

**Firestone**



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# **RUBBER TRACK**

**OPERATING MANUAL FOR AG TRACTORS**

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**EFFECTIVE: JULY 1, 2015**



## ABOUT THIS BOOK

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### INTRODUCTION

- Firestone rubber tracks are designed and built for optimal performance and durability. In order to maximize service life, their proper use, care and maintenance are important.
- Always read and follow the operations manual for your equipment provided by the manufacturer or dealer.
- This booklet is designed to help you understand the suggested operations for Firestone rubber tracks, as well as the cause and prevention of general types of damage that may occur.

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# USE, CARE AND MAINTENANCE

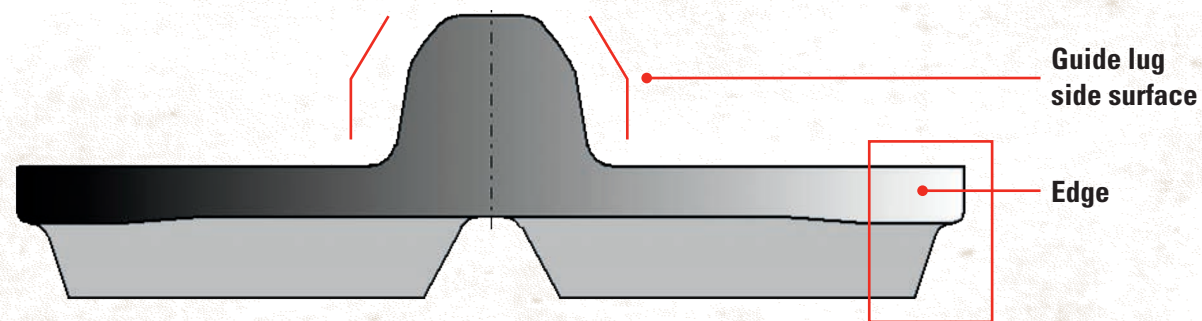
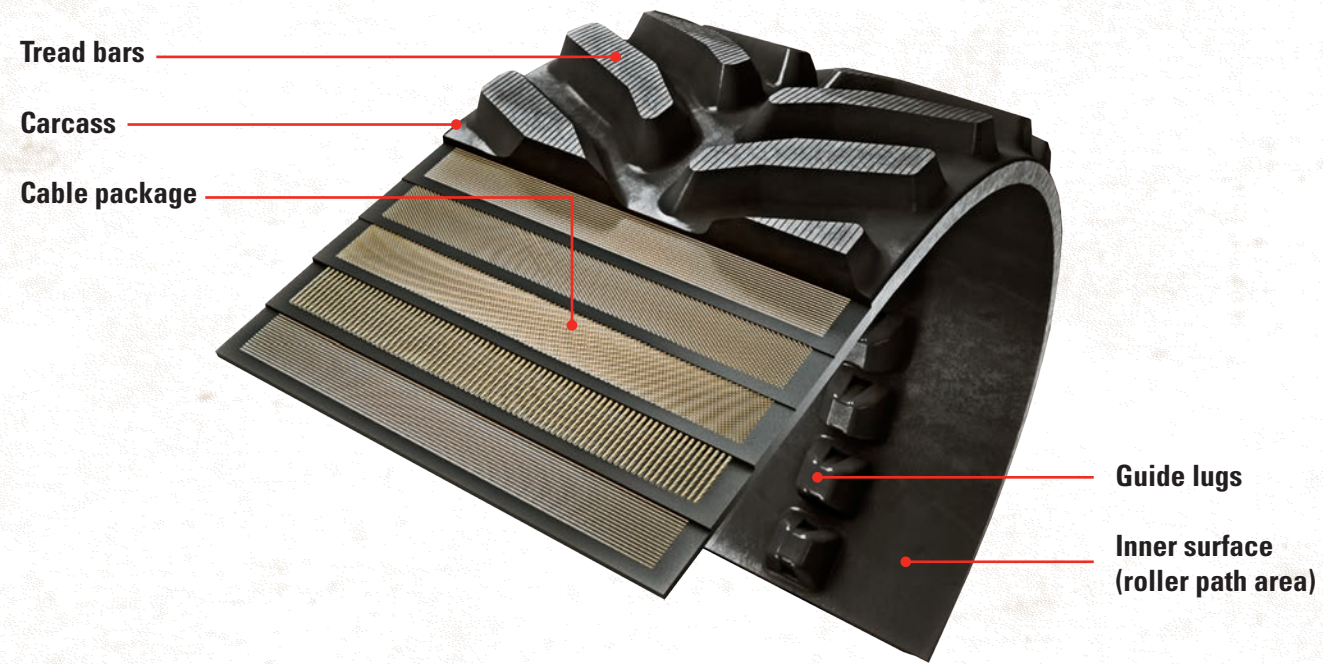
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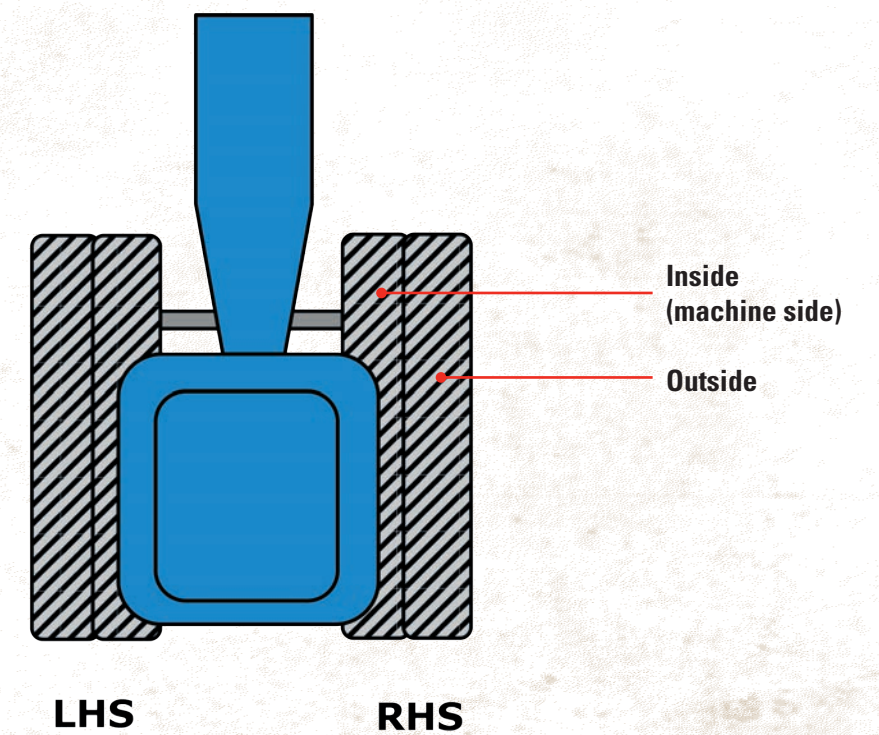
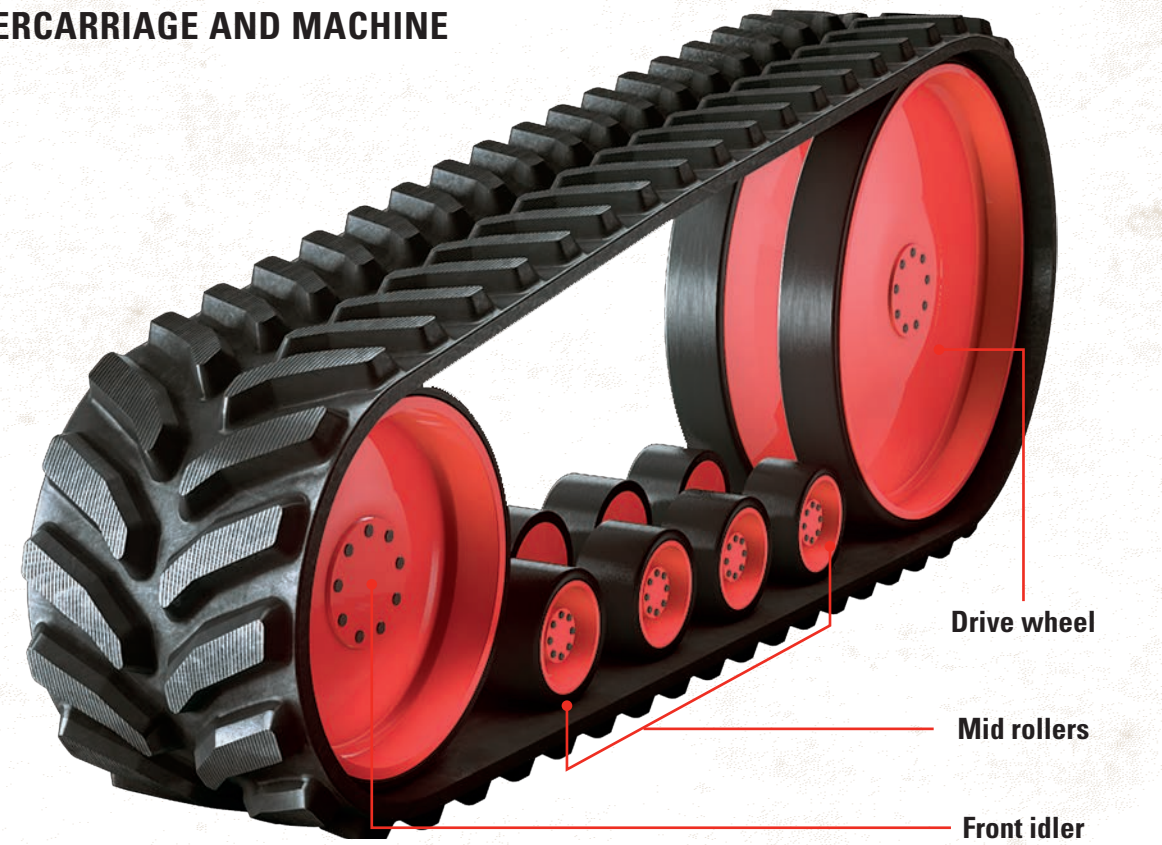
### DEFINITION OF TERMS

#### RUBBER TRACK



### DEFINITION OF TERMS

#### UNDERCARRIAGE AND MACHINE



## SUGGESTED OPERATIONS

### 1. Maintain correct tension

It is essential that the track have correct tension during operations. Loose tension may cause slippage between the drive wheel and the inner surface. This slippage will be the main cause of inner surface damage of the rubber track. Loose tension can be the possible cause of de-tracking. Check your manufacturer's operator's manual for details.

### 2. Periodic check of undercarriage components

Check the undercarriage components (i.e. drive wheel, mid rollers and front idler) for wear and rubberized surface damage periodically. Wear and damage of the undercarriage components can affect the track performance and durability.

### 3. Avoid sharp turns

Avoid fast, sharp turns and side slope turns. This may cause excessive tread wear, especially on asphalt and concrete surfaces.

### 4. Minimize rough terrain operation

Limit use of your machine on large, sharp rocky surfaces and sharp metal objects. These objects may cause severe damage to the rubber track.

### 5. Side slope operation – avoid de-tracking

When a tractor transitions from a side slope to a flat surface, the center portion of the undercarriage is unsupported. If the tractor turns during this transition, de-tracking may occur. Avoid making turns where the side slope meets a flat surface to minimize de-tracking.

### 6. Minimize slippage

During high-torque tractor operations, slippage can occur between the ground and the tread bars and also between the drive wheel and inner surface of the track. This slippage can cause serious damage to the undercarriage components, inner surface of the rubber track and the cable package, as well as accelerate tread wear. Use caution during high torque situations to reduce slippage, minimize wear and prevent damage.

### 7. Oil will degrade the rubber quality

Oil and similar substances will degrade rubber quality over time. If any of these products come in contact with the rubber track during maintenance or operations, remove it as soon as possible.

### 8. Choosing the correct rubber track width

Consider the optimal track width for your operations. For example, narrow tracks (16" and 18") are reasonable for row crop operations, but are not well-suited for tillage work. Wider tracks (24", 30" and 36") have benefits for traction, flotation, compaction and tracking performance.

### 9. Use proper ballast

When pulling equipment, it is important to have the proper ballast to offset the additional weight of the attachment. If the machine weight is not balanced, excessive tread wear and other damage can occur.

### 10. Storage

When storing your equipment for a period of time, it should be kept indoors away from rain, snow and direct sunlight to help prolong the life of its tracks. When extended storage is needed, periodic track rotation is recommended to help avoid "shape memory" in the track.

## ALIGNMENT

### WHAT IS ALIGNMENT

Adjusting the alignment is one of the most important procedures to prolong the life of the rubber tracks. Each track will have a different tendency in terms of tracking performance and is likely to change during its service life. Tracking performance is related to many of the following factors:

#### Machine related

- Undercarriage frame
- Assembly quality
- Tolerance of components
- Wear of components and aging deterioration
- Track gauge
- Camber effect
- Difference in weight distribution between the inside and outside of the tractor

#### Track Related

- Track width (good tracking is more difficult with narrow tracks)
- Uneven tread wear

### MISALIGNMENT ISSUES

Misalignment may cause guide lug side-surface damage and shorten track life. If alignment is not correct, damage not only occurs on the rubber track, but also on undercarriage components including drive wheel, mid rollers and front idlers. Periodic check of alignment is strongly recommended in the following cases:

- When rubber tracks are replaced
- When the components are replaced
- When track gauge is adjusted
- After extended storage
- Every 100 hours during normal operations

### ADJUSTING ALIGNMENT

Please follow the alignment adjustment procedure in your manufacturer's operator's manual. One of the basic procedures is to run on a flat surface without steering the machine. Check the guide lug surface temperature both outside and inside. If there is a significant difference in temperature, the alignment is not correct. Make adjustments to the alignment until the temperature difference is minimal.



## TREAD WEAR

### ROADING

Operating equipment on a paved road (“roading”) is one of the most severe causes of treadwear. Unbalanced weight distribution, narrow track usage, high speed operations and quick sharp turns may accelerate tread wear when roading the equipment.

### MAXIMIZE TREAD LIFE

To maximize tread life, minimize the conditions that may accelerate tread wear:

- Long distance roading
- High speed roading
- High-torque operations
- Slippage
- Unbalanced weight distribution

### TIPS

It is common for the machine-side tread to wear faster than the outside tread (Fig.1). This tendency may be more obvious in cases when the track gauge is extended outward. In order to have even treadwear for both tracks, rotating the LHS (left-hand side) and RHS (right-hand side) track after each season’s usage is recommended (Fig. 2).



Fig. 1. Accelerated machine side tread wear

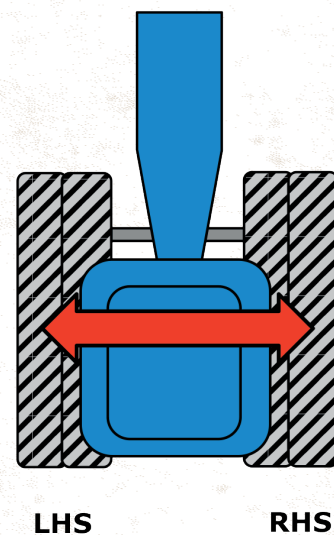


Fig. 2. Track rotation from LHS to RHS

## MEASUREMENT OF TREAD DEPTH

### HOW TO MEASURE THE TREAD DEPTH

Use a depth gauge, place the arms on two adjacent treadbar surfaces and record the measurement (Fig. 1).

If a depth gauge is not available, use two rulers and follow the same procedure.

### WHERE TO MEASURE TREAD DEPTH

Measure the nine different points on the tread (A, B and C for longitudinal direction and outside, center and inside for lateral direction), as shown in Fig. 2. Place measurements in Table 1.



Fig. 1. How to measure the tread depth

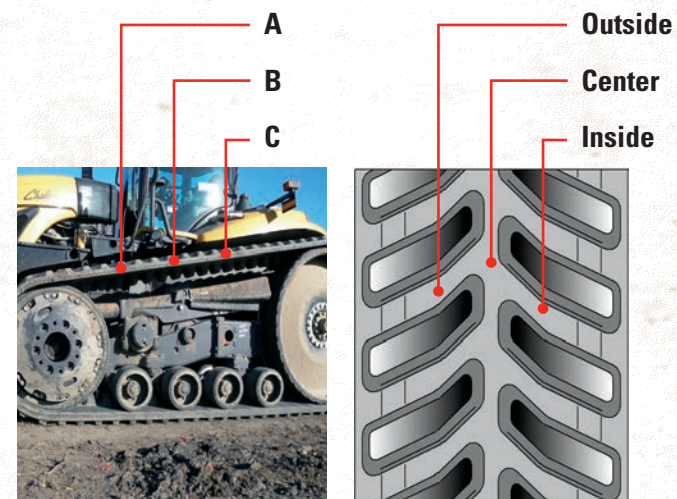


Fig. 2. Location of the measurements

	Outside	Center	Inside
A			
B			
C			

Table 1

## AVERAGE MEASURED TREAD DEPTH

### DEFINITION

Average measured tread depth is defined and calculated as follows:

1. Complete the table shown in "Measurement of Tread Depth" on page 10
2. Select the three lowest values
3. Calculate the average of the three lowest values = Average Measured Tread Depth

### EXAMPLE

1. Complete the table

	Outside (mm)	Center (mm)	Inside (mm)
<b>A</b>	34.5	36.2	31.3
<b>B</b>	35.6	37.1	32.9
<b>C</b>	34.8	36.7	31.7

2. Sort the values in order from lowest to highest

Order of the depth	Data
<b>Minimum 1</b>	<b>31.3</b>
<b>Minimum 2</b>	<b>31.7</b>
<b>Minimum 3</b>	<b>32.9</b>
	34.5
	34.8
	35.6
Maximum 1	36.2
Maximum 2	36.7
Maximum 3	37.1

3. Calculate the average

Average of the lowest values  $(31.3 + 31.7 + 32.9) / 3 = 32.0$

**AVERAGE MEASURED TREAD DEPTH = 32.0 mm**

## EVIDENCE FOR WARRANTY CLAIM

### EVIDENCE FOR WARRANTY CLAIM

The following items should be submitted for warranty claims:

- Warranty inspection form
- Proof of tracks purchase
- Photos (see below)
- Tread depth (see page 11)

### MARKING ON TRACK

Firestone rubber tracks in 16, 18 and 24 inch sizes have the markings on the side surface of the track, and 25, 30 and 36 inch tracks have the markings on the edge of the inner surface.

**Size marking:** Example [24x54x6INP55 or 530661BNEB]

**Date code:** Example [1301132]

**Brand marking:** Example [Firestone logo]



Size marking



Date code

### PHOTOS

The following photos are required for a warranty claim. If photos are not provided, warranty claim may be rejected.

Photo required	To identify
Overall and close-up of failed part	Failure mode and location
Date code	Production lot and record
Size mark	Accurate track specification
Machine photo	Machine model
ID plate of machine	Machine model
Hours gauge	Age of machine
Components (mid roller, front idler and rear drive wheel)	Condition of undercarriage component



## TYPES OF DAMAGE

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### EXTERNAL DAMAGES ON TREAD

#### DEFINITION

- External cuts caused by sharp debris

#### WHERE TO LOOK

- Tread and carcass

#### WHAT TO DO

- Check periodically to determine if the cable package is exposed
- If cable package is exposed, track should be removed from surface



Cosmetic



Minor



Severe

#### CAUSES OF DAMAGE

- Sharp rocks, stone or crop stubble
- Sharp turns or track slippage



#### PREVENTION

- Use caution when operating over rocky surfaces and crop stubble
- Periodic inspections of tread surfaces is recommended

## TREAD WEAR

### DEFINITION

- Wearing down of rubber tread bars

### WHERE TO LOOK

- Tread

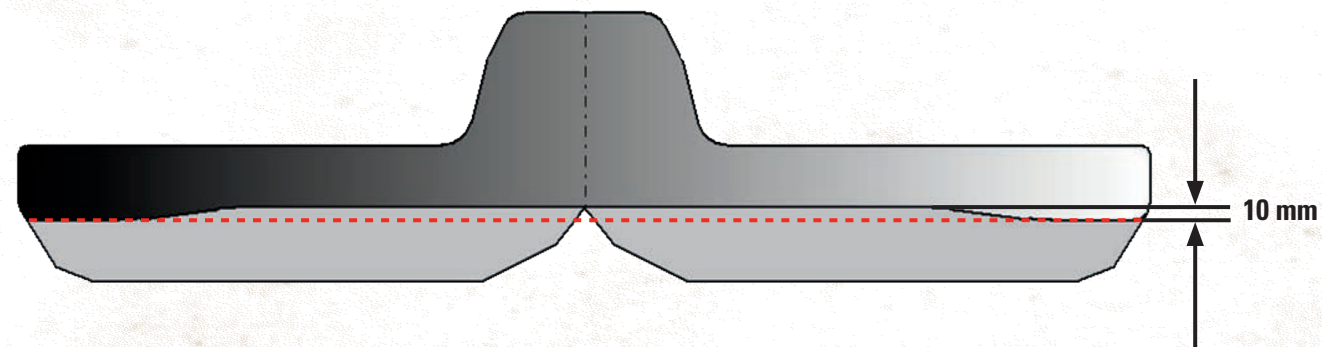
### WHAT TO DO

- Replace the rubber track if the cable package is exposed
- Replacement is recommended if tread depth is less than 10 mm



### CAUSES OF DAMAGE

- Tread is worn by normal usage on mud, dirt and gravel
- Excessive treadwear occurs during roading operations
- Accelerated treadwear occurs from sharp turns, track slippage and weight imbalance



### PREVENTION

- Avoid unnecessary sharp turns, track slippage and weight imbalance
- Minimize high-speed roading

## OZONE CRACKS

### DEFINITION

- Small cracks at the base of the tread

### WHERE TO LOOK

- Tread and carcass

### WHAT TO DO

- Check periodically if the cracks reach the cable package
- Replace track if steel cord is exposed



### CAUSES OF DAMAGE

- Ozone cracks are a natural aging phenomenon of rubber
- Sunlight and high temperatures can accelerate ozone cracks
- Cold temperatures and salt-water environments may accelerate damage to rubber

### PREVENTION

- Indoor and well-ventilated storage is recommended; do not let tracks remain idle for extended periods of time
- If indoor storage is not available, minimize exposure to direct sunlight



## EDGE CUT

### DEFINITION

- External cuts on the outside edge of the track caused by sharp debris on the ground

### WHERE TO LOOK

- Edge cut locations inside outer edge of track

### WHAT TO DO

- Prevent corrosion from damaging the track by removing any hanging rubber that would further tear into the track carcass
- If the track is damaged by corrosion moving inside the tread, the track should be replaced



### CAUSES OF DAMAGE

- Sharp turns on high friction surfaces such as asphalt and concrete. This causes the edge of the track to roll under and fold, causing edge cut.

### PREVENTION

- When operating on asphalt or concrete, avoid making sharp turns

## MID ROLLER EDGE SCRATCH

### DEFINITION

- Mark, scar or cut created at edge of roller, drive wheel and/or idler

### WHERE TO LOOK

- Inner surface

### WHAT TO DO

- Check periodically to determine if the cable package is exposed
- If cable package is exposed the track should be removed



### CAUSES OF DAMAGE

- Undercarriage components such as track roller, idler and drive wheel
- Coated rubber on the rollers deteriorates and metal part is exposed



Metal exposed



Well coated

### PREVENTION

- Periodically check the rollers. If metal exposure becomes severe, replacement is recommended.

## INSIDE RUBBER TRACK

### DEFINITION

- Damage on the inside roller path area

### WHERE TO LOOK

- Inside surface of rubber track

### WHAT TO DO

- Replace rubber tracks if steel cable packages are exposed (see pictures)

### CAUSES OF DAMAGE

- External objects are pressed between bogie wheels and inside surface of rubber track
- Point load friction from the rear drive wheel generated during scraper or tillage operations



### PREVENTION

- Pay attention to the changing ground conditions and avoid operating in severe conditions
- Minimize extreme high traction operation which may cause slippage between drive wheel and track

## GUIDE LUG CRACKS

### DEFINITION

- Cracks that occur around the base of the lug

### WHERE TO LOOK

- Around the base of the guide lug

### WHAT TO DO

- Check periodically to determine if cracks reach the steel cable
- Remove track if steel is exposed

### CAUSES OF DAMAGE

- Integration of small ozone cracks between adjacent guide lugs
- Excessive track rotation due to high-speed roading



Small ozone cracks



Integrated cracks

### PREVENTION

- Avoid or minimize exposure to direct sunlight
- Indoor storage with good ventilation is recommended
- Use tracks at least once a month
- Avoid or minimize high-speed roading

## GUIDE LUG WEAR

### DEFINITION

- Guide lug side surface wear/damage

### WHERE TO LOOK

- Inside and outside face of guide lug

### WHAT TO DO

- Adjust the alignment on the machine (follow manufacturer's operator's manual for the alignment procedure)

### CAUSES OF DAMAGE

- Misalignment of undercarriage
- Operating on extreme side slopes or hills
- Running narrower tracks like 16" widths are more difficult to align to their nature. Periodic alignment checks are important in order to maximize the track life on narrow width tracks.



Not aligned (favors one side)



Aligned (centered)

### PREVENTION

- Adjust the alignment with every track installation. Periodic alignment checks are important when undercarriage components are replaced or worn past their life.

## TOP OF GUIDE LUG DAMAGE

### DEFINITION

- Excessive wear on top of the lugs – chunks missing

### WHERE TO LOOK

- Top of guide lug

### WHAT TO DO

- Replace rubber track if one guide is completely chunked off from the carcass

### CAUSES OF DAMAGE

- When turning, wheels tend to ride over the guide lugs and cause the chunking of guide lug
- When running on rough terrain, reverse bending occurs on the track and the phenomena causes guide lug touching on machine undercarriage



Reverse bending



Close to undercarriage

### PREVENTION

- Avoid or minimize operation on rough terrain



# WARRANTIES

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## LIMITED PRO-RATA WARRANTY - AGRICULTURAL USE FOR FIRESTONE-BRANDED AGRICULTURAL RUBBER TRACKS

### TRACKS COVERED

This Limited Warranty covers all new Firestone-branded Agricultural Rubber Tracks, used in normal agricultural service, when purchased from a Bridgestone Americas Tire Operations, LLC (BATO) authorized dealer or distributor (the "Covered Ag Tracks").

Reference the Firestone Warranty Brochure or visit [Commercial.Firestone.com/en\\_us](http://Commercial.Firestone.com/en_us) for full details.

## LIMITED PRO-RATA WARRANTY - NON-AGRICULTURAL/ INDUSTRIAL USE FOR FIRESTONE-BRANDED AGRICULTURAL RUBBER TRACKS USED FOR NON-AGRICULTURAL/INDUSTRIAL USE

### TRACKS COVERED

This Limited Warranty covers new All Traction Class 5 and All Traction Class 6 Firestone-branded Agricultural Rubber Tracks purchased from a Bridgestone Americas Tire Operations, LLC (BATO) authorized dealer that are used for non-agricultural/industrial use (the "Covered Rubber Tracks"). All Traction Class 3 and All Traction Class 4 Firestone-branded Agricultural Rubber Tracks are not subject to any warranty for non-agricultural/industrial use.

Reference the Firestone Warranty Brochure or visit [Commercial.Firestone.com/en\\_us](http://Commercial.Firestone.com/en_us) for full details.

Have a technical question? Contact Field Engineering:

**1-800-TIRE ENG (847-3364)**

Need additional information?

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