Mount and Balance Manual

Mount and Balance - Manual
Release 5 – August 2025

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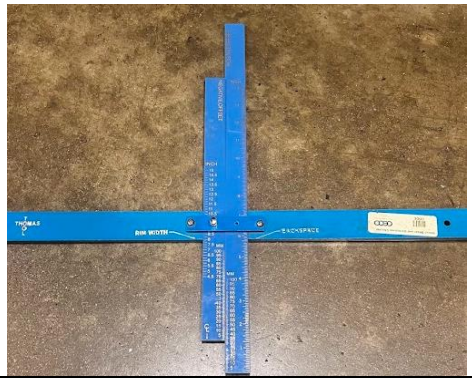
1.Setup

Quick overview -

- Check tire brand, size, speed rating, load index and then inspect the tire for any damage.
- Check the wheel Part #, bolt pattern, offset, and center bore by using the picking label.
- Open up wheels and inspect for any visible damage.
- Input DOT'S for **RETAIL** orders only.
- Match up hardware by invoice #'s and double check correct product has been picked.
- Install valves/ sensors/ optional metal valves.

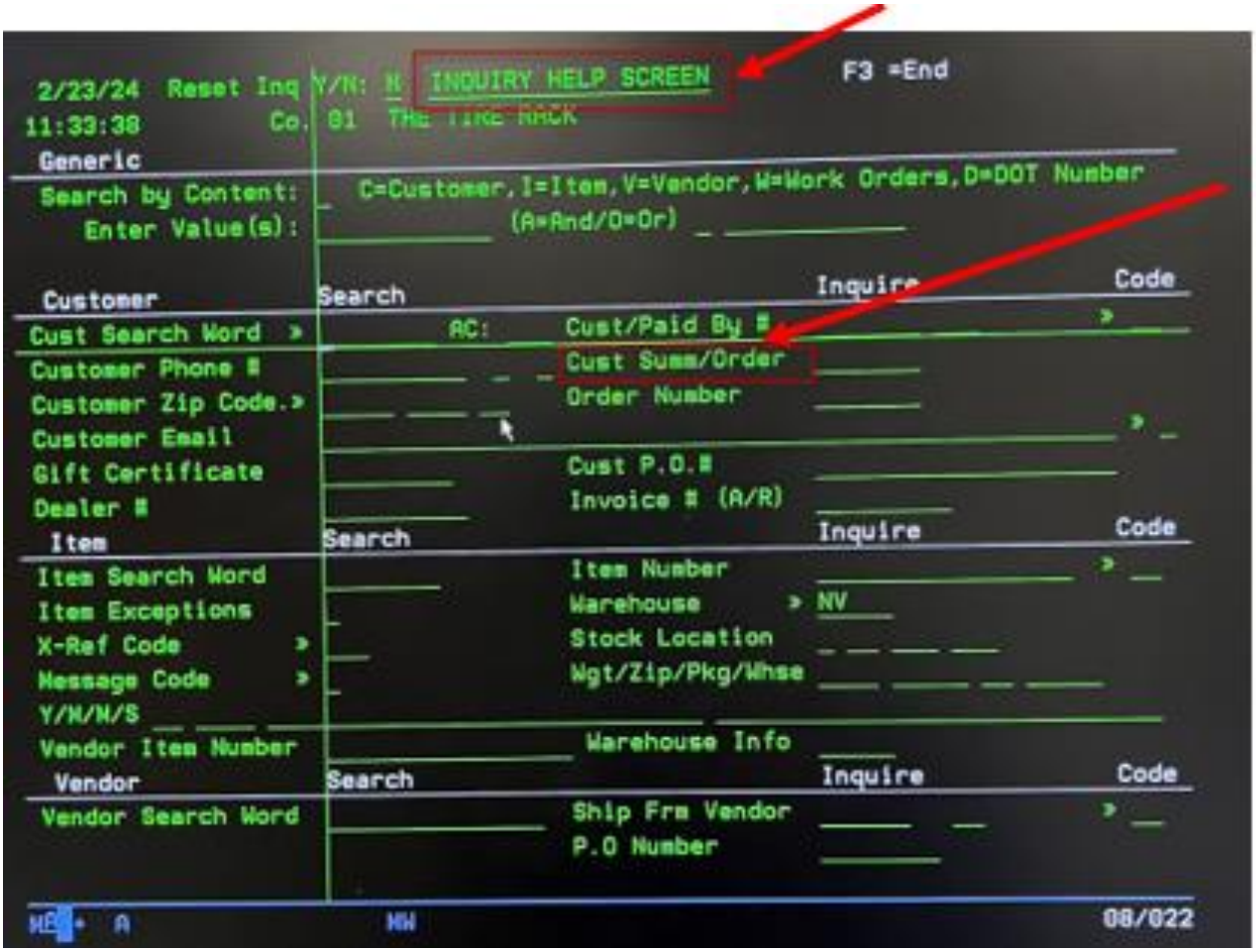
Tools Needed

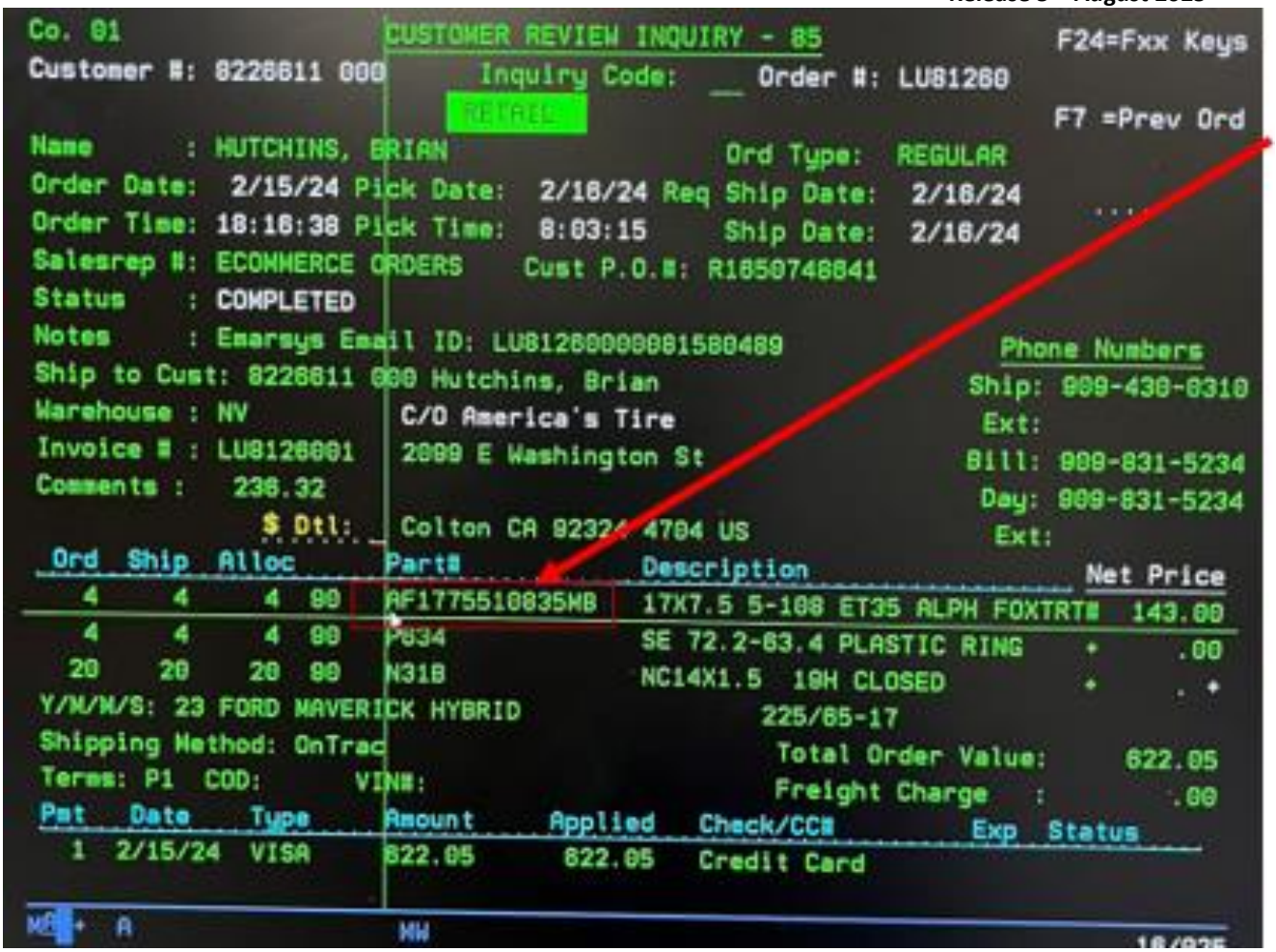
<table>
<tr><td>Valve puller- alloy wheels
 
*Myers Part # 22631</td><td>Valve puller- steel wheels
 
*Myers Part # 22632</td></tr>
<tr><td>Flat head screwdriver</td><td>Phillips head screwdriver</td></tr>
<tr><td>Schrader torque wrench w/11&12mm sockets
 
<u>Must be calibrated every 6 months by:</u>
JKM Calibration
1017 S 400 E
Rochester, IN 46975
Attn: Kent Mills PH 877-434-6122 Fax 574-966-1500
*TTR Part # NUTTORQ3</td><td>Torque tools
*TTR Part # T20TORQ
Dill Part # 5535
 
*TTR Part # T10TORQB
Dill Part # 5414
  </td></tr>
<tr><td>Bolt pattern tool
 
*Myers Part # 89345
(Check bolt patterns from the back hub of the wheel.)</td><td>Hammer/clip-on weight remover
*Myers Part # 50504
  </td></tr>
<tr><td>Tin snips</td><td rowspan="6">Offset Tool
  </td></tr>
<tr><td>Channel Locks</td></tr>
<tr><td>Ratchet w/assorted metric & standard sockets</td></tr>
<tr><td>Assortment of Allen wrenches (English and Metric)</td></tr>
<tr><td>Pick set</td></tr>
<tr><td>Skiver Knife
 
Skiver knife</td></tr>
</table>

1.4 Wheel Inspection Standards

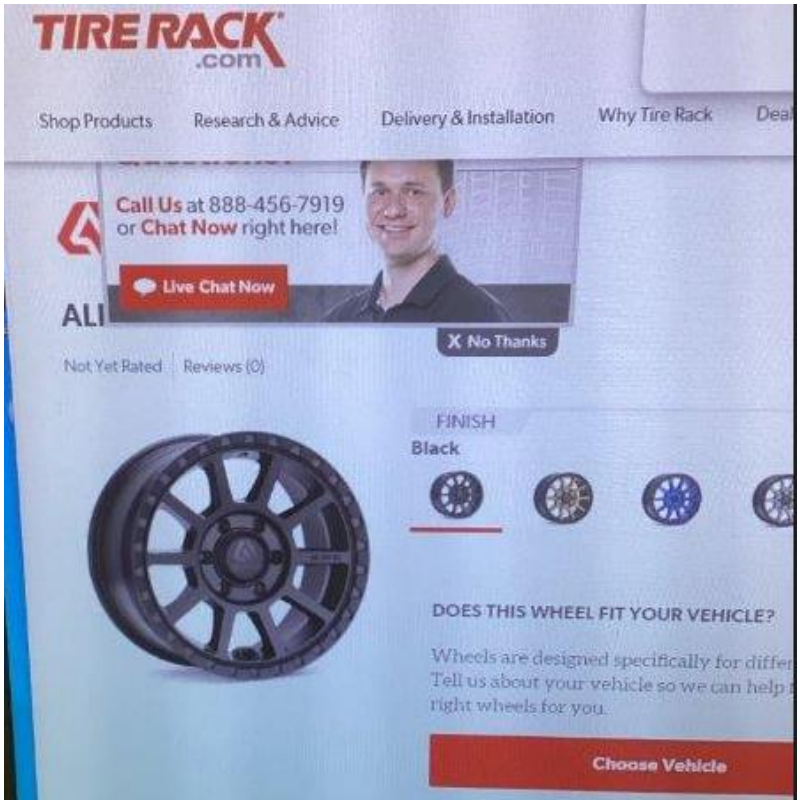
Flip all wheels to ensure the face design matches the website picture reference.

1. Use the **AS400 INQUIRY HELP SCREEN**
    A. Type order # in the **CUST SUMM / ORDER** line, then press **ENTER**.





2. Locate the wheel part number, place the cursor under it
    A. Hit **F8,** then **TAB + ENTER.**
    B. The wheel picture will appear as customers see it on the website.
        i. Check if the Wheel pattern and center cap match the website. Inspect for any cosmetic flaws and possible damages. Install TPMS or specialty valve stems (if any). The employee must install all caps unless the cap is too tall or surpasses wheel face height.



3. If the provided wheel does **NOT** match the website
    A. Refer to manager

General Inspection Guidelines

Below is our inspection standard for wheels. These are the general guidelines for what should and should not pass.

When inspecting wheels, we need to keep in mind; no wheel is going to be 100% cosmetically perfect. Wheels are a functional part of the vehicle and as such, they will be used outdoors and exposed to the elements. In short, they are auto parts, not fine jewelry. Most customers are not going to be looking as closely at their new wheels as our team members who will handle them during the mounting, packing, and shipping process. Wheel inspection involves common sense but is also subjective.

When it comes to cosmetic defects, if they are not visible from 3' (one meter), they are acceptable. This is the industry standard.

Even so, the price of the wheel needs to be considered. The more expensive the wheel, the pickier we can be about what is acceptable or not. A customer purchasing a $1000 wheel is going to be more critical than someone purchasing a steel wheel or an entry level alloy wheel.

- 'A' Surface = outer face of the wheel, from rim edge to center
    - No pits or porosity allowable.
    - The 3' visual standard applies to cosmetic flaws on the face.
    - Price point of wheel will also be a determining factor. Wheels that are $300+ each should be held to a stricter standard than $100 winter package wheels.
- The majority of all of the porosity rejections were from porosity found on the back of the spokes. This area is not considered to be an 'A' cosmetic surface. It is considered to be a 'B' or 'C' surface.
- All other surfaces, non-cosmetic, 'B' and 'C' surfaces
    - Minor pitting and porosity is allowed.
    - Pits larger than 3mm (1/8") across and / or deeper than 3mm (1/8") are not allowable. Reject if larger.
    - Many of the wheels have 'as cast' surface in the spoke recesses. These are allowed.
    - Cosmetic cover-up (paint touch up, filler, etc) are allowed. If the area 'bleeds' or shows a discoloration from the surrounding color, the wheel is to be rejected.

Paint Issues

- Color/finish match issues visible from 3’ or closer are not acceptable
- Please take photos of the wheels side by side and send to fitment
- Always compare wheels to the sample on our website to determine which finish is correct
- Wheels and painted cover plates should match
- **Circle the defects on the wheel with a wet erase marker and note the location in the A09 notes**

There may be instances where stock may be unavailable in other warehouses and the only remaining stock does not meet the above criteria. In those instances, a photo should be taken. If the structural integrity of the wheel does not appear to be compromised, fitment will give the OK to ship the wheel. If it is a cosmetic flaw, we can have customer service send the photo to the customer for approval at a discounted price.

1.6 Inputting DOT into Scanner

1. After scanning the parcel, you will automatically enter a screen requesting the DOT identifier.

A. This screen may present multiple identifiers. Find the correct line(s) and input how many tires exist with each.
    a. Identifiers may be VERY similar as shown above. Ensure accuracy on ALL tires as some may be different than others in the same order

B. Note that total must equal how many tires are in order
    a. Could be split between several DOT identifiers

2. Identify and upload ALL tire's 4 digit DOT (Week/Week-Year/Year) shown in red letters
A. These may vary among set of tires, so check each one.

3. Submit each until scanner returns to main login screen

1.9 Installing Valves

-**Small rubber valves (#413)** - alloy wheels, unless manufacture has provided a valve, or the customer ordered TPMS sensors/metal valves.

-**Large rubber valves (#418)** - steel wheels only, unless customer has ordered TPMS sensors.

-High Pressure rubber valves (TR600HP/TR602HP)-must be used with tires load range D and higher.

Installing TPMS Sensors

Install using provided valve nut and make sure that all rubber/metal washers are not in the way of rubber grommets. When installing certain valves/sensors that have a break-away washer inside, the valve nut needs to be finger-tightened and then torque down. Between 5-15 in.lbs. the internal washer inside the valve nut will break and the valve nut will be able to be torque down to its proper spec.

Correct

Nothing in the way of the rubber grommet

Incorrect

Washer on Bottom

-Torque to the specified NM (Newton Meter) on the hardware label.

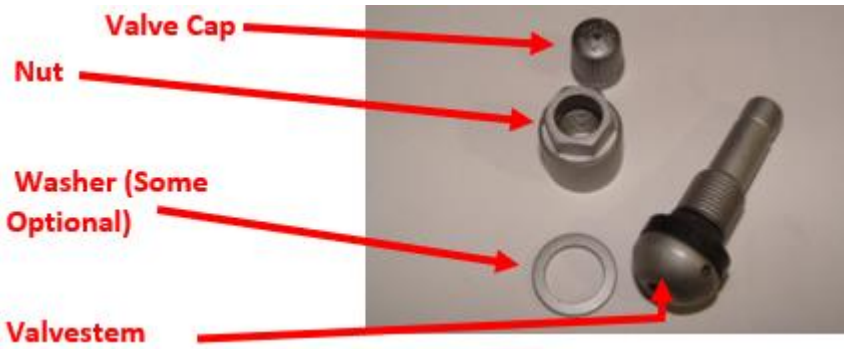
Installing Beru Style/Huff Sensors

Sensor

Valve kit

1. Remove valve cap, nut, and washer from valve stem.

Valve stem and sensor can be connected prior to installing in the wheel on certain applications.



2. Insert valve through valve hole of wheel and place washer on top of the valve stem.

No washer

Washer on Top

3. Place nut on top of valve stem and screw on finger tight.

4. Adjust torque wrench to specified torque and tighten till proper NM(newton meter) is reached.

Sensor must be parallel with wheel

Torque wrench must be calibrated once every 6 months by:

JKM CALIBRATION

1017 S 400 E

Rochester, IN 46975

Attn: Kent Mills

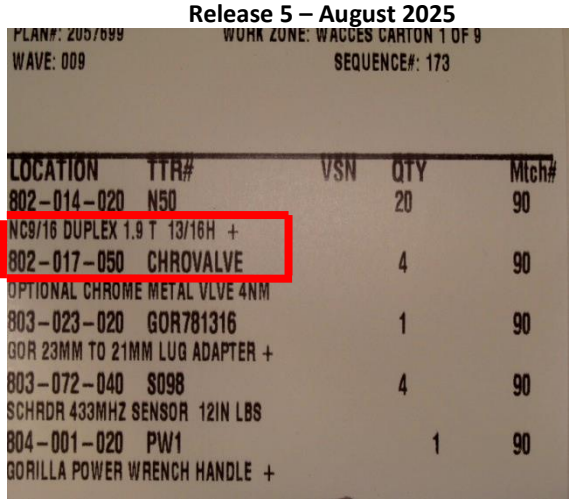
PH 877-434-6122 Fax 574-966-1500

5. Install valve cap and double check sensor is tight.

Replacing rubber valves with metal valves

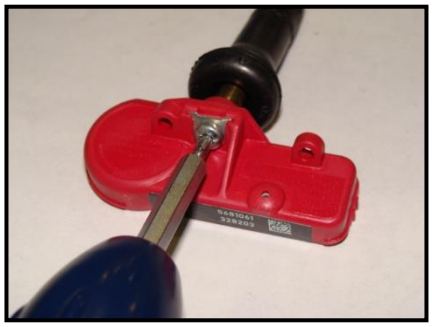
Certain valves on sensors are interchangable with optional metal valves that the customer has purchesed at an addtional price. These valves will be in the hardware tote and noted on the hardware label. After removing rubber valves throw away. **DO NOT send with order**.

Note: Ensure Mtch # corresponds to order Mtch #



Optional metal valve

1. Using the Dill torque tool remove valve stem screw from the back of valve stem.



2. Pull rubber valve stem away from sensor.

3. Place metal valve into same slot as previous rubber valve.

4. Tighten screw with Dill tool until it clicks, the torque for this tool is preset at 12 inch lbs.

Issues with setup station

Damaged Material-

- Set entire order to the side to be inspected by supervisor. If the product is deemed to be damaged, the supervisor will email fitment to approve a discount for the customer to take if no more are in stock.

Bent Beads-

- Place merchandise aside, supervisor writes it up and then prints a label for bent bead and a new tire is picked.
- If no more tires are in stock, take all labels to office staff and let them know.

Missing Hardware (valves, caps, etc)-

- Set order aside and manager is to write off inventory through AS400

Wrong Product Received-

- Picker error: Send picker back with wrong merchandise to put back and pick correct merchandise. Inventory then gets filled in for mispicks, etc.
- Sales error: Take all labels into office and set order aside. This order will most likely be put back to stock.

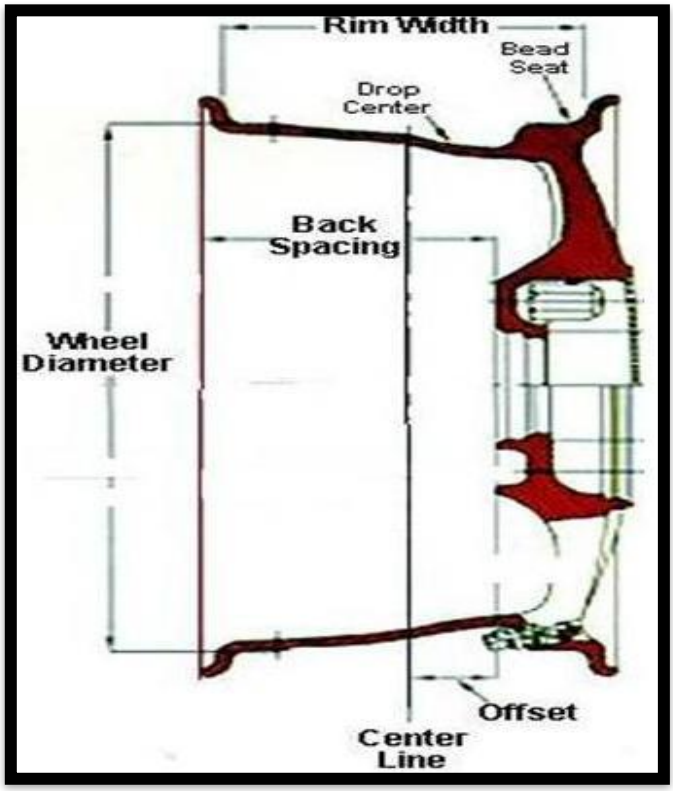
2. Mounting

Quick overview-

After the tires/wheels have been inspected and all necessary hardware installed, the tires are now ready to be mounted to the wheels. Mounting the tire to the wheel only requires one worker using either the TC3500 or the TCX 550 Hunter mounting machines.

Tools Needed

2-Mounting bars (Myers Part # 71422)  **OR** Grip/Athletic Taped Mounting Bar (Recommended) 	1-Mounting bar with Dismounting sleeve  
Lube brush/wand (Myers Part # 46657) 	2-1/2in wrenches (for changing mount heads)
Mount heads (Myers Part # 221-675-2-B) 	Lube (Myers Part # 46251) 
TC3500 Tire Changing Machine ○ Reverse mount pads ○ Tulip extensions	TCX 550 Mounting machine w/attachments ○ Metal head ○ Plastic head ○ Extra arms w/rollers ○ Clamp extensions
Valve core remover (Myers Part # 27130) 	Safety glasses 
Metal Mount head (Myers Part # 71395) 	1-Dismounting bar “Dill 5500-BP” 



Wheel Diameter- Size of the wheel in inches

Rim Width- How wide the wheel is in inches

Drop Center - Point of wheel tire must sink down under in order to insure a safe damage free mount.

Back Spacing - How far the flange is to the back of the wheel.

Offset- The amount of space between the flange and the center line

Bead Seat- Tire must seat tightly around in order to insure no leaks

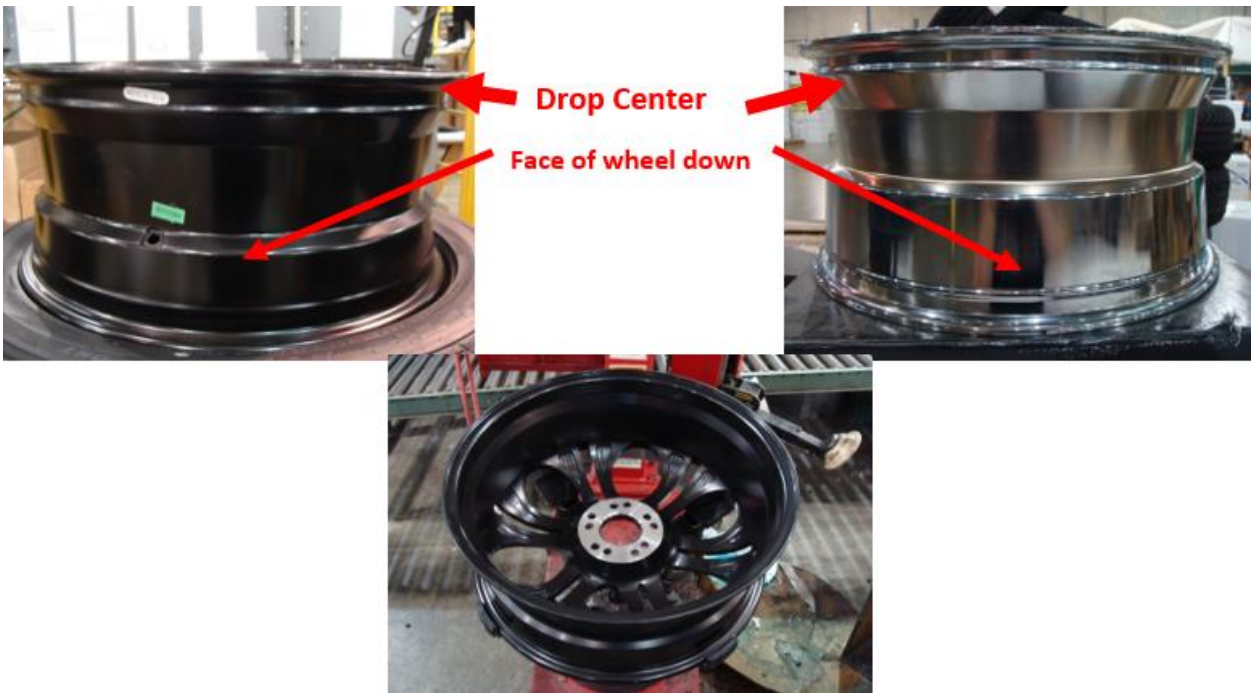
Center Line- Center of wheel

Types of mounting

There are two ways to mount the tires on the wheels, standard face side up or reverse mount. Each way requires that the tire is forced down into the drop center using the least amount of force to ensure a damage free mount.

Standard mount - Face of wheel up towards mounting head because the drop center is smaller on the front of the wheel.

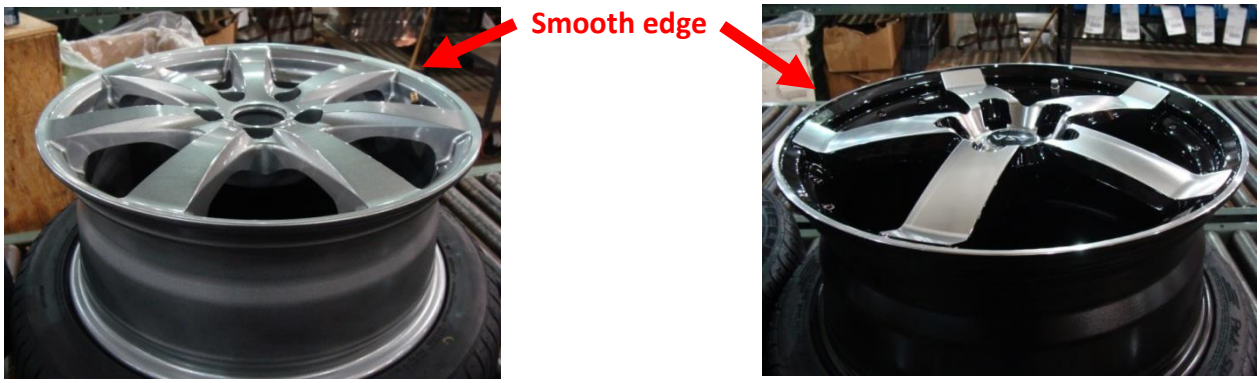
Reverse mount -Wheel upside down because the drop center is smaller on the rear of the wheel.



Identifying which mounting machine to use

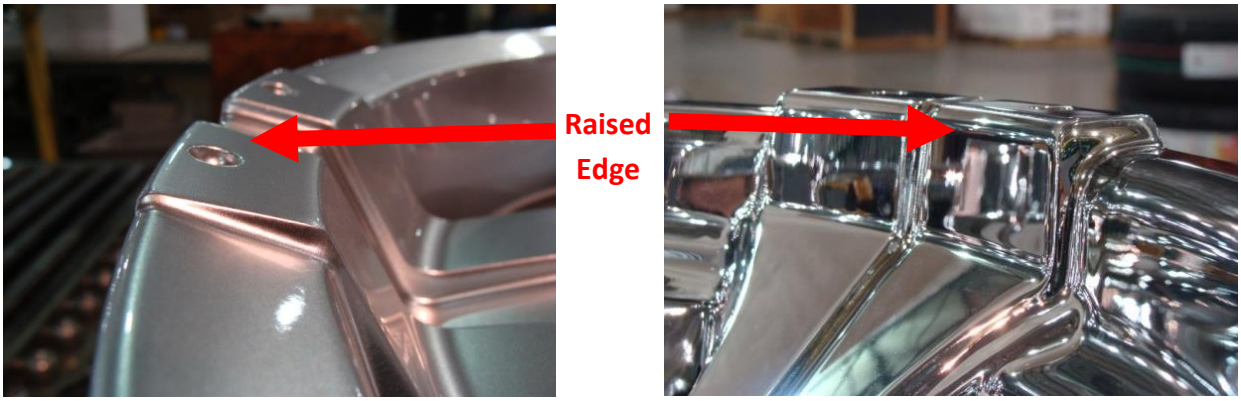
2.2 TC3500

Wheels that do not have any type of raised edge on the face of the wheel are easiest to mount on the TC3500, but can also be done using the TCX550 or TCX50H. **Reverse mount** wheels are also easiest to mount tires using the **TC3500**.



2.2 TCX550 or TCX50H

For wheels with **raised edges** on the face it is best to use the **TCX550** or **TCX50H** bead press system.



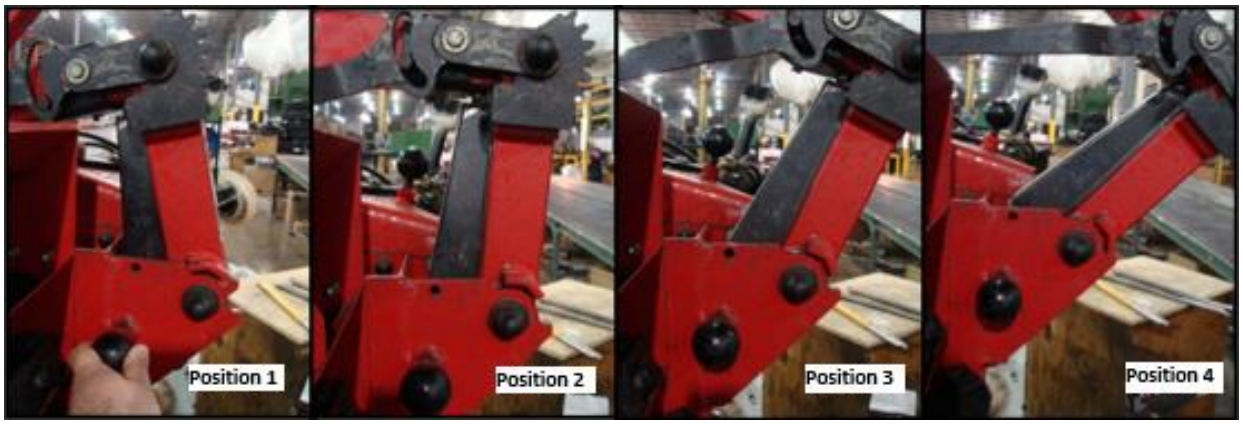
2.5 Basic Mounting Procedures (TC3500)

1. The first step is to identify whether the wheel is standard mount or reverse mount.

2. Next carefully inspect mount head for any damage. Make sure no nicks or groves; this can cause damage to wheels when mounting.

3. The person mounting then checks if tires are directional, asymmetrical, symmetrical, and or have a nicer side. Then a parcel audit is done on one label.
   - **A.** Directional tires - Specific side of the vehicle, mounted by alternating 1 right, 1 left, 1 right, 1 left and marked with directional stickers to avoid mistakes.
   - **B.** Asymmetrical tires - Inside/Outside stamped onto sidewall by manufacture.
   - **C.** Symmetrical tires - Mostly DOT date up except for some Goodyear and Dunlop tires in which the nicer sidewall needs to be mounted facing up towards the face of the wheel.
   - **D.** If symmetrical tires have a manufacturer's bonded barcode on the sidewall, this should always be mounted in for cosmetic reasons.
   - **E.** For all symmetric slick-type Racetrack & Autocross Only tires, one full DOT branded sidewall must face **outward** with the other full DOT branded sidewall facing **inward** per axle when mounted on their wheels in order to help their tires resist tread splices becoming visible or tearing open.

4. After checking tire, worker then clamps the wheel to the mounting machine, by pressing down on the pedal located on the left side of the machine.
5. Always start out with your valve at the 7 o'clock position to ensure that the sensor will not get damaged by the tire bead.



Adjust mount head position if needed: positions range from 1 to 4.

Note: Position 3 is the most common, but the head can be adjusted back to positions 1-2 to help insure a damage free mount. Position 4 is most commonly used for steel wheels.

6. Once clamped, the mounter lubes the tire. Lube the bead area of the tire completely up to the first line.

7. Lower arm down and place mount head onto wheel.

8. Position the bead of the tire under the mounting head and press the wheel rotation pedal located on the right side of the machine down to rotate the wheel clockwise.

9. Spin wheel till valve is at the 5 o'clock position after first bead is mounted so bars do not damage valve/sensor.

10. The tire is then mounted onto the wheel, using bars for assistance as needed. When bars are needed the first bar grabs the first lip of the wheel, and the second bar is positioned to grab the second lip of the wheel (drop center).

Note: When using mounting bars for assistance always make sure to hold firmly in place preventing any slippage. Failure to do so can leave grooves in the bead seating area of the wheel and may allow air to leak.

NOTE: Inspect the first tire and wheel that is mounted to ensure the lip/mount head set-up was done correctly. This will avoid damaging 4 wheels in a row.

2.5 Basic Mounting Procedures (TCX550)

TCX550

1. The first step is to identify whether the wheel is standard mount or reverse mount.

2. Next carefully inspect mount head for any damage. Make sure no nicks or groves; this can cause damage to wheels when mounting.

3. Next, the mounter checks if tires are directional, asymmetrical, symmetrical, and or have a nicer side. Then a parcel audit is done on one label.
   - **A.** Directional tires - Specific side of the vehicle, mounted by alternating 1 right, 1 left, 1 right, 1 left and marked with directional stickers to avoid mistakes.
   - **B.** Asymmetrical tires - Inside/Outside stamped onto sidewall by manufacture.
   - **C.** Symmetrical tires - Mostly DOT date up except for some Goodyear and Dunlop tires in which the nicer sidewall needs to be mounted facing up towards the face of the wheel.
   - **D.** If symmetrical tires have a manufacturer's bonded barcode on the sidewall, this should always be mounted in for cosmetic reasons.
   - **E.** For all symmetric slick-type Racetrack & Autocross Only tires, one full DOT branded sidewall must face **outward** with the other full DOT branded sidewall facing **inward** per axle when mounted on their wheels in order to help their tires resist tread splices becoming visible or tearing open.

4. After checking tire, worker then clamps the wheel to the mounting machine.

5. Always start out with your valve at the 7 o'clock position to ensure that the sensor will not get damaged by the tire bead.

6. Adjust mount head by pulling or pushing arm assembly toward wheel leaving about a ½" gap between the wheel and mount head.

Note: Metal mount head should be used for wheels with raised spokes.

7. Lock head in place by pressing the head lock button located on the handle.

8. Once head is set, the mounter will lube the tire.

9. Position the bead of the tire under the mounting head and press the wheel rotation pedal down to rotate the wheel clockwise

10. Spin wheel till valve is at the 5 o'clock position after first bead is mounted so bars do not damage valve/sensor.

11. The tire is then mounted onto the wheel, using bars for assistance as needed. When bars are needed, the first bar grabs the first lip of the wheel and the second bar is positioned to grab the second lip of the wheel (drop center).

12. After the tire is mounted, release wheel from machine, and place on rollers with the valve facing towards the mounter to help make airing the package faster and easier.

NOTE: Inspect the first tire and wheel that is mounted to ensure the lip/mount head set-up was done correctly. This will avoid damaging 4 wheels in a row.

2.8 Dismounting a Standard Tire from Wheel

1. Place wheel and tire combination on mounter and clamp down using the foot pedal located on the left side of the machine.

2. Use rollers or bead breaker located on side of mounting machine to break down beads.

3. While breaking beads down, rotate the wheel counterclockwise by lifting up on the pedal located on the right side of the machine.

4. Position the wheel with the valve at one o'clock.

5. Lower mount head and position on edge of wheel.

6. Slide dismounting bar with plastic sleeve behind mount head.

7. Pull back on bar to get the tire over the mount head and rotate wheel clockwise by pressing down on the pedal.
    a. Pressure should be applied to opposite side of the head.
    b. Tire needs to tuck under drop center to allow for bead to come over the head.

8. To remove second bead place mount bar under tire and pull back over mount head.

9. Rotate wheel clockwise with mounting bar pulled back over wheel.

Issues with Mounting Station

Scratched wheel-

Set product off to the side for mount and balance supervisor to evaluate the damage.

a. If no more are in stick, the supervisor will email fitment support to approve a discount for the customer.

Ripped bead-

Set product off to the side for mount and balance supervisor to evaluate.

a. If more in stock, write off using appropriate code.
b. If none left in stock take all labels into warehouse office and they will contact sales to see how to proceed.

Bent Bead-

Set product off to the side and mount for balance supervisor to evaluate the damage and write off.

a. If more in stock write off using appropriate code.
b. If none left in stock take all labels into warehouse office and they will contact sales to see how to proceed.

Broken mount head-

Use 2- ½" wrenches to remove nuts and bolts, replace with new mount head.

3.Inflation

Quick overview -

One worker is responsible for:

- Performing a daily quality control air pressure test on one package from each air machine using a TR air gauge.
- Cleaning wheels and checking for any damage
- Airing to specified maximum 50 psi to seat beads
- Airing every package to the given PSI
  ***DO NOT INFLATE BEYOND RECOMMENDED COLD PRESSURE NOTED ON SIDEWALL**
- Removing and re installing proper valve cores and valve caps as needed
- Wearing eye and ear protection while blasting cheetah
- Safety – Insure no items (valve cores, tools, etc.) sit on top of the protective cage

Tools Needed

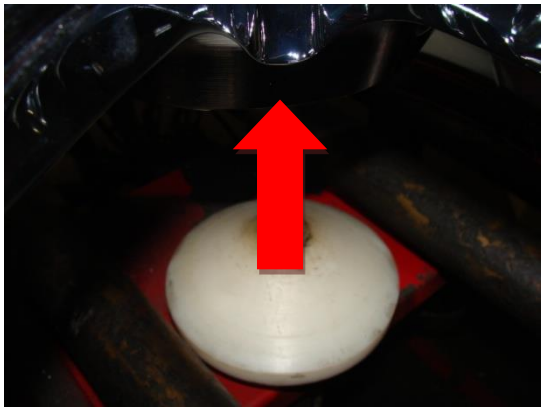
<table>
<tr><td>Xact cleaner
  </td><td>Soft-n-Fresh wipes
  </td></tr>
<tr><td>Ear plugs
   </td><td>Valve core installer Torque tool
(TTR Part # VALVETORQ/Myers Part # 27145)
  </td></tr>
<tr><td>Nickel plated valve cores (TPMS/metal valves)
  </td><td>Brass plated valve cores (rubber valves ONLY)
  </td></tr>
<tr><td>Valve caps
  </td><td rowspan="2">Cheetah Blaster / Bead Bazooka / Viper
    </td></tr>
<tr><td>Safety glasses
  </td></tr>
</table>

3.6 Ring Blaster

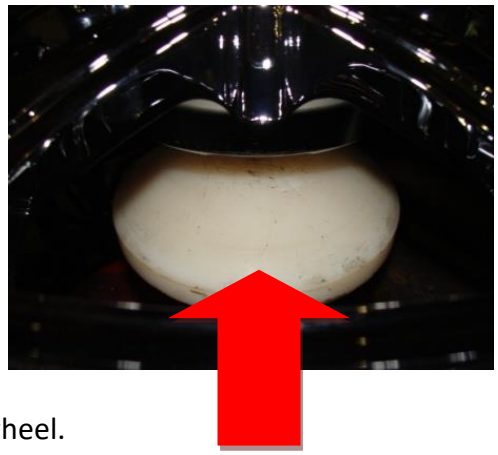
For wheels that have a large gap between the tire and the wheel.

1. Connect air hose to the valve stem.

2. Position wheel center bore so that rubber cone is directly underneath.



3. Pull back on switch to raise cone and lift wheel.



4. Leave a 1” gap between the ring blaster and the wheel.

5. Press start button to activate inflation machine.

6. While inflation machine is running press start button again to blast.

3.6 Tire Beading Ring

1. Fully lube tire beading ring

2. Flip package on side or invert
   A. Lube internal face of wheel, under and around the lip

Note: Inverting and using the bead ring on the top bead is also viable and occasionally faster.

3. Slide tire beading ring over the lip of the wheel
   A. Should be similar to an O ring sealing

4. Flip the tire back to its original position and begin to air
   A. Bead ring will slide off
   B. Pull package off ring and continue with inflation

3.6 Cheetah Blaster/Viper/Bead Bazooka

Only use after the attempt to seat the bead using the ring blaster on the inflation machine has failed.

1. Safety glasses and ear protection are required before use.

2. Connect air hose to cheetah/viper/bead bazooka and open valve to fill.

3. After chosen bead blaster is full, close valve and disconnect air hose.

4. Aim between tire and wheel gap inside cage.

5. Hold cheetah/viper firmly against chest and press start button to activate inflation station.

6. Press release button to blast
   A. Viper/Cheetah – Red release button

B. Bead Bazooka – Silver trigger release

7. Close cage door after tire has started to air up.

Issues with Inflation Station

If tire/wheel won't air up, then try the following:

- Blasting with the Cheetah Blaster
- Bring back to mounting station and work the bead area until it seats up.

If you see damage to tire/wheel, set aside and let manager know to evaluate and write up.

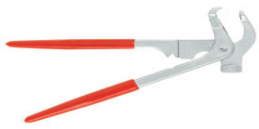
4. Balancing

Quick Overview-

Workers balancing are responsible for:

- Calibrating balancer every morning
- Perform a daily calibration on every balancer using a known, properly balanced “test” tire & wheel package.
- Balancing tire/wheel packages
- Installing rings, clips, caps if needed

Tools needed

Thin 1/4oz adhesive weight strips  **SILVER**  **BLACK**	Silver large 1oz adhesive weight strips  **SILVER**  **BLACK**
<u>Steel wheel</u> clamp-on weights 	<u>Alloy wheel</u> clamp-on weights – Infrequently used 
Assortment of cones 	Hammer w/clamp-on weight remover *Myers Part # 50500 
Premade 4 lug plates 4X100, 4X108, 4X114	2 universal 5 lug plates w/fingers
Premade 5 lug plates 5X100, 5X112, 5X114, 5X120, 5X130	Premade 6 lug plates 6X135, 6X139
Universal screwdriver with bit assortment	Rubber dead blow hammer (3Lbs.) 
Tap set 	Bolt pattern tool (Check bolt patterns from the back hub of the wheel.) 
Alloy wheel weight installation/removal tool 	Safety glasses 

PB “Blaster” 	3M microfiber tack cloth 
Wheel weight adhesive remover 	Digital caliper 
Road Force Calibration Tool Hunter Part # - 221-672-1 	Plastic scraper 

What Is Balancing?

Sensors in the balancer measure the forces of unbalance as the tire rotates. These forces are resolved into static and couple values for the inner and outer planes of the wheel, and compared to the unbalance tolerance.

Balancing Guidelines

- Nothing leaves the warehouse without weight on it
- **Thin 1/4oz adhesive weights**-on all alloy wheels
- No more than **4oz per plane** on wheels **smaller than 20”** (unless approved)
- **Large 1oz adhesive weights** – only used on **20”wheels or larger**
- No more than **8oz per plane** on **20” wheels and larger** (unless approved)
- **Black weights** on **black faced** wheels only
- **White weights** on **white faced** wheels only
- All hardware (caps, rings, retainers) installed

Hunter GSP9700 with Road Force and SmartWeight™

Official Manual Online Link – Click here if using online version

4.0 Daily Maintenance

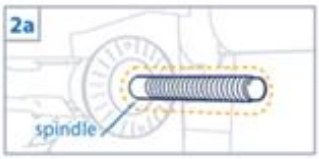
HUNTER Engineering Company

Wheel Balancer - Daily Maintenance

1 **Clean around and under balancer.** Clear all loose weights from floor.

Wheel weights under balancer may cause weight chasing.

2 **Clean and lube spindle.** Apply 3-in-1 oil to a rag. *(Keep oil from skin.)* Use **"Clean Threads"** feature to rotate.



3 **Clean hub face by hand** with Scotch Brite pad. **Do not lube this surface!**

Dry scrub by hand to prevent hub damage. Do not use power tools. **Do NOT use "Clean Threads" to clean hub.**

4 **Inspect wing-nut and cup.** Gritty bearings, broken knobs and missing handle spacers may cause balance issues.

5 **Perform 3 Spin Balancer Calibration.**

4.1 Daily Calibration - Physical Button Calibration

To ensure the balancing machine is working properly, daily calibration must be performed in the morning or before the use of the machine. Calibrating the machine only takes about 5 minutes and can save time and most importantly mistakes throughout the day.

1. The **ON/OFF** (**I/O**) switch is located on the back of the balancer. Turn balancer ON by pressing the **"I"** side of the switch. To turn the balancer OFF press the **"O"** side of the switch.

2. The first screen that will appear is the one pictured to the right.

3. In order to get to the calibration page, you must scroll down by using the green arrows located under the screen.

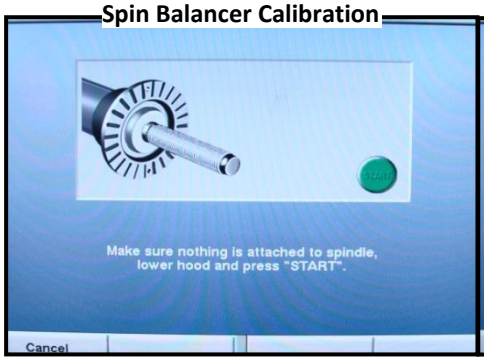
4. On the page below it will show the calibrate box. Next hit the **K1** button located just under the calibrate box.

5. After pressing the **K1** button, you will be able to scroll through the calibration menu by using the **K2** and **K3** buttons located under the up/down arrows.

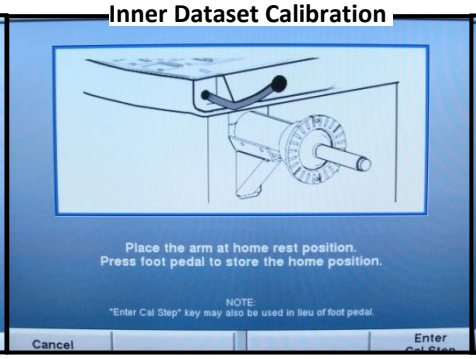
6. To start the calibration after scrolling down press the **K4** button located under the **Begin Procedure** box.

7. When performing a calibration of the machine, it will guide you through each step until the calibration is complete.

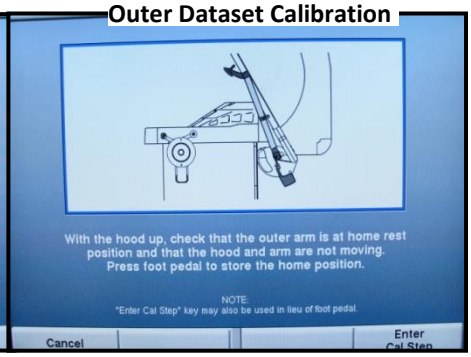
Spin Balancer Calibration



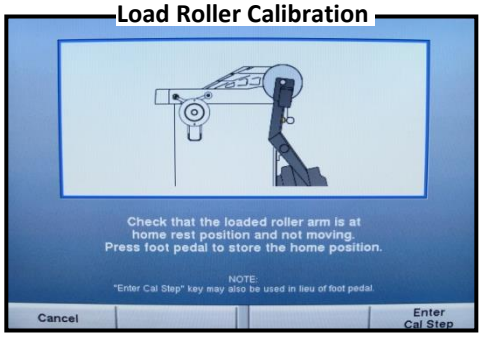
Inner Dataset Calibration



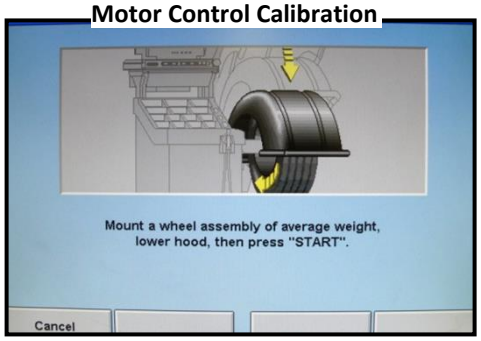
Outer Dataset Calibration



Load Roller Calibration



Motor Control Calibration

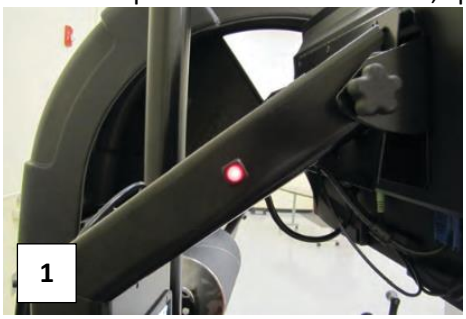


After all calibration procedures have been done a test package must be used across all balancers to ensure all machines are working properly. For example, each machine has the same weight and very close road force.

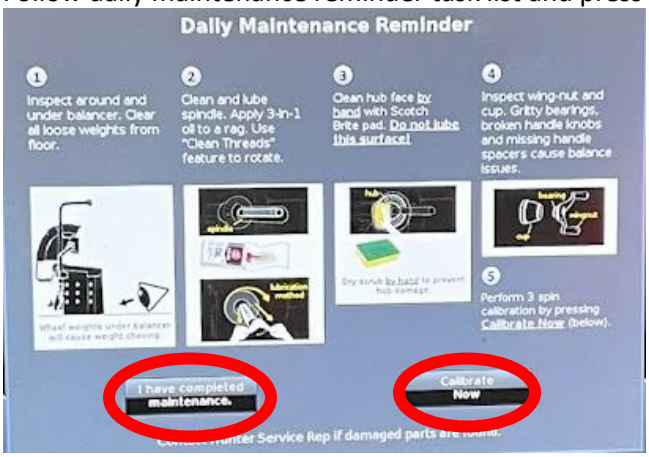
4.1 Daily Calibration – Touch Screen Calibration (No data arm)

To ensure the balancing machine is working properly, daily calibration must be performed in the morning or before the use of the machine. Calibrating the machine only takes about 5 minutes and can save time and most importantly mistakes throughout the day.

1. The SmartWeight Touch®/GSP9200 Touch is equipped with a push button power switch located on the left side of the LCD support. Use this switch for normal shut down and restarting procedures (1).
    A. If necessary, The main power ON/OFF switch is located on the back of the balancer cabinet. To power the balancer "ON," press the "I" side of the ON/OFF switch. To turn all power the balancer "OFF," press the "O" side of the ON/OFF switch (2).



2. Follow daily maintenance reminder task list and press "I have completed maintenance.".



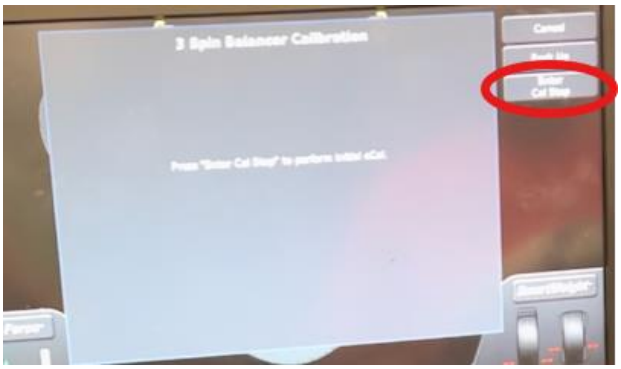
3. Press "Calibrate Now".

4. Spin Balancer Calibration: Lift hood and install cal weight on left side of faceplate (either hole), rotate spindle to position the weight at 12:00, then press "Enter 12:00 Position".

5. Lower hood and press green START button (bottom right side of screen)

6. Lift hood, remove weight and install on the right side of faceplate (same hole), lower hood, then press “START”.

7. Raise hood and press “Enter Cal Step” to perform initial eCal.
    A. Wait for calibration – Do not touch the balancer!



After all calibration procedures have been done a test package must be used across all balancers to ensure all machines are working properly. For example, each machine has the same weight and very close road force.

4.1 Road Force Calibration

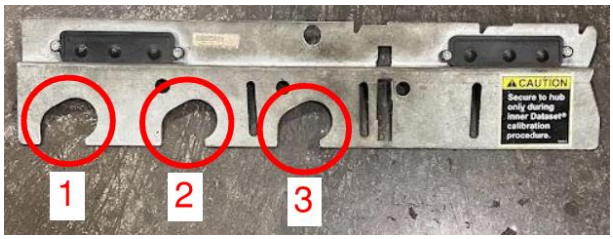
Note: This should be done every 6-12 months (unless there is maintenance done, or parts have been swapped)

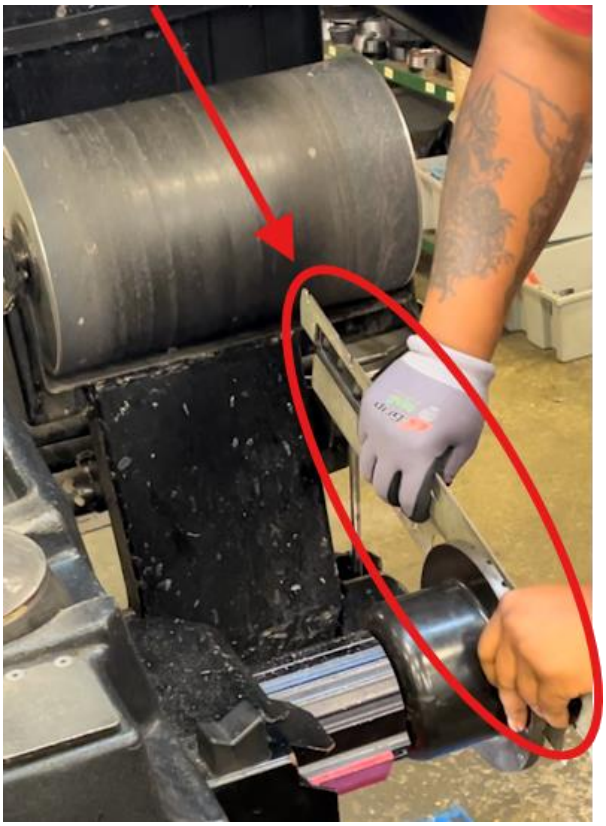
The load roller runs parallel to the tire and applies up to 1,400 pounds of force to simulate real world driving. The amount of force placed on the tire depends on the diameter of the tire and stiffness of the sidewall.

Calibration

1. From home screen, press the following:
    A. Tools
    B. Advanced
    C. Calibration Procedures
    D. Load Roller Calibration
    E. Enter Cal Step

2. Place road force calibration tool in position 1
    A. Pull road force applicator into tool
        i. Part #: 221-672-1
    B. Press foot pedal to set position
    C. Repeat for position 2 & 3





4.5 Setting Dimensions

Note: Steels and alloy wheel dimension setting steps differ

1. Use dataset arm to set the dimensions.

Steel (Single plane) Wheels

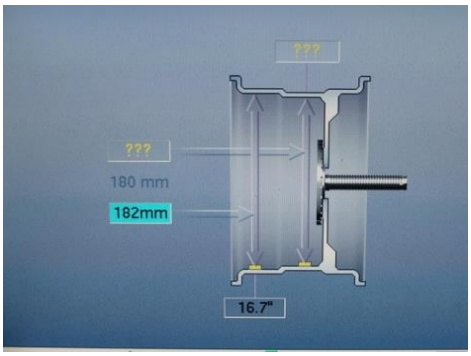
Note:

- Steel wheels will only use 1 plane (Not inner & outer dimensions)
- Following page for all other wheel styles

2. Move the dataset arm close to where a typical outer plane would sit and press foot pedal to set dimension.

Inner

3. Measure ½ inch from the back side of the wheel and press foot pedal to set first dimension.



Outer

4. Move the dataset arm to the outer plane and press foot pedal to set dimension.

a. Outer plane is closest to the face of the wheel

5. Place the data arm back to the home position.

6. Lower the lid and the machine will automatically spin tire.

4.6 Disabling SmartWeight

Left: Static Imbalance (Shake)

Right: Couple Imbalance (Shimmy)

What is Smart Weight

The smart weight balancing method minimizes the amount of correction weight needed. This method computes correction weights by measuring and evaluating the "absolute" or pure static (shake) and couple (shimmy) forces that cause vibration. Unlike traditional balancing, which judges balance conditions based on correction weight values, smart weight balancing uses the actual static and couple forces to directly address the source of vibration problems, resulting in the best possible balance.

How to disable:

1. If balancer returns "Okay, Okay" after measurement without any weights added.
    A. Begin to disable by pressing "SmartWeight".
    B. Then press "Disable SmartWeight".

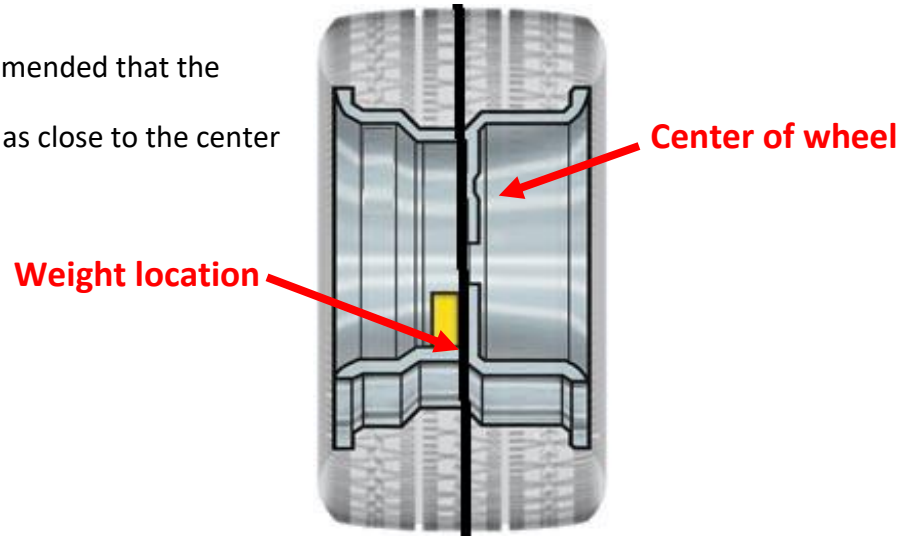
2. Screen should appear as it is shown below.
    A. Ensure dynamic balancing is enabled (tire with two white/blue circles).
    B. For static balancing, refer to next page "Static balance/single plane balance method"

3. Follow weight recommendations shown on screen.
4. If analysis still recommends no weight, manually add 0.25oz to package (single plane).

4.6 Disabling Single Plane SmartWeight (Static Balance)

Static balance/single plane balance method

For this method it is recommended that the adhesive weight be placed as close to the center of the wheel as possible.

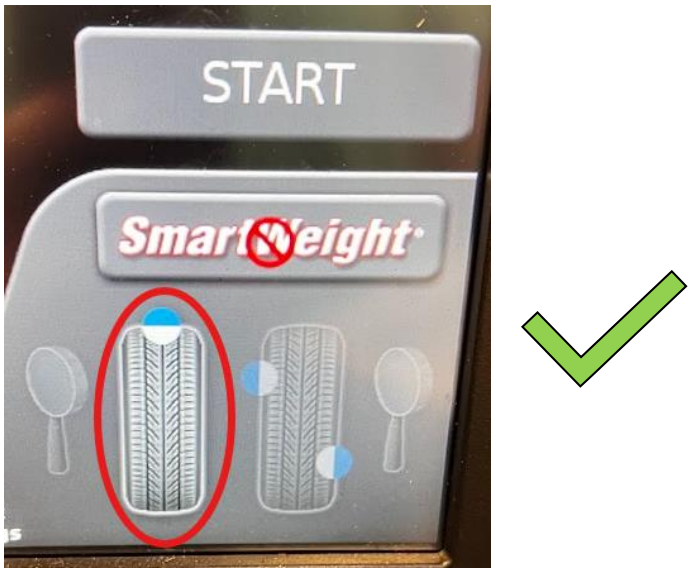


How to identify

1. When setting the dimensions, the machine will let the operator know that the weight locations are too close together and it will suggest a static balance be performed.
2. Wheels that typically have a negative (ex. -15ET) offset.
3. Larger truck tires and wheels are the most common cases for static balancing.

Getting started

1. Switch balancer machine to static balancing mode.
   - **A.** Disable SmartWeight.
   - **B.** Choose tire indicator with single blue/white circle shown below.



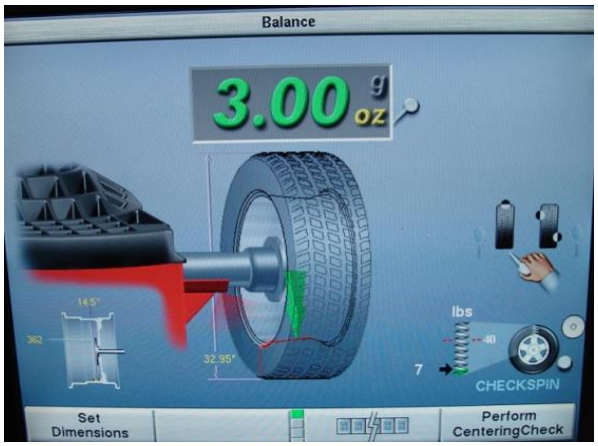
2. Set dataset arm as close to the middle of the wheel as possible and press foot pedal.
   - **a.** Only for balancer with data arm.

3. Lower hood and let machine spin wheel.
4. Once wheel has stopped, two warning notices will appear on the screen before you are able to see the amount of weight needed.

Warning notice 1

Warning notice 2

5. When the notices have gone away the weight will appear in only one spot. Now you are able to apply the correct amount of weight needed.



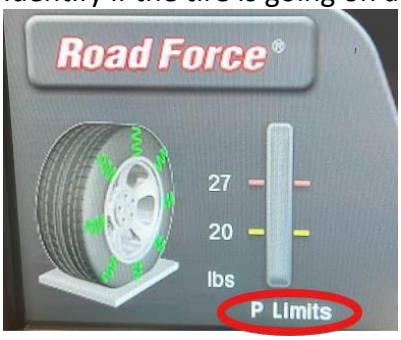
6. After weight is applied and wheel has had a final check spin, the analysis should return with “Okay”, “Okay”.
    a. If analysis still recommends no weight, manually add 0.25oz to package.

4.6 Road Force Limits

	45-series Sidewall and smaller	50-series Sidewall and larger
Passenger	**18 lbs.**	**26 lbs.**
SUV **All Competition** **Light Truck**	**26 lbs.**	**40 lbs.**

Getting started

1. Identify if the tire is going on a passenger (P-Tires) or light truck (LT-Tires).



2. Switch the machine over accordingly by pressing where the red circle is shown above.
    a. Will toggle between P Limits, SUV Limits, & LT Limits.
        i. SUV & LT have same limits.

3. After the tire has stopped spinning, a number will appear next to the wheel.

4.6 Increasing/Reducing Road Force

Increasing Road Force

1. Attempt to re-cone and re-balance
    a. Rerun package and test
2. Deflate and re inflate package
    a. Rerun package and test

Reducing Road Force

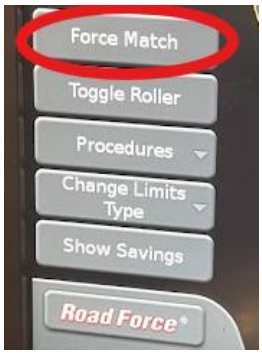
Rotating the tire on the wheel is the most common way to reduce high road force and reduce weight.

1. Loosen the tire on the wheel, turn it 180 degrees and re-inflate the tire after re-lubricating the bead. The run out should be significantly reduced or eliminated.

2. If road force or required weight is not reduced within allowable limits after 180 degree rotation, try it again, this time rotating only 90 degrees.

If tire has not come within the allowable limit, you must dismount and determine whether or not it is a bad tire or a bad wheel by doing a bare rim runout and rim balance weights.

3. Enter “Road Force” options
    A. Select “Force Match”
    B. There should not be a tire on package during this process



4. Once on the measurement screen, follow directions step by step in order to ensure a good rim runout.

5. After runout is complete, it will automatically return to the previous screen.
    A. You should receive a Pass, Fail, or Marginal result
        a. If a wheel is bad, it will tell you in this screen (Get new wheel)
        b. If wheel is good, you need to get a new tire
    B. It will then tell you where to mark & turn the tire if it can be remounted

4.6 Proper Weight Placement

All packages leaving the warehouse with adhesive weights must have proper weight placement like in the photos below. Weights must all be grouped together and not split or stacked.

Correct Inner

Correct Outer

Incorrect Stacked

Incorrect Split

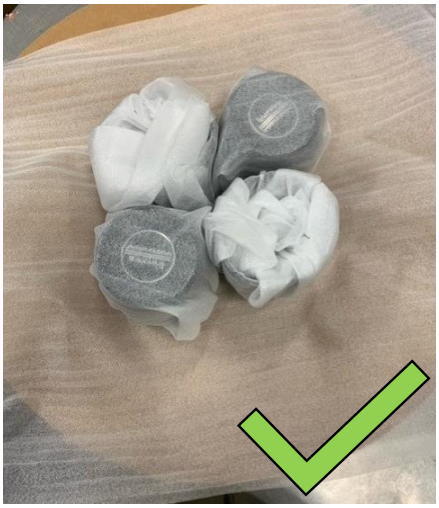
Note: Wheel & weights intentionally do NOT match in color to show contrast for picture. Black weights should only go on black wheels.

4.8 Non-Secured Wheel Caps

All caps that protrude the wheel face or those that do not lock into place should be separately packaged, double strapped to cardboard, and shipped in the same fashion as hardware. Examples include rear loaded and loose push through caps.

In the scenario that the order only contains one package, then retrieve additional label from office and ship as individual hardware package. Verbally identify this to the employee responsible for packaging.

Correct



Incorrect

Clamp-On weights for Alloys

Orders of alloy wheels that need to have these special weights on them will have this orange note in with the hardware. Also, orders will have a special "LIP NOTE" located on the hardware label.

Setting up and weight installation

In order to start using this method of wheel weight application, a few simple steps will need to be taken to setup the balancer.

1. Switch balancer weight settings over to grams (g).

2. Change weight placement settings to "clip-on and adhesive".

3. Locate correct weight and place clip between tire bead and wheel flange.

4. Press clip in with installation/removal tool.

5. Pull clip back with opposite side of tool and insert weight under clip.

Styled Steel - Out Of Round Wheels

Styled Steel

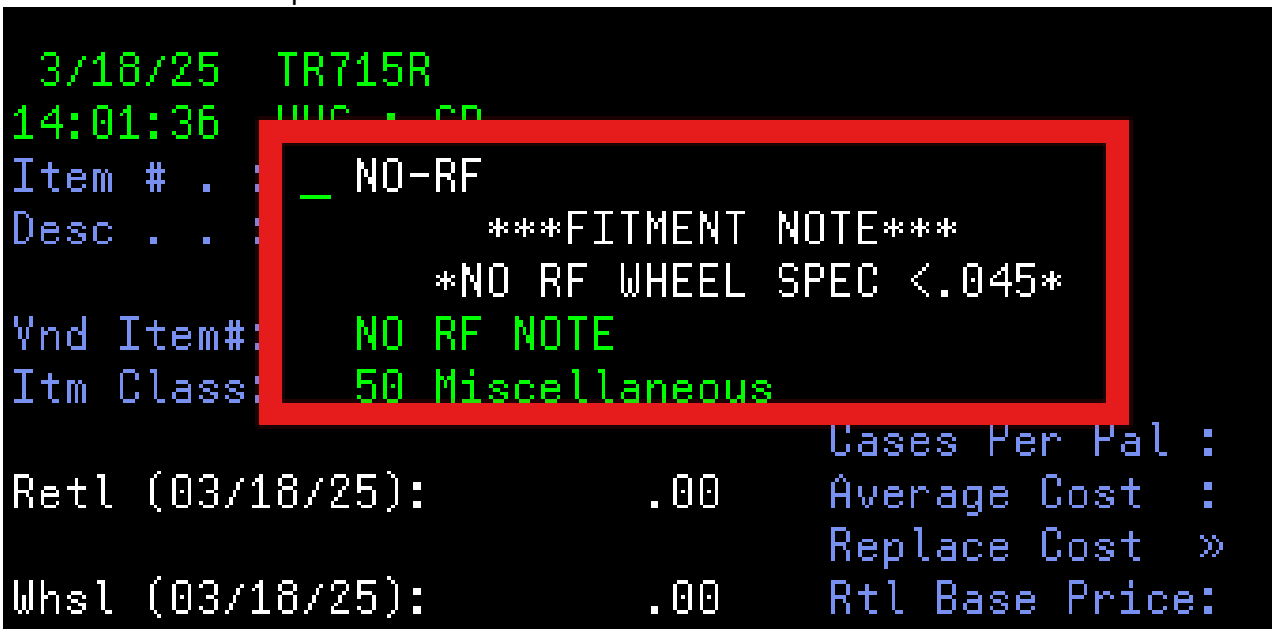
Acceptable Wheel	.045 and Lower
Not Acceptable Wheel	.046 and Higher

Styled Steel Wheel Procedure

Notes:

- Only applicable when NO-RF note is included. Will show “NO-RF”, meaning no road force measurement will be taken
- Slip will **NOT** be sent with the package

1. All packages will be inspected according to weight tolerance limits instead
    a. Not to exceed maximum standard allowance
2. If weight shows as out of tolerance, continue with the following standard procedures
    a. Standard remount procedure
    b. Out Of Round (OOR) check based on given tolerances
    c. Unit Replacement



Guideline for Standard

Out Of Round Wheels

Alloy/Aluminum

Acceptable Wheel	**.020 and Lower**
Not Acceptable Wheel	**.021 and Higher**

Steel

Acceptable Wheel	**.035 and Lower**
Not Acceptable Wheel	**.036 and Higher**

Trailer Steel (Requires Static Balance)

Acceptable Wheel	**.050 and Lower**
Not Acceptable Wheel	**.051 and Higher**

Issues with Balance station

- If bolt pattern doesn't match, you have a wrong wheel. Set aside (entire order if possible) and let supervisor know.
- If rings or caps don't fit then you might have a wrong wheel, or it doesn't need rings.
- If you can't get the weights to zero out, try to recalibrate the machine.
- If screws for caps don't fit then use the tap set to help them fit/take out.

If no additional product remains for packages that require too much weight after turning, product should be set aside and labels taken into the office. Office should contact sales and search for the same product in other warehouses.

5.QC/Packaging

Quick overview-

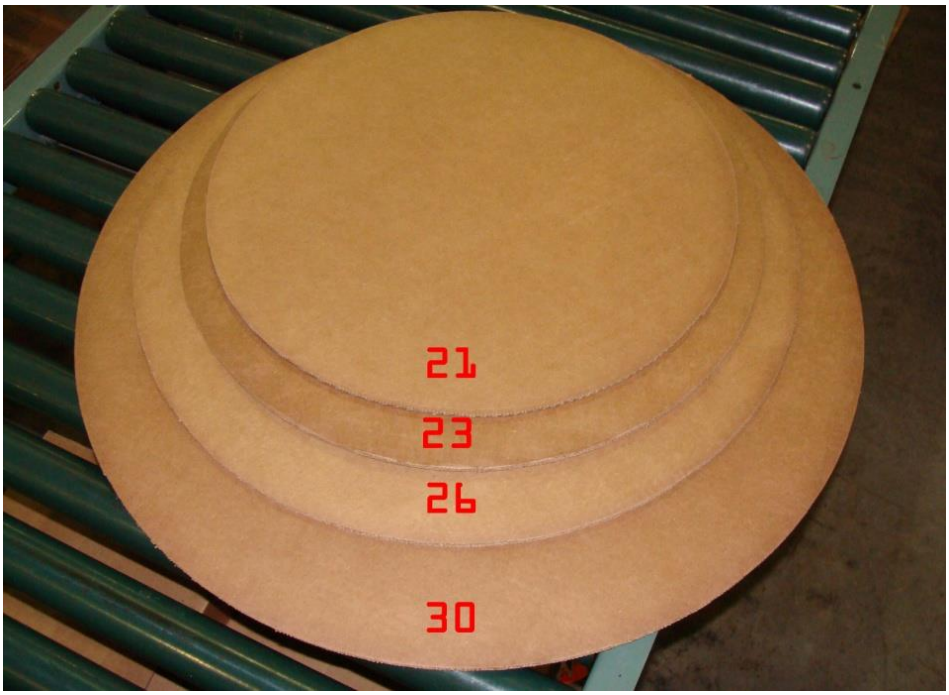
Workers packaging are responsible for:

- Making sure every package leaves clean.
- Checking that all hardware is installed and shipped with package.
- Using correct size cardboard that covers the whole wheel and most of the tire.
- Inserting 2 pieces of foam in between face of wheel and cardboard for every package.

Tools needed

Tape	Hardware label
Utility knife	Invoice enclosed label
Safety Glasses 	Xact Cleaner 

4 sizes of cardboard rounds 21”, 23”, 26”, and 30”



Issues with packaging station

Lost labels

a. Look in trash can to make sure nothing was thrown away.
b. Place entire order to the side and let supervisor know labels are missing.

Missing hardware

a. Double check hardware label.
b. Set entire order to the side and let supervisor know what is missing.

Mislabeled package

a. Set all packages to the side.
b. Get mislabeled package off of UPS or FedEx truck.

APPENDIX

Types of Tread Patterns

Symmetric Tread Patterns

A symmetric tread pattern is the most common and features continuous ribs or independent tread blocks across the entire tread face where both inboard and outboard halves feature the same pattern. Tires featuring symmetric tread patterns allow using multiple tire rotation patterns. Symmetrical tires are mostly mounted DOT date up except for some Goodyear and Dunlop tires in which the nicer sidewall needs to be mounted facing up towards the face of the wheel.

Asymmetric and Directional Tread Patterns

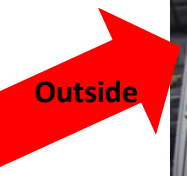
Asymmetric and directional tread patterns have v-shaped tread grooves that are offset compared to the centerline of the tire. Tires featuring asymmetric and directional tread patterns must be treated as directional tires for tire rotation. However, if different tire sizes are used on the front vs. rear axle, they become location-specific and prohibit any tire rotation possibilities.

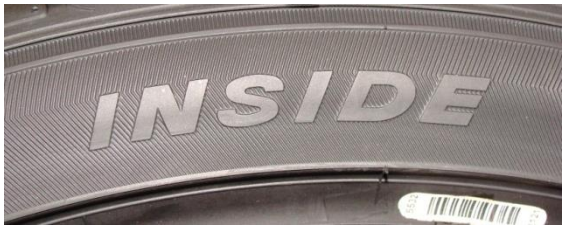
Directional

Asymmetrical

Asymmetric Tread Patterns

An asymmetric pattern is designed to blend the requirements of dry grip and water dispersal/snow traction where the tread pattern changes across the face of the tire. An asymmetric tread pattern usually incorporates larger tread ribs/blocks on the outboard side to increase cornering stability on dry roads by offering greater contact area. This also helps to reduce tread squirm and heat buildup on the outside shoulder. The inboard side usually features smaller independent tread blocks to aid wet and/or winter traction when driving straight ahead. Tires featuring asymmetric tread patterns allow using multiple tire rotation patterns. Asymmetrical tires are labeled Inside/Outside on the sidewall by manufacture and need to be mounted accordingly.





Directional (Unidirectional) Tread Patterns

A directional (also called a unidirectional) tread pattern is designed to roll in only one direction. It incorporates lateral grooves on both sides of the tire's centerline that point in the same direction and result in v-shaped tread blocks. These grooves enhance hydroplaning resistance at high speeds by pumping water more efficiently through the tread pattern. Unless they are dismounted and remounted on their wheels to accommodate use on the other side of the vehicle, directional tires are to be used on one side of the vehicle and are intended to be rotated from the front axle to the rear axle. If different tire sizes are used on the front vs. rear axle, the tires become location-specific and prohibit tire rotation unless remounted. Directional tires are mounted by alternating 1 right, 1 left, 1 right, 1 left to avoid any directional mistakes.

Directional Tire Labels

All mount and balance packages that have directional tires need to have directional tire labels placed on the sidewall. Using directional stickers are a great way to help prevent mounting mistakes associated with directional tires. This also helps the customer to identify which side of the vehicle they should be mounted on.

Directional tire labels should be placed near the rotation markings on the sidewall of the tire.

Competition Tire/Visible Tread Splices

While visible and open tread splices are conditions rarely seen on street tires, they appear more frequently on racing tires, including the DOT-legal competition tires often used for road racing, track days and autocrossing. A visible tread splice is cosmetic in nature when it first appears, however unless appropriate steps are taken, a visible tread splice will probably increase in severity until it becomes an open tread splice, requiring the tire be removed from service. Fortunately the corrective actions may be as simply as rotating the tire and wheel to another position on the car, or remounting the tire inside out on its wheel for continued use in its current position.

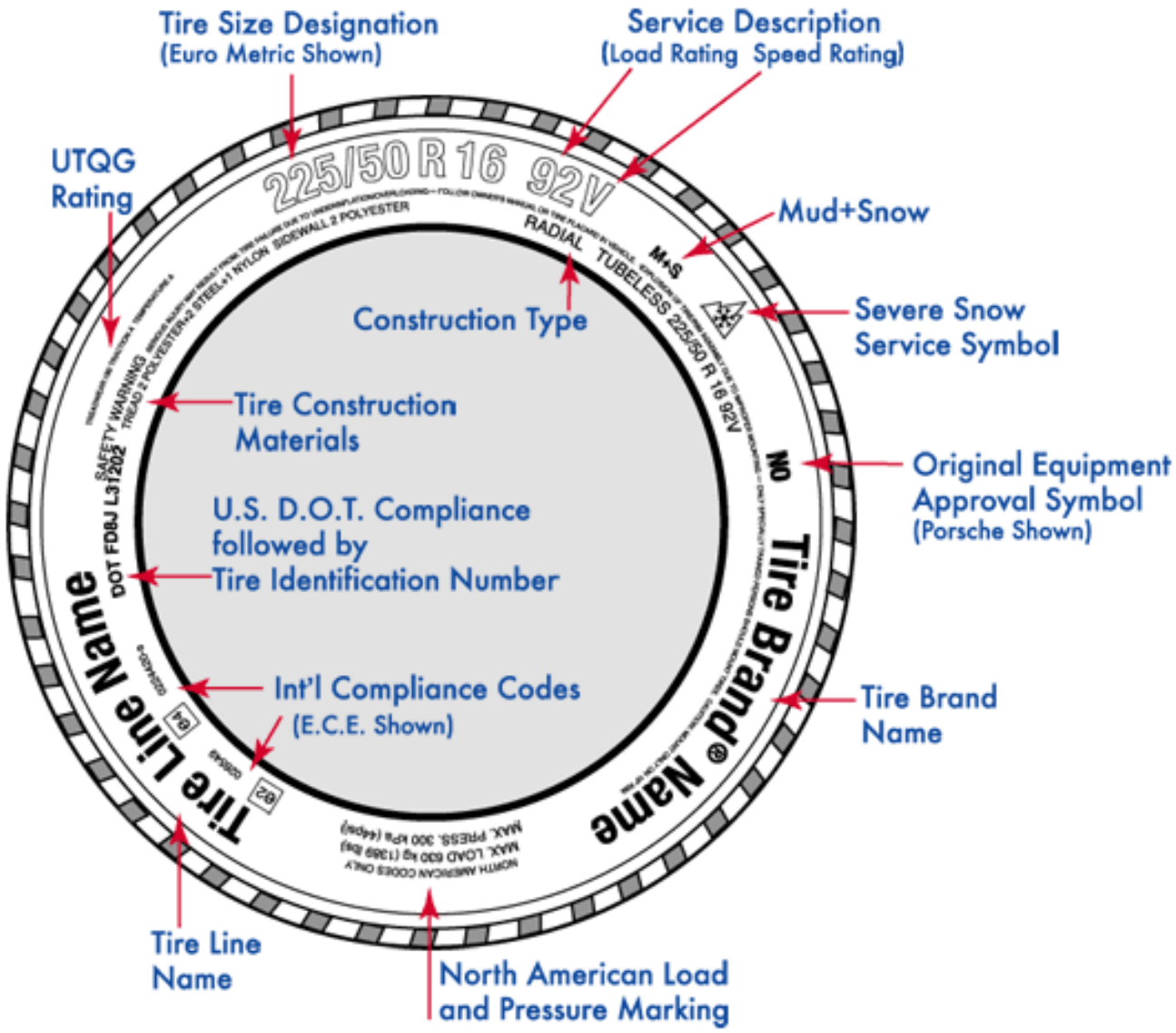
In order to minimize the risk of tread splices becoming visible, specific mounting instructions are used for many racing tires so the direction a tire rotates helps reduce the forces on the tread splice rather than increase them. The objective is to assure that the tire rolls across its tread splice when exposed to its most severe challenges of acceleration and braking. Since the tearing forces on a skidding tire are the opposite of a spinning tire, the tires on a non-driven axle are often mounted to reduce the possibility of tearing the splices if the brakes lock up causing the tires to slide.

Many race tire manufacturers provide guidelines on how to mount their race tires on wheels so they are suited for specific wheel positions. For example: if the tire identifier (often a specification number, identification code or serial number that is branded on only one sidewall) is to be mounted so that it faces one side on the driven axle and the opposite side on non-driven axles. With this type of marking, if a rear-wheel drive car should have the rear axle tires mounted with their identifier facing the right side of the car, the tires installed on the front axle should have their identifiers facing the opposite side. Conversely, if the same tires were mounted on a front-wheel drive car, the tires on the front axle would be mounted the same as the rear axle for the rear-drive car and the tires installed on the non-driven rear axle with their identifiers facing the left side of the car.

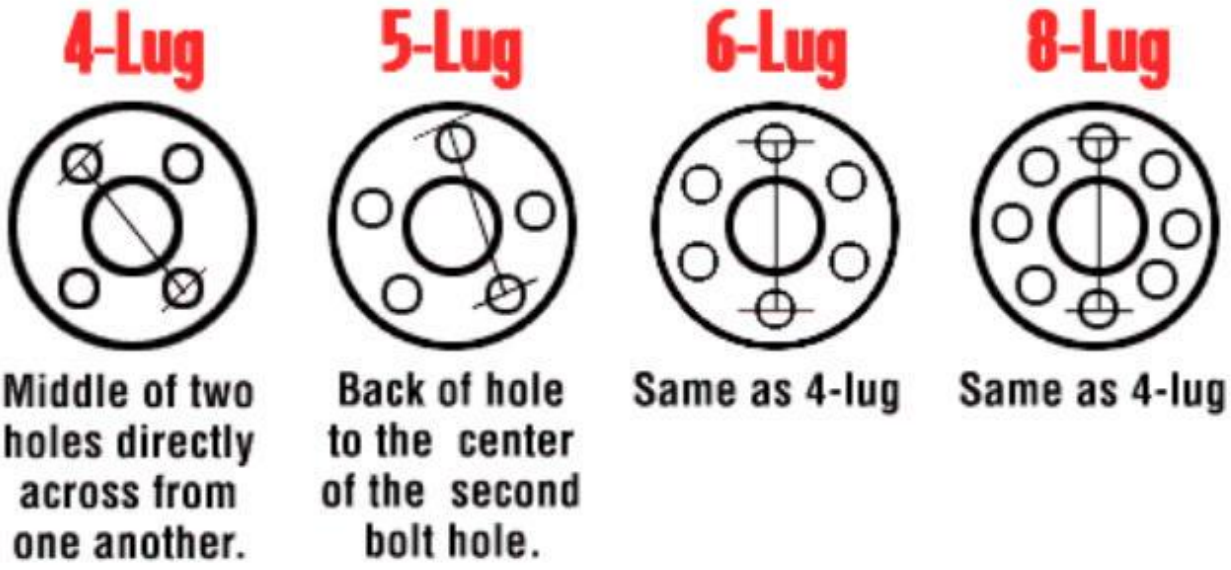
Tire Identification

In addition to the tire's brand and line names (tire model), there is a lot of information provided by the manufacturer on the sidewalls of the tires they produce. Some of the branded information provides the tire's basic dimensions and identifies the week it was produced. Other branding lists the types of materials used internally to reinforce the rubber, along with the tire's maximum inflation pressures and loads. And others confirm the manufacturer certifies the tire meets various industry standards and measures up to the government regulations of the nations in which it will be used.

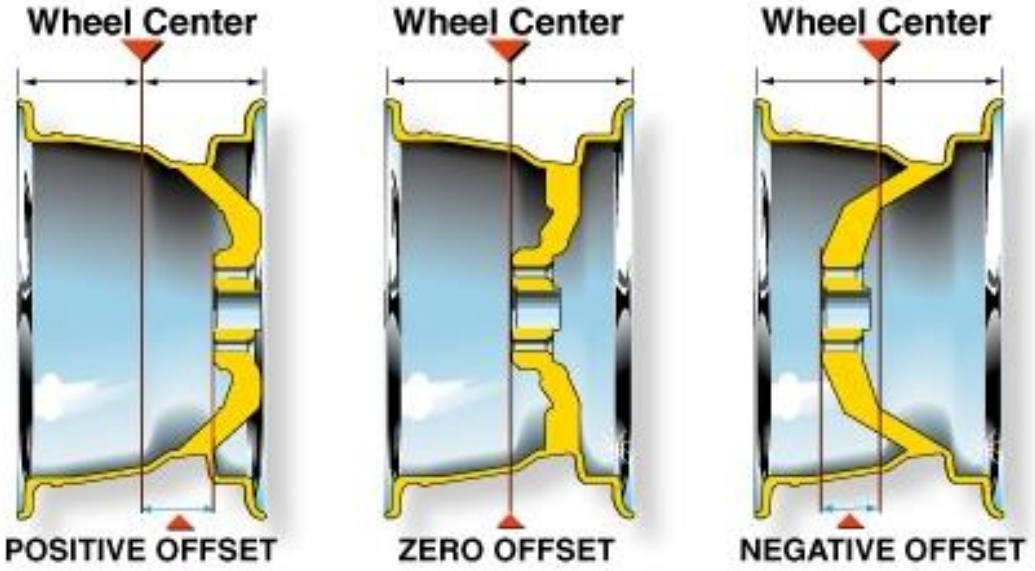
While not all information is branded on every tire, the illustration includes the typical information found on many tires.



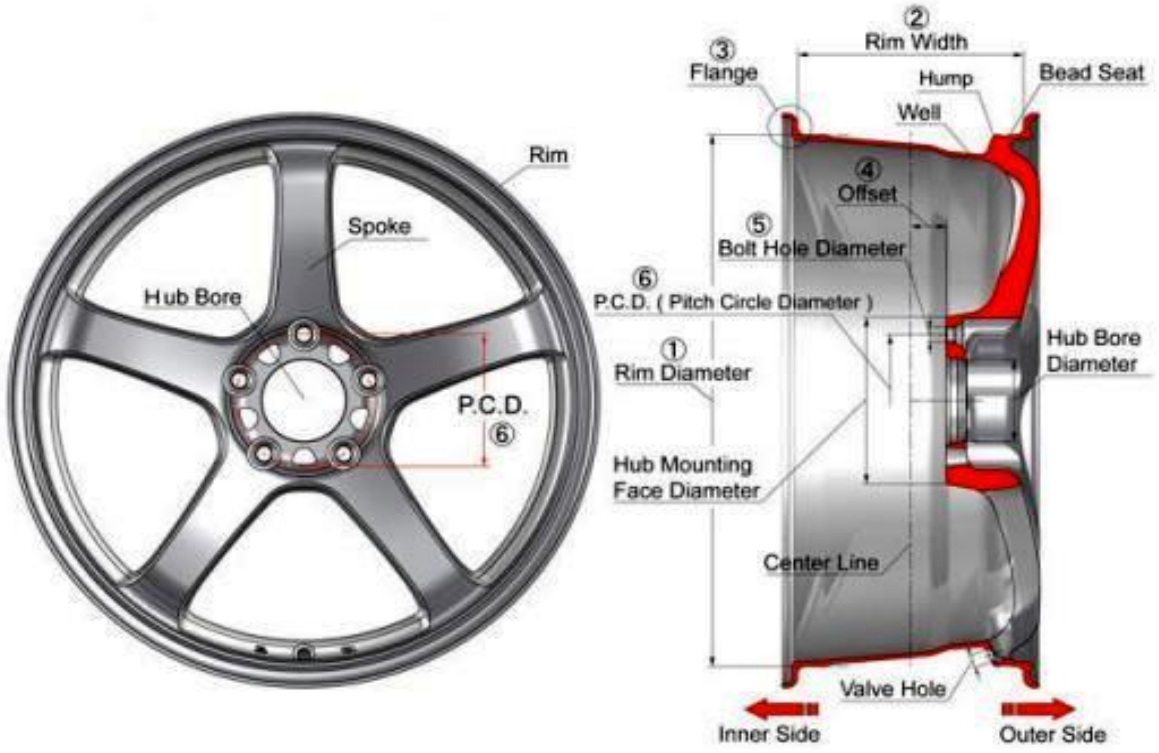
How to measure bolt patterns



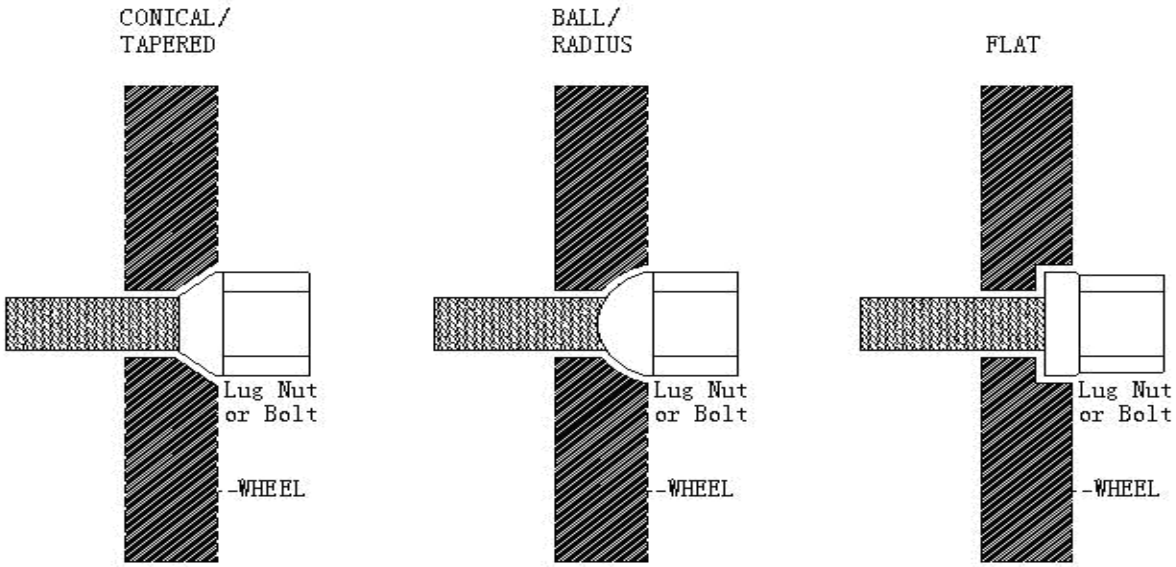
Difference in wheel offsets



Different components of a wheel



Difference in lug seat types



Bolt Pattern Conversion

4 x 3.93	4 x 100
4 x 4.25	4 x 108
4 x 4.33	4 x 110
4 x 4.5	4 x 114
4 x 5.12	4 x 130
4 x 5.51	4 x 140
5 x 4.00	5 x 100
5 x 4.25	5 x 108
5 x 4.5	5 x 114
5 x 4.75	5 x 120
5 x 5	5 x 127
5 x 5.5	5 x 139
6 x 4.5	6 x 114
6 x 5	6 x 127
6 x 5.5	6 x 139
8 x 6.5	8 x 165