MICHELIN TECH TALK

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TYRE MOUNTING, DEMOUNTING & BALANCING

Proper mounting, demounting and balancing of truck and bus tyres are crucial for maximizing their performance, safety and lifespan. Incorrect mounting and demounting practices can cause damage to tyres, vehicle and/or people. Therefore, it is imperative that these procedures are completed by trained personnel with the appropriate equipment. Incorrect wheel balancing can have consequences for your safety and the life of your tyres, resulting in avoidable costs. This TECH TALK will delve into BEST PRACTICES for tyre mounting and demounting also exploring wheel balancing, its mechanics, causes and Influencing Factors.

What do we call mountability ?

- Among the criteria characterizing mountability is :
- It's capacity to assemble itself to the rim.
- It's capacity to take the pressure.
- It's capacity to clear the rim humps.
- It's capacity to place itself correctly on the rim seats.
- It's capacity to dismount from the rim.
- It's capacity to retain air pressure.

For a tyre to perform properly, it must be mounted on the correct wheel size.

What is balancing ?

A mounted assembly in rotation can attain a speed of 1800 revolutions per min in passenger car and 600 revolutions per min in truck tyres..

Each particle of material of this mounted assembly is submitted to a centrifugal force.

Let us take a perfectly mounted assembly, whose masses are symmetrically distributed around the rotation axis.

In rotation, the centrifugal force on each particle is balanced by the force on the particle directly opposite it.

As the mounted assembly is symmetrical, the centrifugal forces compensate themselves 2 to 2 and their result is nul.

We say that the mounted assembly is balanced.

In most mounted assemblies, the mass isn't perfectly balanced, so the centrifugal forces don't compensate.

The mounted assemblies are not balanced.

The unbalance of (tyre + wheel) assemblies has several origins:

The unbalance of the components (tyre, wheel, valv**e).**

The out-of-round (run-out of wheel, tyre)

The mounting effect due to the more or less correct positioning of the tyre on the wheel .

Why balance ?

An observation:

Modern vehicles are increasingly lighter.

The sensitivity of vehicles to vibrations and thus to unbalance are found to be increased.

Since the (tyre + wheel) assemblies by construction do not have a low enough level of unbalance, it is necessary to balance them.

By balancing we reduce:

- the effects of various vehicle components and the suspension
- the vibrations of the vehicle which increases the ride comfort.

STATIC Unbalance

Vertical Vibration

COUPLE Unbalance

Vertical and horizontal vibration.

DEMOUNTING PROCESS OF TUBELESS RADIAL TRUCK TYRES

With the valve core removed, deflate the tyre. Run a wire down the stem to ensure against blockage.

Unseat both beads with slide impact tool (FAGUS Bead Braker).

With beads unseated, lubricate both bead surfaces with an approved rubber lubricant.

Position the tubeless tyre levers* on either side of the valve stem approximately 10-15cms apart with the stops facing in.

Push down both levers to pry the bead over the rim flange making sure the opposite bead is fully in the drop center.

Remove one of the two Levers and reinsert it between the tyre bead and the wheel flange about 10cm further away and push down.

Repeat the operation until the bead is completely removed.

Lift the assembly.

Position the flat end of the tyre lever* between the rim flange and the back bead.

Allow the assembly to fall to the ground while pulling up on the tyre lever* to remove the bottom bead.

* Demonstration utilizing T45A tyre irons

MOUNTING PROCESS OF TUBELESS RADIAL TRUCK TYRES

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PREPARATION

Make sure all of the components are thoroughly cleaned and inspected.

Lubricate the bead seating surfaces of the wheel and tyre bead with an approved rubber lubricant.

Position the tyre opposite the valve stem and align the bead to the drop center of the wheel. Push the first bead on as far as possible. It may not go all the way on.

Place the curved end of the tyre lever with the stop facing down between the bottom bead and the rim. Pry the remaining section of the first bead over the rim flange.

MOUNTING

Reposition the tyre so the sidewall opposite the valve stem is closest to the drop center.

While standing on the sidewall opposite the valve stem, place the curved end of the tyre lever with the stop facing down between the top bead and the rim. Bead keepers can be used in lieu of standing on the sidewall.

Lift the lever to pry the top bead over the rim flange. Continue the process to mount the top bead completely.

BEAD SEATING

With the valve core removed, commence inflation with the tyre in horizontal position.

If necessary, use a bead blasting tank or inflation support ring or similar device to expand the sidewalls in the event the bead fails to make a seal during initial inflation.

Inflate to 5 psi or 0.3 Bar and check for concentric seating.

INFLATION

Place the tyre in an approved restraining device and inflate to 20 psi or 1.4 Bar while listening for any popping sounds.

Once 20 psi or 1.4 Bar is reached, inspect the tyre for undulations in the sidewall. Popping sounds and undulations indicate a potential zipper rupture.

If no irregularities are present at 20 psi or 1.4 Bar, continue inflation to the pressure recommended.

Once recommended pressure is reached, install a new valve core and top off pressure if necessary.

Install metal valve cap or a flow through style (as shown) to protect the valve core from dirt and corrosion.

DEMOUNTING TIPS FOR TUBELESS RADIAL TRUCK TYRES

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Do ✓

Always use slide impact tool to unseat the bead.

Lubricate both bead surfaces with an approved rubber lubricant.

Mounting and demounting MUST be carried out from the narrow seat side of the rim.

Make sure that the tip of the curved end of the slide impact bar is inserted between the wheel and bead completely below the bead toe.

Don't ✗

Do not use a slide impact tool in bad condition or other tools not designed for the task as they can cause bead damage.

Do not use lubricant which contains petroleum based products.

Do not attempt to dismount from the long side of the drop center.

A tyre lever which is improperly positioned can damage the bead sole under the force of prying the bead over the rim flange.

MOUNTING TIPS FOR TUBELESS RADIAL TRUCK TYRES

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Do ✓

Always seat the beads with the assembly in a horizontal position.

Use a bead blasting tank or inflation support ring or similar device to expand the sidewalls of the tyre if necessary.

Always use the clip on Air Chuck.

Always use a restraining device when tyre pressure is greater than 5 psi or 0.3 Bar.

Position the restraining device in a clean area at least 1ft. (30 cm.) from any flat solid surface.

Don't ✗

Never seat the bead in the vertical position. It can cause a non concentric bead seating.

Never use any type of flammable substance such as ether or propane to seat the beads on any tyre.

Do not use Air chucks that require the technician to hold the device on the valve stem.

Do not stand in the trajectory zone during inflation.

Follow AIR SAFE

A — **A**lways use a restraining device.

I — **I**nflate with the valve core removed.

R — **R**emain outside the trajectory zone.

S — **S**afety Glasses and Shoes should be worn while conducting tyre work.

A — **A**ir pressure should not exceed the wheels maximum pressure.

F — **F**eet and hands should never be placed between the tyre and restraining device.

E — **E**vacuate air immediately if popping sounds are heard or signs of zipper rupture are present.

Warning: Serious or fatal injury may result from tyre failure due to incorrect selection, fitting, usage or maintenance of tyres. To ensure correct selection, fitment, usage and maintenance, please contact a tyre professional.

PROPER INFLATION INSTRUCTIONS.

This action must be completed by trained staff using proper equipment. Improper installation can damage the tyre (which may not be visible at the time of installation), the inner tube or the wheel.

Cold tyre inflation pressure must be set in accordance with the load, speed and usage conditions.

Michelin recommends that tyres are inflated using an “inflation cage.”

Inflation must be carried out in two stages:

First stage:
- Pre-inflate to 22 psi (1.5 bar).
- Examine the tyre, if in doubt stop and call a specialist.

Second Stage:
- Inflate to the correct pressure.
- Place the tyre vertically in the inflation cage or in a prepared area.

During inflation, position yourself in line with the tread at least 10 feet (3 meters) away.

PROPER MOUNTING AND DEMOUNTING TOOLS.

Never use a duckbill hammer to mount tubeless truck tyres, as this is the number one cause of bead damages.

* Occupational Safety and Health Administration

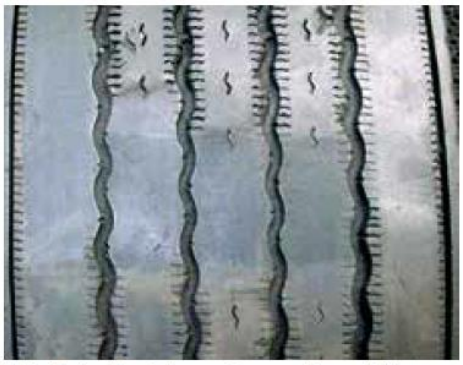
When removing any tyre from a wheel you should use an Impact Bead Breaker (Slide Hammer) to prevent bead damage. This is also a safer way to dislodge the tyre beads from the wheel.

Impact Bead Breaker (Slide Hammer)

TYRE WEAR THAT CAN MANIFEST FROM WHEEL INBALANCE

Diagonal Wear

Appearance	Manifests in the form of oblique wear patches. Can appear singularly or repeat around the circumference of the tire.
Probable Cause	Misalignment, radial and lateral runout, severe out of balance, loose wheel bearings or steering parts.
Corrective Action	Check for mismount and worn parts.
Tire Disposition	Reverse direction of tire or retread.



Multiple Flat Spotting Wear

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

Depression Wear

(Shoulder)

Appearance	Localized wear patch on the shoulder rib of the tire. This patch can repeat around the circumference of the tire.
Probable Cause	Faulty shocks, lateral runout, loose wheel bearings, mis-mount, severe balance issue.
Corrective Action	Check for mechanical problem.
Tire Disposition	Continue to run, rotate or retread.