AvanTech™

TECHNOLOGY FOR THE DRIVE

TBR PRODUCT CATALOG

AvanTech™

TECHNOLOGY FOR THE DRIVE

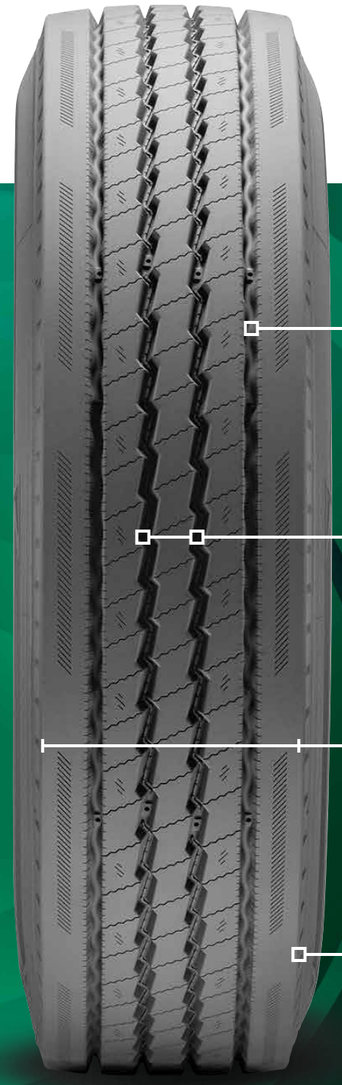
STR 500

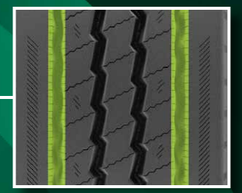
REGIONAL STEER

KTM #6

KTM#6 is a tread compound that provides well-balanced performance with an emphasis on low rolling resistance for excellent fuel economy.

Introducing the STR 500, the ultimate regional/steer tire designed to take on any road condition with ease. Featuring zig-zag grooves that increase traction in both new and worn tire conditions, this tire offers unbeatable grip and control for a smooth ride. With shoulder lugs that minimize irregular tread wear and extend tire life, you can rest assured that your investment in the STR 500 will last for miles to come. The micro-sipes located in the groove walls are strategically placed to reduce irregular tire wear, keeping your tire in top condition for longer. Additionally, the five-rib design ensures even wear and improves handling. The STR 500 is the perfect choice for any driver looking for a reliable and high-performing tire.

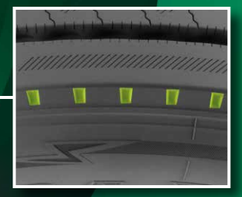




MICRO-SIPES
Micro-sipes located in the groove walls reduce irregular tire wear.

ZIG-ZAG TRACTION GROOVES
Zig-zag grooves help increase traction in new and worn tire conditions.

5-RIB PATTERN
The five-rib design ensures even wear and improves handling.



SHOULDER LUGS
Shoulder lugs minimize irregular tread wear and extend the life of the tire.

TECHNOLOGY FOR THE DRIVE

STR 500

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838124	11R22.5	144/142	G	14	M (81 mph)	7.50-8.25	17	6175	5840	105	11.0	41.5	112.2
838193	11R24.5	146/143	G	14	M (81 mph)	7.50-8.25	17	6610	6005	105	11.0	43.5	121.0
838391	285/75R24.5	144/141	G	14	M (81 mph)	7.50-8.25-9.00	17	6175	5675	110	11.1	41.3	113.5
838476	295/75R22.5	146/143	H	16	L (75 mph)	8.25-9.00	17	6610	6005	120	11.7	39.9	109.3
838483	295/75R22.5	144/141	G	14	L (75 mph)	8.25-9.00	17	6175	5675	110	11.7	39.9	109.3

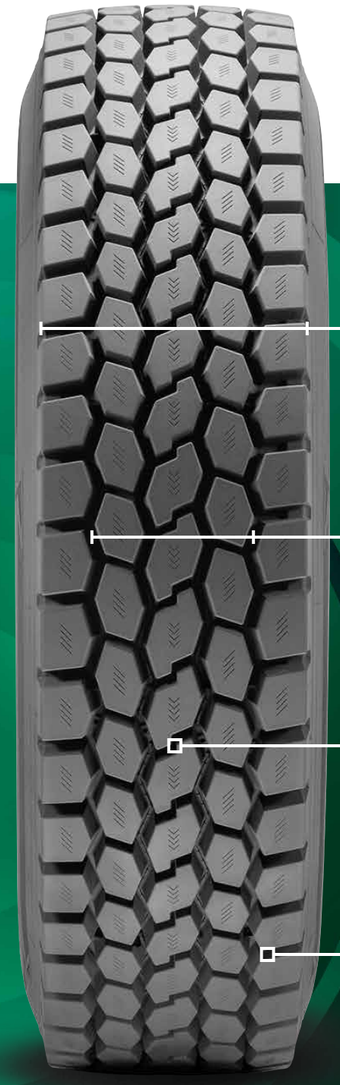
DRO 600

REGIONAL DRIVE

KTM #6

KTM#6 is a tread compound that provides well-balanced performance with an emphasis on low rolling resistance for excellent fuel economy.

Introducing the DRO 600, the ultimate tire for regional/drive trucking. Our innovative block design is engineered to reduce ground contact area, resulting in significantly increased mileage performance. You can expect to go the extra mile with the DRO 600's extra wide tread and deep grooves, which ensure ultra-high mileage is achieved. With a higher number of gripping edges, the DRO 600 provides improved drive axle traction, making it the perfect tire for tackling tough terrain. The open-shoulder design also promotes exceptional traction, ensuring you have the grip you need to drive confidently in any condition.



EXTRA WIDE TREAD
The extra wide tread and deep grooves ensure the most mileage possible.

NEW BLOCK DESIGN
The new block design decreases wear by reducing the ground contact area for significantly increased mileage performance.

MULTIPLE GRIP EDGES
A higher number of gripping edges improves the drive axle traction.

OPEN-SHOULDER DESIGN
The open-shoulder design promotes exceptional traction.

TECHNOLOGY FOR THE DRIVE

DRO 600

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838117	11R22.5	146/143	H	16	M (81 mph)	7.50-8.25	27	6610	6005	120	11.0	41.9	122.8
838186	11R24.5	149/146	H	16	M (81 mph)	7.50-8.25	27	7160	6610	120	11.0	43.9	132.1
838278	225/70R19.5	128/126	G	14	M (81 mph)	6.00-6.75-6.75RW	17	3970	3750	110	9.0	31.9	65.9
838322	245/70R19.5	135/133	H	16	M (81 mph)	6.75-7.50-7.50RW	17	4805	4540	120	9.8	33.0	78.3
838384	285/75R24.5	144/141	G	14	M (81 mph)	7.50-8.25-9.00	27	6175	5675	110	11.1	41.8	123.0
838452	295/75R22.5	146/143	H	16	L (75 mph)	8.25-9.00	27	6610	6005	120	11.7	40.4	120.1
838469	295/75R22.5	144/141	G	14	L (75 mph)	8.25-9.00	27	6175	5675	110	11.7	40.4	120.0

TRR 700

REGIONAL TRAILER

KTM #6

KTM#6 is a tread compound that provides well-balanced performance with an emphasis on low rolling resistance for excellent fuel economy.

Introducing the TRR 700, the ultimate regional/trailer tire designed to provide superior performance and durability in any condition. With inner grooves for optimum protection against stone retention, you can enjoy peace of mind knowing that your tires are protected from damage. The optimized footprint of the TRR 700 promotes uniform wear and prolongs the service life of the tire, ensuring that you get the most out of your investment. The groove design prevents stone retention and protects the casing, providing you with a tire that is built to last. The TRR 700's wide and solid shoulder design also improves mileage and handling, giving you the control and stability you need on the road.

RESISTANT INNER GROOVES
Inner grooves provide optimal resistance against stone retention.

SMART GROOVES
A combination of straight and curved grooves protects the casing and prevents stones from lodging in the tread.

OPTIMIZED FOOTPRINT
Designed for uniform tread wear, this optimizes its carbon footprint and prolongs the life of the tire.

WIDE SHOULDER DESIGN
The wide, solid shoulder design improves mileage and handling.

TECHNOLOGY FOR THE DRIVE

TRR 700

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838131	11R22.5	144/142	G	14	M (81 mph)	7.50-8.25	13	6175	5840	105	11.0	41.5	104.7
838209	11R24.5	146/143	G	14	M (81 mph)	7.50-8.25	13	6610	6005	105	11.0	43.5	113.1
838407	285/75R24.5	144/141	G	14	M (81 mph)	7.50-8.25-9.00	13	6175	5675	110	11.1	41.3	105.4
838490	295/75R22.5	144/141	G	14	L (75 mph)	8.25- 9.00	13	6175	5675	110	11.7	39.9	99.2

DRM 600

MIXED SERVICE DRIVE

KTM#4

KTM#4 is a tread compound that provides well-balanced performance with an emphasis on cut & chip resistance for on/off-road use.

Introducing the DRM 600, the ultimate mixed service/drive tire for any driving condition. Our innovative tread pattern is designed to provide outstanding traction and excellent on and off-road wear performance, ensuring maximum grip and durability. The optimized gripper edges also minimize stone retention and provide optimal off-road grip, giving you the confidence to take on any terrain. The DRM 600's deep tread ensures long life and outstanding traction, while its wide tread dimension promotes high performance both on/off asphalt roads to provide better mileage. The DRM 600 delivers superior performance and long-lasting durability.

ON/OFF-ROAD PERFORMANCE
This innovative tread pattern provides outstanding traction and excellent on and off-road wear performance.

TRACTION DESIGN
This tire features a deep tread design for long life and outstanding traction.

GRIPPER EDGES
These optimized scored edges for optimal off-road grip also minimize stone retention.

DIMENSIONAL TREAD
The wide tread dimension promotes high performance both off-road and on asphalt surfaces, to provide better mileage.

TECHNOLOGY FOR THE DRIVE

DRM 600

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838162	11R22.5	146/143	H	16	K (68 mph)	8.25	28	6610	6005	120	11.0	41.9	
838247	11R24.5	149/146	H	16	K (68 mph)	8.25	28	7160	6610	120	11.0	43.9	

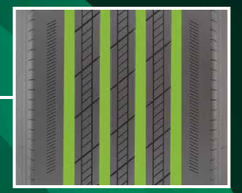
APR 800

REGIONAL ALL-POSITION

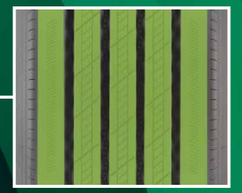
KTM #5

KTM#5 is a tread compound that provides well-balanced performance with an emphasis on high wear resistance for improved mileage and low rolling resistance, for excellent fuel economy.

Introducing the APR 800, the ultimate regional/all-position commercial truck tire designed for superior performance and durability. With smaller groove widths that add tread material and increase wear resistance, you can expect high mileage performance from the APR 800. Our micro-sipe technology relieves tire shoulder pressure and prevents uneven wear, giving you a tire that lasts longer and performs better. The wave groove wall design also improves the overall rigidity of the pattern, providing you with better control and handling on the road. With stone ejectors at the bottom of the main grooves, you can be sure that your tires are protected from damage, ensuring long-lasting durability and reliability.

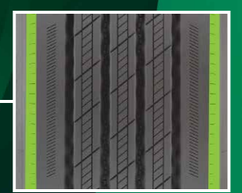


4 WIDE GROOVES
The 4 wide and straight grooves effectively evacuate water, enhancing wet traction and driving confidence.



5-RIB PATTERN
The 5-rib pattern with straight grooves promotes even wear and improved rolling resistance.

STONE EJECTORS
The wave design within a straight groove wall helps prevent stone entrapment and improves tread pattern stiffness, ensuring on-road stability.



EVEN WEAR SIPES
These micro-sipes are used to relieve tire shoulder pressure and prevent uneven wear.

TECHNOLOGY FOR THE DRIVE

APR 800

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838148	11R22.5	146/143	H	16	M (81 mph)	7.50-8.25	17	6610	6005	120	11.0	41.5	112.2
838216	11R24.5	149/146	H	16	M (81 mph)	7.50-8.25	17	7160	6610	120	11.0	43.5	121.0
838261	215/75R17.5	135/133	H	16	L (75 mph)	6.00-6.75	15	4805	4540	123	8.3	30.2	58.9
838285	225/70R19.5	128/126	G	14	M (81 mph)	6.00-6.75-6.75RW	17	3970	3750	110	8.9	31.9	65.5
838292	235/75R17.5	143/141	J	18	L (75 mph)	6.75-7.50	15	6005	5675	127	9.2	31.4	60.8
838308	245/70R17.5	143/141	J	18	K (68 mph)	6.75-7.50	15	6005	5675	130	9.8	31.0	63.9
838315	245/70R19.5	135/133	H	16	M (81 mph)	6.75-7.50-7.50RW	17	4805	4540	120	9.8	33.0	72.3
838339	255/70R22.5	140/137	H	16	M (81 mph)	6.75-7.50-8.25	17	5510	5070	120	10.0	36.6	85.3
838414	285/75R24.5	144/141	G	14	M (81 mph)	7.50-8.25-9.00	17	6175	5675	110	11.1	41.3	113.5
838421	295/75R22.5	144/141	G	14	L (75 mph)	8.25-9.00	17	6175	5675	110	11.7	39.9	109.3
838506	295/75R22.5	146/143	H	16	M (81 mph)	8.25-9.00	17	6610	6005	120	11.7	39.9	109.3
838520	315/80R22.5	157/154	L	20	M (81 mph)	9.00-9.75	18	9090	8270	130	12.3	42.4	130.3

DRC 600

KTM #6

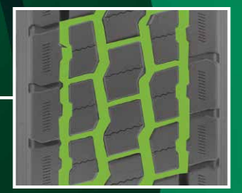
KTM#6 is a tread compound that provides well-balanced performance with an emphasis on low rolling resistance for excellent fuel economy.

Introducing the DRC 600 – the ultimate long haul/drive tire that offers unbeatable performance and reliability. With an optimized pattern block design, this tire provides exceptional damage resistance for the tread, ensuring that it can handle even the toughest road conditions. The unique traction pattern and deep grooves work together to enhance driving performance while also prolonging the service life of the tire. The continuous shoulder design improves tread stability, prevents irregular wear and reduces rolling resistance, which means you can enjoy a smoother and more comfortable ride while obtaining greater fuel savings. Additionally, the shoulder lugs help reduce tread heat, which helps prolong the life of the tread, saving you money in the long run.

LONG HAUL DRIVE

OPTIMIZED TREAD PATTERN
The optimized pattern block design improves tread damage resistance.

CONTINUOUS SHOULDER DESIGN
A continuous shoulder design improves tread stability, prevents irregular wear, and reduces rolling resistance.



DEEP TRACTION GROOVES
Deep grooves in the traction pattern ensure better driving performance and prolong the life of the tire.

ANTI-HEAT SHOULDER LUGS
These shoulder lugs reduce heat produced by road contact and prolong the life of the tread.

TECHNOLOGY FOR THE DRIVE

DRC 600

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838100	11R22.5	146/143	H	16	M (81 mph)	7.50-8.25	27	6610	6005	120	11.0	41.9	122.1
838223	11R24.5	149/146	H	16	M (81 mph)	7.50-8.25	27	7160	6610	120	11.0	43.9	131.4
838377	285/75R24.5	144/141	G	14	M (81 mph)	7.50-8.25-9.00	27	6175	5675	110	11.1	41.8	124.1
838438	295/75R22.5	146/143	H	16	L (75 mph)	8.25-9.00	27	6610	6005	120	11.7	40.3	119.9
838445	295/75R22.5	144/141	G	14	L (75 mph)	8.25-9.00	27	6175	5675	110	11.7	40.3	119.9

APM 800

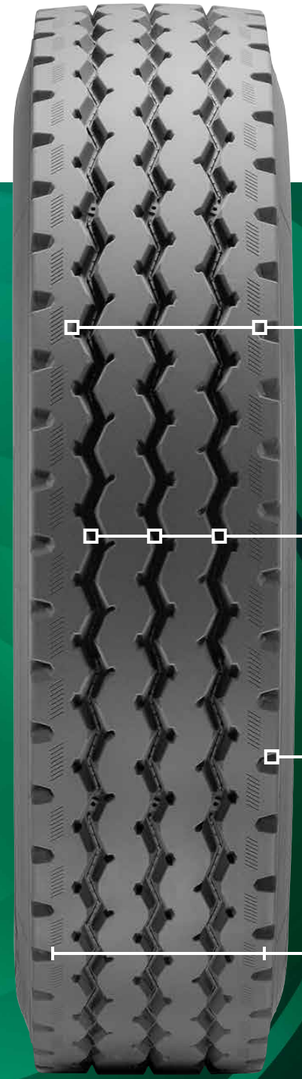
MIXED SERVICE ALL-POSITION

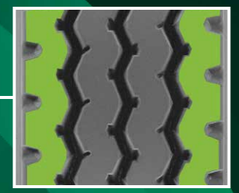
KTM#4

KTM#4 is a tread compound that provides well-balanced performance with an emphasis on cut & chip resistance for on/off-road use.

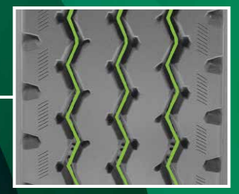
Introducing the APM 800, the ultimate mixed service/all-position commercial truck tire designed for superior performance and durability. Our continuous shoulder design combats tread squirm for long tread life, ensuring that your tires last longer and perform better. With multiple gripping angles that provide biting edges, the APM 800 also helps promote wet traction, giving you the grip you need in any weather condition. And with stone ejector platforms that help protect belts from potential damage, you can enjoy peace of mind knowing that your tires are protected. The APM 800's tread is also designed with variable-pitch noise treatment, helping to deliver a quiet ride and improving durability and traction. Whether you're hauling cargo or driving through mixed service environments, the APM 800 delivers the ultimate in performance, durability, and reliability.

TECHNOLOGY FOR THE DRIVE

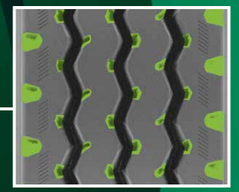




CONTINUOUS SHOULDER DESIGN
This tire's continuous shoulder design enhances stability and ensures longer tread life.



STONE EJECTORS
The stone ejectors remove stones from the tread and help to prevent cracks in the bottom of the grooves.



MULTIPLE GRIP ANGLES
Multiple gripping angles provide biting edges that help promote wet traction.

VARIABLE PITCH
The tread is designed with variable pitch to deliver a quiet ride and improve durability and traction.

APM 800

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838155	11R22.5	146/143	H	16	N (87 mph)	7.50-8.25	17	6610	6005	120	11.0	41.5	116.6
838230	11R24.5	149/146	H	16	N (87 mph)	7.50-8.25	17	7160	6610	120	11.0	43.5	124.8
838346	255/70R22.5	140/137	H	16	N (87 mph)	6.75-7.50-8.25	17	5510	5070	120	10.0	36.6	85.8
838360	275/70R22.5	148/145	J	18	N (87 mph)	7.50-8.25	17	6940	6395	130	10.9	37.7	108.0
838513	315/80R22.5	157/154	L	20	N (87 mph)	9.00-9.75	20	9090	8270	130	12.3	42.4	144.8
838537	385/65R22.5	160	L	20	M (81 mph)	11.75-12.25	19	9920	/	130	15.3	42.2	150.1
838544	425/65R22.5	165	L	20	N (87 mph)	12.25-13.00-14.00	21	11400	/	120	16.6	44.3	202.8

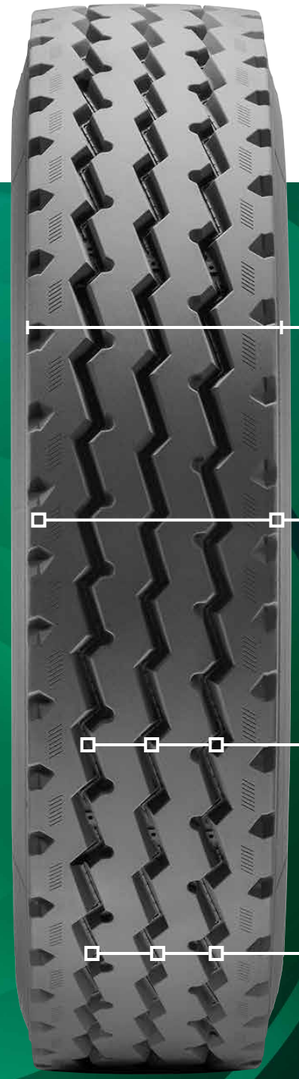
APM 900

MIXED SERVICE ALL-POSITION

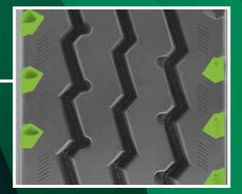
KTM#4

KTM#4 is a tread compound that provides well-balanced performance with an emphasis on cut & chip resistance for on/off-road use.

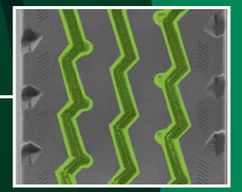
Introducing the APM 900, the ultimate mixed service/all-position commercial truck tire designed for superior performance and durability. Our rugged four-rib design with a special groove shape combats stone retention, ensuring long mileage and retreadability. With V-Channels and groove bottom protectors, the APM 900 also defends the casing against stone retention and stone drilling, providing you with a tire that is built to last. The shoulder lugs provide grip and reduce the tread heat, prolonging the life of the tread. The zig-zag groove design makes it suitable for true all-position use, providing you with the versatility you need in any driving condition. Whether you're hauling cargo or driving through mixed service environments, it delivers the ultimate in performance, durability, and reliability.



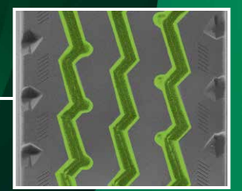
4-RIB DESIGN
This rugged 4-rib design with a special groove shape combats stone retention for longer mileage and tread life.



RUGGED SHOULDER LUGS
Shoulder lugs provide grip and reduce tread heat, prolonging the life of the tire.



GROOVE PROTECTORS
V-Channels and groove bottom protectors defend the casing against stone retention and stone drilling.



ZIG-ZAG GROOVE DESIGN
The zig-zag groove design enables true all-position use.

TECHNOLOGY FOR THE DRIVE

APM 900

ARTICLE NUMBER	SIZE	LOAD INDEX	LOAD RANGE	PLY RATING	SPEED RATING	RIM WIDTH RANGE	TREAD DEPTH	MAX LOAD		MAX INFLATION	TIRE SECTION WIDTH	TIRE OUTSIDE DIAMETER	WEIGHT
								SINGLE	DUAL				
					mph	in.	32nds	lbs.	lbs.	psi	in.	in.	lbs.
838179	11R22.5	146/143	H	16	N (87 mph)	7.50-8.25	17	6610	6005	120	11.0	41.5	115.7
838254	11R24.5	149/146	H	16	N (87 mph)	7.50-8.25	17	7160	6610	120	11.0	43.5	124.8
838353	255/70R22.5	140/137	H	16	N (87 mph)	6.75-7.50-8.25	17	5510	5070	120	10.0	36.6	85.8

AVANTECH TRUCK/BUS RADIAL (TBR) & AVANTECH COMMERCIAL TIRE (LTC) WARRANTY

Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) WARRANTY TERMS

TRUCK & BUS TIRES

This limited warranty/adjustment policy provides coverage for tire replacement under certain specified conditions. This policy applies to tires used in normal highway service displaying warrantable conditions. Tires that become unserviceable or wear out because of neglect or mistreatment are excluded from Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) warranty coverage.

This limited warranty applies to the original purchaser of any new tire manufactured by Avantech, bearing Department of Transportation prescribed identification numbers (DOT numbers). Eligible tires shall be used on the vehicle on which they were originally installed according to the vehicle manufacturer's recommendation. This warranty applies if all the following qualification requirements are met:

- The tires were purchased after September 1st, 2021.
- The tire is a size, load rating, and speed rating equal to or greater than that recommended by the vehicle manufacturer.
- The tire has not become unserviceable due to a condition listed under WHAT THIS WARRANTY DOES NOT COVER section below.

WHAT IS COVERED UNDER THIS WARRANTY AND FOR HOW LONG?

WARRANTY ELIGIBILITY

This warranty applies to every Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) tire bearing an Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) brand name and complete D.O.T. serial identification number operated in normal highway use in the United States. Eligible tires must be on the vehicle on which they were originally installed, in conformance with the vehicle manufacturer's recommendations. This warranty applies only to the original tire purchaser, and is not transferable to any other party. Tires are covered by this warranty for the life of the original usable tread down to the tread depth indicators molded at 2/32" (1.6mm), not to exceed five years (60 months) from the date of purchase or date of manufacture if proof of purchase is not made available.

Replacement warranty applies if tires become unserviceable due to a defect in workmanship or material during the first 2/32nd" of the original tread depth. The defective tire will be replaced with a comparable new Avantech manufactured tire by an Avantech Truck/Bus Radial (TBR) authorized tire dealer. Tires with quality problems related to appearance before use will be reimbursed for the full FOB price.

The warranty period is limited to a maximum of five years (60 months) from the date of manufacture based on DOT. Tires that have become unserviceable as a result of any inherent deficiency relating to workmanship or material shall be compensated in value according to the FOB price based on the percentage of tread depth remaining more than the tread wear indicator (or "TWI", which indicates 1.6 mm tread remaining), as shown in the following example:

EXAMPLE:

New tire tread depth is 10mm, TWI is 1.6mm, remaining tread depth is 6.3mm, FOB cost is USD $200.00

Compensation = FOB price x (Remaining Tread depth - TWI) / New tire tread depth
= USD $200 x (3.6mm - 1.6mm) / 10mm
= USD $200 x 0.2
= USD $40

Unless eligible for **No Charge Adjustment** (detailed below), any applicable taxes or fees, mounting cost, balancing cost, and any charges by the dealer are not covered by the warranty policy from the manufacturer. The buyer shall pay for mounting, balancing, and an amount equal to the full, current Federal Excise Tax and any other applicable taxes and fees for the comparable new tire. Any claims shall always be assessed by an Avantech Truck/Bus Radial (TBR) technician or by technicians designated by Avantech Truck/Bus Radial (TBR).

ADJUSTMENT POLICY

No Charge Adjustment

An Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) tire accepted for warranty credit during the first 2/32" (1.6mm) of treadwear or 12 months from date of purchase, whichever occurs first, will be replaced on a no-charge basis. During this wear period, tires will be mounted and balanced free of charge. Federal Excise Tax (FET) will not be collected on a no-charge adjustment. Other service charges, such as tire rotation and wheel alignment are payable by the customer.

Prorated Adjustment

For all other warrantable conditions, an Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) tire will be replaced on a prorated basis. The customer will receive credit toward the purchase of the new tire by multiplying the percentage of the tread depth remaining by the dealer's current selling price of the new comparable Avantech Truck/Bus (TBR) or Light Truck Commercial (LTC) tire at the time of replacement service, but never less than the casing credit listed in the Special Casing Warranty (see the example above, under the Warranty Eligibility section). The customer pays full Federal Excise Tax (FET) applicable to the comparable new Avantech Truck/Bus TBR or Light Truck Commercial (LTC) tire plus all mounting, balancing and other service charges.

WHAT THIS WARRANTY DOES NOT COVER

Tires that have become unserviceable for the following reasons:

- Road hazard injuries or damage caused to the tire by obstacles and debris, such as cuts, punctures (whether repairable or not), snags, bruises, tears, or impact breaks
- Accident, wreck, vandalism, corrosion, theft, fire, or damage caused by nature
- Improper inflation, overloading, high-speed spinouts, misapplication, misuse, negligence, racing, chain damage, improper balance, wrong wheel sizing, improper mounting or demounting, or other maintenance abuses
- Improper mounting/dismounting procedures or tire/wheel assembly balance
- Improper application of tire size and/or specification
- Improper repairs or repairs that have failed
- Mechanical irregularities in the vehicle or wheel, such as bent wheel assemblies, misalignment, and worn or faulty components
- Damage caused because tires were used for racing or other competitive events, or off-roading when they were not intended for such applications
- Instances of ride disturbance due to damaged wheels or any vehicle condition
- Tire was intentionally altered after leaving the factory
- Weather checking/cracking or failures resulting from climate conditions on tires purchased more than four years (48 months) prior to a warranty claim (if proof of purchase is not provided, the D.O.T. serial number might be an eligible substitute at the discretion of Avantech Tires)

ADDITIONAL EXCLUSIONS

- Tires that have been altered or have had material added after leaving an Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) tire manufacturing plant, such as fillers, sealants, balancing substances, or materials of any kind. Additionally, tires that have had external tire treatments, including but not limited to not limited to: tread siping, shaving, carving, regrooving, white sidewall inlay, or applying materials or treatments to the tread surface. If the material or treatment is the cause of a failure, vibration, or ride disturbance, the tire will not be accepted for warranty or mileage warranty credit.
- Tires submitted for ride disturbance complaints after 2/32" (1.6mm) of treadwear or 12 months from the date of purchase
- Tires on vehicles registered or operated outside of the United States (refer to applicable Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) warranty policies for the country of operation)
- Tires not sold in the United States by AVANTECH Tire USA
- Tires branded by Avantech to note special classification at time of purchase, such as "NA" (non-adjustable), or "blemished" or tires altered by notching or buffing
- Previously adjusted tires
- Tires transferred from one vehicle to another
- Tires that have been improperly stored

Additionally, loss of time and use of vehicle, inconvenience, and/or incidental or consequential damage are not covered.

This limited warranty is applicable only in the United States, Canada, and Mexico, and any tire used or equipped on a vehicle registered or operated outside the U.S., Canada, and Mexico are not covered by this warranty.

AVANTECH FIVE-YEAR CASING WARRANTY

All AVANTECH casings will be warranted for workmanship and materials through the first retread for a period of five years from the manufactured date indicated in the DOT number.

If an authorized AVANTECH dealer examines the casing and finds such a defect, AVANTECH will reimburse the owner for the casing according to the following schedule:

AVANTECH CASING VALUES

SIZE CASING	VALUES
215/75R17.5	$20
235/75R17.5	$20
245/70R17.5	$20
225/70R19.5	$30
245/70R19.5	$30
265/70R19.5	$30
435/50R19.5	$30
255/70R22.5	$45
275/70R22.5	$50
295/75R22.5	$50
315/80R22.5	$50
385/65R22.5	$55
285/75R24.5	$55
11R22.5	$50
11R24.5	$50

OWNER'S GENERAL OBLIGATION

In order to be eligible for the Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) Limited Warranty plan, the owner must do the following:

The customer must present the claimed tire to an authorized Avantech TBR Truck/Bus and Light Truck Commercial (LTC) dealer in the United States.

- Submit photographs of the claimed tire(s), including the following information:
  1. Photos of the damaged area, with the damage marked
  2. A photo of the entire claimed tire(s), both inside and out, which must include the damaged area
  3. The size and brand, DOT, and period number of the claimed tire(s)
- The photos must include the three things listed above, and must all be of the same tire.
- The buyer/owner must present the claimed tire(s) to the authorized distributors for compensation.

If the tire owner abuses the tires through activities not limited to the following:

- Failing to observe safety warnings
- Failing to maintain proper inflation pressure
- Failing to maintain vehicle alignment and tire rotation

The expected tire life will not be achieved and your safety cannot be ensured.

Avantech Tires Corporation's Obligations

Replacements qualifying under warranty must be made by an authorized Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) tire dealer.

SPECIAL CASING WARRANTY ELIGIBILITY

This policy applies to tires displaying warrantable conditions when used in appropriate service and meet the following criteria:

- Tires must be or have been retreaded in a manner consistent with standard industry practice.
- Tires submitted for hidden conditions must be or have been using a non-destructive tire casing analyzer prior to any retreading and be so identified.

Truck tires designated by an Avantech TBR Truck/Bus or Light Truck Commercial (LTC) as approved for and used in on/off highway applications are eligible for warranty consideration if they display warrantable conditions.

What is Warranted and for How Long?

Prior to the retreading process, Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) tires are covered by all provisions of the Avantech Truck/Bus Radial (TBR) and Light Truck Commercial (LTC) Limited Warranty. After the first retreading has been applied on the qualified tire, an additional special casing warranty applies. If a qualified tire becomes unserviceable due to a warrantable condition, the customer will be given a casing credit, as indicated in the chart below. The retread life is defined as beginning with the installation of the new retread stock and ending after buffing for subsequent retread.

What is Not Covered?

- Casings damaged by road hazard injuries or damages caused by obstacles or debris such as cuts, punctures (whether repairable or not), snags, bruises, tears, abrasions, or impact breaks
- Casings damaged by improper repairs or repairs that have failed
- Casings damaged by improper inflation or other maintenance abuses
- Casings damaged by continued operation while flat or severely underinflated
- Casings damaged by improper application of tire size and/or specification
- Casings damaged by improper mounting/dismounting procedures or tire/wheel assembly imbalance
- Casings damaged by accident, corrosion, vandalism, fire, or nature
- Casings damaged by the use of aftermarket tire additives, such as fillers, sealants, or balancing substances
- Casings damaged by improper retreading or defective retread materials
- Casings that cannot be retreaded because of excessive tread wear or buffing
- Casings not retreaded in a manner consistent with standard industry practice
- Tires covered by Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) Tires Limited Warranty
- Tires branded by Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) to note special classifications at the time of purchase, such as "NA" (non-adjustable), or tires altered by notching or buffing
- Tires on vehicles registered or operated outside the United States (refer to applicable Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) warranty policies for the country of operation)
- Tires not sold in the United States by AVANTECH Tire USA

CUSTOMER'S OBLIGATIONS

The customer must present the claim tire to an authorized Avantech Truck/Bus Radial (TBR) or Light Truck Commercial (LTC) tire dealer. The customer is required to pay the adjusted price of the new tire (which is the dealer's current retail selling price at the time of adjustment, less credit allowance) and taxes. The cost of mounting, balancing, and any other service charges or applicable taxes are also payable by the customer.

DISCLAIMER

This warranty, or any warranty stated or referred to herein, is exclusive and in lieu of any other warranty regarding the quality of Avamtecj tires, whether expressed or implied. A remedy for breach thereof shall be limited to those specifically provided herein. Any warranty of merchantability or fitness for any particular purpose, if made, is limited in duration to the effective time period of this limited warranty.

LIMITATIONS AND EXCLUSIONS

All implied warranties, including any warranty of merchantability or fitness for a particular purpose, are expressly limited to the duration of this written warranty. Avantech reserves the right to change warranty provisions at any time without obligation. All obligations or liabilities for loss of time, inconvenience, vehicle use, or any other incidental or consequential damages are hereby excluded. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply. This warranty gives the customer legal rights that may vary from state to state. The customer is advised to determine those rights for their local area and exercise them as required or deemed appropriate.

AVANTECH TRUCK/BUS RADIAL (TBR) AND COMMERCIAL TIRE (LTC) MAINTENANCE GUIDE

Important Safety Information

For your own safety and protection, observe the following safety precautions and instructions at all times. Failure to follow these precautions and maintenance instructions could result in serious injury or death.

PREFACE

The information provided here is intended both to help Avantech Tires Commercial Tire customers maintain their personal safety and to maximize the longevity and economy of their tires.

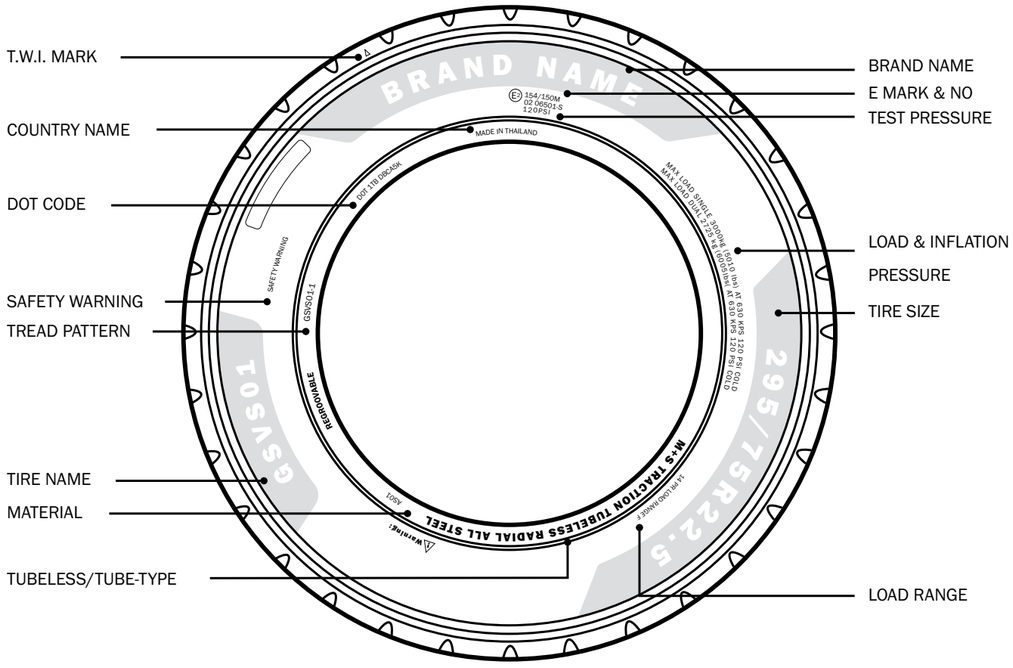
Commercial tire purchases are investments that should be protected through properly installing, maintaining, and repairing your tires. This manual describes how to regularly inspect tires, safe mounting and demounting, proper tire servicing, and tire repair.

By paying attention to these instructions and regularly providing good tire maintenance, tire customers can improve the safety and economy of their vehicles or fleets.

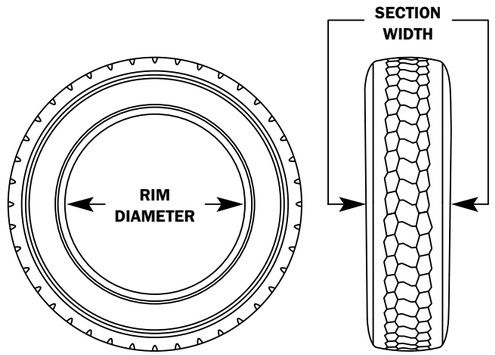
TRUCK TIRE SIDEWALL MARKINGS

All truck tires have sidewall markings that indicate their structure and construction type, the tire dimensions, and the tire brand or manufacturer. They should also be marked with the DOT code (Department of Transportation code) and/or the ISO (International Standards Organization) symbols. Below is a typical Avantech tire that illustrates the DOT and ISO markings that would be found on the tire's sidewall.

TIRE SIDEWALL MARKINGS



TIRE SIZE DIMENSION



TIRE SIZE DESCRIPTION

SIZE: 295/75 R22.5 14L	DESCRIPTION
295	Tire Section Width (mm)
75	Aspect Ratio (Section Height/Section Width)
R	Radial Structure
22.5	Rim Diameter (inches)
14	Ply Rating
L	Tire's Maximum Driving Speed Symbol

WARNING Make sure that the speed rating for any replacement tires is the same as, or higher than the OE tires' speed rating. If a replacement tire is selected that has a lower speed rating than the OE tire, then the top speed of the vehicle will be limited to the lower speed rating of that tire. Make sure the driver and/or customer understand the new speed limitation, as well as the impact it may have on the vehicle's handling if a lower speed-rated tire is used.

Make sure that the speed rating of the replacement tire is the same or higher than the speed rating of the tire being replaced, to maintain the safety, handling, and speed capability of the vehicle. A speed rating does not imply that it is safe to drive at the maximum speed that the OE or replacement tire is rated for. Always obey the laws and rules of traffic, and good traffic safety practices, and be aware that if a vehicle is driven in an unsafe manner or at an illegal speed, serious injury or death may occur.

Avantech Tires Commercial Tires' speed symbol designations are verified and comply with regulatory indoor testing. These symbols are not applicable to repaired tires.

Always make sure that the replacement tire's load carrying capacity is equal to, or greater than the capacity of the OE tire. If tires are overloaded with weights in excess of their allowable maximum load, they can build up excessive heat and lose air suddenly.

LOAD RANGE LIMITS, INFLATION PRESSURE & SPEED ADJUSTMENTS

The load limit of a tire can be affected by driving speed, tire construction, and tire position (for example, Single vs. Dual wheel application).

Refer to the table below to find recommended adjustments to driving speed, inflation pressure, and load limit increases or decreases. Remember never to exceed the manufacturer's recommendations for maximum load and inflation pressure.

TRUCK & BUS TIRES

THE SERVICE LOAD AND MINIMUM (COLD) INFLATION MUST COMPLY WITH THE FOLLOWING LIMITATIONS

SPEED RANGE MPH	INFLATION PRESSURE INCREASE RADIAL PLY TIRES				LOAD CHANGES WITH SPEED RADIAL PLY TIRES			
	CONVENTIONAL (STD) PROFILE 65 MPH	CONVENTIONAL (STD) PROFILE 75MPH	WIDE BASE/METRIC (LOW PROFILE) 65 MPH	WIDE BASE/METRIC (LOW PROFILE) 75MPH	CONVENTIONAL 65 MPH	CONVENTIONAL 75MPH	WIDE BASE/METRIC 65 MPH	WIDE BASE/METRIC 75MPH
71 - 75	+5 PSI	None	+5 PSI	None	- 12 %	None	- 12 %	None
66 - 70	+5 PSI	None	+5 PSI	None	- 4 %	None	- 4 %	None
51 - 65	None	None	None	None	None	None	None	None
41 - 50	None	None	None	None	+ 9 %	+ 9 %	+ 7 %	+ 7 %
31 - 40	None	None	None	None	+ 16 %	+ 16 %	+ 9 %	+ 9 %
21 - 30	+10 PSI	+10 PSI	+10 PSI	+10 PSI	+ 24%	+ 24%	+ 12 %	+ 12 %
11 - 20	+15 PSI	+15 PSI	+15 PSI	+15 PSI	+ 32 %	+ 32 %	+ 17 %	+ 17 %
6 - 10*	+30 PSI	+30 PSI	+20 PSI	+20 PSI	+ 60 %	+ 60 %	+ 25 %	+ 25 %
2.6 - 5*	+30 PSI	+30 PSI	+20 PSI	+20 PSI	+ 85 %	+ 85 %	+ 45 %	+ 45 %
Creep - 2.5**	+30 PSI	+30 PSI	+20 PSI	+20 PSI	+ 115%	+ 115%	+ 55 %	+ 55 %
Creep	+40 PSI	+40 PSI	+30 PSI	+30 PSI	+ 140%	+ 140%	+ 75 %	+ 75 %
Stationary*	+40 PSI	+40 PSI	+30 PSI	+30 PSI	+ 185%	+ 185%	+ 105 %	+ 105 %

*On conventional tires, apply load increase to dual loads and inflations only, even if tire is in single application
** On conventional tires, apply load increase to dual loads and inflations only, even if tire is in single application; Creep motion for not over 200 feet in a 30 min period
Source: The Tire & Rim Association Yearbook

FINDING THE CORRECT SIZES FOR TUBELESS AND TUBE-TYPE TIRES

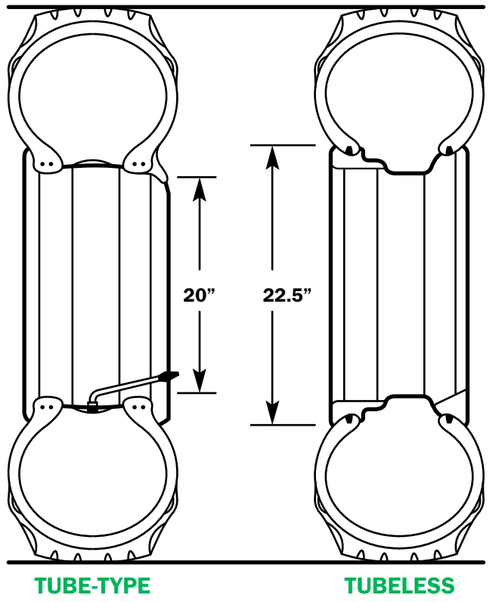
Find the best match of load capacity, overall diameter, and section width by checking the chart below.

TUBE-TYPE	TUBELESS
7.50 R 20	8 R 22.5
8.25 R 15	9 R 17.5
8.25 R 20	9 R 22.5
9.00 R 20	10 R 22.5
10.00 R 20	11 R 22.5
10.00 R 22	11 R 24.5
11.00 R 20	12 R 22.5
12.00 R 20	12 R 22.5

Rim Diameters and Section Widths can vary only slightly between Tubeless and Tube-Type tire assemblies. Check carefully, as measurements can appear very similar to each other. Make sure to select the correct one.

Rim Diameters and Section Widths can vary only slightly between Tubeless and Tube-Type tire assemblies. Check carefully, as measurements can appear very similar to each other. Make sure to select the correct one.

Diameter Comparison between Tubeless and Tube-Type Tires



LOW PROFILE TIRES

Low-profile tires have markings showing additional symbols for the load range and the maximum speed for the tire. Low-profile tires can benefit drivers by increasing fuel economy, increasing the load-carrying capacity, improving the tire’s ability to retread, and improving tire handling, such as cornering and braking.

CHOOSING AND MOUNTING REPLACEMENT TIRES

If a replacement tire size is chosen that differs from the size of the Original Equipment tires on the vehicle, make sure to check the following information:

LOAD CAPACITY

Make sure that the load-carrying capacity of the replacement tires is equal to, or greater than the OE tires.

TRANSMISSION RATIO

Choosing smaller or larger tires (in circumference) than the OE tires will affect driving acceleration and top speed. Choosing smaller tires will improve acceleration but reduce the top speed, while choosing larger tires will reduce acceleration but increase the top speed.

RIM DIAMETER

If smaller diameter wheels or rims are chosen, check for proper brake drum clearance, ground clearance, and a sufficient ride height.

RIM WIDTH

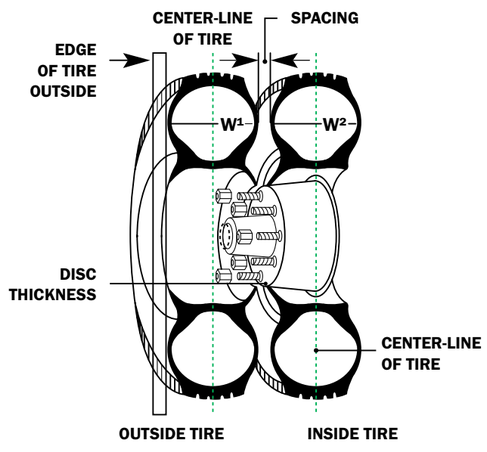
It is important that the rim width of the tire fit within the specified section width range of the tire. If the replacement tire’s section width is only slightly larger or smaller than the OE tire, the same rim width should be acceptable. However, if there is more than just a small increase or decrease in section width, a change of rim widths is necessary to accommodate the replacement tire.

TIRE SPACING

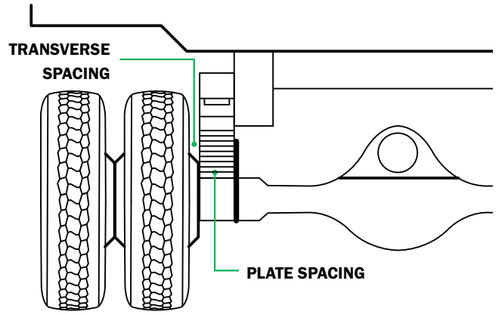
Tire spacing should be checked for sufficient clearance to avoid coming into contact with fixed parts of the vehicle such as the body, chassis, or undercarriage, and to avoid contact with movable suspension parts of the vehicle, like springs and shocks. The minimum clearances generally accepted are 15 mm for stationary parts and 25 mm for movable parts.

Please note that minimum acceptable clearances may vary according to vehicle classification.

Dual Wheel Spacing

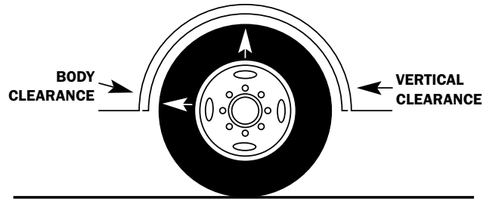


Transverse Clearance



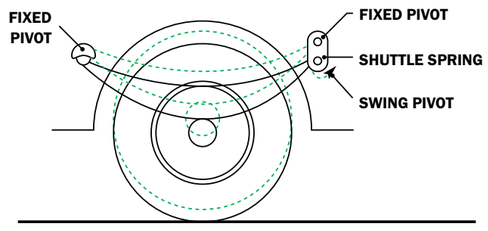
Check to ensure sufficient clearance between the tire, the body, and the chassis, both when suspension is loaded, and unloaded, to avoid the tire hitting or scraping against any parts of the vehicle. The shock absorber and the stiffness rating of the spring is also a factor to consider when checking the vertical clearance. Ensure that clearances will be sufficient to prevent the tire from contacting the body panels or the undercarriage of the vehicle, even when traveling under maximum suspension and with deflection.

Suspension Clearance



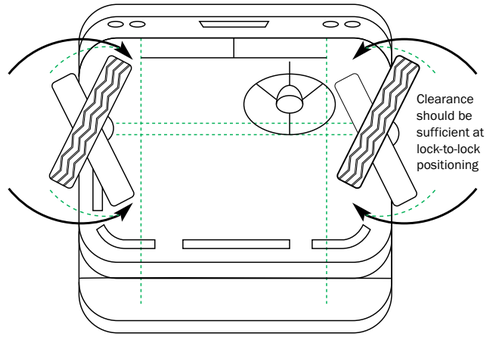
On vehicles with leaf springs with a swing pivot that allow wheels to move forward and backward, make sure to leave clearance of approximately one third of the total distance of the swing action’s travel.

Front-Wheel Pivot Clearance



Ensure sufficient front-wheel clearance, checking to make sure the clearance is acceptable at lock-to-lock steering positions, and at the midpoint.

Lock-to-Lock Clearance



CLEARANCE CHECKS

Once mounted, check to ensure that wheels have clearance from brake drums and discs, suspension parts or steering assembly, the vehicle body, and other parts. There should be a margin of clearance of 20-25 mm, with nothing touching either the tire or valve.

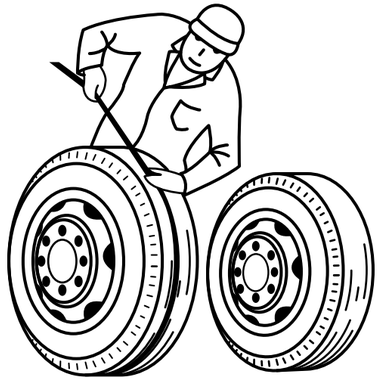
MATCHING DUAL-WHEEL TIRES

In vehicles with dual wheels, it is very important that the circumferences of the two tires be the same. This may sound obvious, however, if tires are not new (have tread wear), have been retreaded, or have differing tread patterns, use a tape measure to carefully match the tires once they are mounted and inflated prior to installation on the vehicle.

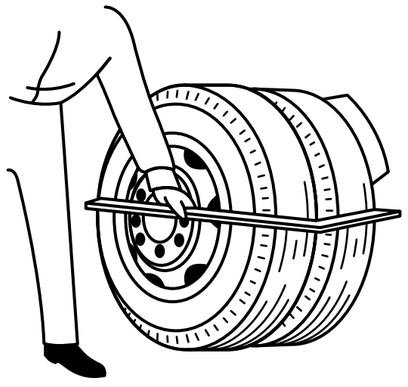
Follow these additional instructions to ensure correctly matching dual wheel tires:

- Mount and inflate the tires to the manufacturer’s recommended pressures before measuring their circumference using a tape measure.
- If the tires are already mounted as dual-wheels, measure them using a square rule to ensure that the tires are matching in size.
- To ensure uniform sizing on a dual-wheeled axle, measure using a long, straight rule across the tread of all four tires.

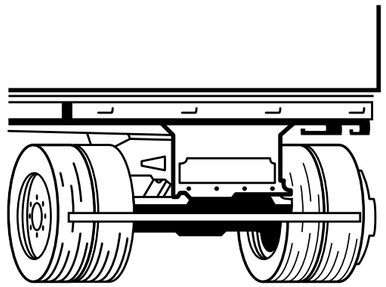
How to Measure the Circumference and Diameter of Dual-Wheel Tires



Circumference Tape Measurement



Stick Rule Measurement



Straight Rule Measurement

Proper inflation is one of the most important aspects of tire maintenance and safety. Sufficiently inflated tires allow safe load carrying and avoid tire damage. Driving on under-inflated or over-inflated tires is dangerous to the vehicle and driver, as it can cause critical damage or sudden tire failure. Tire inflation should be checked and maintained on a weekly basis, at minimum, and before long-distance drives. Check tire pressure while tires are cold before they have been driven any significant distance, and adjust pressure as necessary. It is not advisable to check or adjust tire pressure after driving even a moderate distance, as this increases the tire's temperature and the air pressure inside causing inaccurate pressure readings, resulting in under-inflation once the tire cools. Also, take into account the axle load and driving conditions when tire inflation pressure is being set. Heavier loads can be compensated by increasing inflation pressure, but never exceed the maximum axle load or maximum inflation for the tire.

The best practice for tire maintenance and efficiency is to maintain the tire pressure and inflation recommended by the manufacturer and to make sure that the inflation pressure is equal on both sides.

OVER-INFLATION AND UNDER-INFLATION

The most important factor in taking care of tires is to maintain proper air pressure. Over the course of only one month, a tire could lose up to 10 lbs of air pressure! It is very important to regularly check tire pressure at least once a month with a good quality air gauge, and maintain proper air pressure to avoid driving on over- or under-inflated tires.

Under-inflation is your tire's worst enemy, causing increased tread wear on the tire's shoulders and excessive heat build-up which reduces the durability of the tire. The increased rolling resistance of an under-inflated tire also reduces fuel economy.

Over-inflation also shortens the life and durability of a tire. When a tire is over-inflated, the center of the tread wears faster and deteriorates, shortening the life of the tire.

You can find your tire's correct air pressure in the vehicle owner's manual, or from your tire dealer when new tires are purchased.

CHECKING THE TIRE PRESSURE

Check your tire pressure at least once a month, as most tires naturally lose air over time, or can lose air suddenly due to small impacts such as driving over potholes or objects, or hitting a curb. It is especially important to check radial tires, as it is usually impossible to determine if they are under or over-inflated by visual inspection alone.

Tire pressure gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets. It may be convenient to have one to keep in the vehicle to regularly measure air pressure. Keep in mind that the manufacturer's recommended tire pressure reflects the tire pressure (psi) when the tire is cold, meaning that the tire has not been driven on for at least three hours. (When tires are driven on, they warm up, causing the air pressure inside them to increase, which would give an inaccurate pressure reading). To get an accurate reading of your tire air pressure, make sure to measure it when the tires are cold, or compensate for the extra pressure in the event that reading must be taken while the tires are warm.

INSPECTING YOUR TIRES

When checking tire inflation pressure, also visually inspect the tire itself. Check for problems such as:

- Areas of swelling
- Cracks
- Irregularities on the surface or tread
- Damage or punctures of any kind
- Check wheels, valves, and valve stems for damage

If you find any of these issues, contact your tire dealer or have it repaired according to the manufacturer's recommendations. If the damage is too extensive to be repaired, the tire should be removed and discarded or destroyed to maintain vehicle and passenger safety.

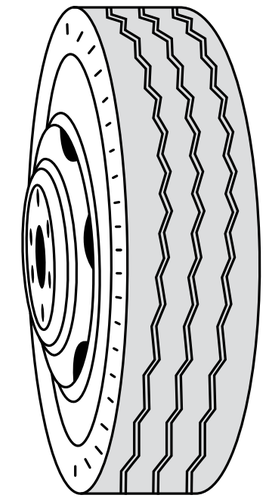
AVOIDING DAMAGE AND RAPID WEAR

Driving conditions such as uneven road surfaces or debris like rocks and stones can be a major cause of damage and rapid tread wear. Driving slowly and carefully, and avoiding rapid stops and starts can help prevent these kinds of damage. Driving while overloaded can also contribute to damage and excessively fast wear of tires. Make sure not to overload the vehicle. These factors and conditions can also cause alignment issues, which should be checked and corrected before high-speed or long-distance driving.

TAKING TREAD DEPTH MEASUREMENTS

When checking the tread depth of a tire to determine tread wear, take measurements at 90-degree intervals around the circumference of the tire. If the tread measures less than 2/32nds of an inch of tread in two or more places, or if the wear indicator bars are exposed, the tire is dangerous to drive on and should be replaced. Keep in mind that some countries and regions may have different tread wear restrictions based on local conditions which may require more tread for safe driving (for example, a 4/32nds of an inch tread minimum). If you have any doubts, check with local driving authorities for this information.

Wear Measurement



Wear indicator bars exposed at 1.6mm means the tire is worn out.

MAXIMUM LOAD

The maximum loads for TBR tires are carefully calculated to take into account inflation, vehicle speed, and driving conditions. Do not overload! For your safety, follow loading recommendations, inflation instructions, and travel at moderate speeds, driving appropriately for road conditions. Consult a tire service provider to verify the maximum load for your tires so that you do not overload. Overloading can result in overheating, damage to the tire or vehicle, or even tire failure, which can cause serious injury.

MAXIMUM SPEED

The maximum speed for the tire is the highest speed that the tire can be driven before it overheats and is damaged or fails. The max speed is molded onto the sidewall of the tire. For the safety and longevity of the tire, drivers should stay below the tire's maximum recommended speed and never exceed posted speed limits. As previously noted, proper tire inflation should be maintained, but it is especially important in the case of higher-speed driving (eg. highways), as driving at higher speeds can cause the tire to heat up rapidly, and tire impacts with road debris can cause more severe damage to a tire at high speeds. Reducing speed can help drivers avoid road hazards and debris.

TIRE ROTATION

Follow the vehicle manufacturer's recommendations for tire rotation. Some other guidelines include:

- Only rotate tires according to the manufacturer's recommendations or when necessary, such as if irregular wear has occurred.
- Follow the vehicle manufacturer's recommendations for rotation patterns.
- There is no restriction on cross-rotation of tires.
- To combat irregular tire wear, rotate tires to spin in the opposite direction of the original position.
- Always mount directional tires in the direction of rotation.

TIRE STORAGE

Proper tire storage areas should be dry and ventilated with protection against direct sunlight and heat. Also avoid exposing tires to fuels, oils and greases, natural gas, or electric charges.

Moisture buildup within or on the outside of the tire should be avoided at all costs as it can cause deterioration of the casing plies, which can result in sudden tire failure.

Repair or retread any damage to the tire's surface, and make sure tires are fully dry before storage, as unrepaired cuts on the tire could allow moisture to infiltrate the casing plies and belts.

CHAIN USAGE

Different locations and areas have specific regulations regarding the use of tire chains. Where chains are permitted, give special attention to these guidelines:

Use chains only when weather conditions require it. In some cases, chain installation may be required when a weather warning is issued, or in a specifically posted area.

Reduce driving speed when using chains, and avoid long-distance driving. Driving at high speeds or for long distances can seriously damage the tires or cause the chains to fail.

It is important to use the correct size of chains for the size of the tire.

Make sure there is sufficient clearance between the chained wheels and the vehicle.

Always check and follow the chain manufacturer's instructions and requirements.

TRUCK MAINTENANCE

The two major things that affect tire wear are inflation pressure and vehicle alignment. The components of alignment are Toe, Camber, Caster, Ackermann, and Axle Parallelism, which includes Thrust Angle and Scrub Angle.

TOTAL VEHICLE ALIGNMENT

Total vehicle alignment is the process by which the vehicle and all tires are traveling in the same direction. The steering axle alone is not sufficient for total vehicle alignment.

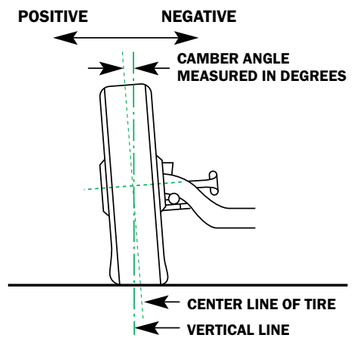
CAMBER

The camber of a tire is the angle at which the tire tilts away from a perpendicular center line in relation to a flat road. If the top of the wheel is tilted outwards from the perpendicular, it is positive camber. If the top of the wheel is tilting inwards from the perpendicular, then it is negative camber.

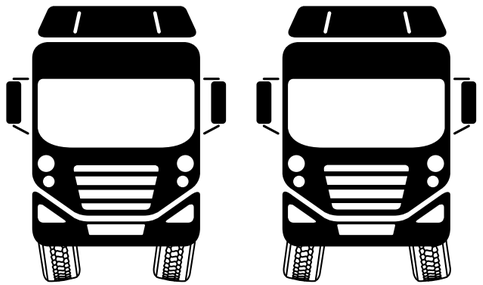
Correct camber settings compensate for the downward force of the vehicle's load, and help the tires maintain firm and regular contact between the tire tread and the road while the vehicle travels while loaded. Check for wear on the inside or outside edge of a tire; this could indicate an incorrect camber setting.

Camber can be seen when viewing steering axle tires from the front, as in the images below. Camber is the inward or outward tilt of these tires. Positive camber means the top of the tire is tilted outwards. The camber becomes more negative (tilts inwards) as the vehicle's load increases.

Positive and Negative Camber



Positive and Negative Camber



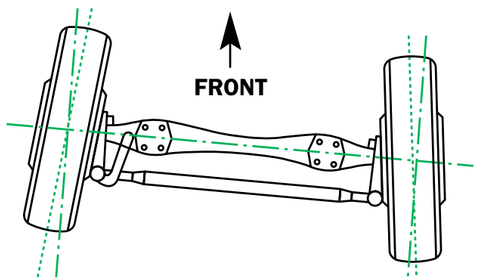
Positive Camber Negative Camber

TOE

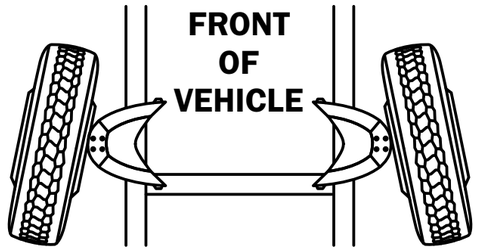
Toe refers to the way the wheels are inclined on a vehicle, either pointing inwards or outwards as viewed from the top of the vehicle. For example, in the illustration below viewing them from the front, the pair of front wheels are closer together at their front than at their rear. This would be called Toe-in. The opposite of this is called Toe- out. The ideal situation is to have zero toe once the vehicle is loaded to its normal capacity.

The reason for having tires toe-in is to counteract the natural force that acts to pull wheels outwards and away from each other as they roll. Toe-in makes sure that the tires rotate in the same direction, or as similar a direction as possible, as they roll along the road at driving speeds.

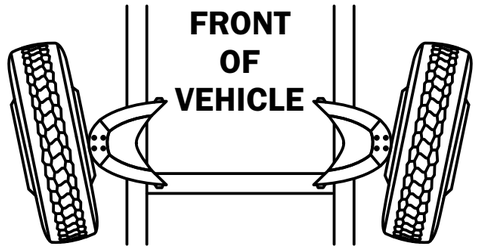
Insufficient or incorrect toe-in settings cause instability in steering, and if toe-in or toe-out is excessive, the tire's wear will be negatively affected, showing up as feathering at the edges of the tread.



Toe-In



Toe-Out



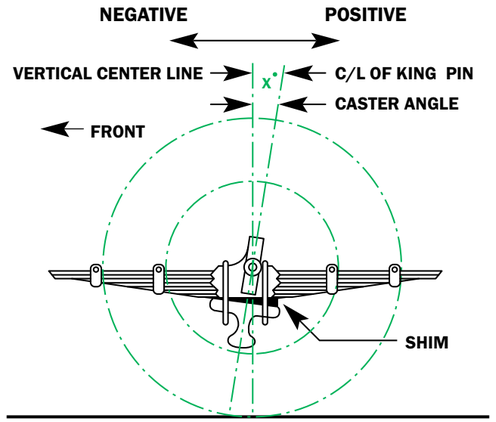
CASTER

Caster is the angle at which the steering axis is connected to the vertical axis of the wheel it is steering. Simply put, how far in front or behind the steering axis connects to the wheel's vertical axis. Typically, the angle is inclined rearward, as in the front forks of a bicycle.

Caster angle compensates for drag forces that cause resistance against the tires during driving, and stabilizes steering. The caster angle should be the same for both of the wheels on an axle.

If the caster angle is not the same for both wheels on a given axle, vibration and abnormal tire wear will occur. Too much caster will make steering more difficult, and too little caster will cause steering to become much easier, but will also cause wandering and steering instability. Caster is not considered to have a significant effect on tire wear.

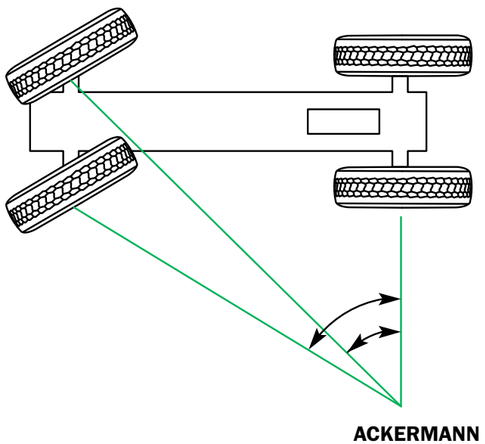
Negative and Positive Caster



ACKERMANN

The Ackermann Principle demonstrates that the inside tire needs to be at a sharper angle than the outside tire when turning. The actual turn angle at the base of the vehicle's wheel determines the difference in the turn angles between the tires. Improper Ackermann setting will cause side force, excess or irregular wear, and scuffing of the tire.

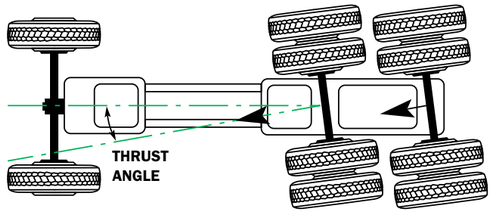
Ackermann



THRUST ANGLE

The thrust angle, or thrust line, is the difference between the line perpendicular to the axle, and the centerline of the vehicle. Each drive axle has its own thrust angle. Ideally, there would be zero thrust angle, meaning the thrust angle and the vehicle's geometric center line are parallel.

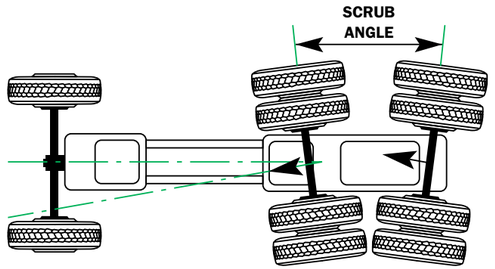
Thrust Angle



TANDEM SCRUB

Tandem scrub refers to the difference between the thrust angles of the drive axles. Ideally there should be zero tandem scrub, as tandem scrub misalignment causes the tandem axles to work in opposition, causing irregular or fast tire wear.

Tandem Scrub



ABNORMAL TREAD WEAR

The primary cause of abnormal tread wear is under- and over-inflation of the tires. However, several other conditions can influence how quickly the tread wears, and cause wear irregularities:

- Wheel alignment errors
- Imbalanced tires or imbalances between tire and wheel assembly
- Bent rims
- Braking issues causing wheel lock-up or flat spotting
- Damaged, broken, or worn shock absorbers, springs, or steering components
- Worn or damaged bearings

Shoulder Wear Due to Wrong Camber or Misalignment

Diagonal Wear

Abnormal Wear on Tread and Shoulder

TIRE DAMAGE

In tubeless tires, small punctures in the tread area can usually be repaired if they are caught early enough, to avoid air loss and further problems. With a slow air leak, if driven carefully, it's often possible to make it to a tire service center. However, more significant air loss can cause rapid heat buildup within the tire, causing damage and possible failure and separation between the tread and the carcass plies. Avoid allowing road debris, dirt, or moisture to enter a puncture or to become trapped between the wheel rim and the tire, or inside the tire. Always repair or replace damaged tires as soon as possible to avoid any damage to the vehicle or persons inside the vehicle.

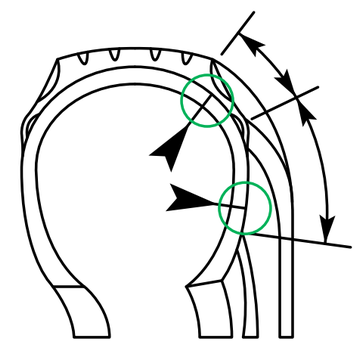
The following conditions cause irregular tire wear and tire failure and can be very dangerous. Regularly check for and correct any of the following:

- Improperly inflated tires (Under- or Over- Inflation)
- Overloading the tires past capacity
- Different tire sizes/circumferences on the same axle
- Improper wheel or tire mounting
- Improperly worn or damaged valve(s)
- Improper use of tubes or flaps
- Braking system problems or abnormalities
- Improper vehicle maintenance

Burned Beads

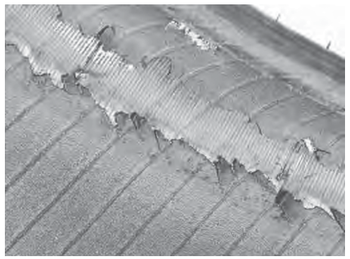
A zipper rupture is a circumferential break in the mid-to-upper sidewall exposing an even line of broken cords caused by severe under- inflation or overloading, producing casing cord failure.

Ripped Sidewalls

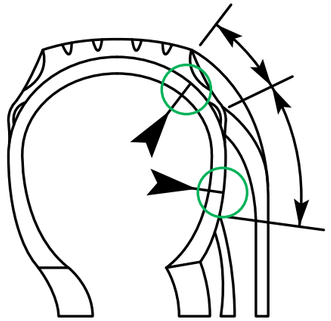


WARNING Any tire that is suspected of being operated while under-inflated or overloaded should be attended to with caution. The permanent and serious damage caused by operating an under-inflated or overloaded tire cannot always be detected. Any tire that is known or even suspected of being operated at 80% or less of normal inflation pressure, or that has been operated while overloaded, could have permanent structural sidewall damage (also known as steel cord fatigue). Ply cords that are weakened by operating while under-inflated or overloaded may break one after the other, until the upper sidewall ruptures with explosive force, causing sudden instantaneous air loss. This can result in serious injury or death.

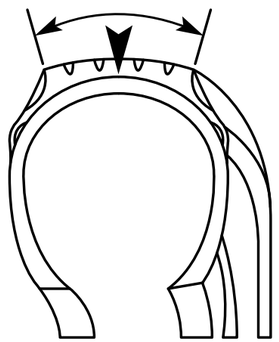
Sidewall Damage Due to Run Flat or Underinflation



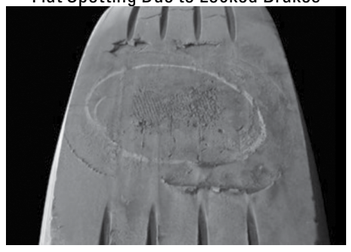
Sidewall Damage Due to Run Flat or Severe Underinflation



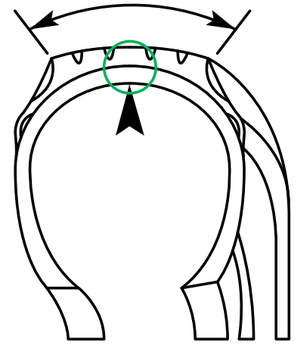
Damage Due to Contact with Vehicle Components (Mud Flaps, Trailer Wheelhouse Molding, Bumpers, etc)



Flat Spotting Due to Locked Brakes



Flat Spotting Due to Locked Brakes



Sidewall Bulge Due to Impact with Pothole or Curb

HEAT DAMAGE TO TIRES

Heat buildup can easily cause damage to tires. Excessive heat buildup can be caused by under-inflation, overloading, or driving at excessive speed. The heat that is created by these situations can easily damage integral parts of the tire such as the cord, the bonding between the carcass, the belts, and the tread. Most tire cords start to weaken at temperatures over 120 degrees Celsius, which makes the tire vulnerable to failure. Heat buildup can also weaken or damage rubber compounds or even cause separation between the plies of the tire. For safety and tire longevity, it is wise to avoid situations where excessive heat buildup is created.

MOISTURE DAMAGE TO TIRES

Moisture that makes its way inside the tire, or that gets through to the steel belts of a radial tire can cause rust damage to the steel cords or the rim. To avoid moisture damage, storing tires in a dry place is very important. Also, make sure that wheels, flaps, tubes, valves, and the inner tire surfaces are clean and dry before and during the mounting process. Make sure to use the recommended mounting lubricant on the rim and the tire bead during mounting. Maintaining proper inflation and keeping the valve stem capped and protected will also help to prevent moisture from entering the tire and causing damage.

PREVENTING TIRE DAMAGE

Other key practices to remember in preventing damage to tires are to always use caution when driving over a pothole, or other objects in the road if they cannot be avoided. Avoid running over curbs, and avoid striking the curb when parking the vehicle.

TIRE SAFETY CHECKLIST

It is important to check your tires regularly to address any problems, keep them in good condition and maintain safety while driving. Here are some things to check regularly:

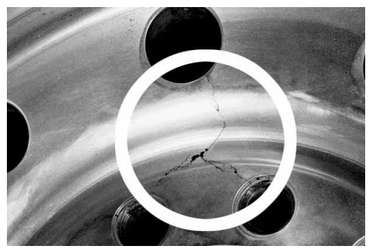
- Tire pressure (check this at least once a month, including your spare tire).
- Wear patterns on the tread; check for uneven wear, cracks, foreign objects embedded in the tire, punctures, or other signs of damage.
- Foreign objects that may have become wedged in the tread, such as glass, rocks or other. Remove these from where they have become stuck.
- Tire valves, making sure they have valve caps and making sure they have not been damaged.
- Make sure to check your tire pressure before going on a long-distance drive or road trip.
- Never overload your vehicle. To find the maximum load for the vehicle, check the owner's manual. When towing a trailer, take into account that some of the weight of the trailer's load will also be transferred to the towing vehicle.

MOUNTING & DEMOUNTING

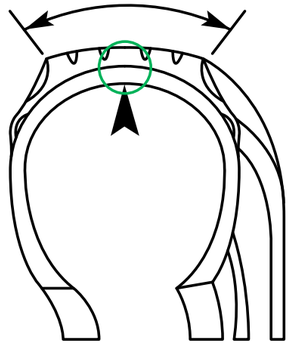
IMPORTANT SAFETY INSTRUCTIONS

No one should mount or demount tires without the proper training. For easy reference, you should be able to find wall charts that contain mounting and demounting instructions for highway rims through your normal rim supplier.

Remove Any Cracked Wheels From Service

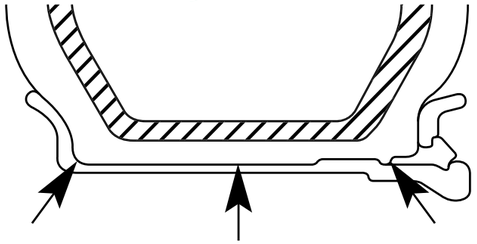


Flat Spotting Due to Locked Brakes

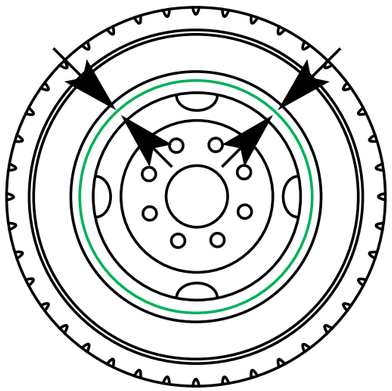


Flat Spotting Due to Locked Brakes

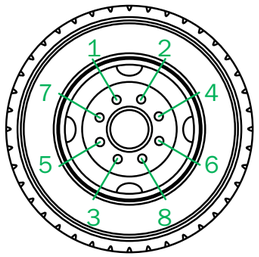
Lubricate Areas Shown by Arrows



Use of GG Ring to Indicate Correct Mounting

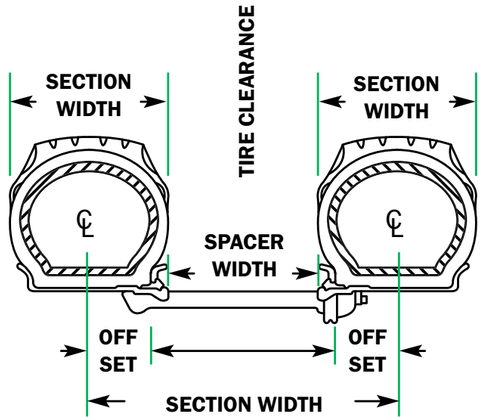


Proper Sequence for Tightening Stud Ruts on an 8 Stud System

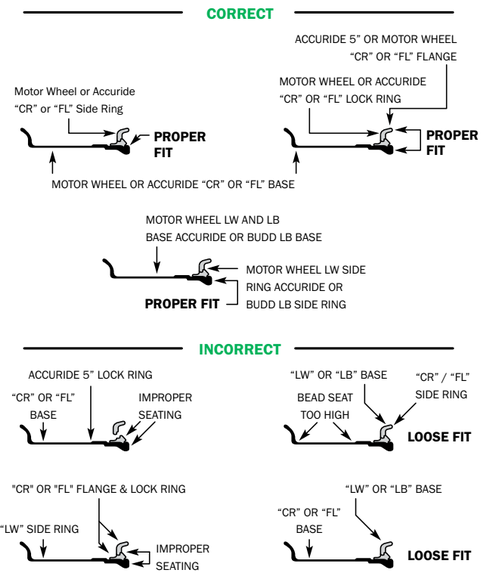


NOTE: Always use a safety cage that is securely held, and an extension hose with a clip-on air chuck. Rapid air loss can cause the assembly to move.

Cross Section Through Typical Dual Installation



Flat Spotting Due to Locked Brakes



MOUNTING TUBE-TYPE TIRES

Clean all parts, making sure they are dry and free of any foreign matter. Always use a new tube, as when old tubes are reused, they can stretch and increase in size, potentially causing cracking, folding, or rapid wearing of the tube. Be sure to use properly sized radial tubes, which are designed to be able to handle radial profiles and flexing requirements.

WHEEL PREPARATION

Check the following to ensure safe mounting and demounting of tires and wheels:

- Make sure that the rim diameter, rim width, and flange design are the correct ones that are recommended for the tire.
- Make sure that the rim profile is appropriate for the type of tire (tube-type or tubeless) that is being used.
- Make sure that the angle and position of the tire bead seats properly to the rim.

Prior to mounting, check the wheel for any cracks or breaks, damage, misplaced parts, deformities or irregularities at the locking ring rim flange, surfaces, or valve hole. Any sign of dirt or dust, rough surfaces, dents, or weak welds should be fixed, if possible. If the defect is not able to be fixed, select another, more suitable wheel. If there is corrosion, the rim may be cleaned with a wire brush, sanded smooth, and painted with anti-rust paint. Any irregularities on the surface, such as dents or rough surfaces must be smoothed.

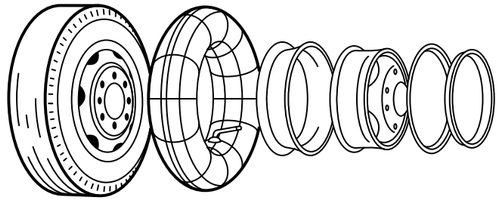
IMPORTANT SAFETY NOTE: Always demount the tire before attempting any wheel repair such as hammering, heating or welding of the wheel.

TIRE MOUNTING AND DEMOUNTING

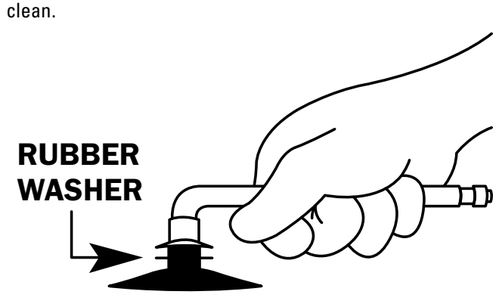
Carefully observe and follow all mounting and demounting procedures and safety precautions. Keep tools and work areas clean, and free of oil or grease.

Note: Mounting and demounting tires always requires the manufacturer's recommended tire mounting lubricant.

Proper Mounting and Demounting



Note: Make sure to use the correct design, size, and tube type. Using incorrect design, size or tube types could cause tube breakage or damage to your Avantech radial tire. Check the tube to confirm the correct type and size, and valve stem type, and that it will properly fit the wheel hub and have sufficient clearances for brake and wheel parts. Screw the valve stem into the tube with a rubber bushing or washer, making sure that the attachment to the tube is secure and clean.



VALVE STEM ATTACHMENT

Make sure not to screw the valve stem in the wrong direction, or tighten past the recommended tightness.

Follow this step-by-step mounting procedure: insert the new tube into the clean, dry tire and inflate slightly, just until the tire becomes rounded. Make sure to use the proper sized new flap. Used flaps that are brittle, cracked, broken, or stretched should never be used.

TUBE-TYPE TIRE MOUNTING

Safely mount a tube-type tire by using these steps as a guideline:

1. Carefully mount the flap inside the tire, making sure not to buckle the flap edges over or under.
2. Center the flap, positioning it so that the valve hole lines up. Inflate the tire a little more until the flap is held close between the tire and the tube. The shape will not conform perfectly until later in the process.
3. Lubricate the rim flange, tire bead and the flap where it will touch the rim.
4. Slide the tire, tube, and flap assembly onto the rim.
5. Combine the side ring and lightly tap the locking ring into position. Do not use excessive force when tapping the locking ring, and avoid hitting the tire.

IMPORTANT SAFETY PRECAUTION

Use an accurate air gauge and an air hose with a remote-operating nozzle that is long enough to allow you to stand a safe distance from the tire assembly for the remainder of the inflation process.

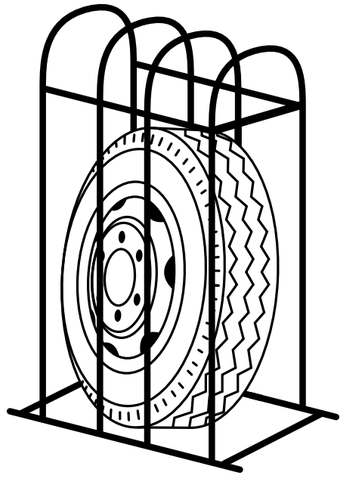
Note: Never stand in front of a wheel while inflating the tire.

6. Inflate the tire slightly and then recheck to make sure that the assembled parts are in their proper positions.
7. Inflate the tire slightly more, and check that the tire bead has been seated (has slid over, making complete contact with the rim flange). If the tire bead has not been seated, deflate the tire, lubricate, and re-try the assembly.
8. Release any trapped air between the tube, flap, and tire by deflating and then reinflating to get the flap to conform to the correct fit.

SETTING THE FINAL INFLATION PRESSURE

A new valve core should be installed every time a new tire is mounted. Always utilize a tire safety cage, and a remote-operating air nozzle. Check and re-check that the assembly is fitting together correctly at every point of the mounting process. Inflate the tire in stages, re-checking the assembly at each stage until the recommended inflation pressure is reached. Once the correct tire pressure is reached, add a valve cap.

Tire Inside Tire Cage



Important Safety Reminders:

Never stand in front of the tire or the valve during inflation. Utilize the safety devices at all times during the process.

Before the final inflation stage, carefully check the assembly positioning to make sure it is correct.

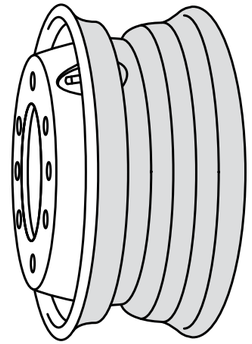
- Check for any air leakage.
- Use only the correct mounting and demounting levers, and make sure that they are clean and dry, as oily or greasy levers can easily slip.
- Use only the recommended mounting and demounting equipment required and never use excessive force or hammering.

Deflate the tires before dismounting the wheel assembly from the vehicle. Clear away any dirt or foreign matter from the valve stem and the surrounding area, then release the valve stem to let the air escape.

DEMOUNTING THREE-PIECE WHEEL ASSEMBLIES

On firm, clean ground or floor, place the wheel assembly down with the lock-ring side facing upward. Using a tire demounting lever with a spoon-type tip, pry in between the rim flange and the tire bead. Working around the tire, operate the lever between the bead and rim flange. Avoid prying into the same place more than once. After the bead and the rim separate, put the lever into the groove at the base, separate the lock ring, and remove the side ring.

Mounting Tubeless Tires



THE TUBELESS TIRE RIM

Note that the areas indicated in gray above will need to be cleaned and lubricated.

RIM PREPARATION

1. Inspect the rim, making sure it has no breaks or damage in any area.
2. Remove the rubber bushing from the valve stem hole. Check that the valve stem is free of any sign of damage or wear.
3. Remove any rust, dirt, or foreign materials from the rim. Clean and sand the areas indicated with shading in the above picture until completely smooth. If rust is found, clean and repaint the rim surface to protect it from further rusting.
4. Replace any worn or damaged valve stem as needed.
5. Lubricate the inner parts of the rim surface where the tire will be mounted (indicated by the shaded area in the above picture)

TIRE PREPARATION

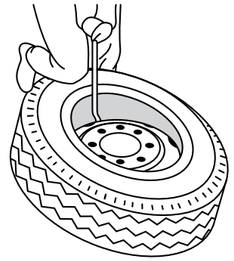
- If mounting new tires, wipe the bead clean with a dry cloth and check to make sure that it has no damage, kinks, or breaks.
- Apply the recommended lubricant to the tire bead.

INSIDE BEAD ASSEMBLY

- On a clean flat surface, lay the wheel down with the valve facing upward.
- Using your hands and knees, as shown in the illustration below, work the bead over the rim flange. If there is difficulty fitting the bead over the flange, the proper tire mounting lever can be used, as shown in the illustration.

Inside Bead Assembly

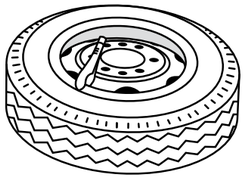
Inside Bead Assembly



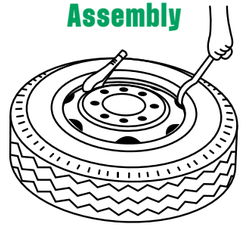
OUTSIDE BEAD ASSEMBLY

- Start the process of placing the outside bead over the outside rim flange by hand, beginning at the point where the valve stem is located.
- Once it becomes too difficult to continue by hand, continue using the correct tubeless tire bead mounting lever to complete the job, as shown in the illustrations below.
- Do not use excessive force, heavy tools, or hammering on the rim while mounting tires.

Outside Bead Assembly



Outside Bead Assembly



TUBELESS TIRE INFLATION

Use an accurate inflation gauge, the proper remote air hose nozzle, and a safety cage when inflating the new mounting tire. The lubricated bead should seat firmly to the rim flange once the tire reaches approximately 10 PSI inflation. Never stand close to, or in front of the tire while inflating. For your safety and protection, always use the safety cage and remain at a safe distance. If the bead fails to seat on the first try, try rotating the tire a few degrees around the rim, make sure that the rim and bead flange are lubricated, and try again. If the bead does not appear snugly or evenly seated, do not try to inflate further. Apply a little more lubricant on the bead and rim areas, and repeat the entire assembly process.

Once the bead is properly seated, the bead and rim flange should have a snug, even fit all the way around. Then the tire can be inflated to the recommended inflation pressure for the axle load. Check to ensure that neither the tire nor the valves are leaking, and finally, tighten the valve cap.

TUBELESS TIRE DEMOUNTING

Make sure that the tire is completely deflated before demounting. To do this, loosen and remove the valve stem core, ensuring that the valve stem has no cracking or damage and that there is no foreign matter left in the valve. Do not stand near the valve stem during the deflation process.

BEAD DEMOUNTING

On a clean, flat surface, place the tire assembly with the valve facing upward. A tire demounting lever will be used for this process.

Bead Demounting

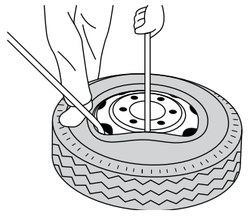
Bead Demounting

OUTSIDE BEAD DEMOUNTING

- Using the tire demounting lever as in the following instructions, pry the bead over the rim flange directly in line with the valve stem.
- Use a second tire demounting lever about 30 cm (roughly 12 inches) around the rim from the first lever to pry the bead over the flange.
- Repeat this process around the tire until the outside bead is fully demounted.

Outside Bead Demounting

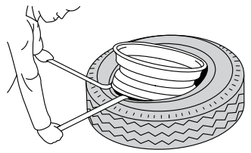
Outside Bead Demounting



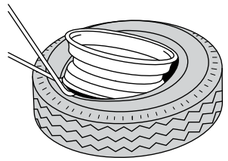
INSIDE BEAD DEMOUNTING

- Turn the tire assembly over onto the other side.
- Lubricate between the bead and the rim.
- Insert the tip of the tire demounting lever between the tire and the rim, and apply pressure.
- Use a second lever about 15 cm (roughly six inches) around the edge of the rim.
- Repeat this until the bead is fully demounted.

Inside Bead Demounting



Inside Bead Demounting

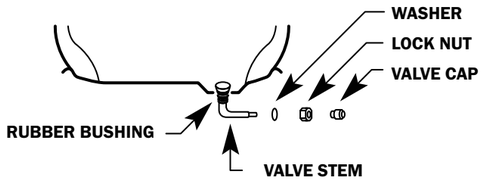


TUBELESS RIM VALVE MOUNTING

A-TYPE RIM VALVE

- Make sure that the valve hole in the rim is clean, smooth and undamaged.
- Apply the recommended lubricant to the rubber bushing of the valve.
- Insert the valve stem through the rim hole, assembling the washer and lock-nut on the inside. Tighten the lock nut using a wrench so that the valve stem is secured to the rim.

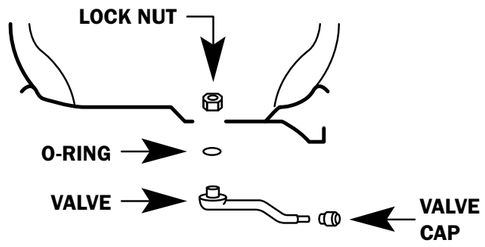
A-Type Rim Valve



B-TYPE RIM VALVE

- Make sure that the valve hole in the rim is clean and undamaged.
- As shown in the illustration below, place a lubricated O-Ring on the valve stem.
- Insert the stem into the valve stem hole in the rim. The valve stem should be facing perpendicular to the rim.
- Tighten the lock nut with a wrench from the opposite side of the rim to secure the valve stem.

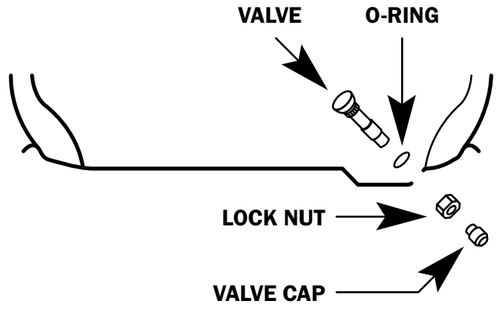
B-Type Rim Valve



C-TYPE RIM VALVE

- Make sure that the valve hole in the rim is clean, smooth, and undamaged.
- Following the illustration below, lubricate the O-Ring, and insert a new valve stem through the O-Ring and then through the valve stem hole in the rim from the inside.
- From the opposite side, hand-tighten the lock nut securely.

C-Type Rim Valve



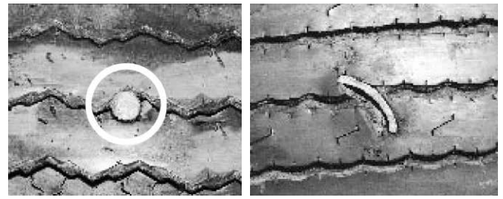
TIRE REPAIRS

Simple tire repairs such as nail punctures can be repaired by fleet operators and tire service centers. However, more extensive repairs such as spot reinforcement or section repairs should be done by an authorized tire retreading and repair center. Make every effort to spot and repair any significant cuts or cracks in the sidewall area as soon as possible to avoid the need for major section repair.

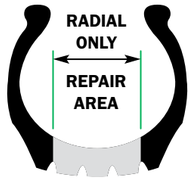
Frequent tire inspection is recommended. The following section gives information regarding tire damage to help determine whether or not section repairs are advisable or possible.

NAIL HOLE REPAIRS

Radial nail hole repairs up to ⅜-inch diameter (9.5 MM) may be done on the tread face as long as the puncture is at least one inch inside the shoulder of the tire. All punctures outside of that point should be treated as a section repair.



Step 1

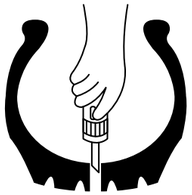


Any number of repairs in the crown area only (using the outer grooves as a guide) Refer larger damages to an authorized tire repair facility. Patches should not be overlapped.

Step 2

With beads in a relaxed position, use a tapered drill bit or carbide cutter to drill a hole from the inside. Using a probe reamer, lubricate the hole with vulcanizing cement.

Step 3



Brush the chemical cure cement onto the nozzle, and insert it into the hole, turning clockwise.

Step 4

Cut off the excess plug 1/16" high on the inside. Do not stretch the plug.

Step 5

Apply a brush-on Nylon bond cement to the buffed surface only, and allow to dry thoroughly if using "Versacure" patches with applied heat. If heat is not applied, use a chemical vulcanizing solution, applying to the buffed surface of the liner only.

Step 6

With the beads in a relaxed position, remove the backing from the "Versacure" patch. Center the patch over the plug, and stitch the patch on from the center outwards. The arrows on the patch must point toward the tire bead.

SECTION REPAIR LIMITS IN SIDEWALL & SHOULDER AREA

There should be no more than two of these section repairs on a given tire that is in line-haul service, and no more than three on a given tire that is in city service. The repairs should be no closer than ¼ of the tire circumference from one another. Unlimited spot repairs may be made on a tire, as long as the body plies are not exposed or damaged. Any loose or questionable existing repairs must be reworked.

A truck tire may have more than one section repair, however repair areas must not overlap.

Make sure that any injured areas are far enough apart from each other so that each repair can be made totally independently. No puncture repair patch may come into contact with another puncture repair patch or section repair unit. Repairing multiple tread area punctures that damage the same radial cord(s), is not permitted unless all of the punctures can be reinforced with a single section repair.

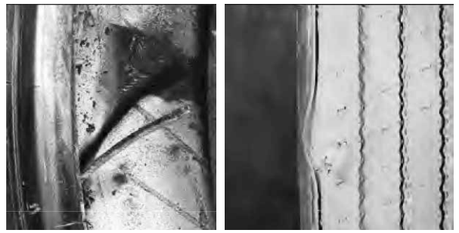
Section Repair

Under certain conditions, if injury to a truck or bus tire exceeds the limitations for a puncture repair, then a section repair in the tread or sidewall may be done. Factors that may limit the size and location of the injury that can be repaired include the tire size, the manufacturer, and the service conditions. For example, section repairs must be made in a full-service tire repair facility by properly trained technicians, using appropriate tools and materials, and following the applicable safety precautions and procedures.

WARNING It is dangerous to drive on damaged tires. A damaged tire may fail suddenly and without warning, leading to accidents, serious personal injury or even death.

When performing a tire repair, always remove the tire from the wheel assembly and do a complete internal inspection of the tire. An outside-in tire repair, or an on-the-wheel repair should not be performed.

Under-Inflated Tires with Puncture Damanage



Pictured above is an example of a tire that was driven in an under-inflated condition and sustained a puncture, causing dangerous, non-repairable damage to the inner liner and body ply material of the tire. Without removing this tire for inspection, this type of damage could not be discovered and repaired, as it would not be visible from the outside of the tire. Remove every tire from the wheel to inspect and assess repairability.

The Basic Principles for a Proper Section Repair:

- Always remove the tire from the wheel in order to inspect and repair it
- Properly prepare the injured area
- Fill injury with a suitable vulcanizing material to keep moisture out
- Using a repair unit, seal the inner liner to reinforce the damaged area of the tire, preventing loss of inflation pressure, and keeping out moisture
- Check the finished repair and re-inspect the tire

Identifying Section Repairs

Depending on different factors such as location and size of tire injury, repair materials, and repair techniques, section repairs can affect the external appearance of a tire differently.

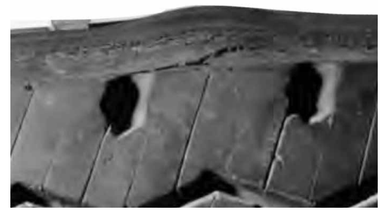
Some notable visual characteristics can include the following:

- Textured appearance or buff marks on the rubber
- Removed or obscured original tire markings
- Coloration differences of the rubber
- Surface contour changes
- A bulge or raised area above the surrounding surface of the tire

A bulge caused by the stretching of the tire's rubber in the repaired area may be noticeable upon full inflation, especially in the sidewall. A bulge is typically the width of the repaired area, usually extending towards one or both beads. If any portion of the repaired area has bulging that is more than 3/8" above the tire's surrounding surface, the section repair is not acceptable and the tire must be evaluated to see if further repair is possible or if the tire must be permanently taken out of service (scrapped). In the following image, a section repair bulge is pictured being evaluated with a metal gauge with a 3/8" clearance.

NOTE: If any portion of the repaired area has bulging that is more than 3/8" above the tire's surrounding surface, the section repair is not acceptable and the tire must be evaluated to see if further repair is possible or if the tire must be permanently taken out of service (scrapped).

Section Repair Bulge (Less than ⅜")



To make it more evident that a section repair has been made to a tire, a blue triangle identification patch may be externally applied to its sidewall. This can prevent the tire or vehicle from being placed out of service unnecessarily by a safety inspector or another authority.

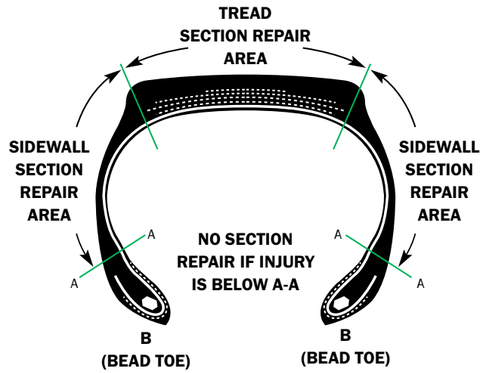
The identification patch should feature a blue equilateral triangle, each side being between 1/2" and 1-1/2" (or 13 mm - 38 mm) in dimension. The patch should be fixed on the tire sidewall immediately above the rim flange, and be adjacent to the repair, but not within the repaired area.

Size and Location Limitations

The areas on which section repairs may be conducted in the tread and sidewall of a tire are shown in the following diagram, Section Repair Areas. Sidewall injuries that extend into the bead area, from A-A to B as shown in the Section Repair Areas diagram, are not permissible for Section

repair. Repair in this area can only be performed on rubber-only injuries, such as to the bead toe region, and in some cases, to limited damage to chafer ply material. Consult the casing manufacturer for repair limitations in the bead area. Never repair a tire with an injury that has broken or otherwise damaged any body ply cord in the A-A to B area; tires with this type of damage should be removed from service permanently (scrapped) and properly disposed of.

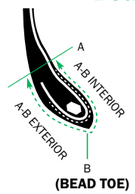
Section Repair Areas



To find point A-A, using a flexible scale/ruler, measure from point B (the bead toe) along the contours of both the exterior and interior surfaces of the tire as shown above in the Section Repair Areas diagram. The measurements will depend on the tire type and size, as shown in the following table, Measurement Values for A-A to B.

For repair of injuries to the rubber only within the A-A to B area, see the "Bead Area Repair" section of this manual. A sidewall injury undergoing section repair must not extend into the A-A to B bead area, however the section repair unit used to perform the repair may extend into this area.

Bead Area Measurements



To locate A-A, two separate measurements are made:

1. From point B along the exterior surface contour of the tire.
2. From point B along the interior surface contour of the tire.

A flexible scale/ruler is needed to make each measurement.

$$\frac{\text{A-B EXTERIOR}}{} = \frac{\text{A-B INTERIOR}}{}$$

The exterior and interior measurement amounts are the same.

Measurement Values for A-A to B

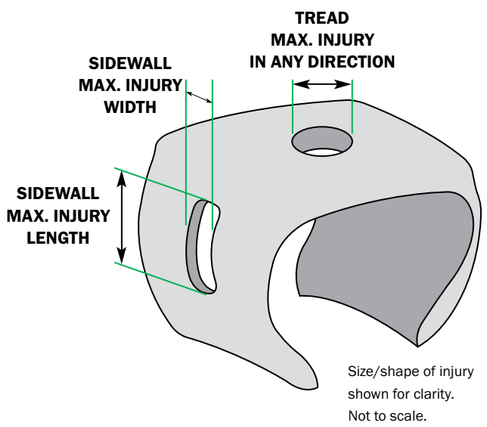
TIRE SIZE NOMINAL SECTION WIDTH			A-A TO B MEASUREMENT
METRIC	Tubeless and Tube-Type	Up to 265	3.0 inch
		275 and Above	3.5 inch
CONVENTIONAL	Tubeless	Up to 8R	3.0 inch
		9R and Above	3.5 inch
	Tube-Type	Up to 7.50R	3.0 inch
		8.25R and Above	3.5 inch

Source: Care and Service of Commercial Truck and Bus Tires

Measure the injury in the sidewall or tread area as shown below in the Injury Measurements diagram. Thoroughly examine the injury to determine the extent of any damage to body ply, belt cords, and other structural materials of the tire. Minor or Cosmetic damage to the rubber only (for example, localized abrasion and tearing) does not need to be included in the measurements.

Section repairs may be conducted on injuries up to the dimensions shown in the following table, Maximum Repairable Size for Sidewall and Shoulder, and will depend on the type and size of the tire. Manufacturers of repair materials may have additional options and restrictions for their specific products. These limitations help to ensure that the structural integrity of the tire can be safely restored. The limitations also take into consideration both the durability of the section repair itself and the bulge limitation of 3/8 inch once the tire is fully inflated.

Injury Measurements



Size/shape of injury shown for clarity. Not to scale.

Sidewall damage is typically "split-type", which is caused by snags or punctures. The maximum repairable damage sizes for the tire sidewall and shoulder are shown below.

TIRE SIZE
Nominal Section Width

			Sidewall Max. Injury Width	Sidewall Max. Injury Length	Tread Max Injury
METRIC	TUBELESS AND TUBE-TYPE	Up to 235	3/8 inch	3.5 inch	1.0 inch
			3/4 inch	2.0 inch	
			1.0 inch	1.0 inch	
		245 to 285	3/8 inch	4.0 inch	1.5 inch
			3/4 inch	3.0 inch	
			1.0 inch	2.0 inch	
		295 to 365	3/8 inch	4.5 inch	1.5 inch
			3/4 inch	4.0 inch	
			1.5 inch	2.0 inch	
		375 and Above	3/8 inch	5.0 inch	2.0 inch
			3/4 inch	4.0 inch	
			1.5 inch	3.0 inch	
CONVENTIONAL	TUBELESS	Up to 8R	3/8 inch	3.5 inch	1.0 inch
			3/4 inch	2.0 inch	
			1.0 inch	1.0 inch	
		9R to 11R	3/8 inch	4.0 inch	1.5 inch
			3/4 inch	3.0 inch	
			1.0 inch	2.0 inch	
		12R to 15R	3/8 inch	4.5 inch	1.5 inch
			3/4 inch	4.0 inch	
			1.5 inch	2.0 inch	
		16.5R and Above	3/8 inch	5.0 inch	2.0 inch
			3/4 inch	4.0 inch	
			1.5 inch	3.0 inch	
	TUBE-TYPE	Up to 7.50R	3/8 inch	3.5 inch	1.0 inch
			3/4 inch	2.0 inch	
			1.0 inch	1.0 inch	
		8.25R to 10.00R	3/8 inch	4.0 inch	1.5 inch
			3/4 inch	3.0 inch	
			1.0 inch	2.0 inch	
		11.00R to 13.00R	3/8 inch	4.5 inch	1.5 inch
			3/4 inch	4.0 inch	
			1.5 inch	2.0 inch	
		14.00R and Above	3/8 inch	5.0 inch	2.0 inch
			3/4 inch	4.0 inch	
			1.5 inch	3.0 inch	

Source: Care and Service of Commercial Truck and Bus Tires

Section repairs that are conducted in the tread area may also require removal of any excess material from the grooves, and tread pattern restoration. To improve ride comfort, high spots may be buffed smooth. Once the section repair is complete, inspect the tire and repair area both inside and out. Mount the tire, and inflate it to the maximum rated inflation pressure stamped on the sidewall. As noted, check to ensure that the repaired area does not bulge more than 3/8" above the surrounding surface of the tire.

Service Restrictions/Recommendations

Based on federal in-use inspection standards (49 CFR 570.62(d)), tires with reinforcement repairs should not be used on the front axle of commercial vehicles over 10,000 pounds GVWR. Section repairs on radial truck tires qualify as reinforcement repairs.

Bead Area Repair

Repair in the bead area (refer to diagram **Bead Area Measurements** and the **Measurement Values for A-A to B** Tables on the previous pages of this manual) is limited to rubber-only tire injuries, such as injuries to the bead toe region. In some cases bead area repair can be done if there is only limited damage to chafer ply material.

- If the chafer cords are rubber-covered, there is no limit to rubber-only repair, for example, to the bead toe region.
- Repair with rubber to the chafer ply is limited by Avantech Tires manufacturer recommendations; consult with Avantech Tires if any chafer cords are damaged (broken, cut, loose or rusted) and the body ply cords are undamaged and rubber-covered.
- If any steel body ply cord is exposed so that the metal is showing, or damaged in the bead area, the tire must not be repaired and/or retreaded. A tire with an injury that has exposed, broken or otherwise damaged any body ply cord (cut, loose or rusted) in the A-A to B area must be permanently removed from service (scrapped) and properly disposed of.

Spot Repair

Spot repairs are performed to superficial, rubber-only injuries that do not require a section repair unit or an interior patch. Gouges or surface cuts are some examples of injuries that can be spot repaired to limit any further damage and improve the tire's appearance.

Spot repairs should not be done on tires with injuries resulting in broken, cut, loose, or rusted body ply cords. Evaluate tires with this type of damage to see if a section repair can be done.

If an injury has exposed, but not damaged body ply cords, contact Avantech tires for a recommendation regarding spot repair.

Follow instructions provided by the repair materials manufacturer for how to prepare the injured area, the application of rubber fill material, curing and the final finish of spot repairs.

NOTES

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