



# MICHELIN TECH TALK



## **TIPS & ADVICE:** *THE USUAL SUSPECTS IRREGULAR TYRE CONDITIONS & WEAR PATTERNS*



# IRREGULAR STEER TYRE WEAR PATTERNS



## ONE SIDED WEAR

<b>Appearance</b>	Wear increasing from one side to the other.
<b>Probable Cause</b>	Out of alignment specification parameters (camber, toe, axle parallelism).
<b>Corrective Action</b>	Check alignment and inspect for worn parts.
<b>Tyre Disposition</b>	Continue to run until minimum tread depth is reached.



## SHOULDER STEP WEAR

<b>Appearance</b>	Partial or full depression of the inside or outside shoulder tread rib.
<b>Probable Cause</b>	This condition is common on radial tyres in slow wearing operations.
<b>Corrective Action</b>	None
<b>Tyre Disposition</b>	Continue to run or rotate.



## EROSION/RIVER WEAR

<b>Appearance</b>	Circumferential worn area situated on the sides of the tread ribs.
<b>Probable Cause</b>	Condition most commonly occurs on slow-wearing radial tyres in steer or trailer position (free rolling).
<b>Corrective Action</b>	None
<b>Tyre Disposition</b>	Continue to run.



## DEPRESSION WEAR (INTERMEDIATE)

<b>Appearance</b>	One or more interior ribs (not center) depressed more than adjacent ribs.
<b>Probable Cause</b>	Incorrect air pressure, worn mechanical part, or non-uniformity such as mismatch.
<b>Corrective Action</b>	Check air pressure and mechanical issues.
<b>Tyre Disposition</b>	Rotate or retread.



## DIAGONAL WEAR

<b>Appearance</b>	Manifests in the form of oblique wear patches. Can appear singularly or repeat around the circumference of the tyre.
<b>Probable Cause</b>	Misalignment, radial and lateral runout, severely out of balance, loose wheel bearings or steering parts.
<b>Corrective Action</b>	Check for mismatch and worn parts.
<b>Tyre Disposition</b>	Reverse direction of tyre or retread.



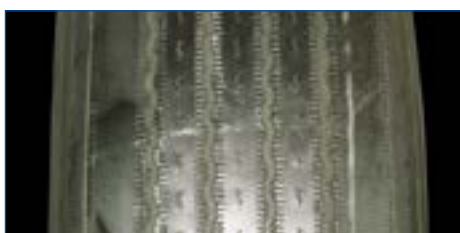
## FEATHERING

<b>Appearance</b>	Feathering at the edge of the tread ribs.
<b>Probable Cause</b>	Usually the result of continued exposure to lateral force, such as excessive toe. Can also form as a result of counter-steering to compensate for drive axle misalignment.
<b>Corrective Action</b>	Check alignment.
<b>Tyre Disposition</b>	Rotate to another position or retread.



## MULTIPLE FLAT SPOTTING WEAR

<b>Appearance</b>	Multiple radially worn areas around the tyre.
<b>Probable Cause</b>	Faulty shocks, loose/worn wheel bearings, severe balance issues, mismatched pressures or tyre diameters, excessive high-speed empty operation.
<b>Corrective Action</b>	Check for mechanical issue; check air pressure.
<b>Tyre Disposition</b>	Continue to run or retread.



## DEPRESSION WEAR (SHOULDER)

<b>Appearance</b>	Localized wear patch on the shoulder rib of the tyre. This patch can repeat around the circumference of the tyre.
<b>Probable Cause</b>	Faulty shocks, lateral runout, loose wheel bearings, mismatch, severe balance issue.
<b>Corrective Action</b>	Check for mechanical problem.
<b>Tyre Disposition</b>	Continue to run until minimum tread depth is reached.



## DEPRESSION WEAR (CENTER)

<b>Appearance</b>	Circumferential depression wear of the center tread rib.
<b>Probable Cause</b>	Overloaded/underinflated, faulty shocks, loose wheel bearings, mismatch, high speed empty haul conditions.
<b>Corrective Action</b>	Check air pressures/load weight and worn parts.
<b>Tyre Disposition</b>	Continue to run, rotate or retread.



# IRREGULAR DRIVE TYRE CONDITIONS



## MULTIPLE CUTS/CHUNKING

<b>Appearance</b>	Numerous small cuts to the tread surface with portions of tread removed, giving a rough appearance.
<b>Probable Cause</b>	Vehicle operation on rough surfaces (misapplication of tread compound).
<b>Corrective Action</b>	Review tyre selection and operation.
<b>Tyre Disposition</b>	Minor damage; should return to service. Consult retreader for possible repair and retread.



## VEHICLE/SPIN DAMAGE

<b>Appearance</b>	Cuts or lines 360 degrees around the tyre.
<b>Probable Cause</b>	Contact with vehicle components (mud flap brackets, bumpers), or spinning the tyres on ice or loose road surface.
<b>Corrective Action</b>	Analyze cause. Ensure tyre does not contact vehicle components. Review driver practices.
<b>Tyre Disposition</b>	Return to service if damage is not below base of tread groove. If deeper, retread or scrap.



## BRAKE SKID DAMAGE

<b>Appearance</b>	Localized spot of excessive wear across tread face showing abrasion marks. Damage may extend into casing.
<b>Probable Cause</b>	New brakes (not worn in), unbalanced brake system, frozen brake lines, driver abuse.
<b>Corrective Action</b>	Check brake system.
<b>Tyre Disposition</b>	May be repaired or retreaded if casing is undamaged; otherwise, scrap.



## STONE RETENTION/DRILLING

<b>Appearance</b>	Stones or gravel embedded between tread blocks, sometimes reaching steel cables.
<b>Probable Cause</b>	Condition is common with vehicles operating on gravel surfaces. Overinflation, misapplication of the tyre.
<b>Corrective Action</b>	Remove stones & return to service. Maintain proper inflation pressures.
<b>Tyre Disposition</b>	Continue to run unless there are multiple spots reaching steel cables. Consult retreader or tyre manufacturer.



## HEEL/TOE WEAR

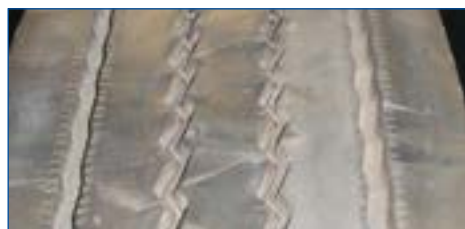
<b>Appearance</b>	Each lug around tyre worn high to low from front to back edge.
<b>Probable Cause</b>	Mismatched inflation pressure or tyre diameters in a dual assembly. High torque conditions, mountainous terrains, and high inflation pressures aggravate this condition.
<b>Corrective Action</b>	Review tyre maintenance practices. Consult tyre manufacturer when selecting tyre for operation.
<b>Tyre Disposition</b>	Continue to run. If severe, change direction of rotation.



## CUPPING/SCALLOP/ALTERNATE LUG WEAR

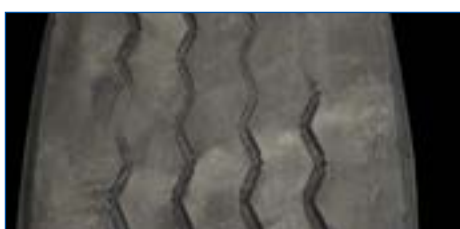
<b>Appearance</b>	Localized cupped-out areas of fast wear around the tyre. Alternate lugs worn to different tread depths around the tyre.
<b>Probable Cause</b>	Mismatched inflation pressure or tyre diameters in a dual assembly. Aggravated by slow rate of wear, poorly maintained suspension components.
<b>Corrective Action</b>	Check for mechanical problem.
<b>Tyre Disposition</b>	Check for worn components, inflation pressures and matching tread depths.

# IRREGULAR TRAILER TYRE CONDITIONS



## DEPRESSION WEAR (INTERMEDIATE)

<b>Appearance</b>	One or more interior ribs (not center) worn below adjacent ribs around the tyre's circumference.
<b>Probable Cause</b>	Worn suspension components, mismatched dual diameter or inflation pressures, underinflation, improper bearing adjustment. Aggravated by high speed/light loads.
<b>Corrective Action</b>	Diagnose mechanical condition and correct.
<b>Tyre Disposition</b>	Continue to run until pull point, then retread.



## DIAGONAL WEAR

<b>Appearance</b>	Localized flat spots worn diagonally across the tread, often repeating around the tyre.
<b>Probable Cause</b>	Improper bearing adjustment, misalignment, mismatched dual tyre diameter and/or inflation pressure. May start as brake skid. Aggravated by high speed/light loads.
<b>Corrective Action</b>	Analyze cause and correct.
<b>Tyre Disposition</b>	Reverse direction of rotation. If excessive, submit for retreading.



## BRAKE SKID DAMAGE

<b>Appearance</b>	Localized spot of excessive wear across tread face showing abrasion marks. Damage may extend into casing.
<b>Probable Cause</b>	New brakes (not worn in), unbalanced brake system, frozen brake lines, driver abuse.
<b>Corrective Action</b>	Check brake system.
<b>Tyre Disposition</b>	May be repaired or retreaded if casing is undamaged; otherwise, scrap.



## DEPRESSION WEAR (SHOULDER)

<b>Appearance</b>	Localized areas of wear in shoulder, generally less than 12" in length.
<b>Probable Cause</b>	Improper inflation pressure or tyre mismounted on wheel. Can also be caused by some other type of wheel end imbalance.
<b>Corrective Action</b>	Review tyre and wheel end maintenance practices.
<b>Tyre Disposition</b>	Continue to run until pull point, then retread.



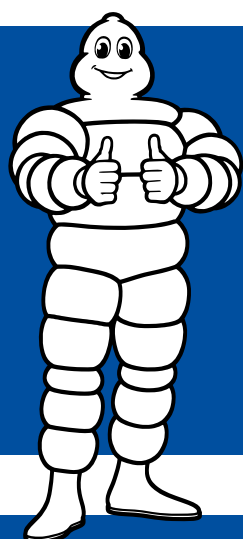
## SHOULDER STEP WEAR

<b>Appearance</b>	Tyre worn on edge of one shoulder, greater than 12" in circumference.
<b>Probable Cause</b>	Excessive camber, misaligned or damaged axle, improper bearing adjustment.
<b>Corrective Action</b>	Diagnose misalignment and/or mechanical condition and correct.
<b>Tyre Disposition</b>	Reverse direction of rotation. If excessive, submit for retreading.



## CUPPING / SCALLOP WEAR

<b>Appearance</b>	Random areas of fast wear around the tyre. Erratic in some instances.
<b>Probable Cause</b>	Mismatched inflation pressure or tyre diameters in a dual assembly. Aggravated by high speeds/light loads, poorly maintained suspension components.
<b>Corrective Action</b>	Check for worn components, inflation pressures and matching tread depths.
<b>Tyre Disposition</b>	Continue to run until pull point, then retread.



AT MICHELIN, WE UNDERSTAND THAT THE LIFESPAN OF THE TYRES IN YOUR FLEET IMPACTS YOUR BUSINESS. AND THEREFORE **WE ARE COMMITTED** TO HELPING YOU OPTIMISE THIS AND MAKE EVERY MILLIMETRE COUNT.

