting

Reusable Fitting
1/4" NPT Male
(1/4" ID x 19/32" OD)

15-5772
Hose Fitting

Reusable Fitting
1/4" NPT Male
(3/8" ID x 11/16" OD)

15-5773
Hose Fitting

Reusable Fitting
1/4" NPT Male
(3/8" ID x 3/4" OD)

15-5780
Hose Splicer

Reusable
Hose Splicer
(1/4" ID, 5/8" OD Hose)

15-5790
Swivel Connector

15-5820
Coupling

1/4" NPT Male x
1/4" NPT Male

15-5830
Coupling

1/4" NPT Female
1/4" NPT Female

15-5840
Bushing

1/4" NPT Female
3/8" NPT Male

15-5850
3-in-1 Air Manifold

1/4" NPT

15-5860
In-Line Regulator

1/4" NPT

15-5870
In-Line Lubricator

1/4" NPT

15-7020
Swivel Fitting

1/4" NPT Male
1/4" NPT Male

15-7021
Swivel Fitting

1/4" NPT Male
1/4" NPT Female

AIR **FILTERS, REGULATORS & LUBRICATORS(FRL)**

REGULATORS, FILTERS & LUBRICATORS
1 per inner pack

Part Number	Description	Size
15-803	Filter and Regulator, Mini with Gauge	1/4" NPT
15-807	Filter and Regulator with Gauge	3/8" - 1/4" NPT
15-808	Filter and Regulator with Gauge	1/2" NPT
15-809	Filter and Regulator with Gauge	3/4" NPT
15-810	Regulator, Mini with Gauge	1/4" NPT
15-813	Regulator, Compact with Gauge	3/8" NPT
15-815	Regulator, Standard with Gauge	1/2" NPT
15-817	Regulator, Standard with Gauge	1" - 3/4"NPT
15-820	Filter, Mini, Manual	1/4" NPT
15-823	Filter, Compact, Manual	3/8" - 1/4" NPT
15-825	Filter, Standard, Manual	1/2" NPT
15-829	Filter, Standard, Manual	1" - 3/4" NPT
15-830	Lubricator, Mini	1/4" NPT
15-833	Lubricator, Compact	3/8" - 1/4" NPT
15-835	Lubricator, Standard	1/2" NPT
15-839	Lubricator, Hi-Flo	1" - 3/4" NPT

15-803
Filter & Regulator
1/4" NPT Mini w/Gauge

15-807
Filter & Regulator
1/4" - 3/8" NPT w/Gauge

15-810
Regulator, Mini
1/4" NPT w/Gauge

15-813
Regulator, Compact
1/4" - 3/8" NPT w/Gauge

15-823
Filter, Compact
1/4" - 3/8" NPT Manual

15-833
Lubricator, Compact
1/4" - 3/8" NPT

AIR LINE GAUGES
1 per inner pack

Part Number	Description		
15-841	Air Line Gauge	0-200 psi	1/8" NPT Back Mount
15-843	Air Line Gauge	0-150 psi	1/4" NPT Back Mount
15-844	Air Line Gauge	0-150 psi	1/4" NPT Bottom Mount
15-845	Air Line Gauge	0-300 psi	1/4" NPT Back Mount
15-846	Air Line Gauge	0-300 psi	1/4" NPT Bottom Mount
15-847	Air Line Gauge	0-60 psi	1/8" NPT Back Mount
15-848	Air Line Gauge	0-60 psi	1/4" NPT Bottom Mount

15-843
Air Line Gauge
0-150 PSI 1/4" NPT
Back Mount

15-844
Air Line Gauge
0-150 PSI 1/4" NPT
Bottom Mount

15-845
Airline Gauge
0-300 PSI 1/4" NPT
Back Mount

TPMS **TOOLS & ACCESSORIES**

15-2173
Valve Core Torque Tool

- Durable, precision torque tool with a torque specification of 4 in-lbs
- Use when installing TPMS valve cores to prevent over tightening which can damage the TPMS valve by stripping the valves internal threads or removing the nickel plating of the core resulting in corrosion

15-2173
TPMS Core Tool
Valve Core Torque Tool
4 in-lbs

15-20008
Replacement Parts Kit

See page 134 for a comprehensive glossary of TPMS terms

TPMS **VALVE CAPS & CORES**

15-4904
TPMS Valve Cores
Nickel Plated Electroless High Temperature Valve

15-4922
TPMS Valve Caps
Black Plastic Sealing Cap

15-4923
TPMS Valve Caps
Green Plastic Cap with Silicone Seal

15-4925
TPMS Valve Caps
Gray Plastic Sealing Cap

15-4935
TPMS Valve Caps
Chromed Plastic Cap with Silicone Seal with Green Top

15-4932
TPMS Valve Caps
Chromed Plastic Sealing Cap

15-4927
TPMS Valve Caps
Long Skirted Black Plastic Sealing Cap

15-4933
TPMS Valve Caps
Chromed Plastic Sleeves and Caps for 15-20008 Valve

VALVE HARDWARE **VALVES**

15-412
Tire Valves
1" Long
Fits .453" Rim Hole

15-413
Tire Valves
1 1/4" Long
Fits .453" Rim Hole

15-4134
Tire Valves
1 1/4" Long
with Chrome Sleeves
Fits .453 Rim Hole

15-4142
Tire Valves
1 1/2" Long
Fits .453" Rim Hole

15-4152
Tire Valves
1 1/4" Long
Fits .625" Rim Hole

15-418
Tire Valves
2" Long
Fits .453" Rim Hole

15-4184
Tire Valves
2" Tire Valves
with Chrome Sleeves

15-4232
Tire Valves
2 1/2" Tire Valves

15-4252
Tire Valves
2" Long
Fits .625" Rim Hole

15-4600
Tire Valves
1 1/4" High Pressure
Fits .453 Rim Hole

15-416
Tire Valves
1 1/2" Metal bolt-In
Fits .453 & .625 Rim Hole

15-4559-2
Tire Valves
1" Chrome
Fits .453 & .625 Rim Hole

15-5452
Truck Tire Valves
Heavy Duty 3 1/2"
w/60 degree bend
For .625 Rim Hole

15-572
Truck Tire Valves
Heavy Duty 3 3/4"
For .625 Rim Hole

15-573
Truck Tire Valves
Heavy Duty 4 3/8"
For .625 Rim Hole

15-4580
Valve Extensions
Metal Braided Dual Wheel
(2 per card)

15-496
Valve Extensions
3/4" Plastic Valve Extensions

15-4961
Valve Extensions
3/4" Metal Valve Extensions

15-497
Valve Extensions
1 1/4" Plastic Valve Extensions

15-4971
Valve Extensions
1 1/4" Metal Valve Extensions

15-498
Valve Extensions
1 1/2" Plastic Valve Extensions

VALVE HARDWARE **VALVE TOOLS & ACCESSORIES**

15-3174
Core Remover
Standard Bore

15-3602
Valve Tool 2-Way
Core Remover & Deflator

15-3605
Valve Fishing Tool
Core Remover, Deflator
Valve Stem Puller

15-3606
Valve Installation Tool

15-3607
Tread Depth Gauge
Checks Tread Wear with Clip

15-4660
Air Water Adaptor
Fills Liquid Tractor Tires

15-4895
Valve Adaptor

15-604
Valve Tool 4-Way
Core Removal & Thread Repair

15-6045
Valve Core Kit
4-Way Tool with Cores

15-4901
Valve Cores
High Temperature

15-492
Valve Caps
Black Plastic

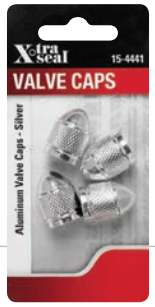
15-4924
Valve Caps
Green Plastic

15-4911
Valve Caps
Slot Head

15-4915
Valve Caps
High Heat Dome Caps

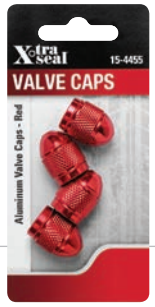
15-493
Valve Caps
Chrome Hex Caps

15-4934
Valve Sleeves
Chrome
1 1/4" to 1 1/2" Long

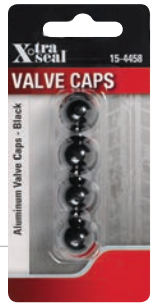


15-4441
Valve Caps
Aluminium – Silver

15-4454
Valve Caps
Aluminium – Blue



15-4455
Valve Caps
Aluminium – Red

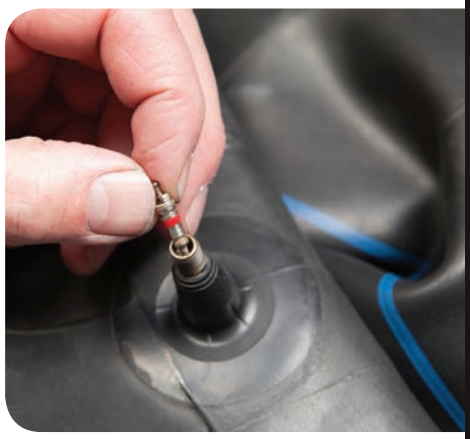


15-4458
Valve Caps
Aluminium – Black

15-4032
Indicator Valve Caps
32 psi

15-4036
Indicator Valve Caps
36 psi

15-4579
Heavy Duty Valve Caps
Double Seal High Pressure Valve Caps



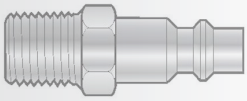
COUPLERS & PLUGS **INDUSTRIAL**

Xtra seal

MATCH STYLE AND TYPE

Cards are color coded to help identify matching components.

STYLE	TYPE
LINCOLN	A GREEN
ARO	B RED
AUTOMOTIVE	C BLUE
INDUSTRIAL	D YELLOW



Industrial Style

15-7110
Swivel Plug
1/4" Body
1/4" NPT M

15-7111
Swivel Plug
1/4" Body
1/4" NPT F

15-7120
Coupler Set
1/4" Body

15-7120BR
Coupler Set
1/4" Body
FML- Plug FML- Plug ML

15-7122
Plug
1/4" Body
1/4" NPT M

15-7122BR
Plug
1/4" Body
1/4" NPT M - Brass

15-7124
Air Coupler
1/4" Body
3/8" NPT F

15-7130
Air Coupler
1/4" Body
1/4" NPT M

15-7130BR
Air Coupler
1/4" Body
1/4" NPT M - Brass

15-7132
Plug
1/4" Body
1/4" NPT F

15-7132BR
Plug
1/4" Body
1/4" NPT F

15-7150
Air Coupler
1/4" Body
1/4" NPT F

15-7150BR
Air Coupler
1/4" Body
1/4" NPT F Brass

15-7125
Air Coupler
3/8" Body
3/8" NPT F

15-7125BR
Air Coupler
3/8" Body
3/8" NPT F

15-7126
Air Coupler
3/8" Body
3/8" NPT M

15-7153
Plug
3/8" Body
3/8" NPT M

15-7154
Plug
3/8" Body
1/4" NPT F

15-7155
Plug
3/8" Body
3/8" NPT F

15-7158
Plug
3/8" Body
1/4" NPT M

15-7151
Plug
1/2" Body
1/2" NPT M

15-7152
Plug
1/2" Body
1/2" NPT F

15-7156
Air Coupler
1/2" Body
1/2" NPT F

15-7157
Air Coupler
1/2" Body
3/8" NPT F

high flow

15-7170
High Flow Coupler
Push To Connect
1/4" Body
1/4" NPT F

15-7171
High Flow Coupler
Push To Connect
1/4" Body
1/4" NPT M

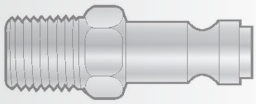
15-7180
High Flow Plug
1/4" Body
1/4" NPT F

15-7181
High Flow Plug
1/4" Body
1/4" NPT M

COUPLERS & PLUGS **AUTOMOTIVE**

MATCH STYLE AND TYPE
Cards are color coded to help identify matching components.

STYLE	TYPE
LINCOLN	A GREEN
ARO	B RED
AUTOMOTIVE	C BLUE
INDUSTRIAL	D YELLOW



Automotive Style

15-7306
Swivel Plug
1/4" Body
1/4" NPT M

15-7307
Swivel Plug
1/4" Body
1/4" NPT F

15-7310
Coupler Set
1/4" Body
1/4" NPT Coupler FML - Plug FML - Plug ML

15-7310BR
Coupler Set
1/4" Body
1/4" NPT Coupler FML - Brass Plug FML - Plug ML

15-7320
Air Coupler
1/4" Body
1/4" NPT F

15-7320BR
Air Coupler
1/4" Body
1/4" NPT F - Brass

15-7321
Air Coupler
1/4" Body
1/4" NPT M

15-7321BR
Air Coupler
1/4" Body
1/4" NPT M - BR

15-7324
Plug
1/4" Body
1/4" NPT M

15-7324BR
Plug
1/4" Body
1/4" NPT M - Brass

15-7334
Plug
1/4" Body
1/4" NPT F

15-7334BR
Plug
1/4" Body
1/4" NPT F - Brass

15-7325
Plug
3/8" Body
1/4" NPT M

15-7326
Plug
3/8" Body
3/8" NPT M

15-7327
Air Coupler
3/8" Body
1/4" NPT F

15-7327BR
Air Coupler
3/8" Body
1/4" NPT F - Brass

15-7328
Air Coupler
3/8" Body
3/8" NPT F

15-7328BR
Air Coupler
3/8" Body
3/8" NPT F - Brass

15-7335
Plug
3/8" Body
1/4" NPT F

15-7336
Plug
3/8" Body
3/8" NPT F

15-7338
Air Coupler
3/8" Body
3/8" NPT M

15-7329
Air Coupler
1/2" Body
1/2" NPT F

15-7339
Air Coupler
1/2" Body
3/8" NPT F

15-7340
Plug
1/2" Body
3/8" NPT M

15-7341
Plug
1/2" Body
1/2" NPT M

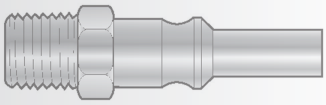
15-7342
Plug
1/2" Body
1/2" NPT F

COUPLERS & PLUGS **LINCOLN**

MATCH STYLE AND TYPE

Cards are color coded to help identify matching components.

STYLE	TYPE
LINCOLN	A GREEN
ARO	B RED
AUTOMOTIVE	C BLUE
INDUSTRIAL	D YELLOW



Lincoln Style

15-7430
Air Coupler
1/4" Body
1/4" NPT F

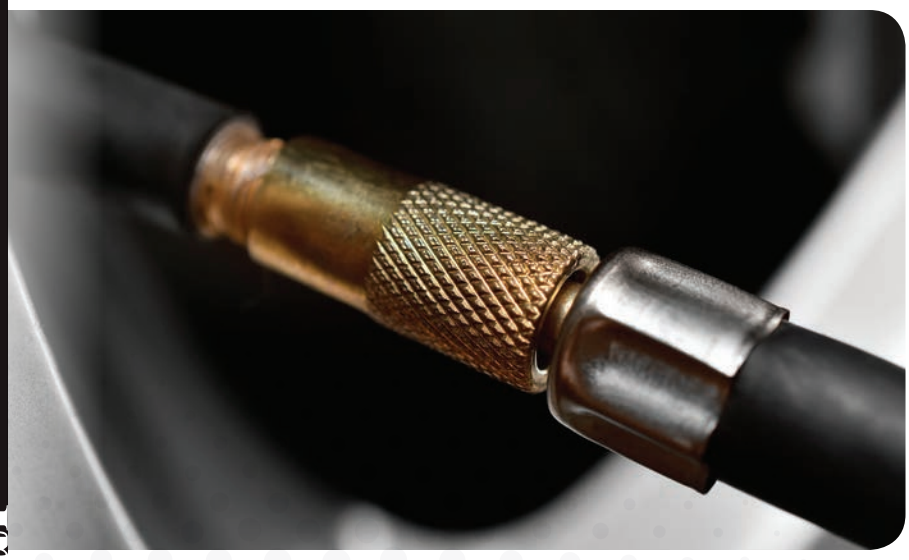
15-7430BR
Air Coupler
1/4" Body
1/4" NPT F - Brass

15-7440
Coupler Set
1/4" Body
Coupler FML - Plug FML - Plug ML 1/4" NPT

15-7461
Plug
1/4" Body
1/4" NPT M

15-7465
Plug
1/4" Body
1/4" NPT F

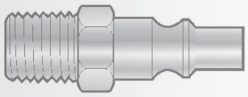
15-7472
Air Coupler
1/4" Body
1/4" NPT M



COUPLERS & PLUGS **ARO**

MATCH STYLE AND TYPE
Cards are color coded to help identify matching components.

STYLE	TYPE
LINCOLN	A GREEN
ARO	B RED
AUTOMOTIVE	C BLUE
INDUSTRIAL	D YELLOW



Aro Style

15-7510
Air Coupler
1/4" Body
1/4" NPT F

15-7510BR
Air Coupler
1/4" Body
1/4" NPT F - Brass

15-7511
Air Coupler
1/4" Body
1/4" NPT M

15-7511BR
Air Coupler
1/4" Body
1/4" NPT M - Brass

15-7521
Plug
1/4" Body
1/4" NPT M

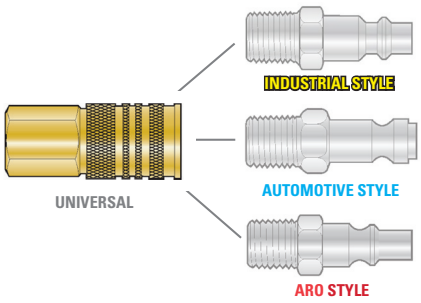
15-7521BR
Nipple
1/4" Body
1/4" NPT M - Brass

15-7530
Coupler Set
1/4" Body
Coupler FML- Plug FML
Plug ML 1/4" NPT

15-7531
Nipple
1/4" Body
1/4" NPT F

15-7531BR
Nipple
1/4" Body
1/4" NPT F - Brass

COUPLERS & PLUGS **UNIVERSAL**



15-7052
Coupler
Push-To-Conect
1/4" NPT F

15-7052BR
Coupler
Push-To-Conect
1/4" NPT F - Brass

15-7054
Coupler
Push-To-Conect
1/4" NPT M

15-7054BR
Coupler
Push-To-Conect
1/4" NPT M - Brass

COUPLERS & PLUGS **INTERCHANGE TABLE**

31 RETAIL	31 PRO.	AUTOMOTIVE	CAMEL	MILTON	ACME	NAPA	ITEM DESCRIPTION
UNIVERSAL STYLE 1/4" BODY							
15-7052BR	17-452	13-511					Coupler Push-Connect 1/4" NPT Female
15-7054BR	17-454	13-509	61-241				Coupler Push-Connect 1/4" NPT Male
INDUSTRIAL STYLE							
15-7110		12-229					Plug Swivel Plug, 1/4" Body 1/4" NPT Male
15-7111		12-239					Plug Swivel Plug, 1/4" Body 1/4" NPT Female
15-7120BR		13-201					Set Type D Set, Coupler Female – Plug Female – Plug Male
15-7122	17-222	12-225	61-578	727	A910N-SBL	90674	Plug Type D, 1/4" Body 1/4" NPT Male
15-7124	17-323	13-236		718		90667	Coupler Type D, 1/4" Body 3/8" NPT Female
15-7125BR		13-537	61-482	1835	A940B-BL	90680	Coupler Type E, 3/8" Body 3/8" NPT Female
15-7126		13-527	61-483	1836		90682	Coupler Type E, 3/8" Body 3/8" NPT Male
15-7130BR	17-332	13-225	61-574	716	A938B-BL	90672	Coupler Type D, 1/4" Body 1/4" NPT Male
15-7132	17-232	12-235	61-579	726	A911N-SBL	90676	Plug Type D, 1/4" Body 1/4" NPT Female
15-7150BR	17-322	13-235	61-573	715	A937B-BL	90670	Coupler Type D, 1/4" Body 1/4" NPT Female
15-7151	17-251	12-752	61-134	1857		90578	Plug Type H, 1/2" Body 1/2" NPT Male
15-7152	17-252	12-762	61-137	1858		90588	Plug Type H, 1/2" Body 1/2" NPT Female
15-7153	17-253	12-527	61-484	1837	A940N-SBL	90683	Plug Type E, 3/8" Body 3/8" NPT Male
15-7154		12-535		1840		90606	Plug Type E Plug, 3/8" Body 1/4" NPT Female
15-7155	17-255	12-537	61-485	1836		90681	Plug Type E, 3/8" Body 3/8" NPT Female
15-7156	17-356	13-713	61-563	1815		90631	Coupler Type H, 1/2" Body 1/2" NPT Female
15-7157	17-355		61-472			90690	Coupler Type H, 1/2" Body 3/8" NPT Female
AUTOMOTIVE STYLE							
15-7306		12-127					Plug Swivel Plug, 1/4" Body 1/4" NPT Male
15-7307		12-137					Plug Swivel Plug, 1/4" Body 1/4" NPT Female
15-7310BR		13-101					Set Type C, Set, Coupler FML – Plug Female – Plug Male
15-7320BR	17-326	13-135	61-523	785	A925B-BL	90600	Coupler Type C, 1/4" Body 1/4" NPT Female
15-7321BR	17-336	13-125	61-524	786	A928N-SBL	90610	Coupler Type C, 1/4" Body 1/4" NPT Male
15-7324	17-224	12-125	61-538	783	A929N-SBL	90624	Plug Type C, 1/4" Body 1/4" NPT Male
15-7325	17-225	12-603	61-480	1809	A944N	90685	Plug Type G, 3/8" Body 1/4" NPT Male
15-7326	17-226	12-605	61-558	1807	A940N	90658	Plug Type G, 3/8" Body 3/8" NPT Male
15-7327BR		13-611	61-476	1803	A944B	90686	Coupler Type G, 3/8" Body 1/4" NPT Female
15-7328BR	17-328	13-613	61-553	1805	A940B	90654	Coupler Type G, 3/8" Body 3/8" NPT Female
15-7329	17-363	13-713	61-563	1815	A942B	90631	Coupler Type G, 1/2" Body 1/2" NPT Female
15-7334	17-234	12-135	61-539	784	A929N	90626	Plug Type C, 1/4" Body 1/4" NPT Female
15-7335	17-235	12-610	61-481	1810	A945N	90687	Plug Type G, 3/8" Body 1/4" NPT Female
15-7336	17-236	12-612	61-559	1808	A941N	90660	Plug Type G, 3/8" Body 3/8" NPT Female
15-7338	17-338	13-604	61-554	1806		90656	Coupler Type G, 3/8" Body 3/8" NPT Male
15-7339	17-364	13-705	61-564	1816		90627	Coupler Type F, 1/2" Body 1/2" NPT Male
15-7340	17-261	12-702	61-474	1819		90689	Plug Type G, 1/2" Body 3/8" NPT Male
15-7341	17-263	12-705	61-568	1817	A942N	90666	Plug Type F, 1/2" Body 1/2" NPT Male
15-7342	17-264	12-713	61-569	1818	A943N	90668	Plug Type F, 1/2" Body 1/2" NPT Female
LINCOLN STYLE 1/4" BODY							
15-7430	17-312	13-435	61-548	790	A935B-BL	90644	Coupler Type A, Long, 1/4" Body 1/4" NPT Female
15-7440		13-401					Set Type A, Long, 1/4" Set
15-7461	17-212	12-425	61-550	791	A933N-SBL	90648	Plug Type A, Long, 1/4" Body 1/4" NPT Male
15-7465	17-213	12-435	61-551	792	A934N-SBL	90650	Plug Type A, Long, 1/4" Body 1/4" NPT Female
15-7472	17-313	13-425	61-486	794	A935B-BL	90645	Coupler Type A, Long, 1/4" Body 1/4" NPT Male
ARO STYLE 1/4" BODY							
15-7510BR	17-342	13-335	61-526	775	A918B-BL	90612	Coupler Type B, 1/4" Body 1/4" NPT Female
15-7511BR	17-347	13-325	61-527	776	A919B-BL	90614	Coupler Type B, 1/4" Body 1/4" NPT Male
15-7521	17-221	12-325	61-528	777	A914N-SBL	90618	Plug Type B, 1/4" Body 1/4" NPT Male
15-7530BR		13-301					Set Type B, Set
15-7531	17-231	12-335	61-529	778	A916N-SBL	90620	Plug Type B, 1/4" Body 1/4" NPT Female

Xtra seal®

TIRE REPAIR

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 not 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.

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 126 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 129 for section repair procedures.)

SECTION REPAIR LIMITS FOR RADIAL TIRES

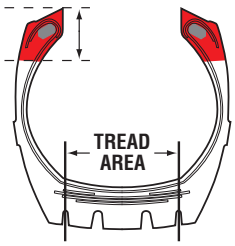
TIRE SIZE	CROWN LIMITS	SIDEWALL LIMITS
PASSENGER		
P195R and Smaller	1/2" (13mm)	3/8" (9mm) x 2" (50mm) or 3/4" (19mm) x 1 1/2" (38mm)
P205R and Larger	3/4" (19mm)	3/8" (9mm) x 2 3/4" (70mm) or 3/4" (19mm) x 2" (50mm)
LIGHT TRUCK		
	1" (25mm)	3/8" (9mm) x 3 1/8" (80mm) or 1" (25mm) x 2" (50mm)
TRUCK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

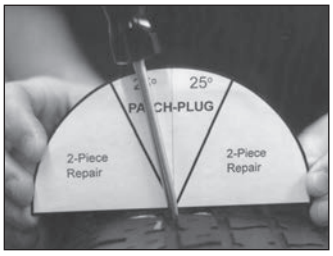
EXTERNAL EXAMINATION

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.

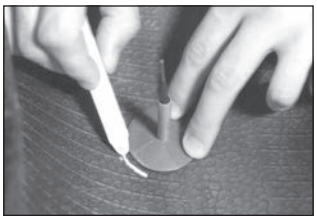


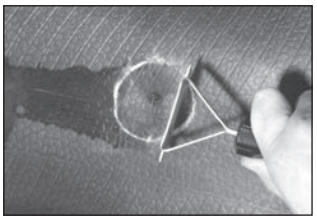
13. For remaining **one-piece repair procedures** follow steps on page 127.
For remaining **two-piece repair procedures** follow the steps beginning on page 128.

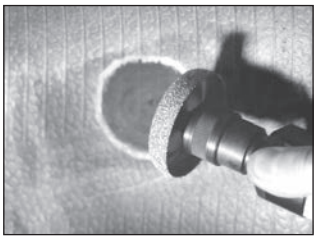
ONE-PIECE REPAIR PROCEDURES

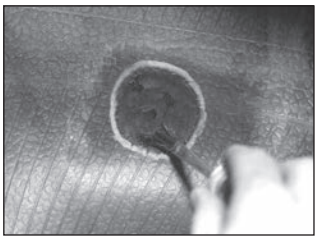
INJURY PREPARATION

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.



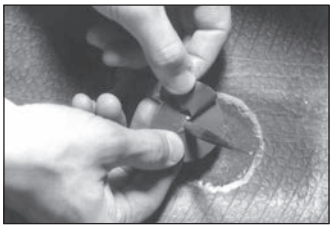




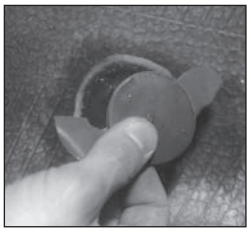


REPAIR UNIT APPLICATION

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.

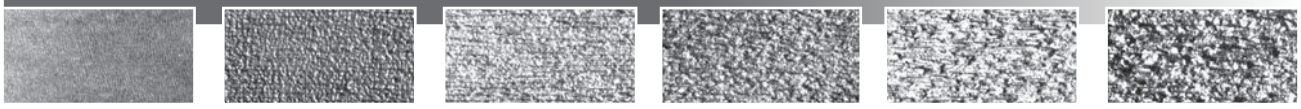


21. Using a roller stitcher, stitch the patch down firmly to the innerliner by working from the center outward making sure to remove all trapped air.
22. Keeping the stem in a relaxed position, cut the stem about 1/8" above the tread surface of the tire. Do not pull the stem while cutting.

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

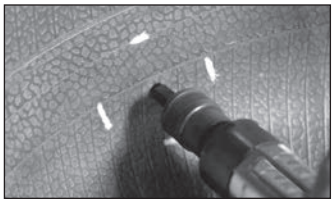


RMA #1 RMA #2 RMA #3 RMA #4 RMA #5 RMA #6

TWO-PIECE REPAIR PROCEDURES

INJURY PREPARATION

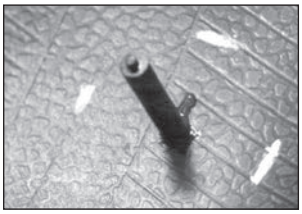
13. Once the size of the injury has been determined, select the appropriate repair material based on the size of the injury and the type of tire being repaired.
14. Using a 500 rpm low speed air drill and the appropriate carbide cutter, clear and prepare the injury channel by drilling it 3 times from 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.

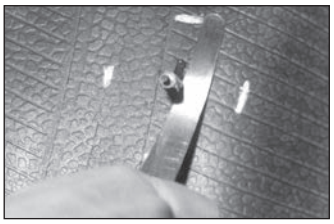


15. Using a cement dipped probe, coat the wall of the injury channel with chemical vulcanizing cement and allow the cement to dry thoroughly.

INSTALLING THE VULCANIZING INSERT

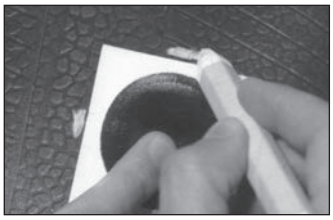
16. Place a drop of cement on the leading edge of the lead wire insert.
17. Insert the lead-wire into the injury channel from the inside of the tire and pull it from the outside of the tire with a pair of pliers until the body of the insert is centered in the injury channel.
18. Using a flexible skiving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



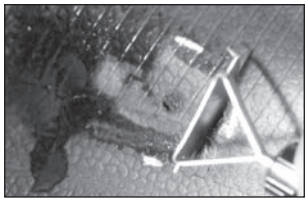


INSTALLING THE REPAIR UNIT

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.

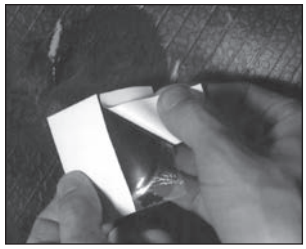


20. Using pre-buff rubber cleaner and an inner liner scraper, thoroughly clean the outlined area, removing all mold lubricants, dirt and debris.

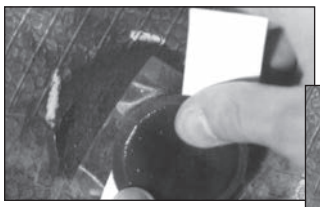


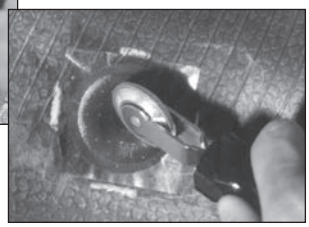
21. Using a low speed buffer at no more than 5,000 rpm, buff the outlined area to an even, velvety RMA #1 textured finish (see bottom of page 127). Be careful not to buff through the innerliner and expose the cord body plies of the tire. Vacuum away any buffing debris.

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 125 for section repair limits and page 126 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 129). 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 127). 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.

Accelerator – A chemical which affects the rate of vulcanization of the rubber compounds.

Air Injection – An inspection method using a high pressure air probe to detect separation.

Awl – A pointed round tool used to probe nail holes and other injuries.

Backing – A removable protective material used on the application side of retread rubber and repair materials to preserve cleanliness and tackiness.

Band Ply – The inner cord ply of a tire.

Bead – That anchoring part of the tire which is shaped to fit the rim. Made of high tensile steel wires wrapped and reinforced by the plies.

Bead Centering Plate – An alignment device used to reduce tire diameter and center the casing in the retread matrix.

Bead to Bead Measurement – The distance from the heel of one bead straight up at 90˚ to the bead over the crown and down the other side to a position on the heel of the other bead directly opposite the starting point.

Belt Edge Separation – Separation adjacent to any edge of the tire.

Break – A crack extending into or through the fabric. An impact break is usually in the shape of an X or star and can be seen from the inside of the tire. A flex or circumferential break runs parallel to the beads.

Breaker Strip – A band or strip of rubber coated bias cut tire cord placed circumferentially around the tire between the last ply of casing fabric and tread. Sometimes called the impact or shock ply.

Broken Belts or Plies – A break limited to one or more belts or plies of the tire.

Buckled Tread – Tire distortion caused by improper molding, evidenced by wrinkling on the inside of the casing.

Buff Contour – The specified shape of a buffed tire.

Buff Line – The dividing line in the cross section of a tire between the buffed surface of the original tire and the new retread rubber.

Buffed Surface – The specially prepared surface of a tire casing to provide proper adhesion between the previously vulcanized casing and the new rubber.

Buffer – A machine used to rasp the old tread from the tire.

Buffing Template – A machined device of a specified shape used to obtain the required buffed contour.

Builder – A machine used to apply tread rubber to a casing.

Build-Up – The application of retread or repair rubber.

Buzz-Outs – (See Skiving)

Casing – The tire structure, excepting tread and sidewall rubber.

Cement – An adhesive rubber compound dissolved in solvent used to provide building tack and cured adhesion. May be brushed or sprayed on the buffed surface.

Centerline – An inked line or indentation applied during extrusion to the center of the tread rubber to aid in positioning the tread.

Chafer Fabric – The layer of fabric covering the bead in the area between the bead and rim.

Channeling – Voids in the shoulder area between the tread and buffed surface.

Check Valve – A one way valve used to prevent pressure loss.

Chemical Cleaning – A rapid drying rubber solvent for removing mold lubricant, dirt, and other foreign material before mechanical buffing.

Chemical Cure – Vulcanization at room temperature activated by chemical agents without the application of heat from an outside source.

Chemical Leak Detector – A liquid capable of detecting air seepage not discernible by visual inspection.

Chemical Vulcanizing Cement (Chemical Cement) – Cement which when used with compatible materials will produce a chemical cure.

Chunking – Separation of tread from the casing in particles that may range from a very small size to several square inches in area.

Cords – The strands forming the plies in a tire.

Corrosion – Degradation of steel reinforcing members.

Cross Section – The maximum width of the tire.

Crown Width – The distance shoulder to shoulder measured along the buffed contour.

Cure Time – The time required at a reference temperature for a compound to reach optimum physical properties.

Curing Rim – The rim used to support the tire and keep the curing tube in place while curing.

Curing Tube – Special, heavy duty tube placed within the tire while curing.

Cushion Gum – A tacky rubber compound used for adhesion, undertread repair, and build-up. (Also See Precured Tread Cushion Gum).

Cut-off Rib – An indentation molded into a retreaded tire to produce a sharp ending at the edge of the new retread rubber.

Debagger – A device for inserting and removing curing tubes.

Delugger – A machine used to cut the lugs from tires prior to buffing.

Detreader – A machine that delugs and buffs a used tire.

Die Size – A coded description of the dimensions of tread rubber.

Extruder – A machine that shapes a rubber compound, by the process of extruding, into a usable form (i.e. strip or die size).

Fabric Fatigue – Fabric degradation and resultant tire cord breakdown due to repeated flexing.

Filler Strip – A free flowing rubber used under the tread when added thickness is needed.

Flow Stop – An indentation molded into a retreaded tire to produce a sharp ending at the edge of the new retread rubber.

Full Capping – Application of new rubber to the tread area and some distance down the sidewall of a used tire. Gives the appearance of a new tire.

Groove – Space between two adjacent tread ribs.

Groove Cracking – Cracking which occurs at the bottom of a tread groove.

Heat Booster – An electric heating unit, which, when placed between the airbag and the casing of the tire, provides internal heat and aids in the curing of the tire.

Kettle Cure – Cure method employing steam and air for the heat and pressure required in vulcanizing.

Liner – The tubeless tire inner surface used to retain the inflation media.

Lug Tearing - Rupture of the lug, sometimes resulting in removal, resulting from violent operation or mechanical interference.

Mandrel – A curved support inserted in a tire to prevent the casing from collapsing while building a repair.

Matrix – Aluminum or steel rings or segments which form the cavity in which the tire is actually cured and from which the tread design is formed.

Matrix Skirt – The sidewall flange of the matrix. In a short skirt matrix the flange extends from the shoulder to the flow stop and in a long skirt matrix it extends below the flow stop.

Moisture Blows – Ply separations caused by the presence of moisture in the carcass which, when subjected to heat, becomes steam and expands.

Mold – Equipment in which the new tread is cured to the worn tire. Mold includes the steam chamber, matrix, and adjusting devices.

Mold Lubricant – Material used as a mold release to facilitate removal of the tire from the mold after curing.

Non-Fill – Failure of the tread rubber to properly fill the matrix during cure, resulting in imperfectly formed tread elements and rounded lug edges.

Open Splice – A retreaded tire defect caused by failure of the rubber to knit together properly at the tread splice during cure.

Optimum Cure – That state of cure at which the rubber compound exhibits the most satisfactory physical properties. Usually expressed in minutes curing time at a specified temperature.

Orbitread Machine – A combined tuber-builder that applies tread rubber in ribbon form, and in a spiral configuration.

Overall Diameter (O.D.) – A measurement used to size a buffed tire. Usually made on an inflated tire using calipers or a diameter type rule.

Overcure – Vulcanizing longer than necessary. Can result in the deterioration of certain physical properties.

Overflow – Spew-out of tread compound at the mold parting line or at the edge of the matrix skirt which should be trimmed or buffed off the finished product.

Padding Gum – Heat resistant rubber used under tread rubber to build up its size for mold fit.

Peaking – A condition, usually in the cushion, resulting from local material starvation and excessive flow from adjacent areas.

Ply – A layer of rubber coated parallel cords.

Ply Separation – A parting of rubber compound between adjacent plies.

Potentiometer – A milivoltmeter calibrated to sense temperature in a desired range. (Usually direct reading.)

Precured Tread – Tread which is vulcanized with the tread configuration molded into it prior to being placed on the buffed casing.

Precured Tread Cushion Gum – A tacky rubber compound used to bond the precured tread to the buffed surface.

Press (Loading) – A machine designed to open and close a matrix, load and eject retreaded tires.

Press Plate – Ring shaped plates in molds which may be adjusted to alter the cross section of tires.

Pyrometer – An instrument to measure temperatures – usually by the generation of electric current by a thermocouple when acted on by direct heat. Commonly used to measure surface mold temperatures or (if a penetrating needle is used) tread rubber temperatures.

Rasp – A tool with raised points forming the cutting prominences, used for roughening rubber surfaces.

Radial Cracking – Cracking, usually in or near the rib area, resulting from under-inflation (or ozone exposure).

Reducing Valve – Pressure regulating device used for controlling steam or air pressure at desired level.

Regrooving (Recutting) – The cutting of a tread design into tread rubber where a design does not already exist or the cutting into an existing tread design to a depth greater than that provided by the new tire manufacturer or retreader.

Reinforcement – Any material, usually rubber and fabric, vulcanized to the tire to add strength to the cord body at an injury.

Reinforcement Repair – Repairs made to the casing when an injury has extended through more than 25% but less than 75% of the tire body requiring both hole-filling material and reinforcing patches.

Relugging – A method of retreading big type design tires using hand build-up and kettle cure.

Repair Gum – Material used for filling voids, or covering reinforcing material in a tire repair.

Repaired Tire – Any tire with punctures, cuts or other types of injuries that have been reconditioned as required to provide additional safe service life.

Repair Patch – The reinforcing material used to seal and/or reinforce the injury in a tire.

Repair Plug – The material that fills the cavity of an injury in a tire.

Retread Tire – A casing to which tread rubber has been affixed to extend the usable life of the tire.

Reversion – Excessive heating of a cured rubber compound leading to deterioration of its physical properties.

Rim – A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Rim Diameter – The diameter (conventionalized) of the rim corresponding to the tire bead heel.

Rim Flange – That part of the rim that supports the bead heel and resists lateral internal pressure.

Rust – Advanced stage of corrosion (See Corrosion).

Scorching of Rubber – Excessive heat of processing equipment which detrimentally changes the surface of the rubber.

Section Repair – Repairs, other than nail hole type, made to the casing when an injury has extended through 75% or more of the actual plies, or completely through the casing in the tread or sidewall areas.

Sectional Bag (Air-Steam) – A rubberized fabric bag made in 1/4, 1/5, or 1/6 circle with valves at both ends. When inflated inside a tire in a sectional mold, it applies pressure in the vicinity of the injury.

Self Vulcanization – (See Chemical Cure).

Separation – A loosened area within the tire.

Set-up – Premature vulcanization of a rubber compound during processing or storage.

Shaping – Buffing the casing to shape it to properly fit the size and contour of the matrix cavity.

Shelf-Life – Refers to the accepted length of time that a perishable product may remain in stock before serious deterioration takes place.

Shoulder Radius – Small radius, (generally) that joins the primary tread radius to the shoulder contour.

Sidewall – That portion of a tire between the tread and bead.

Sipe – Any of the small often hooked shaped or bracket shaped grooves in the tread of an automobile tire for providing extra traction and preventing skids.

Size Factor – The size factor of a tire is the sum of its section width on its measuring rim and its outer diameter.

Sizing – Measuring the tire casing to determine proper matrix fit. Usually a combination of bead to bead or cross section and tire circumference is used.

Skid Depth (Tread Depth) – The distance measured near the centerline of the tire, from the base of the tread design to the top of the tread.

Skiving – The removal of damaged material prior to making a repair.

Slab Stock – Tread compound cut from a rubber mill in wide, thick strips.

Spacer Ring – A ring inserted between two halves of a matrix which enables the matrix to handle tires of the same diameter, but with greater tread widths and larger cross sections.

Special Mileage Tire – A tire manufactured with an extra layer of rubber between the cord body and the original tread design, which extra layer is designed for the purpose of recutting and regrooving, and which is specifically labeled as a special mileage commercial tire.

Splice-Butt – A 90° angle cut across the tread crown and through the gauge which permits full matching of the tread ends when they meet.

Splice-Bevel – A continuous and approximate 45° angle cut through the gauge which allows the tread ends to diagonally overlap themselves.

Spot Repair – The replacement of rubber in an injury that penetrates less than 25% of the body plies.

Spotter – A heat vulcanizing unit used in spot repairs, with a metal curing plate for either (or both) outside or inside tire surface.

Spreader – A multi-arm device that spreads a tire at the bead area.

Standard Rim – A rim that has been calibrated and found to meet the precise measurements specified
by the Tire and Rim Association, Inc. or, where applicable, by European Tire and Rim Association.

Steam Trap – A drainable end of the steam supply line low pressure trap which helps avoid low pressure areas in the steam piping.

Stitching – A hard rolling method used to both remove trapped air and improve rubber contact for better adhesion.

Stop Ring – An indentation molded into a retreaded tire to produce a sharp ending at the edge of the new retread rubber.

Strip Rubber – Tread rubber in strip form most commonly used in cold feed extruders.

Stripping Stock – A rubber stock used to extend the wing of tread rubber.

Tack – A term used to describe tackiness.

Template (Buffing Template) – A pre-cut pattern, usually metal, used to determine the contour of a buffed tire in order for the tire to be compatible with the matrix.

Thermocouple Test – A heat study which utilizes special temperature wires and determines temperatures received at both the surface and base of the retread.

Tire Paint – A black paint, compatible to tire bodies, used to enhance the appearance of a tire.

Toe – The part of the bead which faces the inside portion of the tire.

Top Cap (Top Treading) – A retread which covers the crown, or top, of a tire.

Tread – That portion of a tire that comes in contact with the road.

Tread Depth – The distance, measured near the centerline of the tire, from the base of the tread design to the top of the tread.

Tread Design – The non-skid pattern (design) on the tread portion of the tire.

Tread Rib – A tread section running circumferentially around a tire.

Tread Gum – A rubber compound, used primarily to build up the tread when making a repair.

Tread Radius – A measure of tread surface curvature from shoulder to shoulder.

Tread Roller – A roller, either manual or power, used to help apply the tread rubber, remove trapped air and obtain adhesion.

Tread Rubber – Uncured rubber material which will replace the worn off tread portion of a tire.

Tread Separation – Pulling away of the tread from the tire casing.

Tread Tearing – A tearing away of a portion of the tread design due usually to an in-shop condition.

Tube Plate – A heated metal plate with a smooth surface and is used in making repairs.

Tulip Type Segmented Mold – Shoulder to shoulder segments which come together on a single cone.

Undercure – A condition which describes less than acceptable vulcanization, or curing.

Undertread – The rubber between the base of the tread and the tire body.

Valley Die – A tube die size configuration, which from a cross view, shows that either shoulder is higher than the center portion.

Vent Hole – Small circular holes in the tread area of the matrix which allows the rubber to flow and fill out the tread design.

Venting – The act of perforating a tire above the beads which allows the internal pressure in the cords to escape safely and without loss of tire air retention ability.

Voids – A situation whereby the tread rubber flow fills the tread design but does not completely fill the space between the tire casing and matrix, thereby leaving portions of the base in an unfilled condition.

Vulcanization – A chemical condition which takes place under appropriate curing time, temperature and pressure and develops usable (tire) characteristics.

Vulcanizing Cement – A cement containing additives to provide building tackiness and to cure under heat.

Weather Checking – A visual sidewall condition which appears as cracking of the rubber.

Wicking – A capillary act of air escapement from the tire casing through the use of a piece of cord.

WSW Protective Paint – A special and washable paint, usually colored, used to protect the white sidewall from excess dirt, stains or blemishes while the tire is in inventory.

GLOSSARY OF TPMS TERMS

ABS – Anti-lock braking system.

Activation Tool – Electronic tool used to activate, trigger or wake-up a TPMS sensor once it has entered the Sleep Mode. Typically, the tool sends a 125kHz LF signal to the TPMS sensor forcing it to wake-up and transmit data. Activation tools may be needed to aid in the relearn processes.

Banded Sensor – Sensor mounted in the drop center of the wheel using a metal band. The sensor is typically mounted 180° from the valve stem. The sensor is attached to the metal band using a cradle and secured to the cradle with a plastic clip. Ford is the only vehicle manufacturer that uses banded sensors, as original equipment, on their vehicles.

Clamp-in Style Sensor – Sensor mounted to the wheel through the rim hole using a special sealing nut to secure it into the wheel. These sensors can usually be identified by their aluminum valve stem.

Cradle – The carrier that holds the banded sensor to the band.

Continuous Wave Sensors – Sensors designed to trigger when they are exposed to a continuous electronic signal for 4-7 seconds.

Copy (Clone) – Process of duplicating a sensor whereby a vehicle relearn may be avoided.

Decimal – Sensor ID format consisting of all numeric (numbers) characters.

Direct TPMS – System that uses wheel mounted sensors or transmitters to transmit information to the vehicles ECU. This system meets current federal regulations.

Drive Mode – When a vehicle reaches a certain velocity, for a specified period, the sensor enters drive mode and transmits data at regular intervals.

Driver Information Center (DIC) - Appears on display to show drier the individual pressure of each tire.

Electronic Control Unit (ECU) – Device that decodes the TPMS data and converts the data into information that can be used by the vehicle systems.

FCC – Federal Communications Commission

FMVSS 138 – The Federal Motor Vehicle Safety Standard adopted by the NHTSA, as required by legislation known as the TREAD Act, mandating that TPMS be installed on all new vehicles having a GVWR of 10.000 lbs. or less except motorcycles and those vehicles with dual wheels on an axle.

Galvanic Corrosion – Corrosion caused by two dissimilar metals in contact with each one another.

Gross Vehicle Weight (GVW) – The total weight of a loaded vehicle including the chassis, body and payload.

Hexadecimal – Sensor ID format that may consist of all numeric (numbers) characters or a combination of numeric and alpha (A, B, C, D, E, F) characters.

Hi-Line – Vehicle displays "Pressure by Location" (each individual tire pressure).

ID – Identification

Indirect TPMS – System based on the use of a vehicles ABS. This type of system does not require the use of sensors or transmitters. Indirect systems were once popular, but those systems did not meet current federal regulations.

Learn Mode – Mode in which the vehicles receiver stores the sensors ID, within its memory, for future identification purposes.

LF – Low Frequency (Trigger Frequency) 125kHz

Low-Line – Vehicle displays on the MIL (Malfunction Indicator Lamp)

Magnetically Triggered Sensors – Sensor designed to trigger when exposed to a powerful magnetic wave

Malfunction Indicator Lamp (MIL) - Light that appears on the dash to warn that the TPMS is not operational.

NHTSA – National Highway Traffic Safety Administration. The U.S. federal agency that develops and administers educational, engineering and enforcement programs for safe vehicle use and cost-effective highway travel.

Normal Mode – Also referred to a Park Mode, is the state the TPMS sensor is in during normal driving operations.

OBDII – On-Board Diagnostic systems were introduced as an electronic means to control engine functions and diagnose engine problems. OBDII, introduced in the mid-90's, provides almost complete engine control and also monitors parts of the chassis, body and accessory devices, as well as the diagnostic control network of the car.

OEM – Original Equipment Manufacturer.

Off Mode – Also referred to as Ship Mode is the TPMS sensor state where no transmission occurs and pressure sampling occurs once every 30 seconds. Mainly used for shipment and storage, sensors will remain in this condition until activated into another mode. Sensors being shipped from overseas are often shipped in Off Mode because the FCC will not allow any electronic devices to transmit any type of signal that may interfere with radio air waves. It is important to note that not all sensors are shipped in this mode.

Park Mode – Also referred to as Normal Mode, is the state the TPMS sensor is in during normal driving operations.

Pulse Modulated Sensors – Sensors designed to trigger when they are exposed to a 125kHz signal with a specific and exclusive OEM electronic pattern.

Pressure by Location – Vehicle will display each tire's pressure on the dash.

Protocol – The specific internal programming that runs the TPMS sensor.

Receiver – Device that decodes the TPMS sensor data and converts it into information used by the vehicles onboard computer system.

Relearn – Many TPMS systems require retraining each time the tires/wheel are rotated or a sensor is replaced. Retraining is necessary for the system to learn the sensor(s) new postion(s). A relearn procedure may need to be followed in order to retrain the system. Relearn procedures differ by vehicle makes and are sometimes found in the vehicles Owner's Manual. In those instances where the relearn procedure is not found in the Owner's Manual a TPMS service guide may need to be referenced to find the relearn procedure.

Auto-Relearn – Sensors are learned automatically, to the vehicle's ECU, usually be driving the vehicle at a specified speed continuously for a specified amount of time.

Stationary Relearn – Sensors are relearned to the vehicle via an RF signal (typically by a TPMS tool) that is sent from each sensor after the vehicle has been put into learn mode.

OBD Relearn – Sensors are read by an OBD capable TPMS tool and then relearned to the vehicle by connecting directly t the ECU via the OBD connector.

RF – Radio Frequency (Transmitted Frequency)

Sensor ID – The identification number assigned to a TPMS sensor that is unique to that sensor only. The ID is stored in the vehicle's ECU.

Service Kit – Kit of components needed to properly service TPMS sensors. This kit can include replacement valves, cores, caps, grommets, locking nuts, and washers. The OEM recommends replacing the EPDM grommet, valve cap, valve core and locking nut every time a TPMS sensor is removed from the wheel or the wheel is serviced.

Ship Mode – Also referred to as ***Off Mode*** is the TPMS sensor state where no transmission occurs and pressure sampling occurs once every 30 seconds. Mainly used for shipment and storage, sensors will remain in this condition until activated into another mode. Sensors being shipped from overseas are often shipped in ***Off Mode*** because the FCC will not allow any electronic devices to transmit any type of signal that may interfere with radio air waves. It is important to note that not all sensors are shipped in this mode.

Sleep Mode – TPMS sensor state that occurs in between the time the sensor transmits and measures data.

Snap-In Style Sensor – Sensor mounted to the wheel through the rim hole using a special rubber snap-in valve that is attached to the sensor module using a special T-10 TORX head screw. To identify a Snap-in TPMS sensor, look for a long valve cap or an extended brass shoulder.

Test Mode – Sometimes referred to as ***Factory Test Mode***, is the state in which the sensor transmits at the most frequent transmission rate possible. This mode is used by vehicle assembly plant tests.

TPM – Tire Pressure Monitoring.

TPMS Sensor – Also referred to as sensors, are wheel based electronic sensors used to transmit information/data in TPMS systems.

TPMS – Tire Pressure Monitoring System. A warning system that notifies the driver when a tire is significantly under-inflated.

TPMS Grommet – Many stem mounted sensors use a special rubber grommet for sealing. The OEM recommends replacing the grommet whenever the sensor is removed from the wheel. The rubber grommet provides the air seal in the valve stem opening, and a new one should be used to ensure a fresh seal after each service.

TPMS Nut – Many TPMS sensors are attached to the wheel using a specially designed sealing nut. The OEM recommends replacing these nuts whenever it is removed. These nuts are either 11mm or 12mm. Each manufacture has its own recommended torque specification for the TPMS nuts.

TPMS Valve Cap – TPMS sensors with an aluminum valve stem require a specially designed sealing cap. Sensors with an aluminum stem cannot use a standard (non-TPMS) valve cap. These special valve caps are designed for use with TPMS sensors and protect against the corrosion that forms when dissimilar metals come in contact.

TPMS Valve Core – Many TPMS sensors have an aluminum valve stem with a specially designed valve core. The OEM recommends replacing this valve core whenever it is removed. Sensors with an aluminum valve stem cannot use a standard brass valve core; instead, they require a special nickel-plated valve core to protect against the corrosion that forms when dissimilar metals come in contact. The Tire and Rim Association (TRA) recommends a torque specification of 2 – 5 inch pounds for TR C1 valve cores. Sensors with a rubber valve stem may use a standard brass valve core for replacement.

TRA – Tire and Rim Association. The standardizing body for the tire, rim, valve and allied parts industry for the United States.

TREAD Act – Transportation Recall Enforcement Accountability Documentation Act. The law that mandates, beginning September 1, 2007, all new vehicles sold in the U.S. under a GVW of 10,000 lbs., excluding motorcycles and light duty trucks with dual wheels on an axle, are required to be equipped with a tire pressure monitoring system (TPMS) to warn drivers when one or more of a vehicles tires are under-inflated by 25% or more.

TSS – Tire Safety System

UHF – Ultra High Frequency 315MHz and 433.92 (sometimes referred to as 434) MHz.

TPMS **SERVICE PROCEDURE**

INITIAL INSPECTION

A. Before performing wheel service on any vehicle, check to see if the wheels are equipped with TPMS sensors.

B. Following the diagnostic tool manufacturer's instructions, check each sensor to ensure each is working properly and note the state of each on the service ticket.

C. If a sensor is not working properly, inform the vehicle owner that it will need to be replaced.

SENSOR IDENTIFICATION

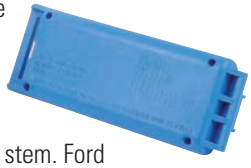
D. Identify which type TPMS sensor is on the vehicle as seen below. Then follow the steps to the right for that type of sensor.

Complete service by following Step F.

CLAMP-IN SENSORS have an aluminum valve stem mounted directly to the wheel through the valve hole using a special aluminum nut.

SNAP-IN SENSORS have a rubber snap-in valve stem mounted directly to the wheel through the valve hole. Typically identified by the long, black plastic cap and/or the extended brass shoulder.

BANDED SENSORS mounted in the center of the wheel using a metal band typically 180° from the valve stem. Ford is the only vehicle manufacturer using banded sensors as original equipment.



E. SERVICING –

CLAMP-IN SENSORS

1. Remove the tire from the vehicle following industry recommended procedures.
2. Deflate the tire by removing the valve core using a valve core removal tool and releasing the air completely.
3. Remove the sensor nut and push the sensor inside the tire.
4. Break the tire beads at 90° and 270° from the valve stem and remove the sensor from the wheel.
5. Dispose of the valve cap, core, nut and rubber grommet.
6. Using the appropriate new service kit, replace the valve core and grommet.
7. Reinstall the sensor through the rim hole with the flat side of the sensor facing the rim.
8. Install the new nut using a torque wrench and tighten to the proper torque specification.
9. Install the new sealing valve cap.
10. Service the tire/wheel as required following all industry and tire manufacturer guidelines.
11. Mount the tire onto the wheel taking special care not to damage the TPMS sensor.
12. Inflate the tire to the recommended placard pressure.

SNAP-IN SENSORS

1. Remove the tire from the vehicle following industry recommended procedures.
2. Deflate the tire by removing the valve core using a valve core removal tool and releasing the air completely.
3. Break the tire beads at 90° and 270° from the valve stem and remove the sensor from the wheel.
4. Remove the screw from the base of the sensor using a T-10 torque screwdriver tool and carefully remove the sensor from the valve stem.
5. Dispose of the old screw.
6. Remove the rubber snap-in valve from the wheel as normal.
7. Attach the sensor to the rubber snap-in valve using a new T-10 TORX screw, then torque the screw to 11.5 in-lbs (1.3 N.m.)
8. Apply mounting lube to the rubber snap-in valve stem.
9. Align the sensor with the rim hole and attach a standard valve installation tool.
10. Pull the valve stem straight into the valve hole until it is properly seated.
11. Service the tire / wheel as required following all industry and tire manufacturer guidelines.
12. Mount the tire onto the wheel taking special care not to damage the TPMS sensor.
13. Inflate the tire to the recommended placard pressure and install the new sealing valve cap.

BANDED SENSORS

1. Remove the tire from the vehicle following industry recommended procedures.
2. Deflate the tire by removing the valve core using a valve core removal tool and releasing the air completely.
3. Break the tire beads at 90° and 270° from the valve stem and remove the sensor from the wheel.
4. Remove the mounting clip to release the sensor from the mounting bracket.
5. Gently pry the sensor from the open end of the bracket and discard the mounting clip.
6. If the mounting band and/or mounting bracket show signs of wear or corrosion, replace with a new band and/or mounting bracket.
7. Install a new sensor using a new retaining clip.
8. Service the tire/wheel as required following all industry and tire manufacturer guidelines.
9. Mount the tire onto the wheel taking special care not to damage the TPMS sensor.
10. Inflate the tire to the recommended placard pressure.

F. SERVICE COMPLETION

1. Using your TPMS sensor activation tool, check all sensors making sure each is working properly.
2. Refer to your Motor TPMS Guide or vehicle owner's manual to determine if a TPMS relearn is necessary. A TPMS relearn tool may be required to reset the system.
3. If necessary, follow the instructions for resetting the vehicles TPMS system.

14-603 WALL CABINET PUNCTURE REPAIR SYSTEM

1	14-600	Wall Cabinet
1		RMA Wallchart
1		X-tra Seal Catalog

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-002	2-1/4" Tube Patch
1	11-321	1-3/4" Round Uni
1	11-322	2-1/4" Round Uni
1	13-621	3/16" Injury Lead Wire Stem
1	13-620	1/4" Injury Lead Wire Stem
1	13-672	3/16" Injury Lead Wire Combination Repair
2	13-673	1/4" Injury Lead Wire Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-101	Bead Sealer
1	14-128A	Inner liner Sealer

TOOLS

1	14-399-1	Spiff Vacuum (vacuum only)
1	14-921	XLIGHT
1	14-802	Safety Glasses
1	14-319DX	Deluxe Low Speed Buffer Kit
1	14-345	3/16" Injury Carbide Cutter
1	14-346	1/4" Injury Carbide Cutter
1	14-333	QC Adapter for 345 Carbide
1	14-334	QC Adapter for 346 Carbide
1	14-330	QC Adapter for BS-1
1	14-320	BS-1 Buffing Wheel
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-553	White Paint Stick
1	14-301	Brass Brush
1	14-310	Power Awl
1	14-218	Spiral Cement Tool
1	14-318R	Inline Air Regulator

14-604 WALL CABINET PUNCTURE REPAIR SYSTEM

1	14-600	Wall Cabinet
1		X-tra Seal Cabinet Decal
1		X-tra Seal Catalog
1		Puncture Repair Procedure Guide
1		RMA Wall Chart

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-311	2-1/4" Square Euro-style Universal Patch
1	13-621	3/16" Injury Lead Wire Insert
1	13-620	1/4" Injury Lead Wire Insert
2	13-672	3/16" Injury Combination Repair
2	13-673	1/4" Injury Combination Repair
2	14-008	Vulcanizing Cement
2	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer
1	14-101	Bead Sealer

TOOLS

1	14-204	Spiral Cement Tool
1	14-301	Brass Brush
1	14-305	Flex Skiving Knife
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-319DX	Deluxe Low-Speed Buffer kit
1	14-359	2" Dome Buffing Wheel
1	14-326K	Deluse Low-Speed Reversible Drill
1	14-331	Long QC Adapter for BS-1
1	14-333	QC Adapter for 345 Carbide
1	14-345	Carbide Cutter - 3/16" Injury
1	14-334	QC Adapter for 346 carbide
1	14-346	Carbide Cutter - 1/4" Injury
1	14-399	Spiff Vacuum
1	14-554	Markal Paint Stick
1	14-803	Work Gloves
1	14-802	Safety Glasses
1	14-921	XLIGHT

14-605 TRUCK TIRE PUNCTURE CABINET REPAIR SYSTEM

1	14-600	Wall Cabinet
1		X-tra Seal Cabinet Decal
1		X-tra Seal Catalog
1		Puncture Repair Procedure Guide
1		RMA Truck Puncture Wall Chart

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-311	2-1/4" Square Euro-style Universal Patch
1	11-712	Radial 12 - Reinforced Patch
1	13-620	1/4" Injury Lead-Wire Stem
1	13-623	3/8" Injury Lead-Wire Stem
2	13-673	1/4" Injury Combination Repair
2	13-675	3/8" Injury Combination Repair
2	14-008	Vulcanizing Cement
2	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer

TOOLS

1	14-802	Safety Glasses
1	14-204	Spiral Cement Tool
1	14-301	Brass Brush
1	14-305	Flex Skiving Knife
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-359	2" Dome 60 Grit Buffing Wheel
1	14-319DX	Deluxe Low Speed Buffer Kit
1	14-326K	Low Speed Reversable Drill
1	14-331	Long QC Adapter for Buffing Wheel
1	14-346	1/4" Injury Carbide Cutter
1	14-348	3/8" Injury Carbide Cutter
1	14-399	Spiff Vacuum
1	14-554	Markal Paint Stick
1	14-803	Work Gloves

14-613 SERVICE CART PUNCTURE REPAIR SYSTEM

1	14-614	HD Service Cart
1		X-tra Seal Decal
1		X-tra Seal Catalog
1		Puncture Repair Procedure Guide
1		RMA Wall Chart

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-309	2" Square Universal Patch
1	13-621	3/16" Injury Lead Wire Insert
1	13-620	1/4" Injury Lead Wire Insert
1	13-672	3/16" Injury Combination Repair
2	13-673	1/4" Injury Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer
1	14-101	Bead Sealer

TOOLS

1	14-204	Spiral Cement Probe
1	14-301	Brass Brush
1	14-305	Flex Skiving Knife
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-319DX	Deluxe Low Speed Buffer Kit
1	14-318R	Inline Air Regulator
1	14-359	2" Dome Buffing Wheel
1	14-330	QC Adapter - Buffing Wheel
1	14-333	QC Adapter - 345 Carbide
1	14-334	QC Adapter - 346 Carbide
1	14-345	3/16" Injury - Carbide Cutter
1	14-346	1/4" Injury - Carbide Cutter
1 PC	14-553	White Paint Stick
1	14-802	Safety Glasses
1	14-803	Work Gloves
1	14-399-1	Spiff Vacuum (vacuum only)

14-650 TRUCK TIRE PUNCTURE TOOLBOX REPAIR SYSTEM

1	14-652BOX	Toolbox
1		X-tra Seal Catalog
1		RMA Truck Puncture Wall Chart
1		Puncture Repair Procedure Guide

TIRE REPAIR MATERIALS AND CHEMICALS

20	11-311	2-1/4" Square Euro-Style Universal Patch
1	11-491	4 1/4" Bias Ply Patches
1	11-655	Medum Round Euro Tube Repair
1	11-712	Radial 12 - Reinforced Patch
6	13-674	5/16" Lead-Wire Combination Unit
1	13-622	5/16" Lead-Wire Insert
2	14-511	HD Blue Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer

TOOLS

1	14-802	Safety Glasses
1	14-204	Spiral Cement Tool
1	14-305	Flex Skiving Knife
1	14-314	Patch Stitcher
1	14-315	Inner Liner Scraper
1	14-319LST	Low-Speed Buffer Kit
2	14-553	White Paint Stick
1	14-803	Work Gloves
1	14-324	Arbor Adapter
1	14-347	5/16" Carbide Cutter
1	14-365	2 1/2" Carbide Buffing Wheel

14-651 QUILLED UNIT PUNCTURE TOOLBOX REPAIR SYSTEM

1	14-652BOX	Toolbox
1		X-tra Seal Catalog
1		RMA Wall Chart
1	14-803	Mechanics Gloves
1		Puncture Repair Procedure Guide
1		Quilled Unit Wall Poster

TIRE REPAIR MATERIALS AND CHEMICALS

2	13-382	Large Quilled Combination Repair
2	13-381	Small Quilled Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer
1	14-101	Bead Sealer

TOOLS

1	14-802	Safety Glasses
1	14-399-1	Spiff Vacuum (vacuum only)
1	14-319DX	Deluxe Low Speed Buffer Kit
1	14-318R	In-Line Air Regulator
1	14-330	QC Adapter
1	14-320	BS-1 Buffing Wheel
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-553	White Paint Stick
1	14-301	Brass Brush
1	14-310	Power Awl
1	14-218	Spiral Cement Tool
1	14-303S	Stickle Back Probe, Small
1	14-303P	Stickle Back Probe, Large

14-652 TIRE REPAIR MATERIALS TOOLBOX SYSTEM

1	14-652BOX	Toolbox
1		X-tra Seal Catalog
1		RMA Wall Chart
1		Puncture Repair Procedure Guide

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-322	2-1/4" Round Universal Patch
1	13-621	3/16" Injury Lead Wire Stem
1	13-620	1/4" Injury Lead Wire Stem
1	13-672	3/16" Injury Combination Repair
1	13-673	1/4" Injury Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer
1	14-101	Bead Sealer
1	14-803	Mechanics Gloves

14-653 PUNCTURE REPAIR TOOLBOX SYSTEM

1	14-652BOX	Toolbox
1		X-tra Seal Catalog
1		RMA Wall Chart
1		Puncture Repair Procedure Guide

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-311	2-1/4" Square Uni-Euro Patch
1	13-621	3/16" Injury Lead Wire Stem
1	13-620	1/4" Injury Lead Wire Stem
1	13-672	3/16" Injury Combination Repair
2	13-673	1/4" Injury Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer
1	14-101	Bead Sealer

TOOLS

1	14-802	Safety Glasses
1	14-399-1	Spiff Vacuum (vacuum only)
1	14-921	XLIGHT
1	14-319DX	Deluxe Low Speed Buffer Kit
1	14-318R	In-Line Air Regulator
1	14-345	3/16" Injury Carbide Cutter
1	14-346	1/4" Injury Carbide Cutter
1	14-333	QC Adapter for 345 Carbide
1	14-334	QC Adapter for 346 Carbide
1	14-330	QC Adapter
1	14-359	60 Grit 2" Dome Buffing Wheel
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-553	White Paint Stick
1	14-301	Brass Brush
1	14-310	Power Awl
1	14-218	Spiral Cement Tool
1	14-803	Mechanics Gloves

14-657 TRUCK TIRE PUNCTURE REPAIR SYSTEM

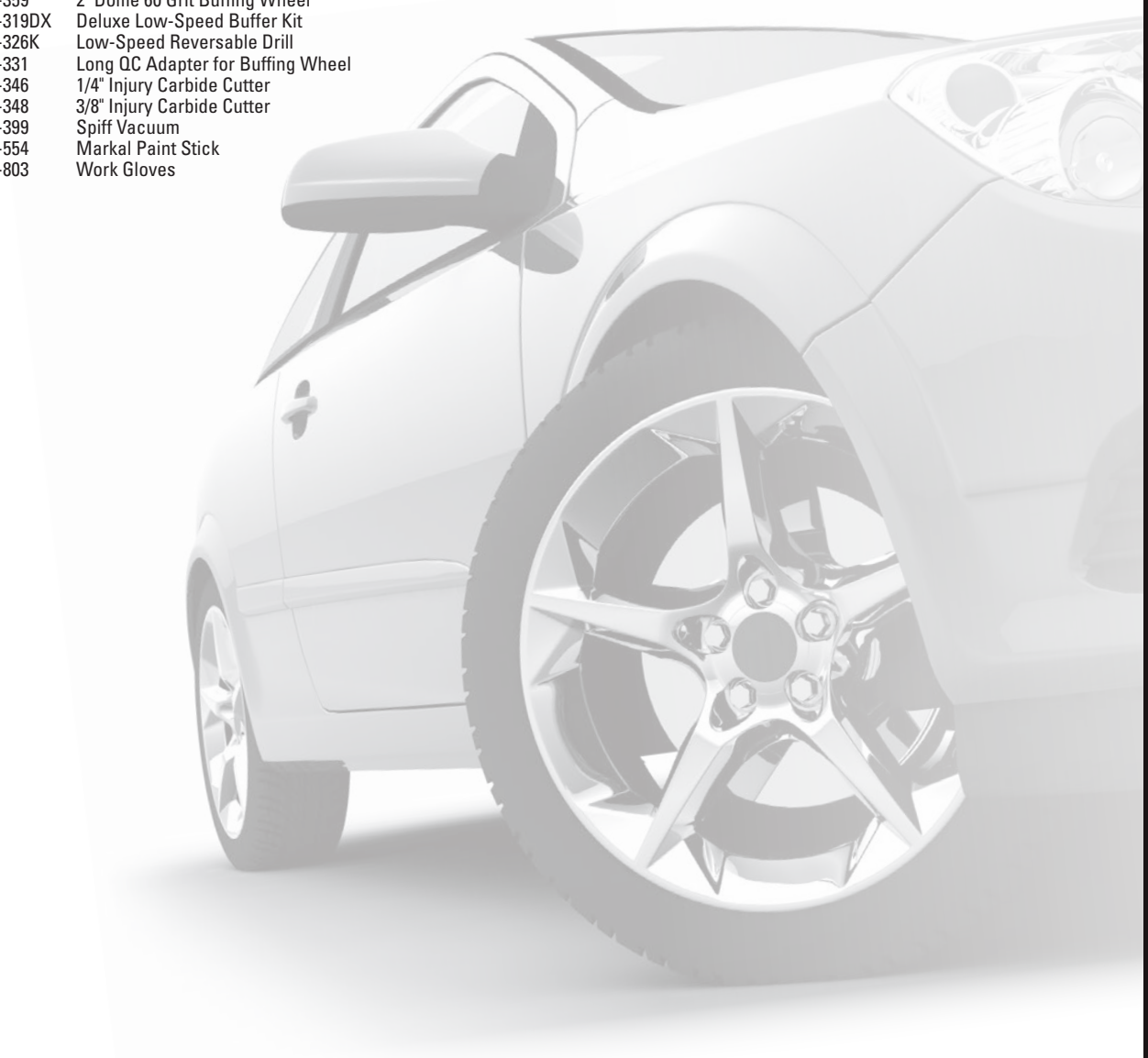
1	14-652BOX	Toolbox
1		X-tra Seal Catalog
1		RMA Truck Puncture Wall Chart
1		Puncture Repair Procedure Guide

TIRE REPAIR MATERIALS AND CHEMICALS

1	11-311	2-1/4" Square Euro-Style Universal Patch
1	11-712	Radial 12, Reinforced Patch
1	13-620	1/4" Injury Lead-Wire Stem
1	13-623	3/8" Injury Lead-Wire Stem
2	13-673	1/4" Injury Combination Repair
1	13-675	3/8" Injury Combination Repair
1	14-008	Vulcanizing Cement
1	14-100	Rubber Prep
1	14-128A	Inner Liner Sealer

TOOLS

1	14-802	Safety Glasses
1	14-204	Spiral Cement Tool
1	14-301	Brass Brush
1	14-305	Flex Skiving Knife
1	14-314	Patch Stitcher
1	14-315H	Inner Liner Scraper
1	14-359	2" Dome 60 Grit Buffing Wheel
1	14-319DX	Deluxe Low-Speed Buffer Kit
1	14-326K	Low-Speed Reversable Drill
1	14-331	Long QC Adapter for Buffing Wheel
1	14-346	1/4" Injury Carbide Cutter
1	14-348	3/8" Injury Carbide Cutter
1	14-399	Spiff Vacuum
1	14-554	Markal Paint Stick
1	14-803	Work Gloves



FLOOR SPINNER **CONTENTS**

Let our experienced experts design the spinner that's right for you!

15-9825 FLOOR SPINNER DISPLAY

This is an example of a parts listing for a spinner

3	14-008	Rubber Cement 8 oz., Flammable
1	14-100	32 oz. (945ml) Buffing Solution, Flammable
1	14-101	32 oz. (945ml) Bead Sealer, Flammable
2	11-321	1 3/4" (45mm) Small Round
2	11-322	2 1/4" (57mm) Medium Round
1	11-323	3 1/8" (79mm) Large Round
2	12-361	4" (102mm) Fat, Brown String
1	12-362	8" (204mm) Fat, Brown String

DIY TIRE REPAIR

3	15-005	Tubeless Tire Repair Kit
3	15-011	Tubeless Tire Repair Kit
4	15-019	Radial Tire Patch Kit
4	15-020	Chemical Tire and Tube Patch Kit
4	15-026	1 oz. Rubber Cement, Flammable
2	15-390	4" Refill – 30 Pack
6	15-394	4" Refill – 5 Pack

TIRE GAUGES

2	15-9061	Dial Gauge with Bleeder
4	15-908	Tractor Tire Gauge
4	15-909	Low-Pressure Tire Gauge
6	15-910	Deluxe Tire Gauge
4	15-911	High-Pressure Gauge
2	15-951	Mini Dial with Bleeder 0-60 psi
2	15-952	Low-Pressure Mini Dial 1-20 psi
4	15-1023	Mini Digital Tire Gauge
4	15-1021	Digital Tire Gauge
2	15-1027	Digital Truck Tire Gauge
2	15-1075	SUV Dial Gauge
4	15-1031	Pocket Dual-Foot Gauge
3	15-1045	Truck Gauge Straight-On
2	15-1078	High-Pressure Dial Gauge
3	15-1313	Truck Gauge

VALVE HARDWARE

4	15-3607	Tread Depth Gauge
4	15-20008	Rubber Snap-in TPMS Valve for GM
4	15-412	1" Tire Valves
4	15-413	1 1/4" Tire Valves
2	15-4134	1 1/4" Tire Valves with Chrome Sleeve
4	15-4142	1 1/2" Tire Valves
4	15-4152	1 1/2" Tire Valves for 0.625" Rim Hole
4	15-418	2" Tire Valves
2	15-4184	2" Tire Valves with Chrome Sleeves
2	15-4252	2" Tire Valves for 0.625" Rim Hole
4	15-4559-2	1" Chrome Valve
4	15-4600	1 1/4" High Pressure Valves (TR600HP)
4	15-4904	TPMS Valve Cores, Red
4	15-4911	Slot Head Valve Caps
6	15-4922	Black Cap with Grommet
4	15-4923	Green Cap with Grommet
4	15-4932	Chrome Cap with Grommet
4	15-4933	Chrome Cap & Sleeves with Grommet
4	15-4927	Black Cap with Grommet for 15-20008
4	15-4925	Gray TPMS Cap with Grommet
4	15-604	4-Way Valve Tool

AIR ACCESSORIES

4	15-501	Ball Foot Air Chuck
2	15-503	Ball Foot Air Chuck with Clip
4	15-5754	1/4" Hose Mender
4	15-5766	3/8" Hose Mender
4	15-5767	1/2" Hose Mender
4	15-5733	1/4" Barb 1/4" FNPT
4	15-5743	3/8" Barb 1/4" FNPT
4	15-5745	1/2" Barb 1/4" MNPT
4	15-7150BR	Industrial Style, Type D, Coupler Female
4	15-7150	Industrial Style, Type D, Coupler Female
4	15-7122	Industrial Style, Type D, Plug Male
4	15-7132	Industrial Style, Type D, Plug Female
4	15-7320BR	Automotive Style, Type C, 1/4" Bdy, 1/4" NPT F Coupler
4	15-7320	Automotive Style, Type C, 1/4" Bdy, 1/4" NPT F Coupler
4	15-7324	Automotive Style, Type C, Bdy 1/4" NPT M
4	15-7334	Automotive Style, Type C, 1/4" Bdy 1/4" NPT F
4	15-7566	Dual Foot Chuck, Angled
4	15-7568	Dual Foot Chuck, Straight-On Tilt Lock

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NUMERICAL **INDEX**

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