1645 Lemonwood Dr.
Santa Paula, CA 93060 USA
Toll Free: (800) 253-2363
Tel: (805) 933-9970
rangerproducts.com

Wheel Guardian™ Tire Changer

Installation and Operation Manual

Manual P/N 5900089 — Manual Revision A — March 2019

Model:

- RV1

Designed and engineered in Southern California, USA. Made in China.

DANGER

Read the *entire* contents of this manual ***before*** using this product. Failure to follow the instructions and safety precautions in this manual can result in serious injury or death. Make sure all other operators also read this manual. Keep the manual near the product for future reference. By proceeding with setup and operation, you agree that you fully understand the contents of this manual.

Manual. RV1 Wheel Guardian™ Tire Changer, *Installation and Operation Manual*, Manual P/N 5900089, Manual Revision A, Released March 2019.

Limitations. Every effort has been made to have complete and accurate instructions in this manual. However, product updates, revisions, and/or changes may have occurred since this manual was published. BendPak Ranger reserves the right to change any information in this manual without incurring any obligation for equipment previously or subsequently sold. BendPak Ranger is not responsible for typographical errors in this manual. You can always find the latest version of the **manual for your product on the Ranger website**.

Warranty. The BendPak Ranger warranty is more than a commitment to you: it is also a commitment to the value of your new product. For full warranty details, contact your nearest BendPak Ranger dealer or visit **bendpak.com/support/warranty**. Go to **bendpak.com/support/register-your-product/** and fill out the online form to register your product (be sure to click **Submit**).

Safety. Your new product was designed and manufactured with safety in mind. Your safety also depends on proper training and thoughtful operation. Do not set up, operate, maintain, or repair the unit without reading and understanding this manual and the labels on it; ***do not use this product unless you can do so safely!***

Owner Responsibility. In order to maintain your product properly and to ensure operator safety, it is the responsibility of the product owner ***to read and follow these instructions***:

- Follow all setup, operation, and maintenance instructions.
- Make sure product installation and operation conforms to all applicable local, state, and federal codes, rules, and regulations, such as state and federal OSHA regulations and electrical codes.
- Read and follow all safety instructions. Keep them readily available for operators.
- Make sure all operators are properly trained, know how to safely operate the unit, and are properly supervised.
- Do not operate the product until you are certain that all parts are in place and operating correctly.
- Carefully inspect the product on a regular basis and perform all maintenance as required.
- Service and maintain the unit only with approved replacement parts.
- Keep the manual with the product and make sure all labels are clean and visible.
- **Only use this product if it can be used safely!**

Unit Information. Enter the Model Number, Serial Number, and the Date of Manufacture from the label on your unit. This information is required for part or warranty issues.

Model: _____

Serial: _____

Date of Manufacture: _____

Table of Contents

Introduction

This manual describes the RV1, a touchless tire changer that quickly and efficiently breaks Beads and demounts and mounts Tires.

The RV1 features the latest in touchless wheel-service technology. The RV1 is designed to work on all wheel types without damaging the Rim or requiring clumsy tool bars, bead locks, or tire levers.

More information about BendPak Ranger products is available at **rangerproducts.com**.

This manual is mandatory reading for all users of the RV1, including anyone who sets up, operates, maintains, or repairs it.

You can always find the latest version of the **manual for your product on the Ranger website**.

⚠ **DANGER** Be very careful when setting up, operating, maintaining, or repairing this equipment; failure to do so could result in property damage, product damage, injury, or (in very rare cases) death. Make sure only authorized personnel operate this equipment. All repairs must be performed by an authorized technician. Do not make modifications to the unit; this voids the warranty and increases the chances of injury or property damage. Make sure to read and follow the instructions on the labels on the unit.

Keep this manual on or near the equipment so that anyone who uses or services it can read it.

Technical support and service for your Tire Changer is available from your distributor or by calling **BendPak Ranger at (805) 933-9970**. You may also call regarding parts replacement (please have the serial number and model number of your unit available).

Shipping Information

Your equipment was carefully checked before shipping. Nevertheless, you should thoroughly inspect the shipment ***before*** you sign to acknowledge that you received it.

When you sign the bill of lading, it tells the carrier that the items on the invoice were received in good condition. *Do not sign the bill of lading until **after** you have inspected the shipment.* If any of the items listed on the bill of lading are missing or damaged, do not accept the shipment until the carrier makes a notation on the bill of lading that lists the missing or damaged goods.

If you discover missing or damaged goods ***after*** you receive the shipment and have signed the bill of lading, notify the carrier at once and request the carrier to make an inspection. If the carrier will not make an inspection, prepare a signed statement to the effect that you have notified the carrier (on a specific date) and that the carrier has failed to comply with your request.

It is difficult to collect for loss or damage after you have given the carrier a signed bill of lading. If this happens to you, file a claim with the carrier promptly. Support your claim with copies of the bill of lading, freight bill, invoice, and photographs, if available. Our willingness to assist in helping you process your claim does not make us responsible for collection of claims or replacement of lost or damaged materials.

Safety Considerations

Read this manual carefully before using your new product. Do not set up or operate the product until you are familiar with all operating instructions and warnings. Do not allow anyone else to operate the product until they are also familiar with all operating instructions and warnings.

⚠ WARNING There are many moving parts on a Tire Changer; you must keep clear of the Tire Changer and the Tire being changed at all times while using it. In particular, when inflating a Tire, never lean over the Tire; if it were to explode (which does happen), the force could injure or kill the Operator or bystanders. During inflation, the Operator should be as far away from the Tire as possible and bystanders must be at least 30 feet away.

Safety Information

Please note the following:

- The product is a Tire Changer. ***Use it only for its intended purpose.***
- The product ***must*** only be operated by authorized, trained personnel. Keep children and untrained personnel at least 30 feet away from the product.
- When using the product, wear appropriate work clothes (*nothing loose*) and ANSI-approved safety goggles (or similar). Keep hair, jewelry, and clothing away from the Tire Changer.
- Do not use the product while tired or under the influence of drugs, alcohol, or medication.
- Do not use the product in the presence of cigarette smoke, dust, or flammable liquids or gases. Use the product indoors in a well-ventilated area.
- Do not make any modifications to the product; this voids the warranty and increases the chances of injury or property damage. ***Do not modify any safety-related features in any way***.
- Make sure all operators read and understand the *Installation and Operation Manual*. Keep the manual near the device at all times.

- Make a visual inspection of the product before each use. Do not use the product if you find any missing or damaged parts. Instead, take the unit out of service, then contact an authorized repair facility, your distributor, or **Ranger Products at (805) 933-9970**.
- BendPak Ranger recommends making a ***thorough*** inspection of the product once a month. Replace any damaged or severely worn parts, decals, or warning labels.

Symbols

Following are the symbols that may be used in this manual:

⚠ DANGER Calls attention to a hazard that **will** result in death or injury.

⚠ WARNING Calls attention to a hazard or unsafe practice that **could** result in death or injury.

⚠ CAUTION Calls attention to a hazard or unsafe practice that could result in personal injury, product damage, or property damage.

NOTICE Calls attention to a situation that, if not avoided, could result in product or property damage.

Tip Calls attention to information that can help you use your unit better.

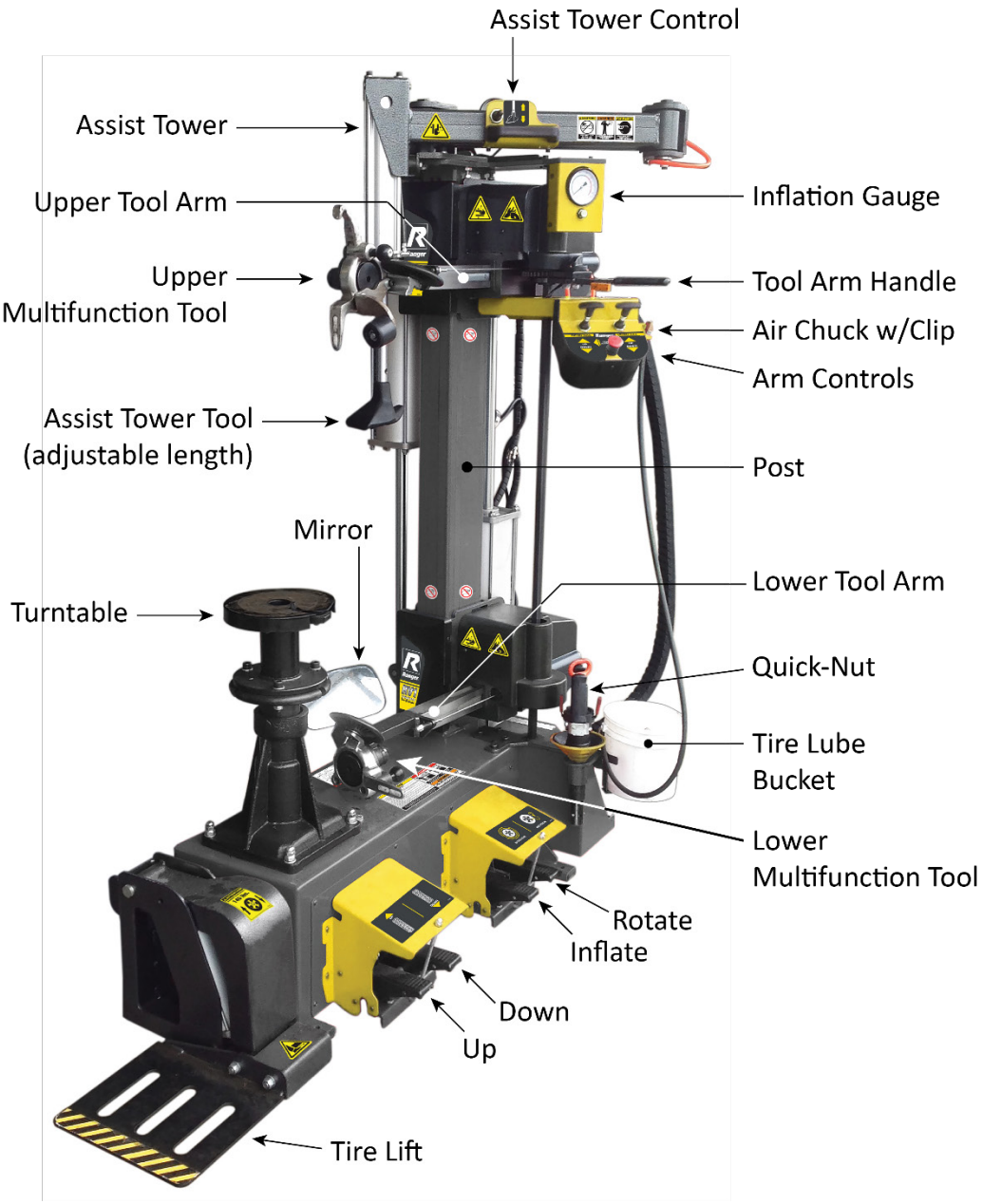
Liability Information

BendPak Ranger assumes **no** liability for damages resulting from:

- Use of the equipment for purposes other than those described in this manual.
- Modifications to the equipment without prior, written permission from BendPak Ranger.
- Damage to the equipment from external influences.
- Incorrect operation of the equipment.

Components

The following image shows the main components of the Tire Changer.



The Air Pressure Regulator/Filter and Oiler/Lubricator are on the other side of the Tire Changer and are not visible above.

Tire Changer components include:

- **Turntable**. Holds the Wheel.
- **Mirror**. Lets you see what is happening on the underside of the Wheel.
- **Post**. Holds many components. Needs to be lubricated for easy movement of those components. Once lubricated, ***do not lean on or touch the Post***.
- **Multifunction Tools**. Tools that let you perform multiple functions.
- **Assist Tower Tool**. Helps you mount a new Tire on a Wheel.
- **Assist Tower Control**. Lets you control the Assist Tower Tool.
- **Inflation Gauge**. Lets you see the amount of air pressure being used to inflate a Tire.
- **Arm Lock / Unlock**. Controls the locations of the two Tool Arms.
- **Upper / Lower Tool Arms**. Both have multifunction tools on them. The Tool Arms are synchronized, so whatever the location of the Upper, the Lower is in the same location under the Tire even if it is hard to see.
- **Inflate foot pedal**. Inflates the new Tire.
- **Rotate foot pedal**. Rotates the Turntable.
- **Tire Lift**. Lets you easily move the Wheel into position on the Turntable.
- **Tire Lift Down foot pedal**. Moves the Tire Lift *down*.
- **Tire Lift Up foot pedal**. Moves the Tire Lift *up*.
- **Regulator/Filter and Oiler/Lubricator**. Control and route the incoming air supply.

Tire Changer accessories include:

- **Bucket**. For your Tire lubricant. Only use a lubricant approved by the Tire manufacturer for the Tire being changed.
- **Lube Brush**. To spread your Tire lubricant.
- **Petroleum jelly**. For lubricating the Post; comes inside the Bucket. Also called Vaseline®. ***Not*** a Tire lubricant.
- **Two metal Cones with plastic Cone Protectors**. Used with the Quick-Nut to accommodate larger Tire hole sizes. Require Turntable Spacer.
- **Rubber Turntable Cover**. An extra Rubber Turntable in case the original gets damaged or lost.
- **Quick-Nut**. Holds the Wheel in place on the Turntable. Greased for transport, so clean it before using it.
- **Quick-Nut Adapters**. Used with the Quick-Nut to accommodate smaller Tire hole sizes.
- **Turntable Spacer**. Required when using either of the two metal Cones.

Other important terms include:

- **Wheel**. A circular metal piece that attaches to an axle and rotates. A Tire is the rubber piece that attaches on the outside of the Wheel.
- **Rim**. The part of a Wheel that directly attaches to a Tire; the outer portion of the Wheel. “Wheel” and “Rim” are not the same thing, but some people use them interchangeably.
- **Tire**. A circular rubber piece that surrounds and attaches to a Wheel; more specifically, to the Rim, which is the part of the Wheel that directly touches the Tire.
- **Tire Sidewall**. Displays information about the Tire and the Wheel onto which the Tire fits.

Frequently Asked Questions

Question: What does a Tire Changer do?

Answer: A Tire Changer takes Tires off of Wheels (called demounting) and puts Tires onto Wheels (called mounting).

Q: What is the difference between a Tire, Wheel, and Rim?

A: A Wheel is the round ***metal*** piece that attaches to the Vehicle's axle. A Tire is the round ***rubber*** piece that surrounds the Wheel. The outer edge of the Wheel, where the Tire attaches to the Wheel, is called the Rim.

Q: What are the steps in the process of demounting a Tire and then mounting a new Tire?

A: The steps are: Secure the Wheel on the Turntable, deflate the Tire, break the Bead, demount the Tire, mount the new Tire, inflate the new Tire, then remove the Wheel from the Turntable.

Q: What does "break the Bead" mean?

A: A Tire is held on the Rim of a Wheel by the Tire Bead sitting between the Rim Lip and the Bead Retainer of the Rim. The air in the Tire holds it in place. When you "break the Bead", you move the Tire Bead out of its location between the Rim Lip and the Bead Retainer, which is required if you want to take the Tire off of the Wheel.

Q: Can I break the Bead without fully deflating the Tire?

A: No, do not do this. ***Always fully deflate a Tire before attempting to break its Bead***. The air pressure energy in a Tire, even if not fully inflated, can be considerable. If you were to attempt to break the Bead of a Tire not fully deflated, that air pressure energy would be released all at once, possibly injuring or, in rare cases, killing the Operator or bystanders.

Q: What thing should I always do when working with the RV1 Tire Changer?

A: You must match Rim Width for the Tire you are mounting. The result of a mismatch is that the Tire could literally explode off the Wheel when you reinflate it or while the Vehicle is being driven. In both cases, people could be injured or killed.

Q: Where should I put my Tire Changer?

A: What you want is a flat Concrete floor with room around it that is also near where you work on Tires. Ideally, you want it a little off the beaten path, as you must – for safety – keep everyone away from the Tire Changer while it is in use. For safety, no one other than the Tire Changer Operator should be within 30 feet of the Tire Changer while it is being used.

Q: Why isn't there a plug on the end of the Power Cord?

A: 220 VAC plugs vary by region, so you need to use one that is appropriate for the power outlet where you will be using your Tire Changer. You ***must use*** a licensed Electrician to wire the power cord and plug in accordance with applicable electrical codes.

Specifications

Model	**RV1**
Wheel Diameter Range	13" to 30" / 330 mm to 762 mm
Maximum Tire Diameter	47" / 1,194 mm
Maximum Wheel Width	15" / 381 mm
Maximum Tire Weight	143 lbs / 65 kg
RPM of Turntable	7 to 14 turns per minute
Motor Power	1.1 kW / 24 A / NEMA 30 amp plug
Motor Specs	3 HP, 208–240 VAC, 50/60 Hz, 1 Phase
Air Supply Requirements	140–165 psi / 9.6 to 11.4 bar
Air Consumption	1 SCFM / 27 L/Min
Width	34" / 864 mm
Height	73" / 1,854 mm
Depth	71" / 1,803 mm
Shipping Weight	1,150 lbs / 522 kg
Shipping Dimensions	61" x 35" x 80" / 1,550 mm x 900 mm x 2,030 mm
Working Temperature	27°F to 82°F / -5°C to 50°C
Sound	< 70 dBA

Installation Checklist

Following are the steps needed to install an RV1 Tire Changer. Perform them in the order shown.

☐ 1. Review the installation Safety Rules.

☐ 2. Plan for Electrical Work.

☐ 3. Make sure you have the necessary Tools.

☐ 4. Make sure there is adequate Clearance on all Sides.

☐ 5. Select the Installation Site.

☐ 6. Unpack the Components.

☐ 7. Anchor the Unit.

☐ 8. Adjust the Foot Pedal Covers.

☐ 9. Connect to an Air Source.

☐ 10. Connect to a Power Source. ***Requires a licensed Electrician***.

☐ 11. Prepare the Tire Lube Bucket.

☐ 12. Prepare the Quick-Nut.

☐ 13. Lube the Post.

☐ 14. Test the Tire Changer.

☐ 15. Review the Final Checklist.

Installation

This section describes how to install your Tire Changer.

Installation Safety Rules

Pay attention at all times during installation. Use appropriate tools and equipment. Stay clear of moving parts. Keep hands and fingers away from pinch points. ***Safety is a top priority***.

Use caution when unpacking the Tire Changer from its shipping container and setting it up. The Tire Changer is heavy and the weight is not evenly distributed; dropping or knocking over the unit may cause equipment damage and personal injury.

⚠ **WARNING** You must wear appropriate protective clothing at all times during setup: leather gloves, non-skid steel-toed work boots, ANSI-approved eye protection, and an industrial back belt. Accidents can cause significant injuries.

Only allow experienced, trained technicians to install the Tire Changer. In particular, all electrical work ***must*** be done by a licensed, certified Electrician.

⚠ **CAUTION** Certain parts of installing the Tire Changer are difficult for just one person. BendPak Ranger strongly recommends having two or more persons work together to install the Tire Changer.

If you have to use an extension cord, make sure its current rating is equal to or greater than that of the equipment being used. Make sure the extension cord cannot be stepped on, run over, or pulled out. Extension cords are also a tripping hazard, so they must be secured.

Plan for Electrical Work

The RV1 does ***not*** come with a Plug on the end of the Power Cord; it is your responsibility to supply the Plug and have an Electrician attach it to the Power Cord. A 220 VAC NEMA 30 Amp plug is needed.

Refer to **Plug Wiring Information** for additional information.

⚠ **WARNING** ***All electrical work***, such as attaching the Plug to the Power Cord, ***must be done by a licensed, certified Electrician*** in accordance with all applicable local electrical codes.

Tools

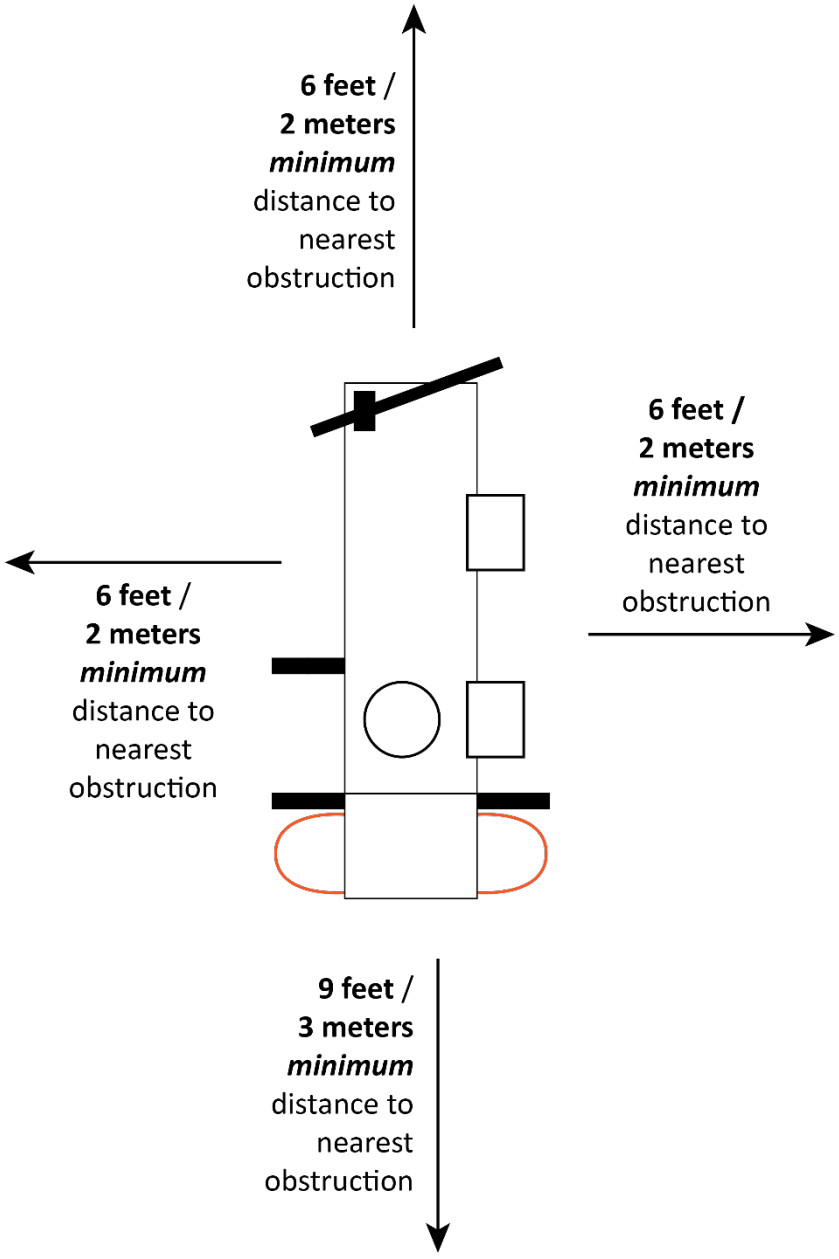
You may need some or all of the following tools:

- Forklift, pallet jack, or shop crane
- Utility knife
- Hammer, crow bar, or pry bar
- Tin or sheet metal snips
- Hex key set, metric and SAE
- Wrench set, metric and SAE
- Screwdriver set, flat head and Phillips

Clearances

To allow space to work with Wheels and Tires, a certain amount of space around the Tire Changer is required.

⚠ **WARNING** The Clearance values shown below are to allow enough space to operate the Tire Changer. ***For safety purposes, only the Tire Changer Operator should be within 30 feet of the Tire Changer while it is being used.***



*You also need room **above** the Tire Changer, which is 73 inches /1,850 mm high. BendPak Ranger recommends leaving at least an additional 12 inches / 305 mm of open space above the top of the Tire Changer.*

Finding a Location

Keep the following in mind when deciding on a location:

- **Power source**. The Tire Changer needs to be near an appropriate 220 VAC power source.
- **Floor**. The Tire Changer is best used on a flat, Concrete floor.
- **Accessibility**. You need some space to move the Wheels whose Tires you are going to change to and from the Tire Changer.
- **Danger**. When a Tire is on the Tire Changer, especially during Inflation, you need to keep everyone far away from it; only the Tire Changer Operator should be near it. Except for the Tire Changer Operator, all other people must be kept at least 30 feet away from the Tire Changer.

  Do not set up the Tire Changer in a well-travelled area.
- **No water**. The Tire Changer has electronic components. If the Tire Changer gets wet while turned on, those electronic components will most likely short circuit and have to be replaced.

⚠ **WARNING** Do not use the Tire Changer if it is sitting in water. You will almost certainly short circuit the electronic components in the Tire Changer and you could electrocute yourself.

Unpacking

Use caution when taking the Tire Changer out of its shipping container. You do not want to damage the unit, misplace any of the components that come with it, or hurt anyone.

⚠ **CAUTION** Make sure to use an appropriate lifting device, such as a forklift or pallet jack, to move the Tire Changer while it is on its pallet. Make sure only personnel who are experienced with material handling procedures are allowed to move the Tire Changer. The Tire Changer is heavy and the weight is not evenly distributed; dropping or knocking over the unit may cause equipment damage or personal injury.

We recommend you unpack the Tire Changer in the area where you are going to set it up.

To unpack the Tire Changer:

1. Where the Cover meets the Pallet, push the metal tabs all the way down, on all four sides.
2. Lift the Cover off.

   You may have to apply some force to get all of the metal tabs free; they sometimes stick a little.
3. Remove the plastic wrap around the Tire Changer and other components.
4. Remove the Accessory Box.
5. Remove the shipping bolts that are holding the Tire Changer to the Pallet.
6. Move the Tire Changer off the Pallet, then move it to the desired location.

⚠ **CAUTION** Ranger recommends having at least two people move the Tire Changer; it is heavy and the weight is not evenly distributed. If it is dropped or falls, it could cause injuries and the Tire Changer could be damaged.

Refer to **Finding a Location** and **Clearances** for additional location information.

Anchoring the Tire Changer

The Tire Changer has holes for anchoring it into place; anchoring is optional.

Note: You are not required to anchor your Tire Changer. BendPak Ranger recommends doing so, as the Tire Changer applies a certain amount of force at various times during the changing of a Tire. Anchoring it ensures it will not move during operation.

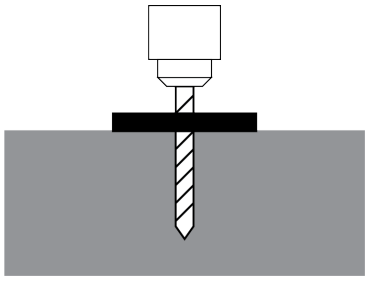
The Anchor Bolts (sometimes called Wedge Anchors) mentioned in the following procedure are ***not*** *supplied with the Tire Changer*.

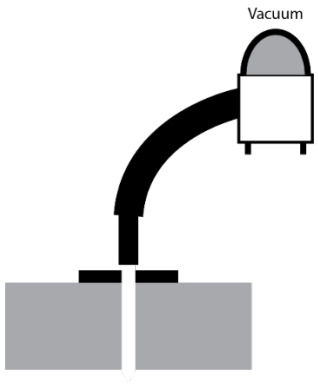
To anchor the Tire Changer:

1. Make sure the Tire Changer is in the desired location.

   Remember that you need to allow some space around the Tire Changer. Refer to **Finding a Location** for additional information.

2. Using the holes as guides, drill the holes for the Anchor Bolts.





   Go in straight; do not let the drill wobble. Use a carbide bit (conforming to ANSI B212.15-1994).

   The diameter of the drill bit must be the same as the diameter of the Anchor Bolt. So if you are using an M10 diameter Anchor Bolt, for example, use an M10 diameter drill bit.

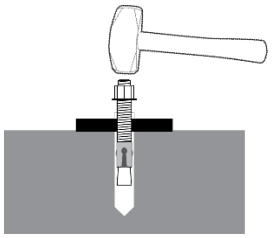
3. Vacuum each hole clean.

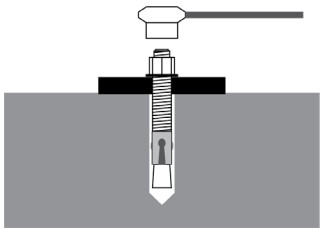
   BendPak recommends using a vacuum to get the hole very clean.

   Do ***not*** ream the hole. Do ***not*** make the hole any wider than the drill bit made it.

4. Make sure the Washer and Nut are in place, then insert the Anchor Bolt into the hole.

   The Expansion Sleeve of the Anchor Bolt may prevent the Anchor Bolt from passing through the hole in the Base Plate; this is normal. Use a hammer or mallet to get the Expansion Sleeve through the Base Plate and into the hole.





   Even using a hammer or mallet, the Anchor Bolt should only go into the hole part of the way; this is normal. If the Anchor Bolt goes all the way in with little or no resistance, the hole is too wide.

Once past the hole in the Base Plate, the Anchor Bolt eventually stops going down into the hole as the Expansion Sleeve contacts the sides of the hole; this is normal.

5. Hammer or mallet the Anchor Bolt the rest of the way down into the hole.

   Stop when the Washer is snug against the Base Plate.

6. Wrench each Nut ***clockwise*** to the recommended torque, 60 – 70 lbf-ft / 81 – 95 N-m.

Important: Do ***not*** use an impact wrench to torque the Anchor Bolts.

Wrenching the Nut forces the Wedge up, forcing out the Expansion Sleeve and pressing it tightly against the Concrete.

Adjusting the Foot Pedal Covers

The Tire Changer has two Foot Pedal Covers, both shown in the drawing in the **Components** section.

During shipping, the eight bolts that hold the Foot Pedal Covers in place can get pushed up, the result being that when you are ready to use the Tire Changer, the Foot Pedals do not work correctly.

To make sure this does not happen, you need to adjust the Foot Pedal Covers ***before*** you put the Tire Changer into normal operation.

The eight bolts are all 6 mm hex bolts, so you will need a 6 mm hex wrench for this procedure.

Important: Do not perform this procedure until *after* the Tire Changer is anchored in place, if you are going to anchor it.

To adjust the Foot Pedal Covers:

1. Loosen each of the eight 6 mm hex bolts that hold the Foot Pedal Covers in place.

   It is not necessary to *remove* them, you just need to *loosen* them.

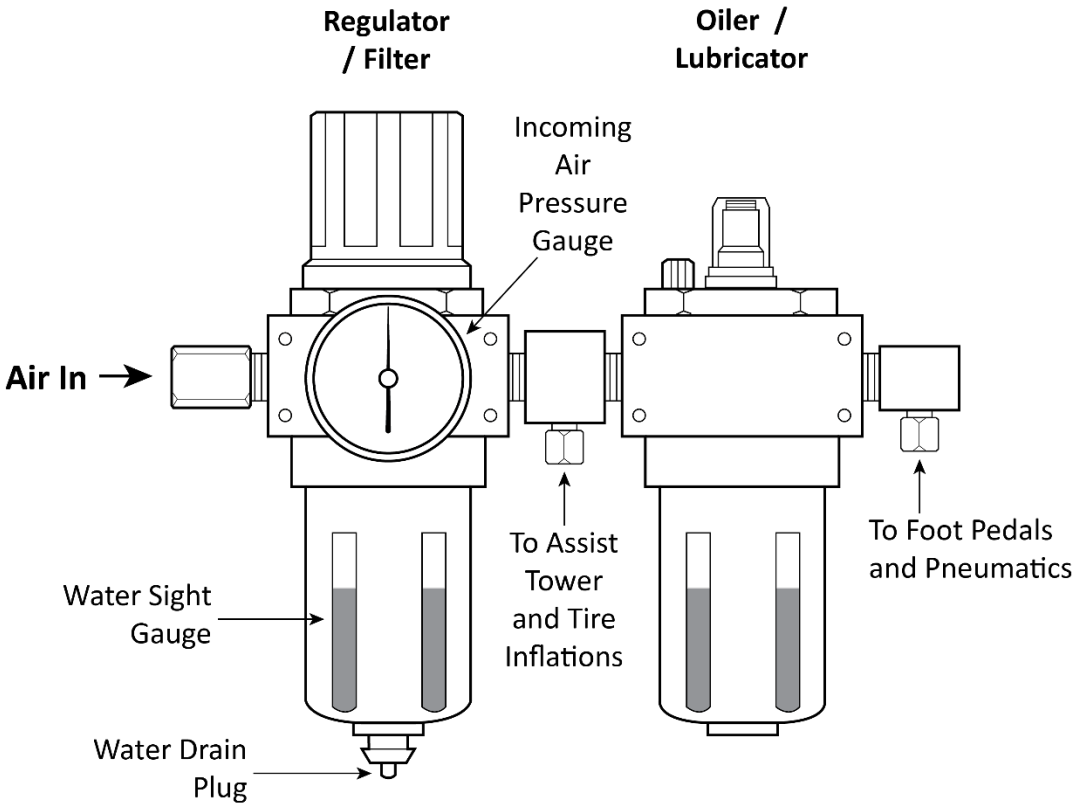
2. Push the Foot Pedal Covers down so that the bottoms are on the ground.
3. Tighten the eight 6 mm hex bolts.

Connecting to an Air Source

The Tire Changer requires a 15 to 25 CFM Air Source with an operating air pressure of 140 to 165 PSI (9.6 to 11.4 bar).

The Tire Changer uses pneumatic and electrical energy; if your organization has Lockout/Tagout policies, make sure to implement them after connecting to the Air Source.

The incoming Air Source connects to the Tire Changer via the Air In connector on the left side of the Regulator/Filter. You need to provide a fitting for the Air In connector; it is not supplied.



Drawing not necessarily to scale. Not all components shown. Note that the air lines going to the Assist Tower/Tire Inflations and the Foot Pedals/Pneumatics come connected and ready for use; no installation or adjustment is required.

There are three main components of the Air Source:

- **Incoming Air**. The Tire Changer requires an air source of 15 to 25 CFM that has an operating air pressure of 140 to 165 PSI (9.6 to 11.4 bar). *You need to supply a fitting for the Air In connector.*
- **Regulator / Filter**. Removes contaminants from the Incoming Air. It also includes a gauge that shows the operating air pressure of the Incoming Air. If you see water in the Water Sight Gauge, you can drain it using the Water Drain Plug. Refer to **Maintenance** for more information. Air that passes through the Regular/Filter – that does not go to Foot Pedals or other pneumatic components of the Tire Changer – are routed to the Assist Tower and to Tire Inflations.
- **Oiler / Lubricator**. Puts pneumatic oil, for lubrication, into the Incoming Air. This lubricated air is routed to the Foot Pedals and other pneumatic components of the Tire Changer. It is very important to make sure the oil feed rate is correct, 1 or 2 drops of oil per use of the Up or Down Foot Pedals. Refer to **Maintenance** for more information.

Connecting to a Power Source

The Tire Changer has to be connected to a 208-230 VAC power source.

A Power Cord with *no Plug* is provided with the unit. You need to have a licensed, certified Electrician wire the open end of the Power Cord to an appropriate 208-230 VAC NEMA 30 Amp Plug.

Refer to **Plug Wiring Information** for additional wiring information.

⚠ **WARNING** All electrical work ***must be done by a licensed, certified Electrician***.

Additional electrical information:

- Make sure wiring is done in accordance with National Electric Code (NED) and local codes and standards covering electrical apparatus and wiring.
- Operation with no Ground can damage electronics and could create a shock hazard. ***You must ground the unit***.
- Damage caused by improper electrical installation (not grounding the unit, for example) voids the warranty.
- The Tire Changer uses pneumatic and electrical energy; if your organization has Lockout/Tagout policies, make sure to implement them after connecting to the power source.
- Make sure that adequate wire sizes are used, service is of adequate amp rating, the supply line has the same electrical characteristics (voltage, cycles, and phase) as the motor, and that no other equipment is operated from the same line.
- Electrical codes may require “hard-wiring” when the machine is anchored to the floor. Consult a licensed Electrician regarding the applicable codes for your location.

⚠ **WARNING** ***Disconnect power before performing any maintenance***. Make sure the unit cannot be reenergized until you are done with maintenance; secure the plug so that it cannot be accidentally plugged back in. If your organization has Lockout/Tagout policies, make sure to implement them. This equipment has internal arcing or sparking parts that should not be exposed to flammable vapors. The unit must not be located in a recessed area or below floor level.

Prepare the Tire Lube Bucket

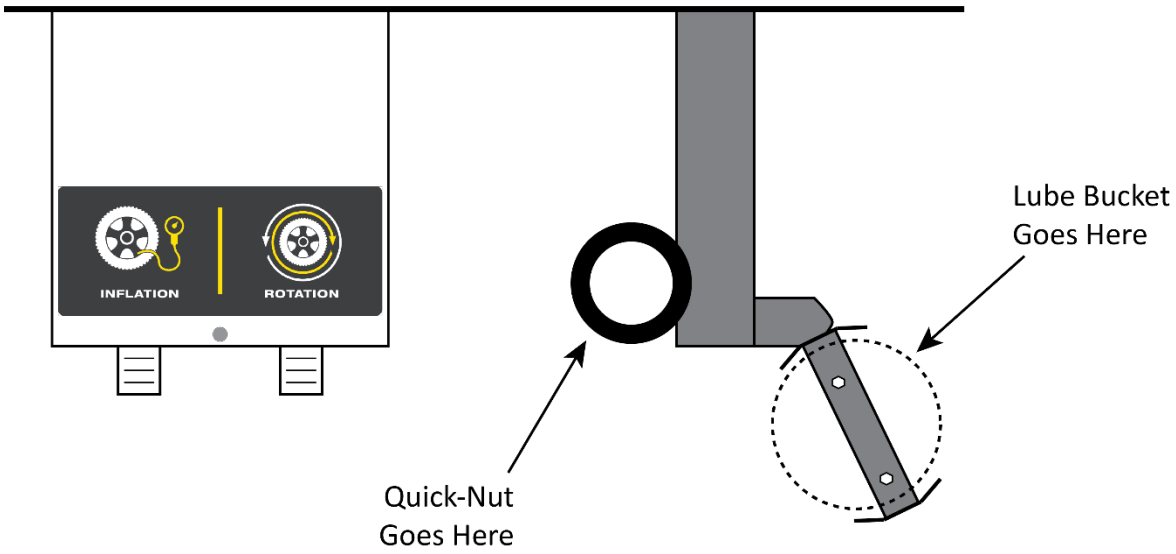
The Tire Changer comes with a Tire Lube Bucket (to hold your Tire Lube) and a Tire Lube Brush (to apply your Tire Lube).

BendPak Ranger does not include any Tire Lube with the Tire Changer, as there are many options available.

⚠ **CAUTION** Only use Tire Lube that is approved by the Tire manufacturer. Using non-approved Tire Lube could corrode the Wheel or cause Tire/Wheel slippage and vibration issues.

Be sure to use enough lubricant without using too much. The point of lubricant is to ***temporarily*** reduce the friction between the Tire Bead area and the Rim. What you are looking for is a lubricant that is slippery when wet but not slippery once dried. If you notice excessive amounts of lubricant on the Tire or Rim, remove it.

There is a location on the Tire Changer for the Tire Lube Bucket near the Quick-Nut.



Drawing is not necessarily to scale. Not all components shown. View is from above.

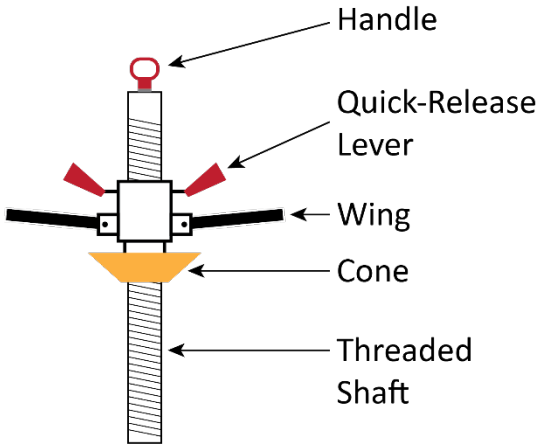
Refer to the drawing in the **Components** section for a side view of the Lube Bucket and Quick-Nut location.

Preparing the Quick-Nut

The Quick-Nut holds Wheels in place while the Tire is being demounted or mounted.

Note: When the Quick-Nut and its Cones and Adapters are shipped from the factory, they are coated with oil to protect them. Until you clean the oil off of them, either wear gloves, keep a rag handy, or be prepared to wash your hands frequently.

The Quick-Nut has multiple parts.



The parts of the Quick-Nut and their functions are:

- **Handle**. Lets you easily pick up the Quick-Nut and move it around.
- **Quick-Release Lever**. Lets you quickly put on or take off the Quick-Nut. Twist both Levers to prevent the Wings from engaging the threads in the Threaded Shaft; release when you want the Wings to engage the Threaded Shaft.
- **Wing**. Used to tighten the Quick-Nut on, or loosen it from, the Threaded Shaft, depending on whether you are securing the Wheel on the Turntable or taking the Wheel off the Turntable. After securing a Wheel to the Turntable, fold up the Wings to get them out of the way.
- **Cones and Adapters**. The Quick-Nut has several different sized Cones and Adapters you can use to firmly secure the Wheel in place. The two large metal Cones come with yellow plastic protectors for securing aluminum rims (so you do not scratch or mar the rims).
- **Threaded Shaft**. Goes into the hole in the center of the Turntable, which holds the Wheel in place.

There is a location on the Tire Changer to hold the Quick-Nut when it is not being used; refer to the drawing in **Components** for the exact location.

Lube the Post

The Tire Changer Post needs to be lubed so that both Tool Arms can easily slide up and down as required.

The Tire Changer comes from the factory with a packet of petroleum jelly for lubing the Post. The packet is located inside the Lube Bucket.

⚠ **CAUTION** ***The petroleum jelly for lubing the Post is not a Tire Lube***. Do not use it to lube Tires. Once the Post is lubricated with the petroleum jelly, do not lean on it or touch it. When you run out of the provided petroleum jelly, you can replace it with more petroleum jelly or Vaseline®.

Test the Tire Changer

Make sure the following items have been done before putting the Tire Changer prior to normal operation:

- **Check for pneumatic (air) pressure**. The Tire Changer requires pneumatic energy to perform many of its functions. You can press the Lock Button on the Tool Arm Handle to make sure the Tire Changer is getting air; you will hear a whoosh of air when you press the button if it is getting air. If it is not, check the air source.
- **Test the power source**. Other Tire Changer functions require electric power. Step on and hold down the Rotation Foot Pedal to check for electric power. If the Turntable turns, you have electric power.
- **Test the Laser**. Press the Laser On/Off button to see if the red laser dot appears on the Turntable. If it does, the Laser is working.
- **Test the Tire Lift**. Step on and hold down the Up Foot Pedal. If the Tire Lift starts moving up, then the Tire Lift is working. You do not need to have a Tire on the Tire Lift to test it.
- **Make sure there is Tire lubricant available**. Your shop probably has a brand of Tire lube that it prefers. Make sure some is in the Lube Bucket on the Tire Changer. Always use Tire lube; it just makes changing Tires easier, including helping to prevent damage to the Tire and the Wheel.
- **Make sure the Turntable turns**. Step on and hold down the Rotation Foot Pedal. If the Turntable starts turning, then the Turntable is working.
- **Test both Tool Arms**. Use the Tool Arm Handle to move both Tool Arms in or out together. Use the Upper and Lower Tool Arm Controls to move the Upper Tool Arm and Lower Tool Arm, respectively, up and down separately.
- **Change some non-customer Tires**. Just to make sure you are used to all of the controls, BendPak Ranger recommends changing some *non-customer Tires* before changing some customer Tires.

Final Checklist Before Operation

Do the following things ***before*** putting your Tire Changer into normal operation:

- Review the Installation Checklist to make sure all steps have been performed.
- Make sure the Tire Changer is getting electric and pneumatic power.
- Check to see that all Anchor Bolts are in position and tightened, if you installed them.
- Make sure the Tire Changer has been tested.
- Leave the Manual with the owner/operator.

Operation

This section describes how to use your Tire Changer.

⚠ DANGER Do not proceed with using the Tire Changer to change a Tire unless you have formal training and have read the entire *Installation and Operation Manual*. Tire changing must only be done by trained personnel. ***Failure to understand and follow proper procedures will result in injury or death***.

Usage Precautions

Keep the following in mind while you use your Tire Changer:

- Never perform service on an *inflated* Tire; ***always*** fully deflate the Tire before beginning work.
- Never mount or change damaged Tires or Wheels.
- Always secure the Wheel to the Tire Changer or place in a safety cage before inflating the Tire.
- Make sure new employees are trained and supervised in the performance of their duties.
- Make sure all employees receive specific training in Tire demounting and mounting before they are allowed to use the Tire Changer, that their training is verified through a testing program, and that all training is documented. All others, including children and untrained personnel, must be kept at least 30 feet away from the Tire Changer.
- ***The RV1 Tire Changer may work differently than other Tire Changers you have used***. BendPak Ranger recommends practicing with non-customer Tires to get familiar with how the product works *before* starting work on customer Tires.
- Make a visual inspection of the Tire Changer ***before each use***. Do not operate the unit if you find any issues. Instead, take it out of service, then contact your dealer, visit **www.bendpak.com/support/**, or call **(805) 933-9970**.
- When using the Tire Changer, you ***must*** wear appropriate work clothing: leather gloves, non-skid steel-toed work boots, and an industrial back belt. Keep hair, jewelry, and clothing away from the unit.
- When using the Tire Changer, be careful of your hands, as there are multiple pinch point dangers on the unit. Do not rest your hands on any part of the Tire Changer while using it.
- When using the Tire Changer, ***the operator must wear ANSI-approved eye protection at all times***: safety glasses, a face shield, or protective goggles.

⚠ WARNING Always wear ANSI-approved eye protection. An accident could cause significant injuries to your eyes.

- Keep the work area clean and well lit. Dirty, cluttered, and dark work areas increase the chances of an accident happening.
- Do not try to access the inside of the unit unless instructed to do so by Ranger Support. There are no user serviceable parts inside.

⚠ **WARNING** Be especially careful when inflating Tires. This is a dangerous time when using a Tire Changer. If the Tire and Wheel are mismatched or there is a defect in the Tire, it could explode, injuring or killing you or anyone nearby. ***Never lean over the Tire when inflating a Tire***. Move away from the Tire during inflation.

- Do not use the unit in a wet environment or expose it to rain or excess moisture.
- If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment must be used. Cords rated for less current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
- Do not use anything flammable on the Beads or Rim surfaces for lubrication purposes; instead, use non-flammable vegetable or soap-based rubber lubricant.
- Do not use the unit in the vicinity of open containers of flammable liquids.
- Clean the unit according to the instructions in **Maintenance**.
- Read the entire *Installation and Operation Manual* before using the unit.

Using the Controls

The Tire Changer has multiple controls; this section describes how to use them.

Pedals

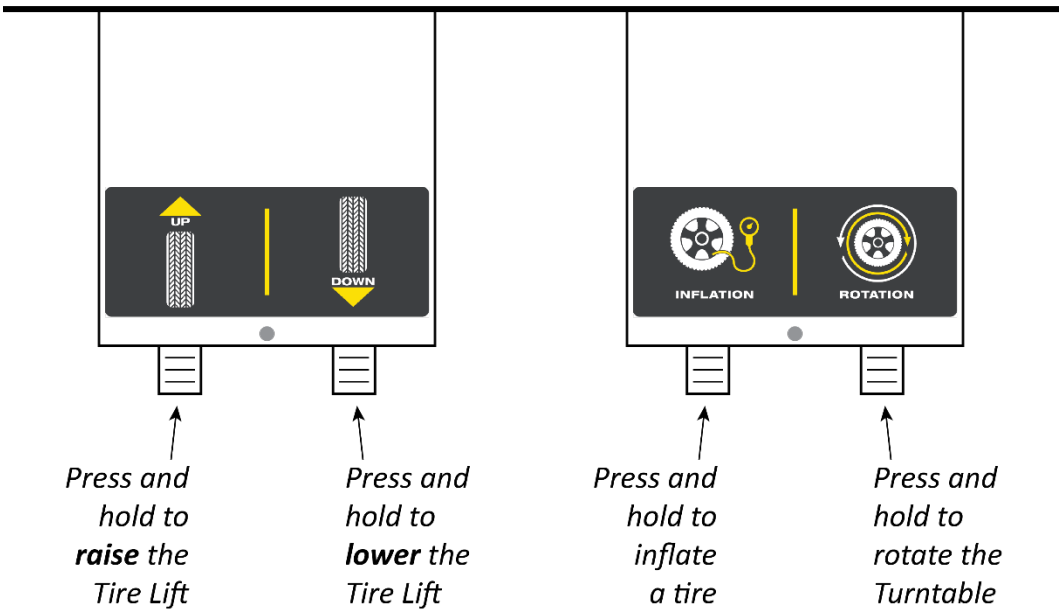
The Tire Changer has four Pedals:

- **Up**. Step on and hold down to raise the Tire Lift. Uses pneumatic power. Step off to stop.
- **Down**. Step on and hold down to lower the Tire Lift. Uses pneumatic power. Step off to stop.
- **Inflation**. Step on and hold down to inflate the Tire (when the Air Chuck is connected). Uses pneumatic power. Step off to stop.

  ⚠ WARNING The Air Chuck has a clip so that you can clip it on when inflating a Tire. Do not hold the Air Chuck while you are inflating a Tire. This leaves you very close to the Tire, which could result in injury if there were a problem during the inflation. Instead, clip the Air Chuck into position, move away from the Tire, then press and hold the Inflation Foot Pedal.

- **Rotation**. Step on and hold down to turn the Turntable clockwise. Uses electric power. Step off to stop. Press ***up*** to turn the Turntable ***counterclockwise***.

The following drawing is a top view of the Pedals.



Tool Arm Handle

The Tool Arm Handle controls the in and out movement (towards and away from the Wheel/Tire) of the Upper Tool Arm and the Lower Tool Arm.

Important: The Upper and Lower Tool Arms are synchronized; ***they move in and out together***. However, *they move up and down separately* (controlled by the Upper and Lower Tool Arm Controls).

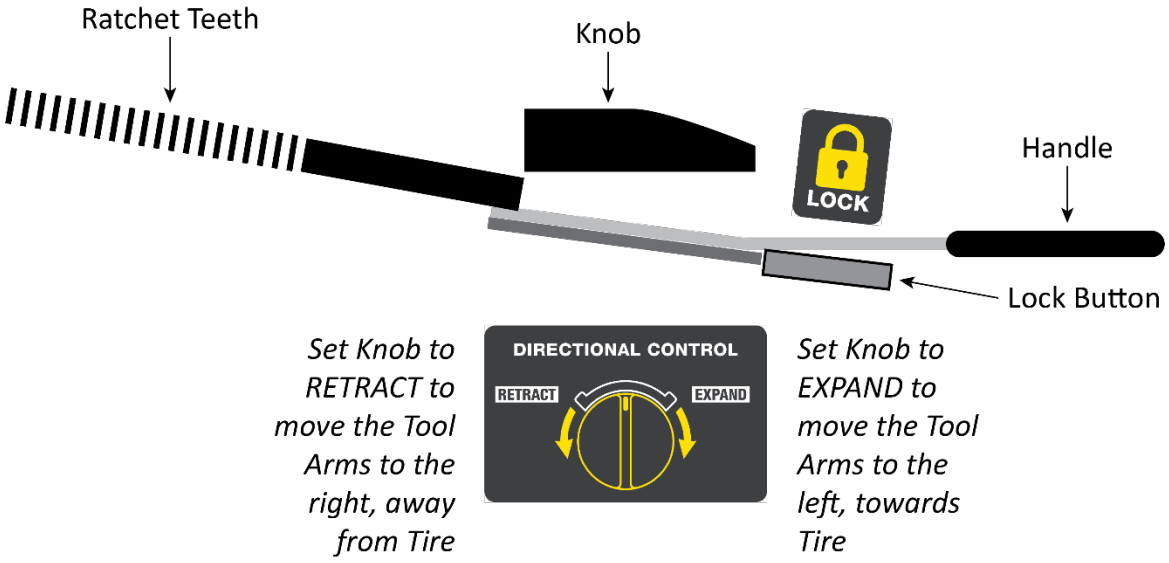
The components of the Tool Arm Handle include:

- **Handle**. Pump to move the Tool Arms in and out.
- **Lock Button**. Hold to allow the Handle to move the Tool Arms. Uses pneumatic power. You cannot move the Tool Arms unless you hold down the Lock Button while pumping the Handle.
- **Knob**. Controls the direction the Tool Arms move. If they move the "wrong" direction when you pump the Handle, turn the Knob to the other position and then try again.

  To use the Handle, Lock Button, and Knob:

  – Turn the Knob to the right (EXPAND), press the Lock Button, then ratchet the Handle to the right to move the Tool Arms towards the Tire.

  – Turn the Knob to the left (RETRACT), press the Lock Button, then ratchet the Handle to the left to move the Tool Arms away from the Tire.



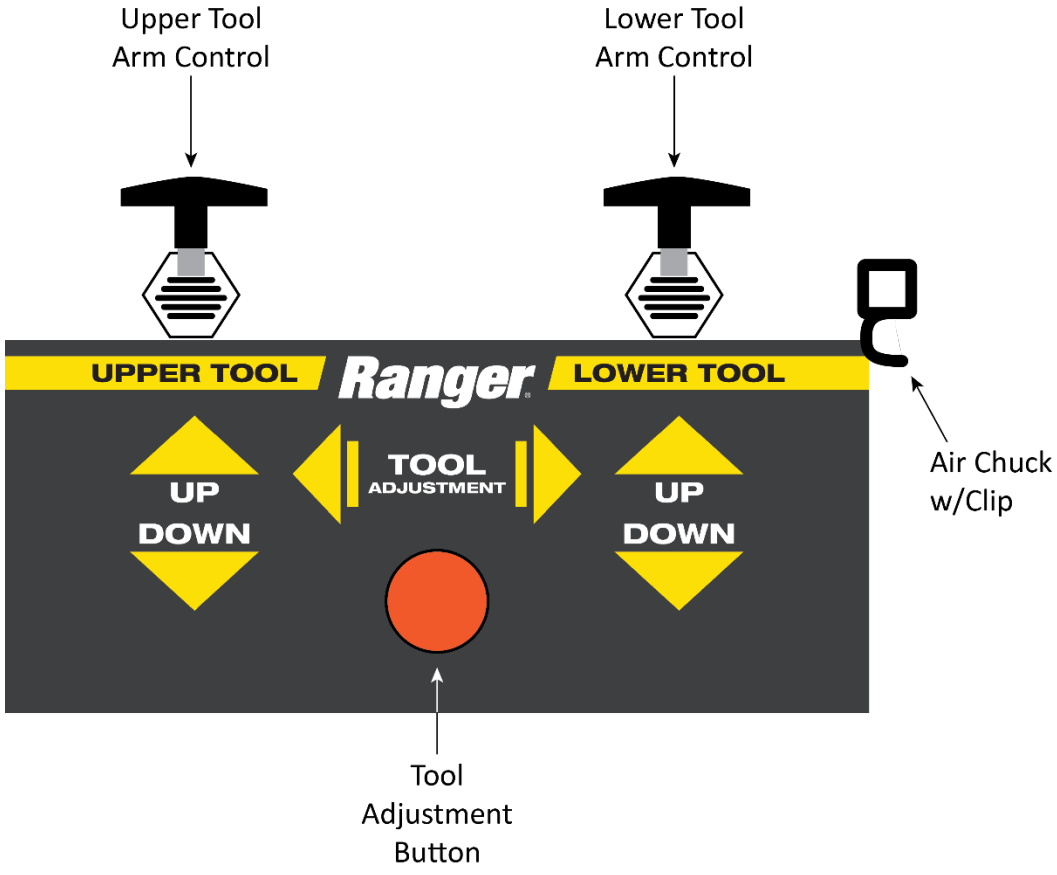
Upper and Lower Tool Arm Controls

The Upper and Lower Tool Arms Controls control the up and down movement of the Upper Tool Arm and the Lower Tool Arm.

Note: The Upper and Lower Tool Arms *move up and down separately*. Their up and down movement are not synchronized with each other.

- **Upper Tool Arm Control**. Moves the Upper Tool Arm up and down.
- **Lower Tool Arm Control**. Moves the Lower Tool Arm up and down.
- **Tool Adjustment Button**. Automatically moves both Tool Arms in about one inch (25 mm) for as long as you hold the button down. Use of the Tool Adjustment Button is situational; you do not need to use it all the time.

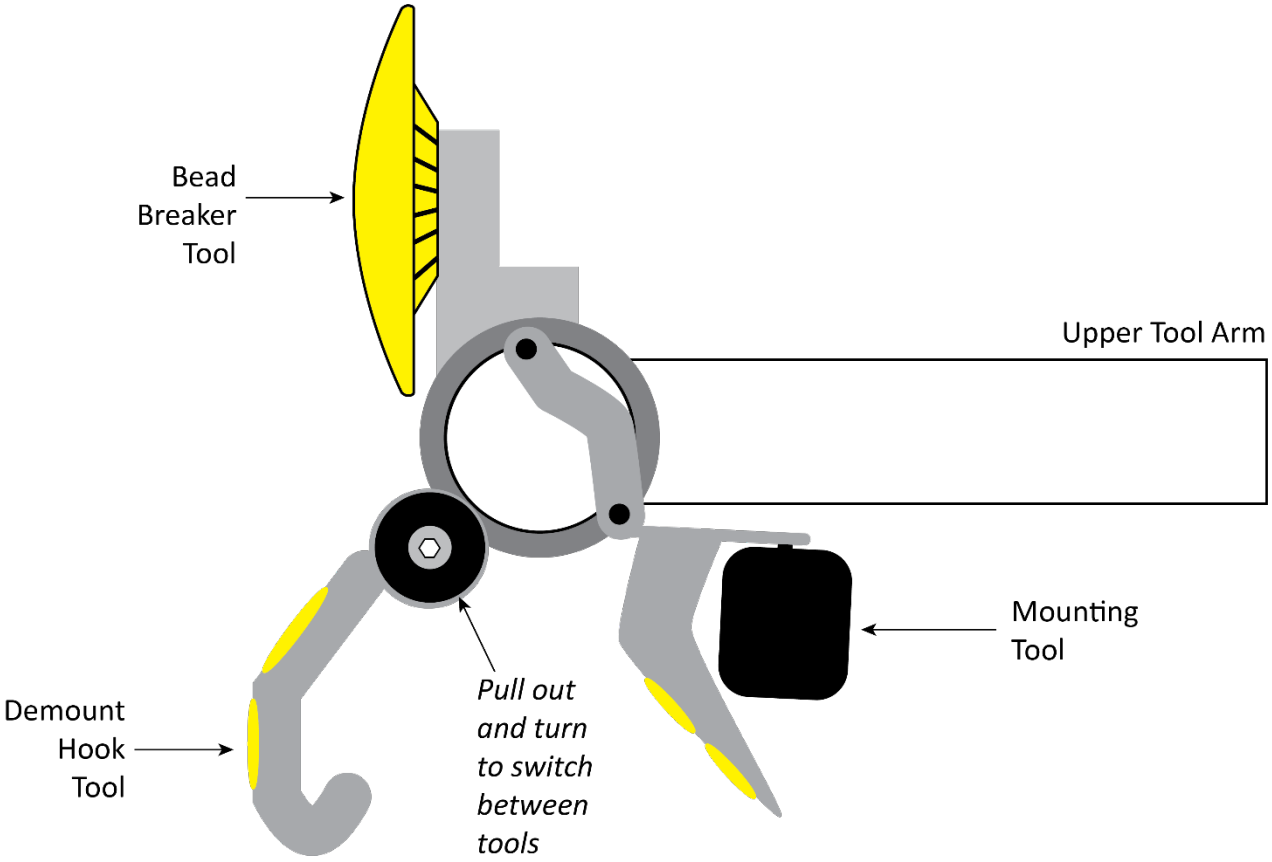
  For example, when you are breaking a Tire's Bead and the Bead Breaker Tool slips under the Wheel's Rim Lip, you can press and hold the Tool Adjustment Button to move the Bead Breaker Tool in. When you release the Tool Adjustment Button, the Bead Breaker returns to its original position.
- **Air Chuck with Clip**. The Air Chuck is used to inflate a Tire. When not in use, it can be stored on the side of the Upper and Lower Tool Arm Controls.



Upper Multifunction Tool

The Upper Multifunction Tool has three components:

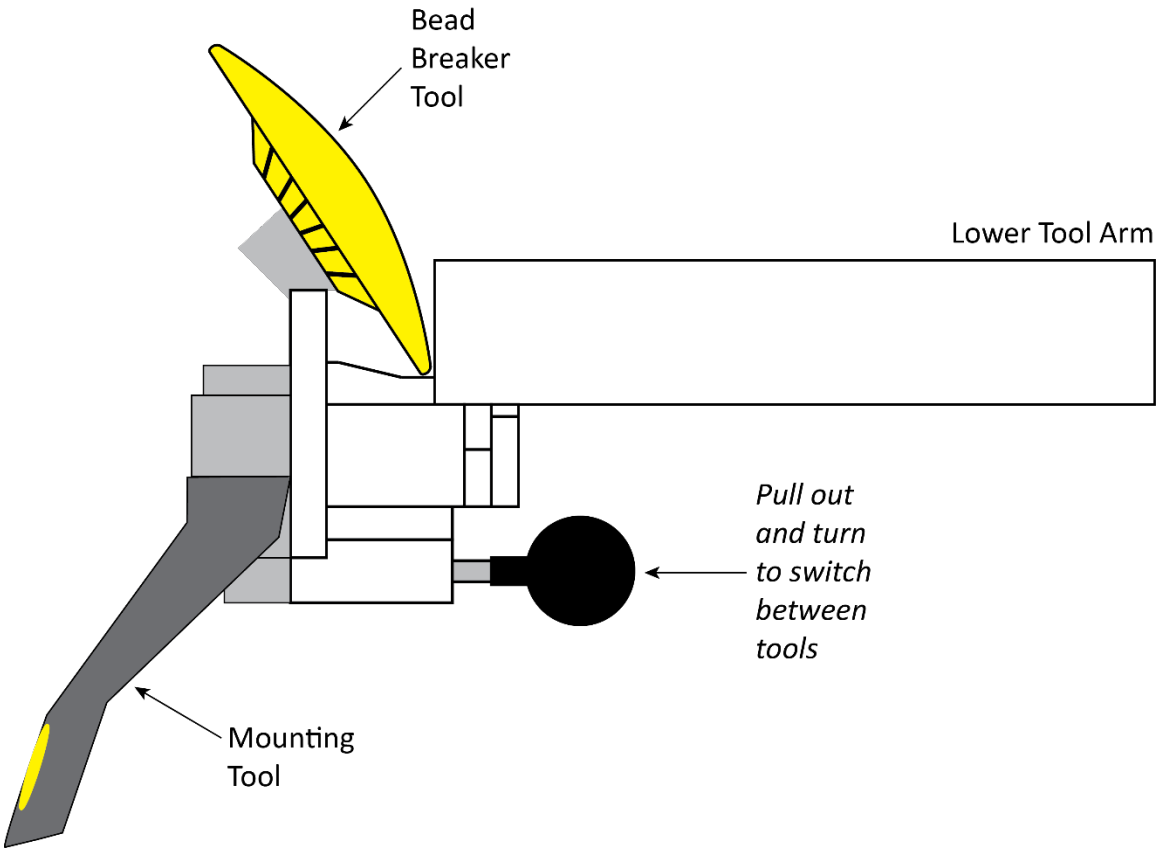
- **Bead Breaker Tool**. Breaks the Bead on the top side of a mounted Tire.
- **Demount Hook Tool**. Pulls the Tire up and over the Wheel during the demount process.
- **Mounting Tool**. Pushes the Tire down into place during the mount process.
- **Turn Knob**. Pull out and turn to switch between the three tools on the Upper Multifunction Tool.



Lower Multifunction Tool

The Lower Multifunction Tool has two components:

- **Bead Breaker Tool**. Breaks the Bead on the *underside* of a mounted Tire.
- **Mounting Tool**. Slides the Tire back onto the Wheel during the mount process.
- **Turn Knob**. Pull out and turn to switch between the tools on the Lower Multifunction Tool.



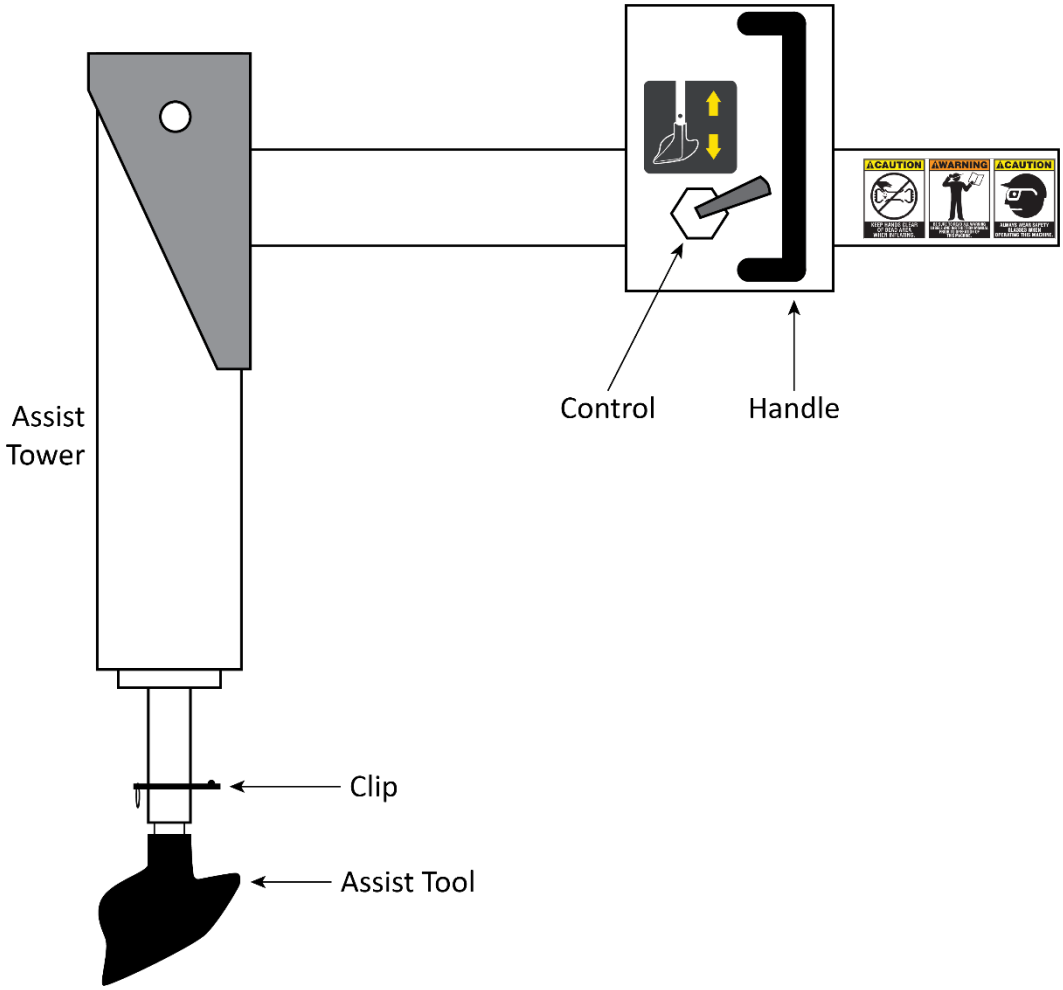
Assist Tower

The Assist Tower holds the Assist Tool, which is used to hold the sidewall of the Tire down during the mount process.

The components of the Assist Tower are:

- **Handle**. Helps to move the Assist Tower into the desired position.
- **Control Joystick**. Moves the Assist Tool up and down.
- **Clip**. Lets you lengthen or shorten the Assist Tool.

  To adjust the length of the Assist Tool: remove the Clip, move the Assist Tool to the desired length, then replace the Clip.
- **Assist Tool**. Used to hold the Tire in place (you put it on the sidewall of the Tire) during the mount process.



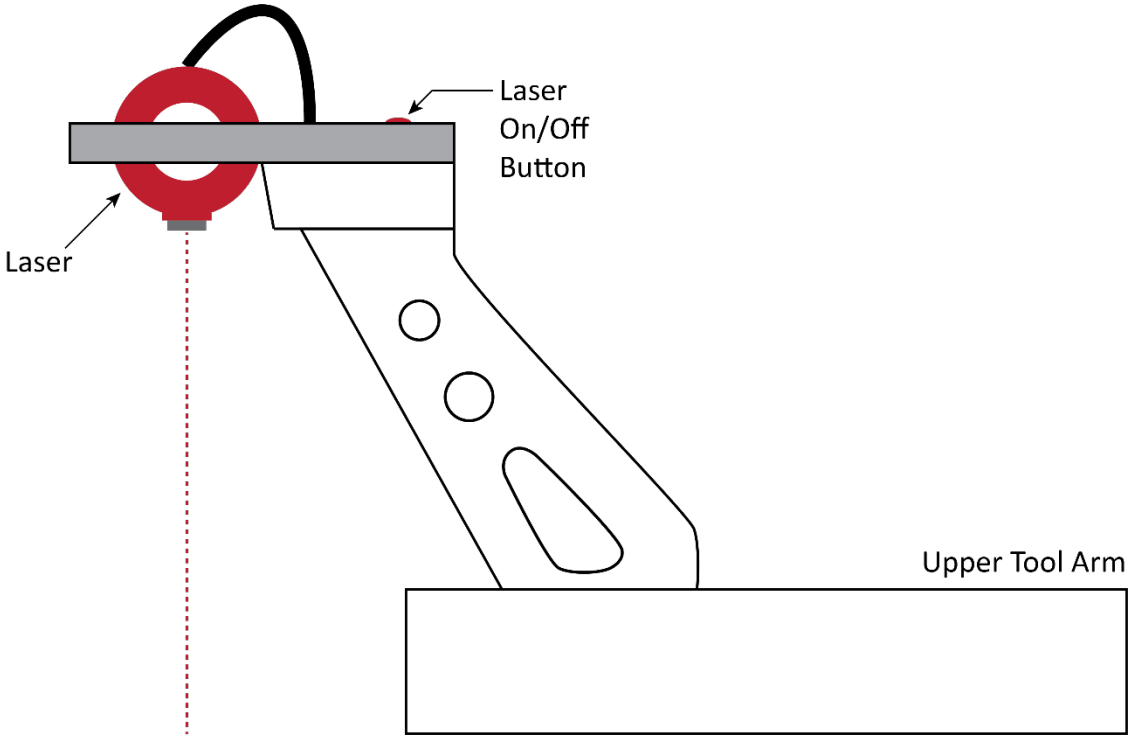
Laser

The Laser, when turned on, shines a beam straight down, showing you where the selected Upper Multifunction Tool will impact the Tire if used.

For example, if you are looking to use the Bead Breaker Tool on the Upper Multifunction Tool and you want to know where it will hit the Tire if you were to lower it, the Laser shows that location.

When the Upper Tool Arm moves, the location where the Laser hits also moves.

Press the Laser On/Off Button to turn the Laser on and off. When done using the Laser, remember to turn it off.



Before You Change a Tire

⚠ **DANGER** Do not use the Tire Changer unless you have been properly trained and have read the entire *Installation and Operation Manual*. Tire changing must only be done by trained personnel. Failure to understand and follow proper procedures will result in injury or death.

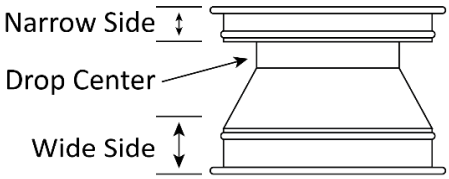
Before you change a Tire, you should:

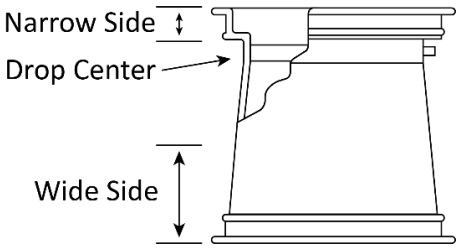
- **Remove weights**. Check the Wheel to make sure that all clip-on and adhesive weights (from having the Tire balanced) have been removed.
- **Deflate the Tire**. Some shops have their technicians do this before putting the Wheel on the Tire Changer, others when it has been mounted and secured on the Tire Changer. The Tire Changer supports either option. ***Fully* deflate Tires before working on them**.

  To make sure a Tire is *fully deflated*, remove the Valve Core from the Valve Stem. You should use a Valve Core Tool for this, but if you do not have one, you may be able to use needle-nosed pliers.
- **Have Tire lubricant ready**. Tire Lubricant makes the process of demounting and mounting Tires much easier. If you do not use Tire Lubricant, you significantly increase the chances of damaging the Wheel and the Tire. Tire Lubricant is not provided with the Tire Changer.
- **Check for damage**. Especially with expensive Wheels, make sure to check them for any damage *before* changing the Tire. Depending on the circumstances, if you find any damage you might want to discuss that damage with the owner of the Vehicle and/or photograph the damage. If you work in a shop, talk to your supervisor regarding shop policies in this area.

  Additionally, damaged Wheels and Tires are dangerous to work with. If you are not sure whether a Wheel or Tire is too damaged to work with, talk to your supervisor.
- **Understand Performance Wheels**. Before servicing performance Wheels, review the Performance Wheels section of this manual.
- **Identify the Narrow Side/Drop Center of the Wheel**. The rule is: the Narrow Side/Drop Center side of the Wheel gets put onto the Tire Changer facing up. For most Wheels, this means the side of the Wheel facing the *outside* of the Vehicle goes on top, because that's where the Narrow Side/Drop Center side is on most (but not all) Wheels.

  The following drawing shows two Wheels and identifies the Narrow Side, Drop Center, and Wide Side of each.





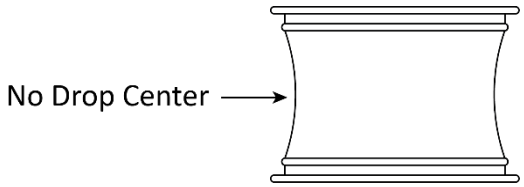
  Some aftermarket and OEM performance Wheels are **reverse** drop-center Wheels, meaning the Narrow Side/Drop Center side of the Wheel is closer to the *inside* of the Vehicle. The rule still holds for these Vehicles: the Narrow Side/Drop Center side of the Wheel gets put onto the Tire Changer facing up.
- **Ask your Supervisor**. If you have ***any*** concerns about a Tire you have been asked to demount or mount or about how to use the Tire Changer, consult with your Supervisor ***before*** starting work.

Working with Custom and Special Wheels

This section covers working with Alloy Wheels with no drop center, European performance Wheels, and Wheels with tire pressure monitoring systems.

Alloy Wheels

Some manufacturers offer Wheels with little or no drop center. These types of Wheels are almost never Department of Transportation approved.



⚠ **DANGER** The Tire, Wheel, or both can be damaged and the Tire could explode under pressure, resulting in serious injury or death. ***BendPak Ranger recommends you not try to demount or mount this type of Wheel***. If you do attempt to demount or mount this type of Wheel, **proceed with extreme caution**.

European Performance Wheels

Some European performance Wheels have very large humps except near the Valve Hole.

On these Wheels, the Beads should be loosened at the Valve Hole on both the upper and lower sides first.

Wheels with Tire Pressure Monitoring Systems (TMPS)

Some Wheels have a pressure sensor located behind the Valve Stem. On these Wheels, the Beads should be loosened opposite the Valve Stem on both upper and lower sides first, before breaking the Beads on the rest of the Tire.

Performance Wheels on some Vehicles (including Corvette, BMW, and Lamborghini Diablo) have a pressure sensor strapped to the rim opposite the Valve Hole. On these Wheels, the Beads should be loosened at the Valve Hole on both the upper and lower sides first, before breaking the Beads on the rest of the Tire.

The Steps in Changing a Tire

Changing a Tire consists of multiple steps:

1. **Place the Wheel on the Turntable**. Use the Tire Lift and the Up Foot Pedal to get a Wheel onto the Turntable.
2. **Secure the Wheel**. It is important for the Wheel to stay in place on the Turntable. Use the Quick-Nut to do this.

   ⚠ **DANGER** It is extremely important to carefully secure every Wheel you work on. When pressurized Tires fail, they can literally explode. The better the Wheel is secured, the better off everyone in your garage will be if a pressurized Tire fails. Note that even if you carefully secure the Wheel with the Quick-Nut, you must still take precautions (described throughout this manual) with pressurized Tires. The Quick-Nut can control the Wheel, in most cases, but cannot control what happens to the Tire portion if it were to explode. Bystanders can be seriously injured or even killed if a pressurized Tire explodes.

3. **Deflate the Tire**. There is a lot of energy stored in a Tire when it is inflated. You **must** fully deflate the Tire before you can change it. If you do not, that energy will be released when you try to change it, which could result in the Tire exploding, causing injury and even death to the Operator or bystanders. ***Never work on a Tire unless you have personally confirmed that it is fully deflated***. The best way to do this is to make sure the Valve Core has been removed from the Body of the Valve Stem.
4. **Break the Bead**. Tires stay in position because the Tire Bead is correctly seated between the Bead Retainer and the Rim Lip of the Wheel (called the Bead Seat). To change a Tire, you must get the Tire Bead out of the Bead Seat all the way around both sides of the Tire. This is called breaking the Bead.
5. **Demount the Tire**. Once the Bead is broken, you still have to slide the Tire over the Rim Lip of the Wheel to get it fully off. Once the Tire is demounted from the Wheel, you can move it out of the way and then put on the new Tire.
6. **Mount the new Tire**. Mounting a Tire is basically the opposite of the steps described above. You first need to get the Tire over the Wheel (the opposite of demounting the Tire), then get the Bead into position in the Bead Seat (the opposite of breaking the Bead), and then inflate the Tire (the opposite of deflating the Tire).
7. **Inflate the Tire: Bead Seal, Bead Seat, Inflate**. The Tire inflation process consists of three stages that could easily be considered a single process. **Bead Sealing** is putting in a small amount of air pressure to push the Tire up against the Rim so that air does not leak out. **Bead Seating** is putting in more air pressure to “pop” the Tire Beads into position in the Bead Seat. **Inflation** is adding air pressure to the Tire manufacturer’s recommended pressure after the Bead has been seated.
8. **Remove the Wheel from the Turntable**. Remove the Quick-Nut, slide the Wheel onto the Tire Lift, and then use the Down Foot Pedal to lower it down to the ground.

Placing a Wheel on the Turntable

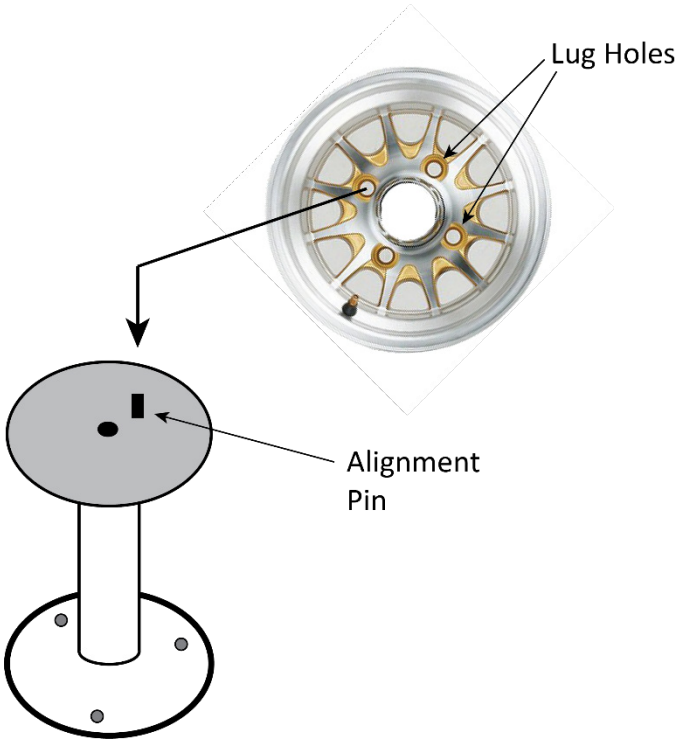
When you want to take the Tire off of a Wheel (called *demounting* the Tire), you must first put the Wheel onto the Tire Changer Turntable.

To put a Wheel onto the Turntable:

1. Make sure you are wearing ANSI-approved eye protection: safety glasses, face shield, or goggles.
2. Review the requirements in **Before You Change a Tire**.
3. Move the Wheel onto the Tire Lift.
4. Press and hold the Up Foot Pedal.

   The Tire Lift rises and moves the Wheel over the Turntable.

   Make sure the Narrow Side is facing up.
5. Release the Up Foot Pedal and then put the hole in the middle of the Wheel directly over the Turntable.
6. Align a Lug Hole in the Wheel over the Alignment Pin on the Turntable.



Not necessarily to scale. Not all components shown.

Secure the Wheel

Securing the Wheel ensures it stays in place while you demount or mount the Tire.

To secure a Wheel on the Turntable:

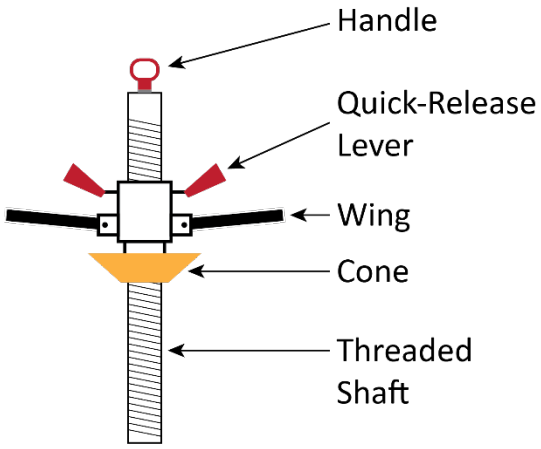
1. Select an appropriate Adapter or Cone.

   You want the Adapter or Cone to go into the hole in the center of the Wheel without going all the way through and touching the Turntable.

2. If you are using a Cone, you also need to use the Turntable Spacer on the Turntable and under the hole in the center of the Wheel; this prevents the Cone from touching the Turntable.

3. Put the Quick-Nut into place.

   Make sure to use the correct Cone (and Turntable Spacer) or Adapter with the Quick-Nut.



4. Hold the Handle up and adjust the Threaded Shaft until the Threaded Shaft goes all the way down into the top of the Turntable.

   Important: Make sure the Threaded Shaft goes down into the Turntable. If it does not, the Quick-Nut will not correctly hold the Wheel in place.

5. Hold the Quick-Release Levers to the side to quickly pass most of the threads in the Threaded Shaft.

6. When the Adapter or Cone is all the way down, release the Quick-Release Levers and turn the Wings clockwise until the Quick-Nut is securely tightened.

7. When the Wheel is secured by the Quick-Nut, flip up the Wings to get them out of the way.

   When you need to remove the Quick-Nut later, reverse the process: flip down the Wings, turn the Wings counter-clockwise until the Quick-Nut is untightened, then hold the Quick Release Levers to the side and pull up the Quick-Nut.

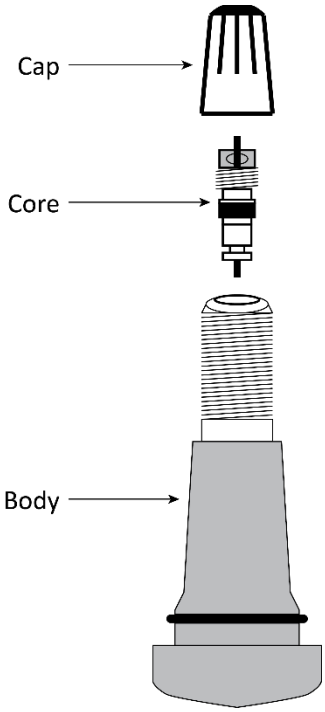
Deflate the Tire

If you have not done so already, you need to fully deflate the Tire.

⚠ **DANGER** Never attempt to demount or mount an *inflated* Tire. You must fully deflate it first. ***Attempting to demount or mount an inflated Tire will result in injury or death.***

To deflate a Tire:

1. If the Valve Stem has a Cap on it, remove the Cap.
2. Pull the Valve Core out of the Valve Body.



You can use a Valve Core Tool to remove the Valve Core. If a tool is not available, you may be able to use needle-nosed pliers.

3. Make sure all of the air comes out of the Tire.

Important: Do not proceed with any other Tire changing activity until the Tire is ***fully*** deflated.

Break the Bead

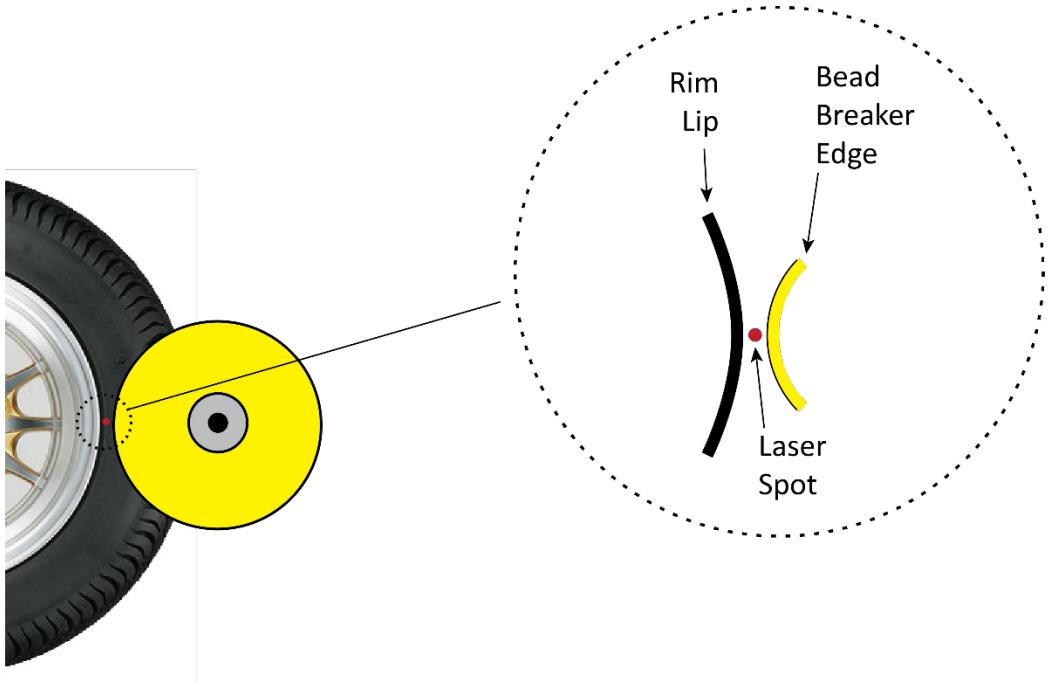
The Bead must be broken – on both sides of the Tire – before the Tire can be taken off the Wheel.

Important: Do not begin breaking a Tire's bead until you are ***sure*** that the Tire is being held securely in place and it is completely deflated.

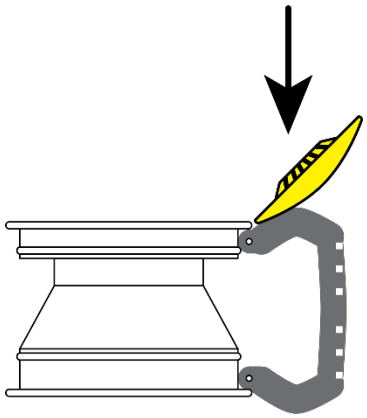
The following procedure describes first breaking the bead on the upper side of the Tire and then on the lower side of the Tire.

To break a Tire's bead:

1. On both the Upper and the Lower Multifunction Tool, make sure the Bead Breaker Tool is selected.
2. Turn on the Laser.
3. Move the Upper Multifunction Tool (using the Tool Arm) until the Laser is pointing at a spot on the Tire that is about 1/4 inch to 1/8 inch away from the Rim Lip.



4. Using the Upper Tool Arm Control, bring the Upper Tool Arm down to about an inch over the Tire.
5. Check the location of the edge of the upper Bead Breaker Tool in relation to the edge of the Rim.
6. If necessary, use the Tool Arm to adjust the location of the upper Bead Breaker Tool.



7. Using the Upper Tool Arm Control, push the upper Bead Breaker Tool down into the Tire about an inch.
8. Step on the Rotation Foot Pedal and hold it down.

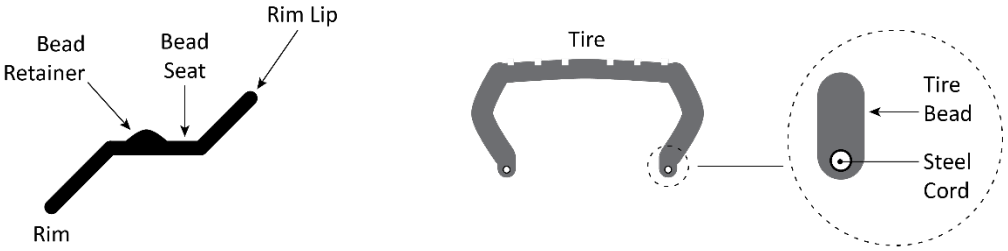
   The Turntable begins turning clockwise.
9. Press and hold the Tool Adjustment Button.

   The upper Bead Breaker Tool pushes down into the Tire until it gets below the edge of the rim and then automatically moves in about an inch or two, depending on the geometry of the Tire.

   The Bead Breaker Tool moves in because you pressed the Tool Adjustment Button.
10. Continue turning the Turntable.
11. When the Bead has been broken, release the Rotation Foot Pedal and the Tool Adjustment Button.

    The Bead Breaker Tool automatically returns to the starting location, where it was ***before*** you pressed and held the Tool Adjustment Button.
12. Verify that the Bead has been broken all the way around the Rim on the upper side of the Tire.

    The Bead is broken when the Tire Bead comes out from between the Rim Lip and the Bead Retainer (the Bead Seat) all the way around the Tire.



13. When you have verified that the upper Bead has been broken, you can switch to the lower Bead.
14. Without changing the location of the Upper Tool Arm, check the Mirror to verify that the Bead Breaker Tool on the Lower Multifunction Tool is at a spot on the Tire that is about 1/4 inch to 1/8 inch away from the Rim Lip on the lower side of the Tire.

    The Upper Tool Arm and the Lower Tool Arm are synchronized, so if the Upper Bead Breaker is in the correct location to break the Bead on the upper side of the Tire (you can verify this using the Laser), then the Lower Bead Breaker Tool is in the correct location to break the Bead on the lower side of the Tire.
15. After verifying the location of the lower Bead Breaker Tool, use the Lower Tool Arm Control to push the lower Bead Breaker Tool up into the Tire about an inch.
16. Press down the Rotation Foot Pedal and hold it down; the Turntable starts rotating.
17. Press and hold the Tool Adjustment Button.

    The lower Bead Breaker Tool pushes into the Tire until it gets below the edge of the rim and then automatically moves in about an inch or two, depending on the geometry of the Tire.
18. When the lower Bead has been broken, release the Rotation Foot Pedal and the Tool Adjustment Button.
19. Verify that the Bead has been broken all the way around the Rim on the lower side of the Tire.

    The Tire's Bead is now broken. The next step is to take the Tire off the Wheel, called demounting.

Demount the Tire

After the Bead is broken, you can take the Tire off the Wheel, called demounting.

Important: BendPak Ranger recommends using a liberal amount of lubricant; this makes the Tire come off more easily and helps to prevent damage to the Wheel or the Tire.

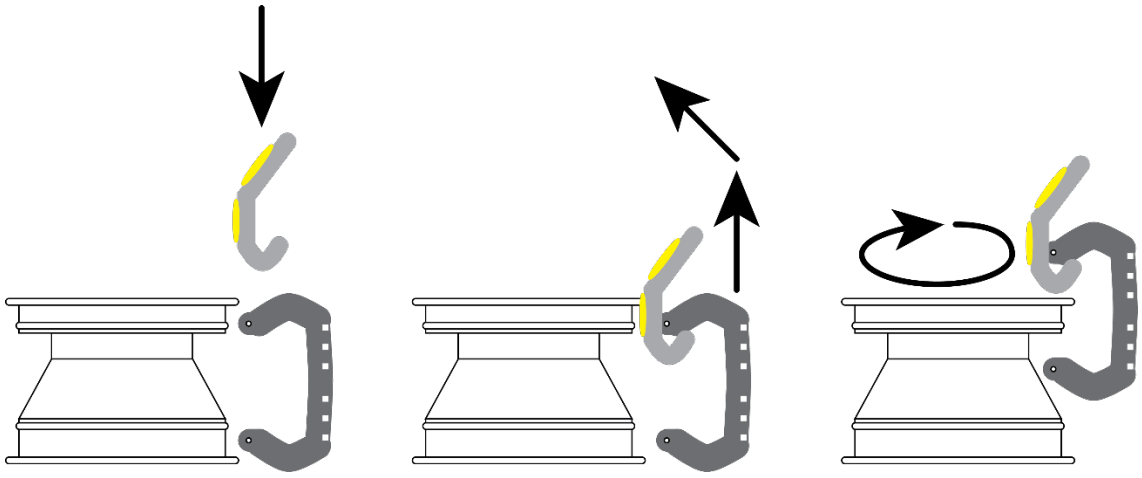
⚠ **WARNING** The following procedure ***requires*** that the Tire's Bead is broken on both sides. ***Do not*** try to demount a Tire whose Bead is not broken; you could damage the Wheel, the Tire, or even cause personal injury to yourself or bystanders.

The following procedure demounts a Tire from the Wheel it is on.

To demount a Tire:

1. Verify that the Tire's Bead is completely broken on both sides of the Tire.
2. Apply Tire lubricant to both the upper and lower Beads of the Tire.

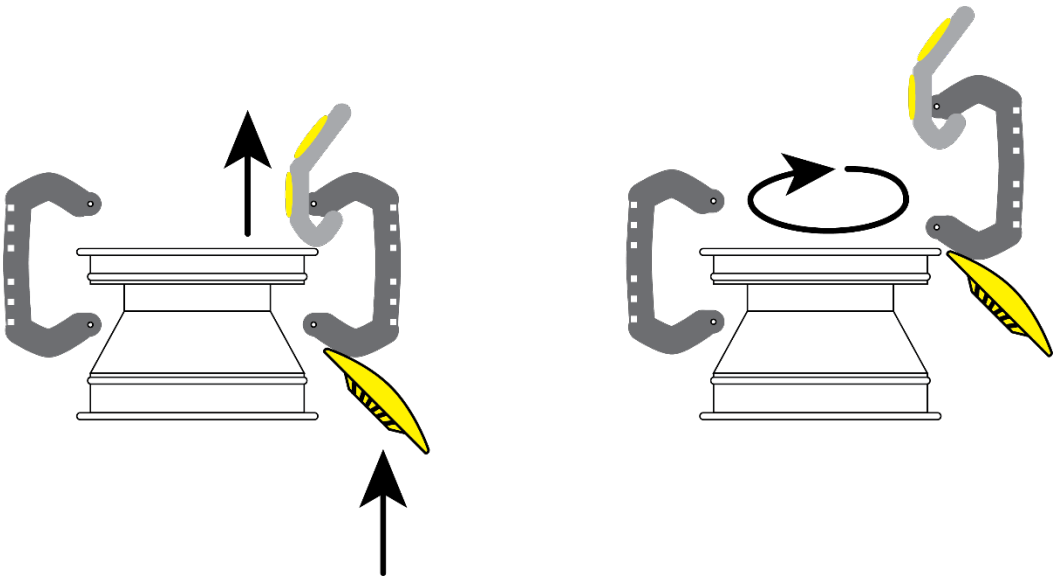
   This helps get the Tire off the Rim.
3. Switch the Upper Multifunction Tool to the Demount Hook Tool.
4. Move the Demount Hook Tool down onto the top of the Tire.
5. Press and hold the Rotation Foot Pedal to start the Turntable rotating.
6. Press and hold the Tool Adjustment Button.
7. Move the Demount Hook Tool down into the space where the Bead edge of the Tire meets the Rim using the Upper Tool Arm Control.



8. When the Demount Hook Tool slips under and catches the Bead edge of the Tire, release the Rotation Foot Pedal to stop the Turntable.
9. Release the Tool Adjustment Button.

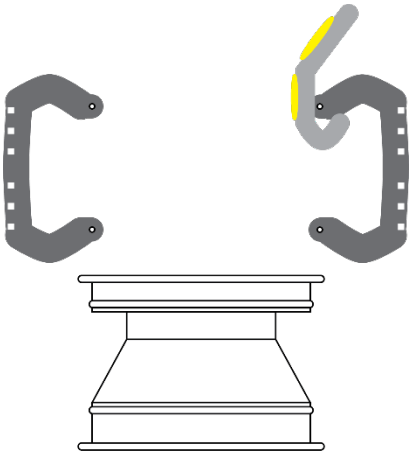
   The Demount Hook Tool automatically moves out.
10. Use the Upper Tool Arm Control to pull the Demount Hook Tool up.
11. Use the Upper Tool Arm Control to move the Demount Hook Tool in.
12. Press and hold the Rotation Foot Pedal to start the Turntable rotating.
13. When the entire upper Bead edge of the Tire is above the upper Rim, release the Rotation Foot Pedal to stop the Turntable.

14. Move both Arms up, high enough so the lower Bead edge will clear the top of the upper Rim.



15. Use the Lower Tool Arm Control to move the lower Bead Breaker Tool up.
16. Press and hold the Tool Adjustment Button and the Rotation Foot Pedal.

    The Tire is pulled up.
17. Release the Tool Adjustment Button and the Rotation Foot Pedal when the Tire's lower Bead is above the top of the upper Rim.



The Tire is now dismounted. The next step is to mount the new Tire.

Wheel / Tire Mismatches

A Wheel / Tire mismatch is mounting a Tire where the Tire Bead diameter does not exactly match the Diameter of the Wheel.

A Wheel / Tire mismatch is dangerous. A mismatched Tire and Wheel may separate or explode, resulting in injury or even death.

The differences can be subtle, so you must take care to get an exact match. For example, a 16 inch Tire goes on a 16 inch Wheel, not a 15.5 or a 16.5 inch Wheel. It may be possible to slide the 16 inch Tire over the Rim Lip of a 16.5 inch Wheel, but during inflation it will not seat properly.

⚠ **WARNING** ***Never mount a Tire on a Wheel until you have positively identified and correctly matched the Tire and Rim diameters***. If you try to seat a Tire Bead on a mismatched Wheel and Tire by inflating it, the Tire Bead may break with explosive force, which could result in serious injury or death.

Mount a New Tire

This section describes how to mount a new Tire on a Wheel.

⚠ WARNING Mounting a new Tire can be hazardous if not done correctly. Do not change a Tire unless you have been trained to do so. Failure to understand and follow proper procedures can result in injury or death.

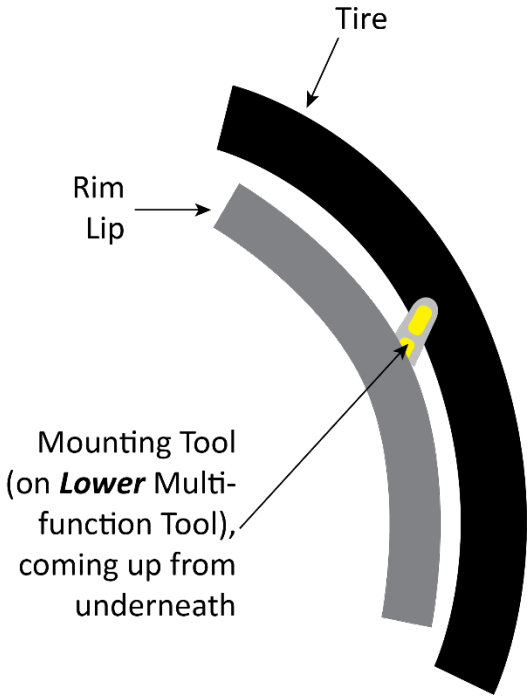
Review the following points before mounting a new Tire:

- Check the Tire and Wheel to make sure they are an exact match.
- Check the Tire for damage; ***do not mount a damaged Tire***.
- Make sure the Tire is both clean and free of balancing weights.
- Check the location of the TPMS and adjust the Tire if necessary.
- Make sure the Tire is ***fully*** deflated.

To mount a Tire:

1. Make sure you are wearing ANSI-approved eye protection: safety glasses, face shield, or goggles.
2. If the Wheel is not already secured on the Turntable, move the Wheel onto the Turntable and secure it with the Quick-Nut.

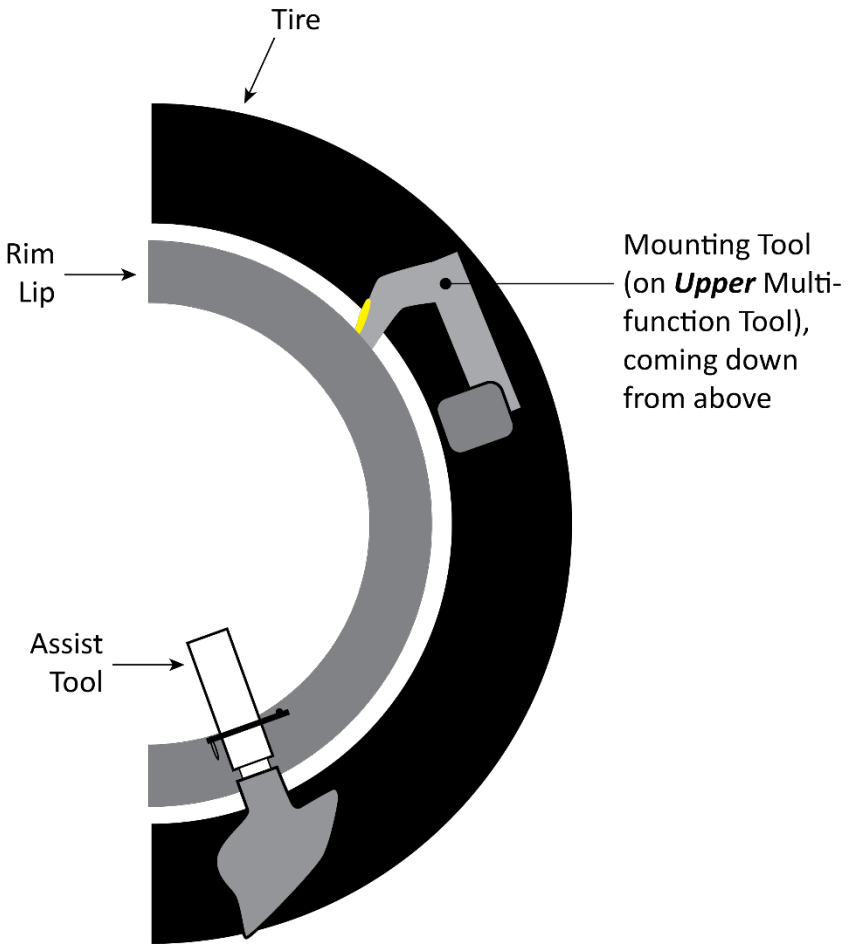
   Make sure the Narrow Side is facing up.
3. Align a Lug Hole in the Wheel with the Alignment Pin on the Turntable, if desired.
4. Apply Tire lubricant liberally to both the upper and lower Beads of the Tire.
5. Set the **Lower** Multifunction Tool so that the Mounting Tool is pointing up.
6. Adjust the Mounting Tool so that the top of it is about an inch over the Wheel's Rim bottom and about half an inch from the Rim Lip.
7. Lift the new Tire over the Quick-Nut and place it on top of the Wheel with the Mounting Tool between the Wheel and the Tire.



8. Push down on the Tire so that it is part way down the Mounting Tool.
9. Rotate the Turntable until the bottom edge of the Tire slips down over the top edge of the Wheel.
10. Lower the Lower Tool Arm.

    The Tire slides down so that it is next to the Wheel.
11. Set the **Upper** Multifunction Tool so that the Mounting Tool is facing down.
12. Move the Mounting Tool down so that it is pressing into the top of the Tire.

    The tip of the Mounting Tool should be pressing down about an inch past the Wheel Rim.
13. Move the Assist Tool into place; put it at about a quarter of the way around the Tire from the Mounting Tool.



14. Rotate the Turntable; move the Assist Tool with the Tire as the Tire moves.

    The Top Bead of the Tire slips over the Rim edge as the Wheel rotates.
15. Raise the Upper Multifunction Tool.

    The Tire is now in place around the Wheel. The next step is to inflate the Tire.

Inflate the Tire

The Tire inflation process consists of three stages:

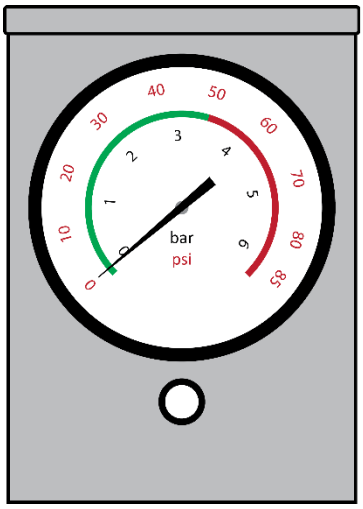
- ***Bead sealing*** is putting in a small amount of air pressure to push the Tire up against the Rim (after the new Tire has been mounted) so that air does not leak out.
- ***Bead seating*** is putting in more air pressure to "pop" the Tire Beads into position in the Bead Seat.
- ***Inflation*** is adding air pressure to the Tire manufacturer's recommended pressure.

If the Tire inflation process goes smoothly, these three stages could easily be considered a single stage instead of multiple stages.

⚠ CAUTION The inflation process can produce some additional noise. BendPak Ranger recommends wearing ear protection when inflating a Tire.

⚠ WARNING Do not exceed the maximum air pressure specified by the Tire manufacturer. This increases the chances that the Tire could explode, causing injury or even death to the Operator and bystanders.

Use the Pressure Gauge on the Tire Changer to monitor the air pressure in the Tire you are inflating.



⚠ DANGER If you are inflating a Tire that requires more than 60 psi, ***always*** use a **Tire Inflation Cage such as the RIC-4716** for safety purposes. If a Tire fails at high pressure, it can explode and cause serious injury or death to anyone near it. Using a Tire Inflation Cage helps reduce the danger.

To inflate a Tire:

1. Make sure you are wearing ANSI-approved eye protection: safety glasses, face shield, or goggles.
2. Make sure the Wheel on the Turntable is well secured with the Quick-Nut.

⚠ WARNING The Quick-Nut can hold the Wheel in place, but it cannot restrain a Tire that explodes. To reduce danger during Tire inflation, no one other than the Tire Changer Operator should be closer than 30 feet to the Tire and the Operator should as far from the Tire as possible.

3. Make sure both the upper and lower Beads are lubricated.
4. Clip the Air Chuck to the Valve Stem of the new Tire.

5. Press and hold on the Inflation Foot Pedal for a second or two.

   Air goes into the Tire and seals the Bead.

   Bead Sealing takes very little air pressure, anywhere from 0 to 3 psi, which you can monitor on the Pressure Gauge.

   The purpose of Bead Sealing is to push the Tire up against the Rim so that air does not leak out during the rest of the inflation process.

6. Check to make sure the upper and lower Beads are sealed against the Rim.

   If the Beads are not sealed, try again, this time putting it slightly more air.

7. When the Beads are sealed, press and hold on the Inflation Foot Pedal to seat the Bead.

   You should hear a pop as the Beads are seated.

8. Bead Seating takes more air pressure, usually requiring 7 psi or above.

   Do not exceed 40 psi to seat the Bead.

   Always follow the Tire manufacturer's recommended procedure for Bead Seating.

   If air pressure gets to 40 psi but the Bead is not seated, let most of the air out of the Tire and try again.

9. If the Bead is still not seated, you can use an air blast to try to seat the Bead.

   If the Bead still does not seat, either get a different Tire or remove all air from the Tire and start the inflation procedure over from the beginning.

   Never exceed 40 psi to seat the Bead.

10. When you have verified that both the upper and lower Beads are seated, press and hold the Inflation Foot Pedal and inflate the Tire to the manufacturer's recommended air pressure for the Tire.

    The typical inflation pressure for automobile Tires is from approximately 25 to 45 psi. Light truck Tire inflation pressures typically cover a wider range.

    Do not exceed the Tire manufacturer's recommended air pressure for a Tire.

    The Tire Changer has an air pressure limiter that is set at the factory so that it does ***not*** exceed 60 psi. ***Do not override the pressure limiter***.

⚠ **DANGER** Inflating a Tire with a bypassed pressure limiter could result in the Tire exploding, which could injure or kill bystanders or the Tire Changer Operator. Do not exceed 60 psi unless the Tire is in a Tire Inflation Cage.

11. When the Tire is correctly inflated, remove the Air Chuck from the Valve Stem.

    The Wheel can now be removed from the Turntable.

Remove the Wheel from the Turntable

Once the new Tire has been correctly mounted on the Wheel and inflated, you can remove it from the Turntable.

To remove a Wheel from the Turntable:

1. Take the Quick-Nut off and return it to its holder on the Tire Changer.

   Flip down the Wings, turn the Wings counter-clockwise until the Quick-Nut is untightened, then hold the Quick Release Levers to the side and pull up the Quick-Nut.

2. Press and hold the Up Foot Pedal to raise the Tire Lift.
3. Slide the Wheel off the Turntable and onto the Tire Lift.
4. Press and hold the Down Foot Pedal to lower the Tire Lift.
5. Move the Wheel off the Tire Lift.

Maintenance

Make sure your Tire Changer is maintained on a regular basis.

⚠ **WARNING:** Disconnect the Power Cord from power ***before performing any maintenance*** and take whatever steps are necessary to make sure the unit cannot be re-energized until Maintenance is over (such as Lockout/Tagout). Because the unit uses electricity, you could be electrocuted or even killed if the unit is powered back on during Maintenance. The Tire Changer uses pneumatic and electrical energy; if your organization has Lockout/Tagout policies, make sure to implement them before performing maintenance on the Tire Changer.

Regular Maintenance

- **Daily**: Make sure the unit is clean and dry.
- **Weekly**: Check all labels to make sure they are in place and legible. Contact BendPak Ranger if replacement labels are needed.
- **Weekly**: Check the water of the Regulator/Filter. If the reservoir is one quarter (25%) or more filled with water, drain it. Refer to **Check the Water Level** for instructions.
- **Weekly**: Check the oil feed rate of the Oiler/Lubricator. It should be 1 to 2 drops per use of a pneumatic component. If it is above or below this level, you need to adjust it. Refer to **Check the Oil Feed Rate and Adding Oil** for instructions.
- **Weekly**: Check the amount of pneumatic oil in the Oiler/Lubricator reservoir. If it is under one half (50%) full, you need to add oil. Refer to **Check the Oil Feed Rate and Adding Oil** for instructions.
- **Monthly**: Check the accuracy of the Inflation Gauge using a pressurized tire and a high quality pressure gauge. Fix immediately if not working correctly.
- **Monthly**: Make sure all Anchor Bolts are tightened and secure.
- **Monthly**: Make sure all components are in good operating condition. If you find a component that is ***not*** working correctly, take the Tire Changer out of service and refer to **Troubleshooting** for more information.
- **Yearly**: Have a licensed Electrician check the electronic components.
- **Yearly**: Take the Tire Changer out of service, disconnect the Power Cord from the power source, and then thoroughly check and clean all components.

⚠ **WARNING:** Do not operate your Tire Changer if you find issues; instead, take the unit out of service, then contact your dealer, visit **rangerproducts.com/support/**, or call **(805) 933-9970**.

Check the Water Level

Water coming in from the Air Source is pulled out of the incoming air by the Regulator/Filter and dropped into the reservoir at the bottom.

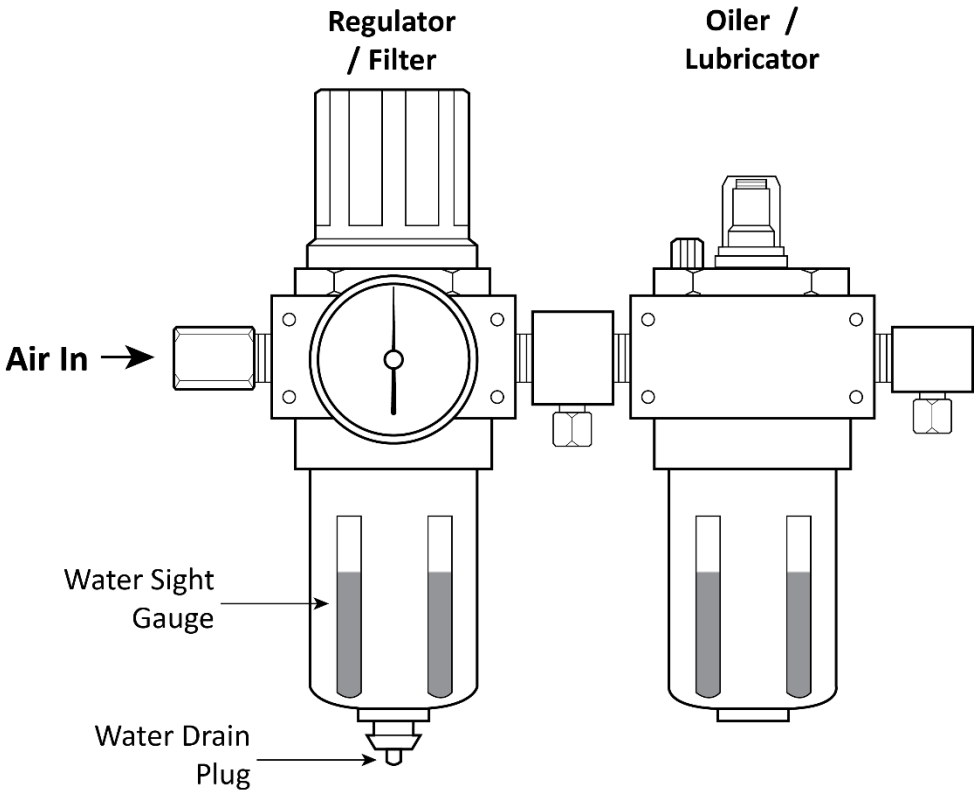
This water needs to be drained periodically.

To drain water from the Regulator/Filter reservoir:

1. Check the Water Sight Gauge to see how much water is currently in the reservoir.

   If the reservoir is one quarter (25%) or more filled with water, you need to drain it.

2. Disconnect the Air Source at the Air In connector.



3. Press upwards on the Water Drain Plug at the bottom of the reservoir.

   The water drains out.

4. Release the Water Drain Plug.
5. Re-connect the Air Source.

Check the Oil Feed Rate and Adding Oil

The built-in lubricator adds pneumatic oil to the Incoming Air. This ensures that all pneumatic components of the Tire Changer receive the necessary lubrication, which maintains operating performance, reduces wear, and extends service life.

It is very important to make sure the oil feed rate is correct, 1 or 2 drops of oil per use of the Up or Down Foot Pedals, and that there is enough pneumatic oil in the Oil Reservoir of the Oiler/Lubricator.

To check the oil feed rate on the Oiler/Lubricator:

1. With the Air Source connected, press on the Up or Down Foot Pedal for several seconds, then release.

   You do not need a Tire on the Tire Lift, you just need to use a pneumatic tool.

2. Watch the Sight Glass to see how much pneumatic oil comes out each time you use the Up or Down Foot Pedal.

   Your goal is for 1 or 2 drops to come out each time.

3. If you are getting ***fewer*** than 1 or 2 drops, turn the Adjustment Screw counter-clockwise (using a small flat-head screwdriver), then press the Up or Down Foot Pedal again to check the output.
4. If you are getting ***more*** than 1 or 2 drops, turn the Adjustment Screw clockwise, then press the Up or Down Foot Pedal again to check the output.
5. When you are getting 1 or 2 drops, stop turning the Adjustment Screw.

To add pneumatic oil to the Oiler/Lubricator:

1. Check the Oil Sight Gauge to see how much pneumatic oil is currently in the reservoir.

   If the reservoir is less than one half (50%) filled with pneumatic oil, you need to add oil to it.

2. Disconnect the Air Source at the Air In connector.
3. Turn the Oil Reservoir counter-clockwise and pull it off.
4. Add SAE 10W Air Tool Oil or generic pneumatic oil to the reservoir.
5. Put the Oil Reservoir back in place, turning it clockwise until tight.
6. Re-connect the Air Source.

Troubleshooting

⚠ **WARNING:** Disconnect the Power Cord from power ***before performing any maintenance*** and take whatever steps are necessary to make sure the unit cannot be re-energized Maintenance is being performed on the unit (such as Lockout/Tagout). The unit uses pneumatic and electrical energy; if your organization has Lockout/Tagout policies, make sure to implement them before troubleshooting the Tire Changer.

Issue	Action to Take
The Turntable does not move when you step on the Rotate pedal.	Make sure the unit is getting power.
The Lock button on the Tool Arm Control does not work.	Make sure the unit is connected to an appropriate air source.

If you continue to have problems with your Tire Changer, visit **www.bendpak.com/support/** or call **BendPak Ranger at (805) 933-9970**.

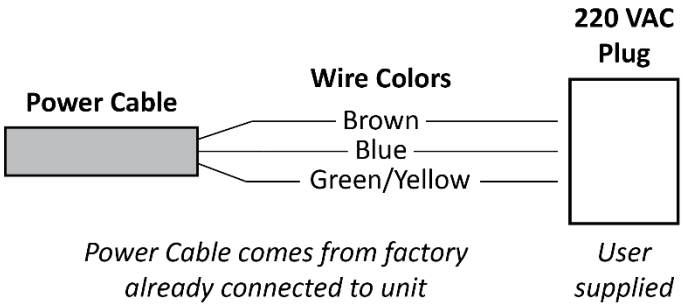
Plug Wiring Information

The RV1 comes with a Power Cord that is connected inside the unit on one end and with three exposed wires on the other end. The three exposed wires need to be hard-wired to an appropriate power source or connected to a 220 VAC Plug.

⚠ **WARNING:** All electrical work, such as hard-wiring the unit or attaching a Plug to the Power Cord, ***must be done by a licensed, certified Electrician*** in accordance with all applicable local electrical codes. Damage caused by improper electrical installation may void your warranty.

The RV1 does ***not*** come with a 220 VAC **Plug**; you must supply one.

The colors of the three exposed wires are Brown, Blue, and Green/Yellow, the European color code.



Important: To connect the three exposed wires to an appropriate Plug or to hard-wire them, have your Electrician follow the electrical codes for the country in which you are using the unit and any local electrical codes.

For example, if you are using the unit in the United States, the color codes on the wiring that comes with the RV1 correspond to:

- **Brown**: Live
- **Blue**: Live
- **Green/Yellow**: Ground

If you were using the unit in a European country, the color codes on the wiring that comes with the RV1 correspond to:

- **Brown**: Live
- **Blue**: Neutral
- **Green/Yellow**: Ground

Information about color code conventions in other regions and countries is available online. Make sure your Electrician installs the Plug in accordance with all applicable local electrical codes.

Labels

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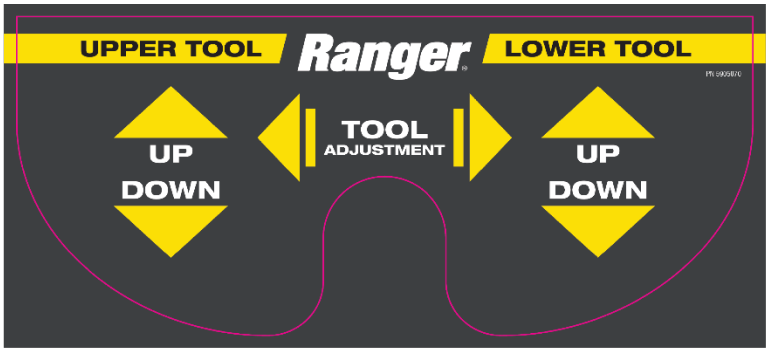

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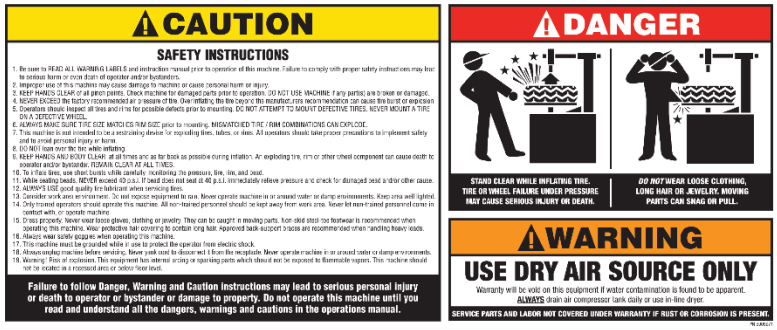

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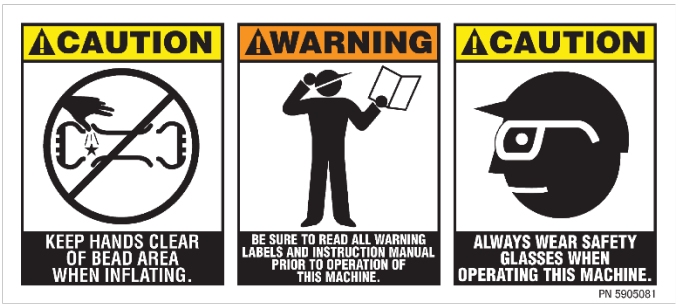

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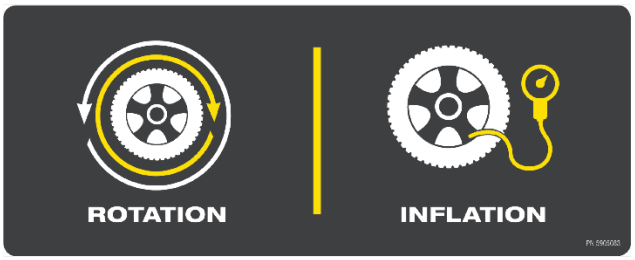

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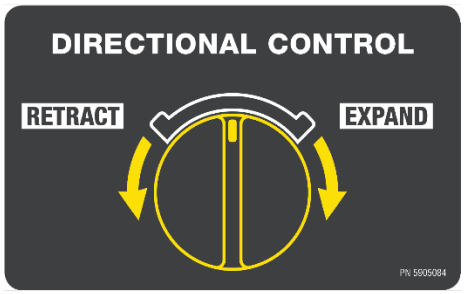

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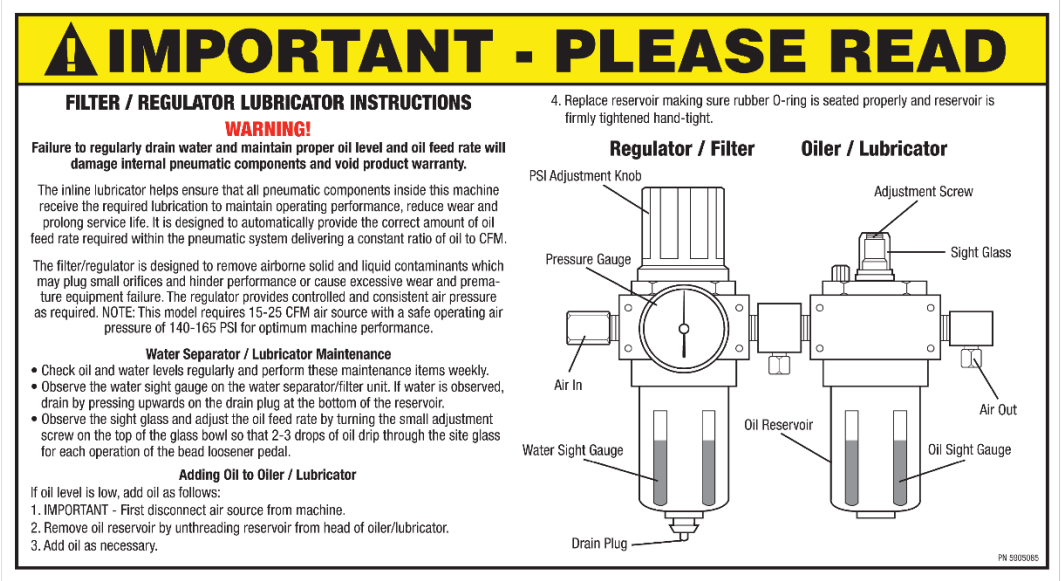


IMPORTANT - PLEASE READ

FILTER / REGULATOR LUBRICATOR INSTRUCTIONS

WARNING!

Failure to regularly drain water and maintain proper oil level and oil feed rate will damage internal pneumatic components and void product warranty.

The inline lubricator helps ensure that all pneumatic components inside this machine receive the required lubrication to maintain operating performance, reduce wear and prolong service life. It is designed to automatically provide the correct amount of oil feed rate required within the pneumatic system delivering a constant ratio of oil to CFM.

The filter/regulator is designed to remove airborne solid and liquid contaminants which may plug small orifices and hinder performance or cause excessive wear and premature equipment failure. The regulator provides controlled and consistent air pressure as required. NOTE: This model requires 15-25 CFM air source with a safe operating air pressure of 140-165 PSI for optimum machine performance.

Water Separator / Lubricator Maintenance

- Check oil and water levels regularly and perform these maintenance items weekly.
- Observe the water sight gauge on the water separator/filter unit. If water is observed, drain by pressing upwards on the drain plug at the bottom of the reservoir.
- Observe the sight glass and adjust the oil feed rate by turning the small adjustment screw on the top of the glass bowl so that 2-3 drops of oil drip through the site glass for each operation of the bead loosener pedal.

Adding Oil to Oiler / Lubricator

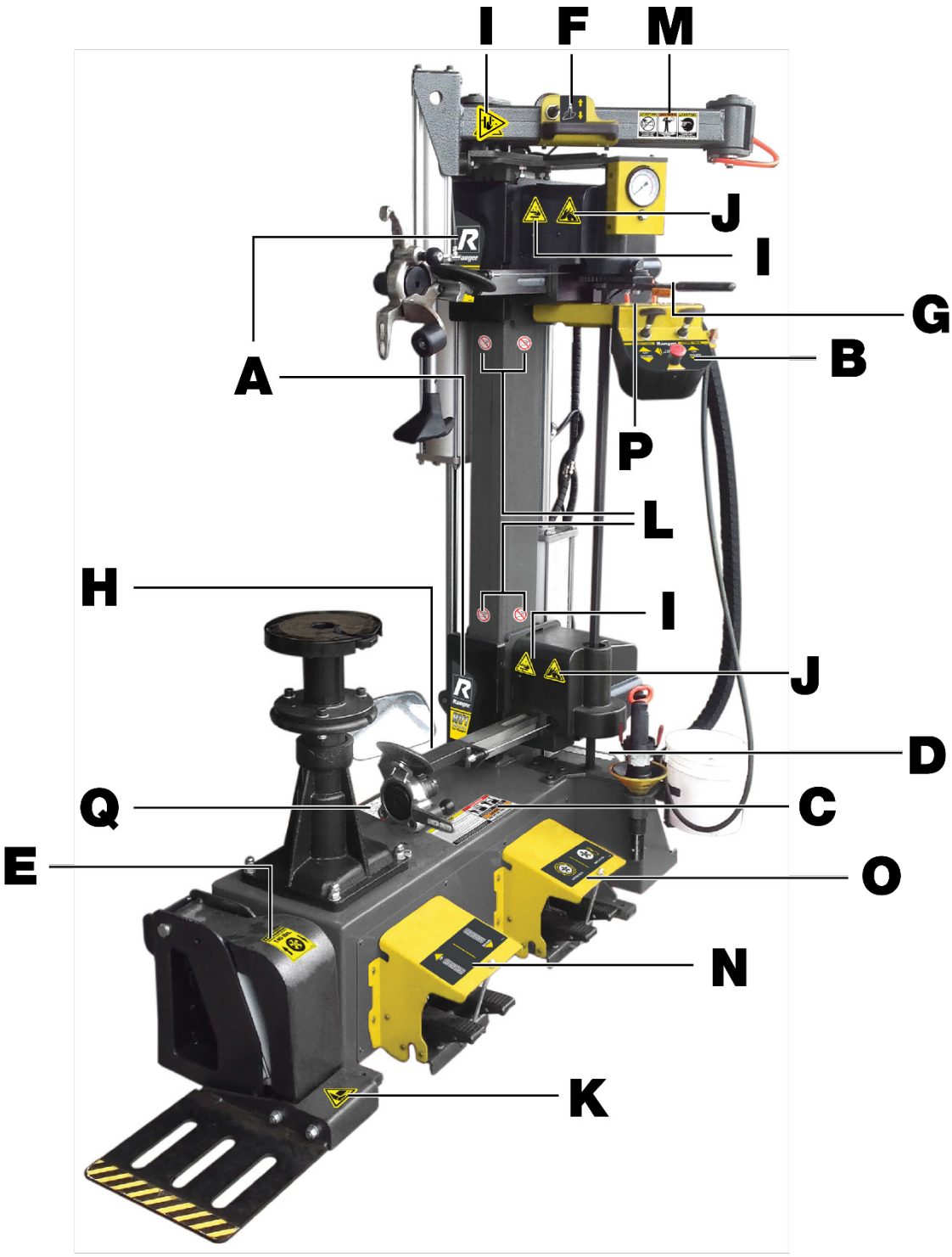
If oil level is low, add oil as follows:

1. IMPORTANT - First disconnect air source from machine.
2. Remove oil reservoir by unthreading reservoir from head of oiler/lubricator.
3. Add oil as necessary.
4. Replace reservoir making sure rubber O-ring is seated properly and reservoir is firmly tightened hand-tight.

Regulator / Filter **Oiler / Lubricator**

PSI Adjustment Knob
Pressure Gauge
Air In
Water Sight Gauge
Drain Plug
Adjustment Screw
Sight Glass
Air Out
Oil Reservoir
Oil Sight Gauge

PN 5905085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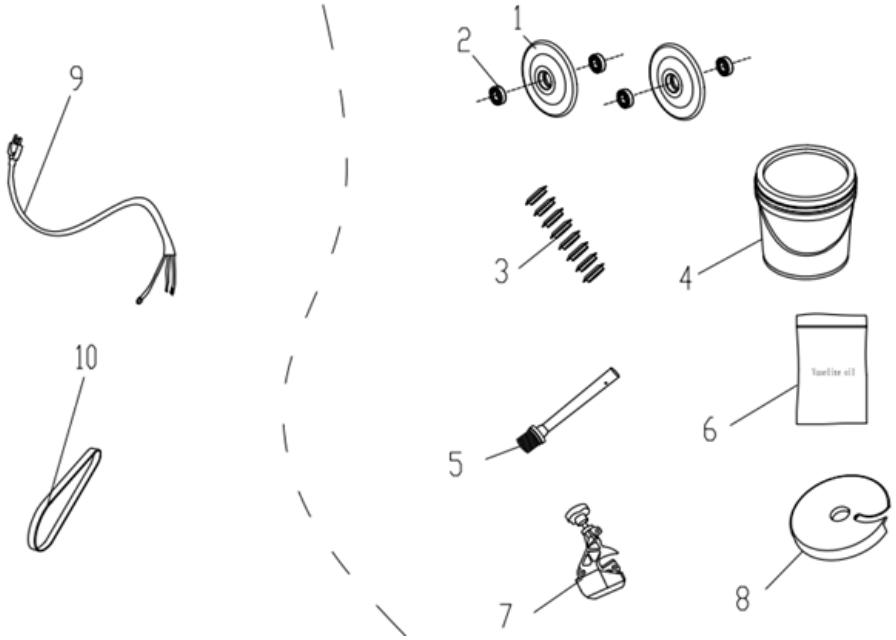
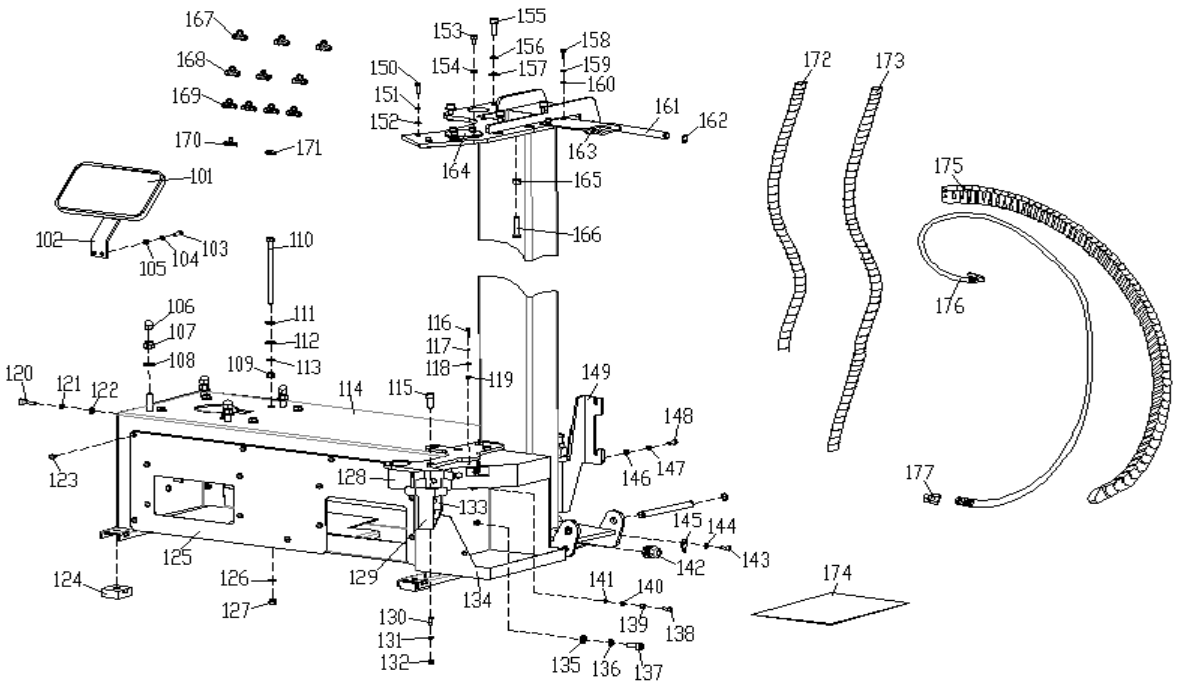
Parts



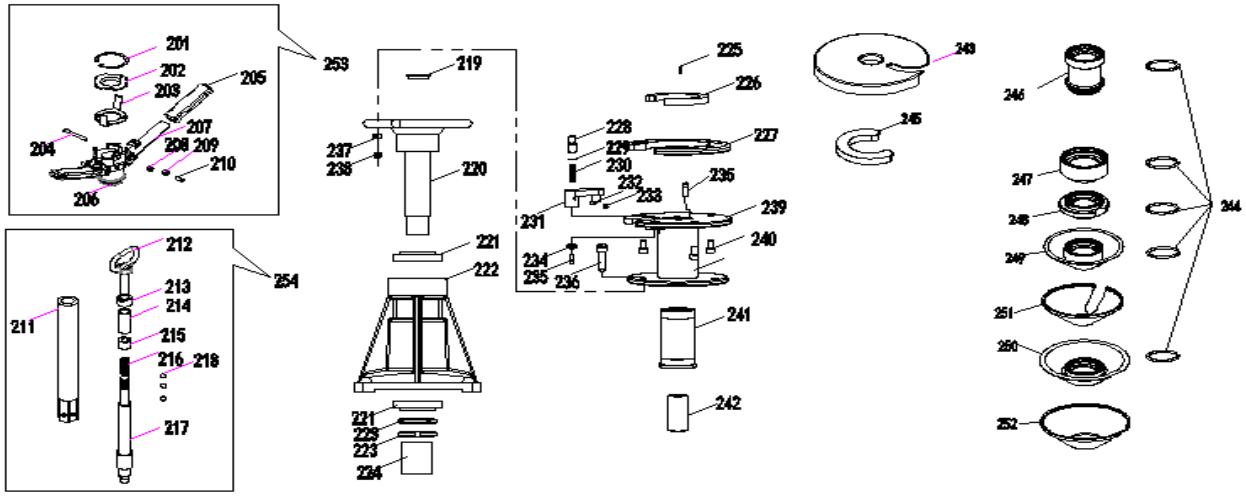
#	Part Number	Description
1		Shovel tire wheel
2		Deep groove ball bearing
3		Tool disc gasket
4		Water box
5		Round hairbrush
6		Vaseline
7		Tire mouth clamp
8		Work plate rubber pad
9		Power line
10		Triangular belt



#	Part Number	Description
101	5328467	Mirror with bracket
102	5328467	Mirror with bracket
103		Hexagon socket cap screws
104		Spring washer
105		Flat washer
106		Acorn nut
107		1-Type Non-metal insert hexagonal lock nut
108		Flat washer
109		1-Type Hex nut
110		Hexagon bolt
111		Flat washer
112		Flat washer
113		Spring washer
114		Box welded parts
115		Hexagon socket cap screws
116		Hexagon socket cap screws
117		Flat washer
118		Spring washer
119		1-Type Hex nut
120		Hexagon socket cap screws
121		Spring washer
122		Flat washer
123		Hexagon socket cap screws
124		Anchor rubber
125		Side panel assemblies
126		Flat washer

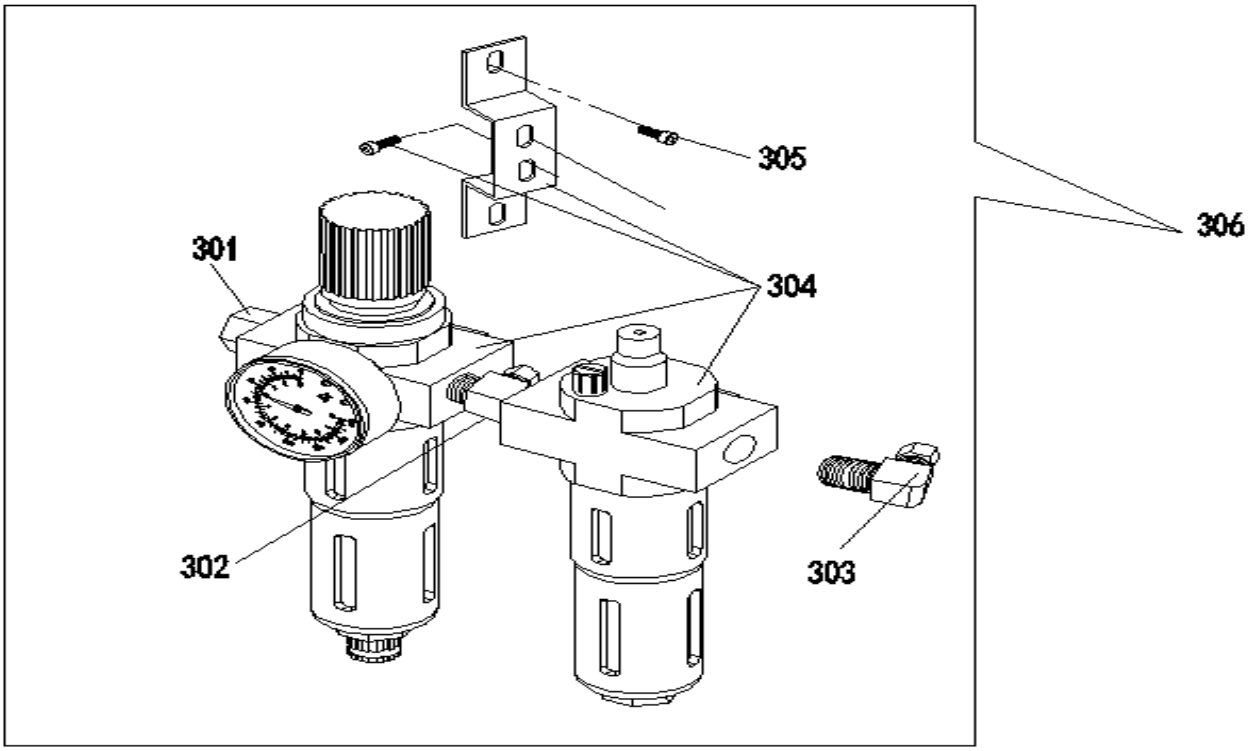
127		1-Type Non-metal insert hexagonal lock nut
128		Tool frame assembly
129		Water box adjusting rack
130		Hexagon bolt
131		Flat washer
132		1-Type Non-metal insert hexagonal lock nut
133		Water box support
134		Accessory box assembly
135		Flat washer
136		Spring washer
137		Hexagon socket cap screws
138		Hexagon socket cap screws
139		Spring washer
140		Flat washer
141		Hexagon bolt
142		Waterproof via coil nut
143		Hexagon socket cap screws
144		Flat washer
145		Ground wire logo
146		Flat washer
147		Spring washer
148		Hexagon socket cap screws
149		Inflating-tank rack assemblies
150		Hexagon socket cap screws
151		Spring washer
152		Flat washer
153		Hexagon socket cap screws
154		Spring washer
155		Hexagon socket cap screws
156		Flat washer
157		Spring washer
158		Hexagon socket cap screws
159		Spring washer
160		Flat washer
161		Breaker cylinder shaft
162		A-type circlip for shaft
163		Inflating pipe rack
164		Locking shaft cover
165		Hexagon bolt
166		Hexagon bolt
167		Lock nut tee
168		Lock nut tee
169		Lock nut tee
170		Lock nut tee
171		Reducer
172	5328485	Spiral wrap
173	5328485	Spiral wrap

174		Rubber sheet for accessory case
175	5328454	Bridge type nylon chain
176	5328463	Inflation hose with air chuck
177		Inner buckle shoot-through

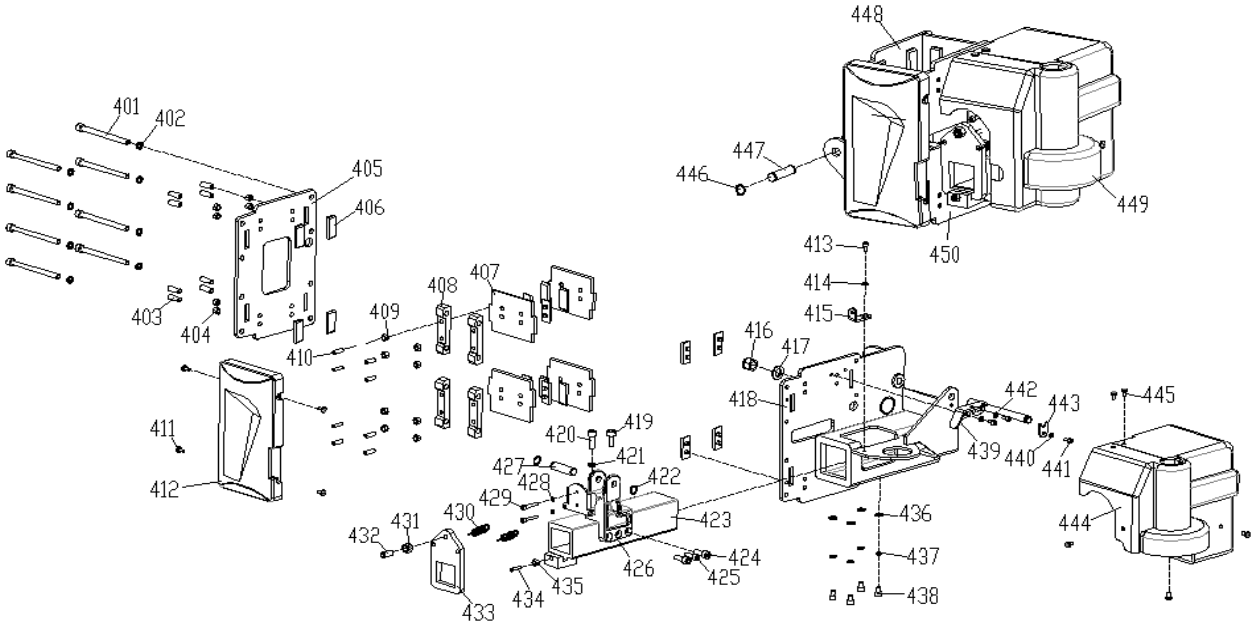


#	Part Number	Description
201		Circlip for hole
202		Lock nut gland
203		Shifting fork
204		Hexagon socket cap screws
205	5328461	Hand shank sleeve, set of two
206		Lock nut main body welding assembly
207		Handle
208		1-type non-metal insert hexagonal lock nut
209		Hexagon bolt
210		Set screw
211		Locking sleeve
212		Lock shaft pull ring
213		Locking cover
214		Upper spring catch
215		Lower spring catch
216		Rotating shaft spring
217		Rotation axis
218	5328474	Steel ball
219		Dustproof plug
220		Principal axis
221		Single-row tapered roller bearing
222		Main shaft sleeve
223		Round nut

224		Spline housing
225		Elastic bilge pin
226		Turntable inner lift plate
227		Turntable outer lift plate
228		Backing pin
229		O-ring
230		Stop pin spring
231		Block assembly
232		Hexagon socket set screw
233		I-type hexagon nut
234		Large side pads
235		Hexagon socket cap screws
236		Hexagon socket cap screws
237		Flat washer
238		1-Type Non-metal insert hexagonal lock nut
239		Turntable
240		Hexagon socket cap screws
241		Locking collar
242		Stop block
243	5328477	Turntable rubber pad
244		Round wire snap rings for hole
245		Turntable rubber pad inner plate
246		Positioning spacer
247		58 mm cone
248		75 mm cone
249		120 mm cone
250		135 mm cone
251	5328456	Cone fastener 120 mm
252	5328457	Cone fastener 135 mm
253	5328464	Locking nut assembly
254	5328465	Locking screw assembly

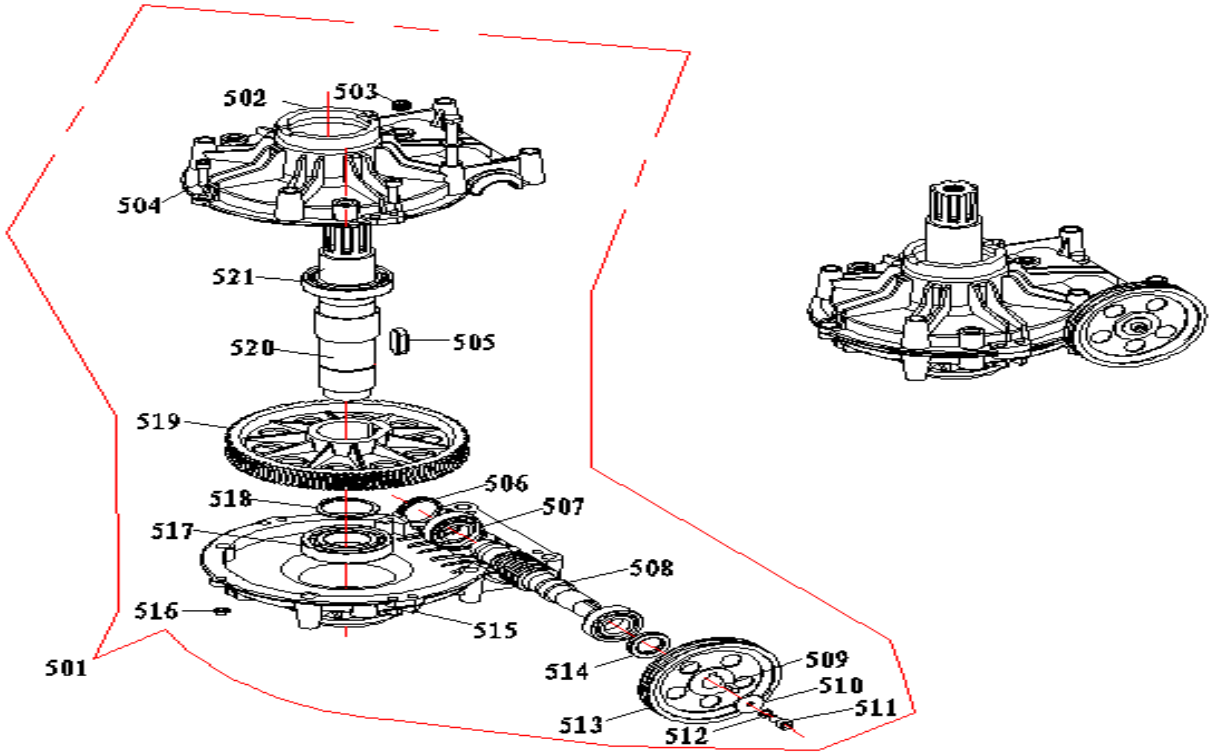


#	Part Number	Description
301		Extension piece
302		Tee
303		Lock nut elbow
304		Oil-water separator
305		Hexagon socket cap screws
306		Pneumatic filter regulator lubricator

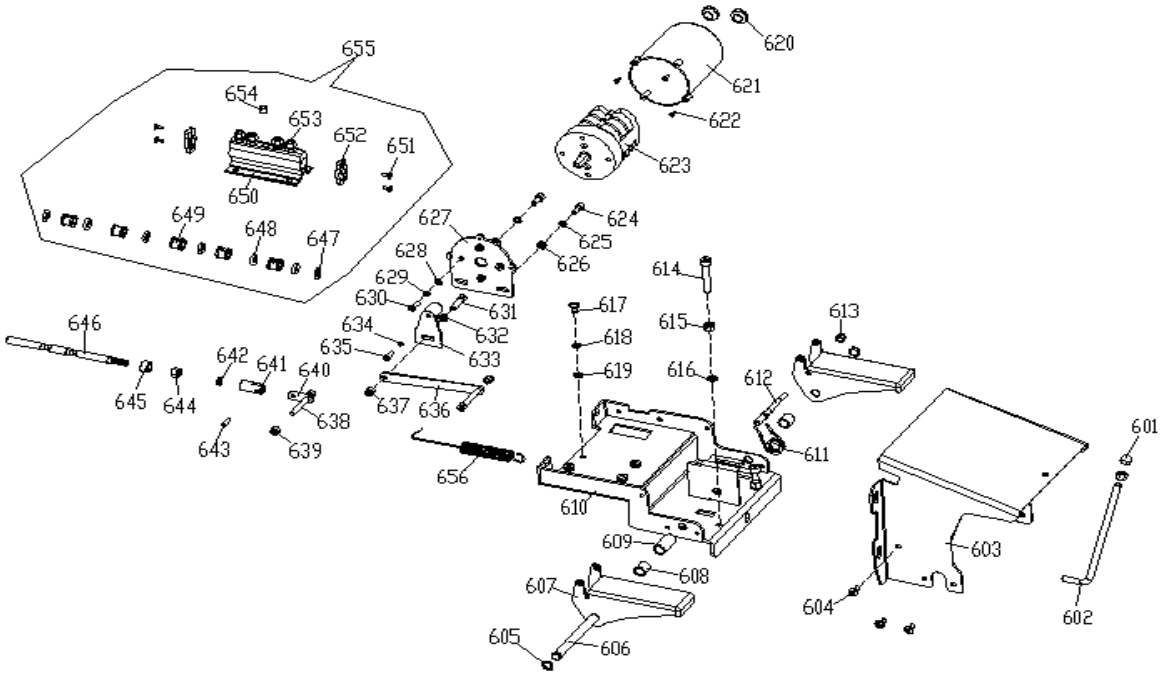


#	Part Number	Description
401		Hexagon socket cap screws
402		Spring washer
403		Inner hexagon cylinder end set screw
404		Hexagon thin nut
405		Upper left sliding block assembly
406	5328471	Slide block
407		Slide front and rear
408		Skid adjustment plate
409		Hexagon thin nut
410		Inner hexagon cylinder end set screw
411		Hexagon socket head screw
412	5328472	Sliding front cover
413		Hexagon socket cap screws
414		Flat washer
415		Front supporting for side cover
416		1-type non-metal insert hexagonal lock nut
417		Flat washer
418		Upper right sliding block assembly
419		Hexagon socket head screw
420		Hexagon socket head screw
421		Spring washer
422		A-type circlip for shaft
423		Front cut block assembly
424		Hexagon socket head screw
425		Hexagon socket head screw
426		Front cut cylinder frame assembly welding parts
427		Front cut cylinder shaft
428	5328469	O-ring, Ø9 x 2.4

429		Hexagon socket head screw
430	5328455	Coil spring
431		Hexagon thin nut
432		Hexagon socket set screw
433		Square bar locking plate
434		Inner hexagon cylinder end set screw
435		Hexagon thin nut
436		Flat washer
437		Spring washer
438		Hexagon socket cap screws
439		Fixed rack on side cover
440		Flat washer
441		Hexagon socket cap screws
442		Front cutting cylinder shaft
443		Front cutting cylinder shaft baffle
444	5328478	Upper sliding body side cover
445		Hexagon socket head screw
446		A-type circlip for shaft
447		Front cutting cylinder shaft
448		Lower left sliding block assembly
449	5328466	Lower sliding body side cover
450		Lower right sliding block assembly

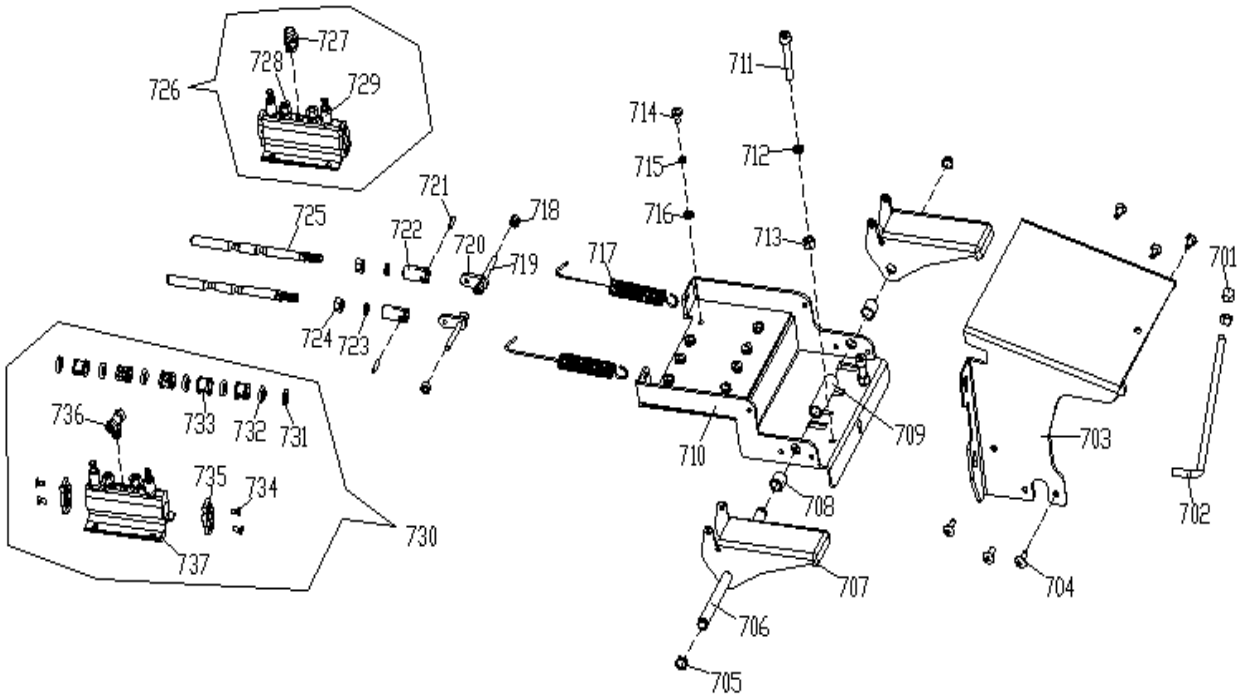


#	Part Number	Description
501	5328476	Transmission assembly
502		Reducer casing roof cover
503		Oil plug
504		Hexagon socket cap screws
505		General flat key
506		Oil plug
507		Annular ball bearing
508		Worm
509		General flat key
510		Worm pad
511		Hexagon socket cap screws
512		Spring washer
513		Large belt
514		Oil seal
515		Reducer casing lower cover
516		Hex nut
517		Deep groove ball bearing
518		A-type circlip for shaft
519		Worm wheel (cast iron)
520		Key shaft
521		Deep groove ball bearing



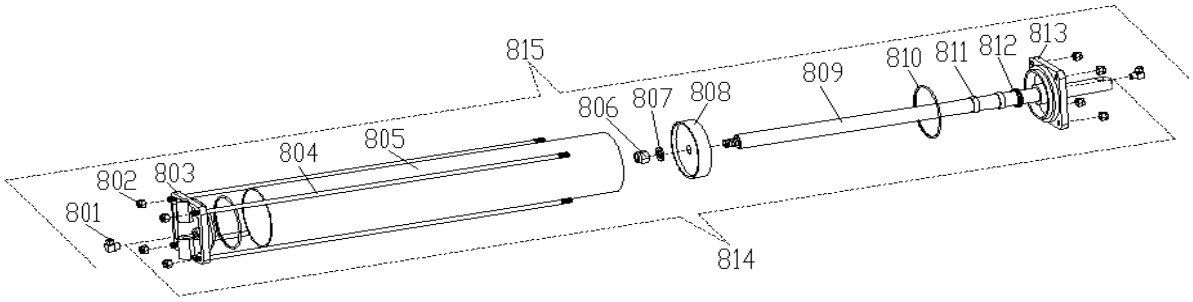
#	Part Number	Description
601		Acorn nut
602		Solid block stick
603		Pedal cover
604		Hexagon socket half-cap screws
605		A-Type circlip for shaft
606		Pedal spindle
607		Pedal plate
608		Two sides spacer sleeve
609		Interval spacer sleeve
610		Control panel assembly
611	5328459	Foot pedal torsion spring
612		Torsional spring block shaft
613		Non-metal insert hexagonal lock nut
614		Hexagon socket head bolt
615		Hex nut
616		Spring washer
617		Cross recess pan head screw
618		Spring washer
619		Flat washer
620		Coil
621		Big switch cover
622		Cross recessed pan head tapping screws
623		Reversing switch
624		Hexagon socket head bolt
625		Spring washer
626		Flat washer
627		Reverse switch bracket
628		Flat washer
629		Spring washer
630		Cross recessed pan head tapping screws

631		Hexagon socket head bolt
632		Flat washer
633		Switch fork
634		Spring washer
635		Cross recessed pan head tapping screws
636		Switch to pull board
637		Non-metal insert hexagonal lock nut
638		Hexagon socket head bolt
639		Non-metal insert hexagonal lock nut
640		Small valve pull plate
641		Small air valve joint
642		Spring washer
643		Elastic cylindrical pin
644		Hexagon nut
645		Adjusting sleeve
646		Valve stem
647		Valve adjusting pad
648		O-ring
649		Small air valve skeleton
650		Small air valve
651		Cross recessed countersunk head screw
652		Small valve end cover
653		Lock the mother through
654		Plug
655	5328462	Inflation air valve
656		Tension spring

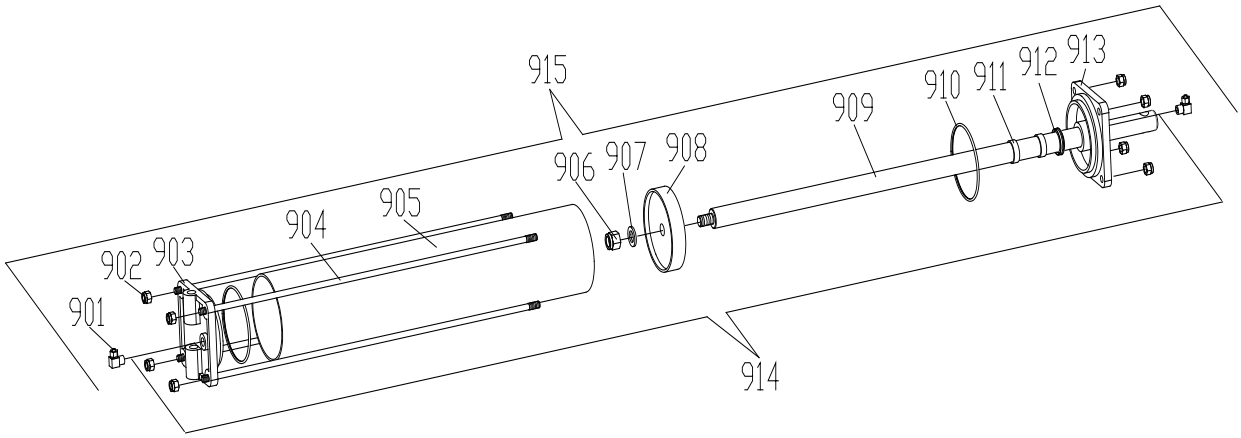


#	Part Number	Description
701		Acorn nut
702		Pedal block stick
703		Pedal buckle cover
704		Hexagon socket head screw
705		A-type circlip for shaft
706		Pedal spindle
707		Pedal plate
708		Two sides spacer sleeve
709		Pedal spacer sleeve
710		Control panel assemblies
711		Hexagon socket head cap screws
712		Spring washer
713		Hex nut
714		Cross recessed pan head tapping screws
715		Spring washer
716		Flat washer
717	5328458	Foot pedal return spring
718		Non-metal insert hexagonal lock nut
719		Hexagon socket head cap screws
720		Small valve pull plate
721		Elastic cylindrical pin
722		Small air valve sub
723		Spring washer
724		Hex nut
725	5328473	Spool valve
726	5328479	Wheel lift air valve, up/down
727		Lock nut elbow
728		Lock nut connection
729		Adjustable silencer

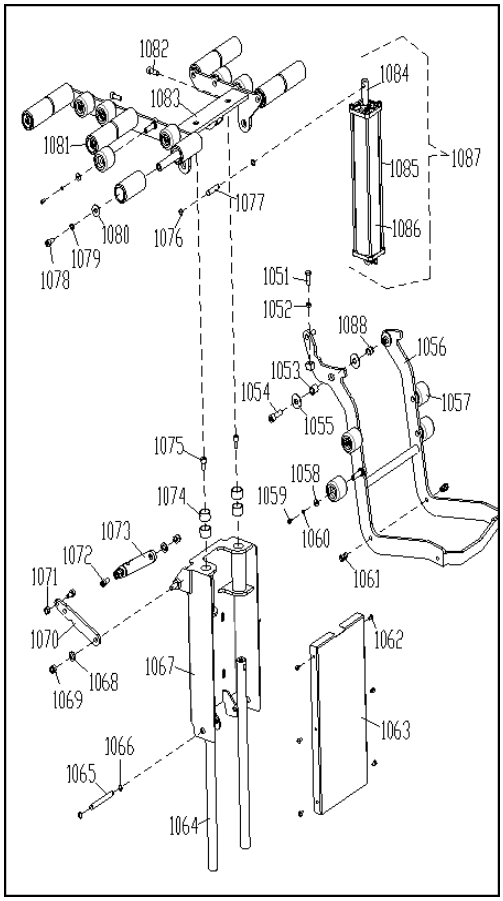
730	5328479	Wheel lift air valve, up/down
731		Valve adjusting pad
732		O-ring
733		Small air valve skeleton
734		Cross recessed countersunk head screw
735		Small valve end cover
736		Equal tee
737		Small air valve



#	Part Number	Description
801		Lock nut elbow
802		1-type non-metal insert hexagonal lock nut
803		Rear cover
804		Double armed bolt
805		Aluminum cylinder
806		1-type non-metal insert hexagonal lock nut
807		Flat washer
808		Rubber piston
809		Piston rod
810		O-ring
811		Bronze belt
812		Y-ring-dustproof
813		Front cover
814		Upper shovel cylinder
815	5328489	Upper bead breaker cylinder

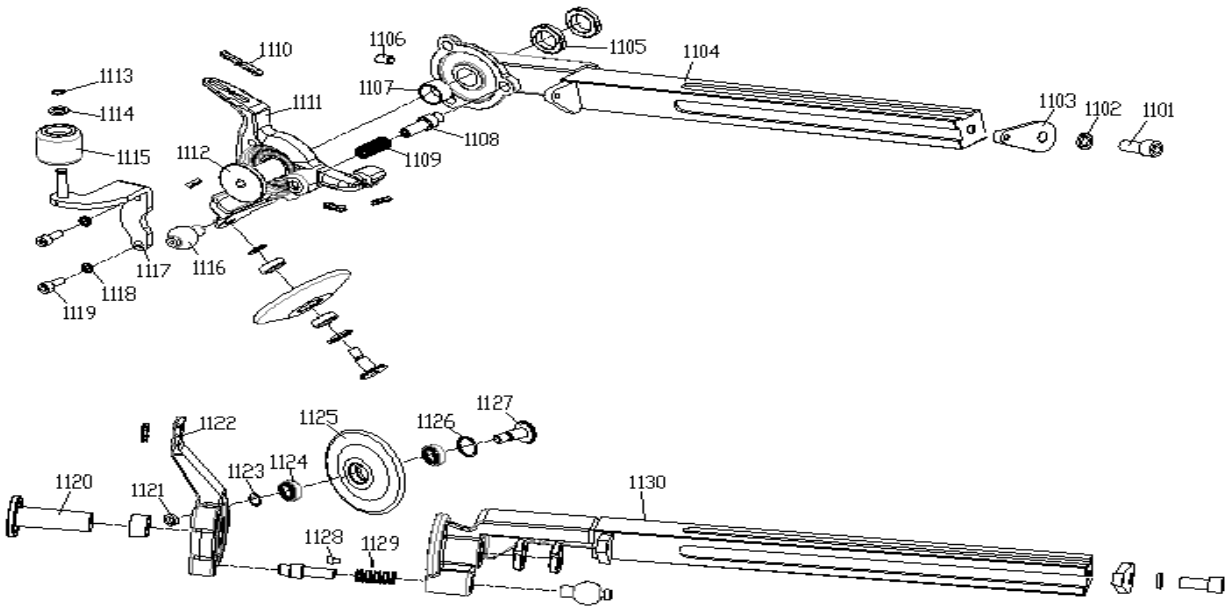


#	Part Number	Description
901		Lock nut elbow
902		1-type non-metal insert hexagonal lock nut
903		Rear cover
904		Double armed bolt
905		Aluminum cylinder
906		1-type non-metal insert hexagonal lock nut
907		Flat washer
908		Rubber piston
909		Piston rod
910		O-ring
911		Bronze belt
912		Y-ring-dustproof
913		Front cover
914		Nether shovel cylinder
915	5328484	Lower bead breaker cylinder

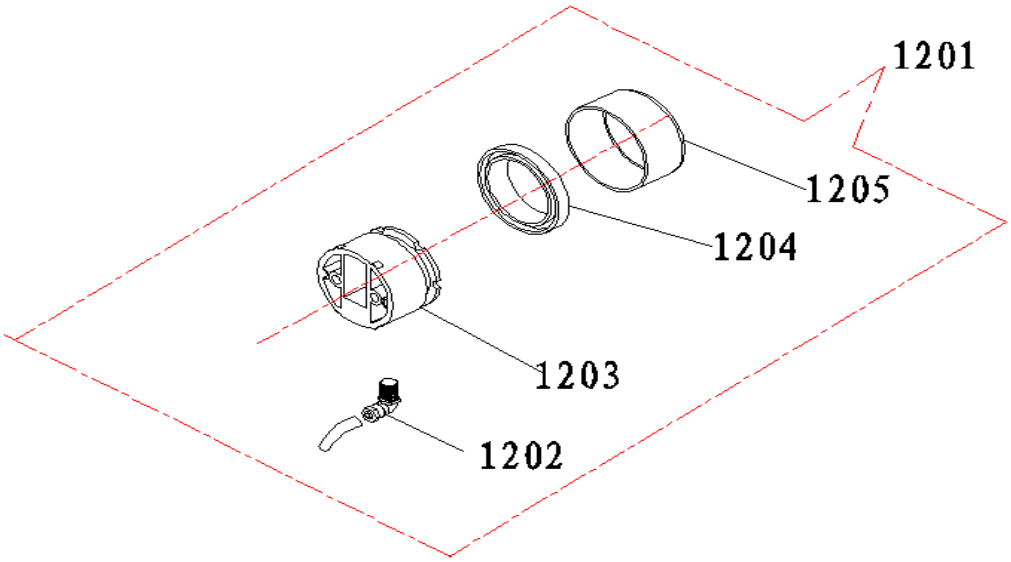


#	Part Number	Description
1051		Hexagon bolt full thread
1052		Hexagon thin nut
1053		Turnbuckle
1054		Hexagon socket cap screws
1055		Big washer
1056		Flip frame assembly
1057		Pinch roller
1058		Big washer
1059		Hexagon socket cap screws
1060		Elastic washer
1061		Lock nut connection
1062		Hexagon socket head screw
1063		Cover
1064		Guide pillar
1065		Fixed shaft under cylinder
1066		Circlip for shaft
1067		Lifting block welded parts
1068		Flat washer
1069		1-type non-metal insert hexagonal lock nut
1070		Pulling plate
1071		Hex nut
1072		Hexagon socket cap screws
1073		Upper Stretch plate welding assemblies
1074		Oil bearing

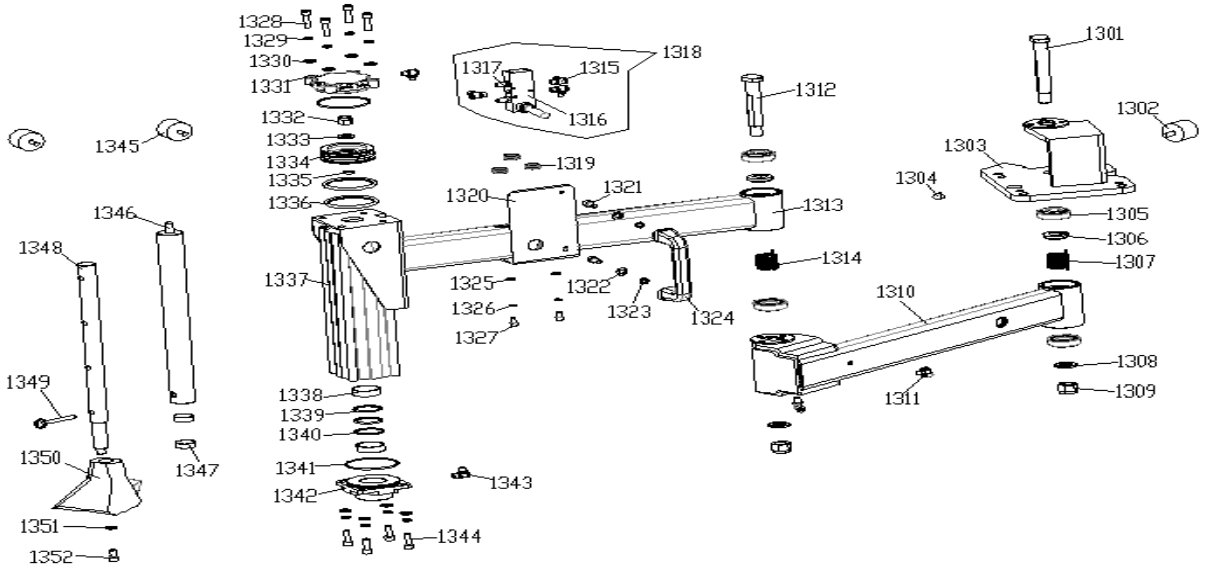
1075		Hexagon socket cap screws
1076		Circlip for shaft
1077		Cylinder fixed shaft
1078		Hexagon socket cap screws
1079		Circlip for shaft
1080		Big washer
1081		Tire pressure roller
1082		Hexagon socket cap screws
1083		Lifting block welded parts
1084		Cylinder piston rod
1085		Double end connection bolt
1086		Small cylinder body
1087	5328480	Wheel lift cylinder
1088		1-type non-metal insert hexagonal lock nut



#	Part Number	Description
1101		Hexagon socket cap screws
1102		Elastic washer
1103		Rear synchronous plate
1104		Upper arm welding assembly
1105		Round nut
1106		Hexagon socket set screw
1107		Oil bearing
1108		Locating pin
1109	5328468	Mount demount retaining spring
1110		Tool disc gasket
1111		Upper tool disc
1112		Nether tool disc spindle
1113		A-type circlip for shaft
1114		Flat washer
1115		Pinch roller
1116		Rotation handball
1117		Press roller stand assembly
1118		Elastic washer
1119		Hexagon socket cap screws
1120		Nether tool disc shaft
1121		Tighten cap
1122		Nether tool disc
1123		Roller pad
1124	5328450	Bead breaker ball bearing
1125		Shovel tire wheel
1126		O-ring
1127	5328452	Bead breaker roller bolt
1128		Hexagon socket cap screws
1129		Elastic washer
1130		Nether cross arm welding assembly

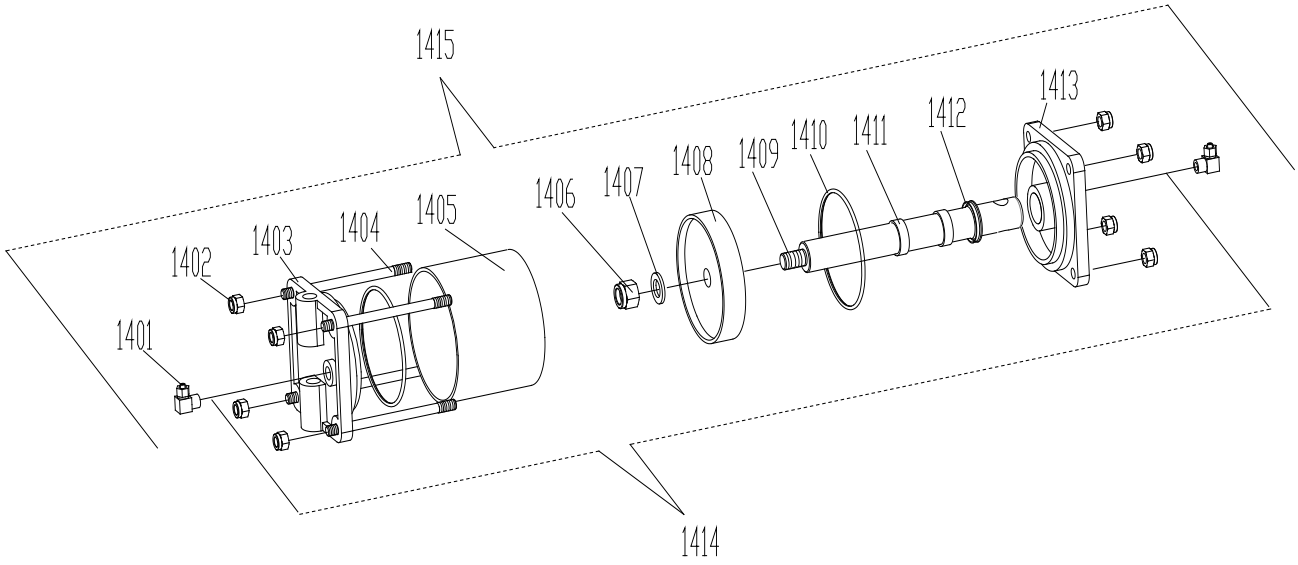


#	Part Number	Description
1201		Lock air cylinder assembly
1202		Lock elbow
1203		Valve foundation support
1204		Y-ring
1205		Lock air valve piston



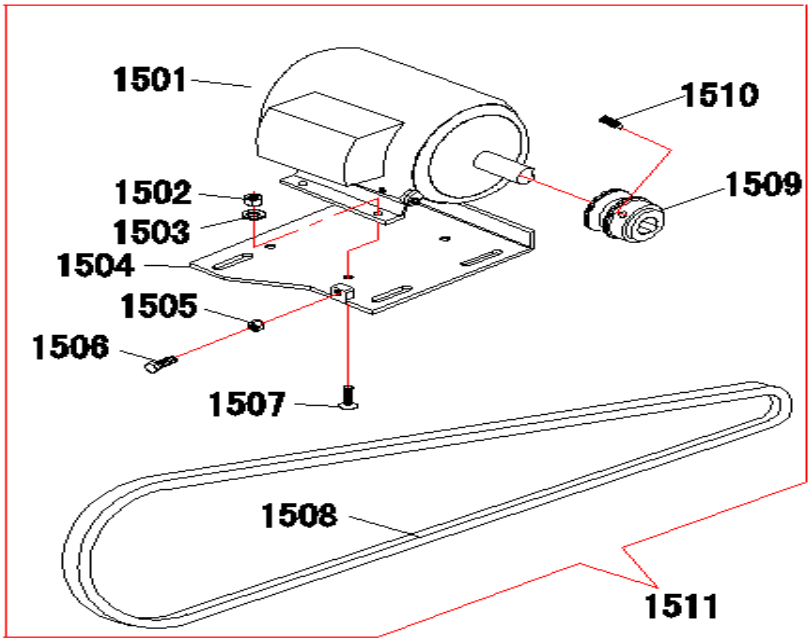
#	Part Number	Description
1301		Swing arm shaft
1302		Tower crash pad
1303		Swing arm block assembly
1304		Acorn nut
1305		Tapered roller bearing
1306		Stop collar
1307		Torsional spring
1308		Flat washer
1309		Non-metal insert hexagonal lock nut
1310		Swing arm assembly
1311		Lock nut elbow
1312		Tire arm rotor
1313		Press tire arm welding assembly
1314		Torsional spring
1315		Adjustable elbow
1316		Three position five-way valve
1317		Pagoda muffler
1318		Three position five-way valve assembly
1319		Coil
1320		Handle valve seat
1321		Hexagon socket cap screws
1322		Elastic washer
1323		Flat washer
1324		Handle
1325		Flat washer
1326		Elastic washer
1327		Hexagon socket cap screws
1328		Hexagon socket cap screws
1329		Elastic washer
1330		Flat washer
1331		Cylinder cover
1332		Non-metal insert hexagonal lock nut
1333		Flat washer
1334		Aluminum piston

1335		O-ring
1336		O-ring
1337		Cylinder body
1338		Oil bearing
1339		O-ring
1340		Ptfe gasket
1341		O-ring
1342		Cylinder lower cover
1343		Adjustable Elbow
1344		Hexagon socket cap screws (galvanize)
1345		Rubber cushion
1346		Cylinder piston rod
1347		Oil bearing
1348		Head shaft
1349		Single bead bolt
1350	5328449	Assist Arm Block
1351		Flat washer
1352		Hexagon socket cap screws

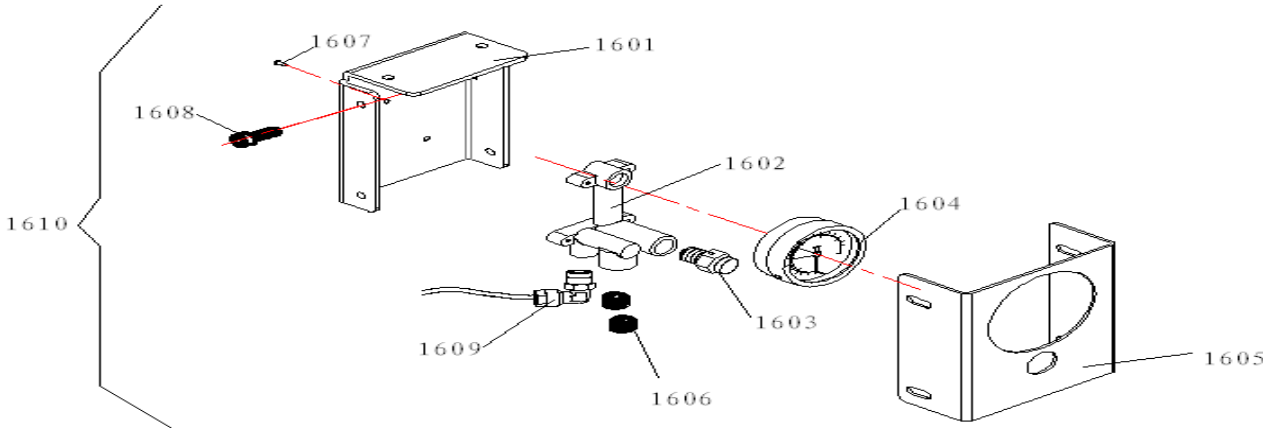


#	Part Number	Description
1401		Lock nut elbow
1402		Non-metal insert hexagonal lock nut
1403		Rear cover
1404		Double end bolt
1405		Aluminum cylinder
1406		Non-metal insert hexagonal lock nut
1407		Flat washer
1408		Rubber piston
1409		Piston rod
1410		O-ring
1411		Bronze belt

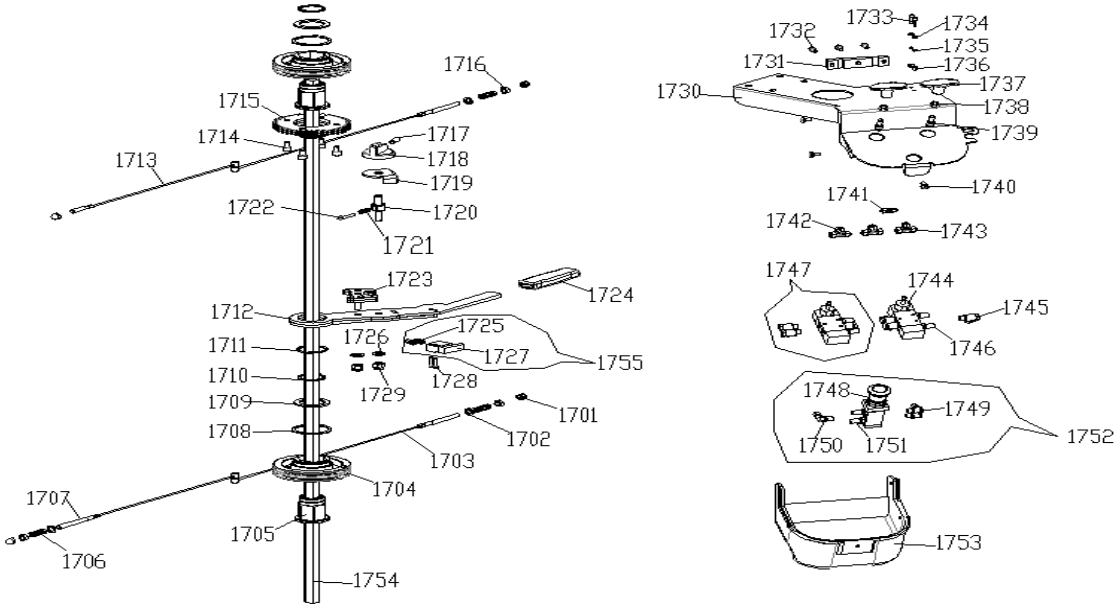
1412		Y-type(dust proof)
1413		Front cover
1414		Front cut cylinder
1415		Front cut cylinder assembly



#	Part Number	Description
1501		Motor
1502		Small cylinder
1503		Flat washer
1504		Motor underplate welded parts
1505		Hexagon nut
1506		Hexagon head bolt
1507		Hexagon socket head screw
1508		Triangular belt
1509		Motor pulley
1510		Inner hexagon end set screw
1511		Single-phase motor/hanging bracket

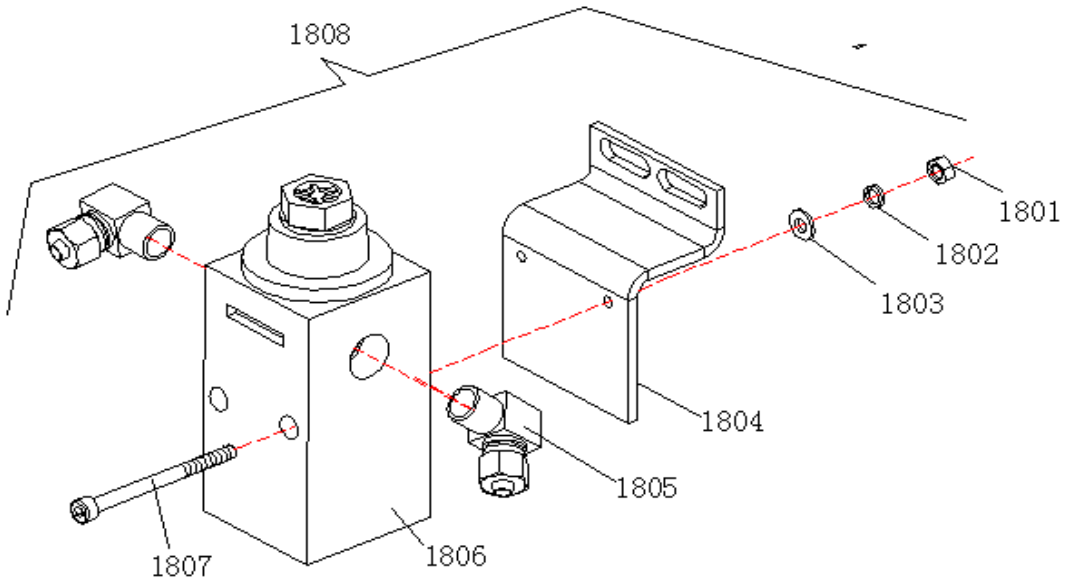


#	Part Number	Description
1601		Gas meter support
1602		Atmolysis head skeleton
1603		Vent valve
1604		Pressure gauge with back connection
1605		Meter box cover
1606		Plug 1/8 inch
1607		Cross socket head screw
1608		Hexagon socket head screw
1609		Lock nut elbow
1610		Air inflation indicator

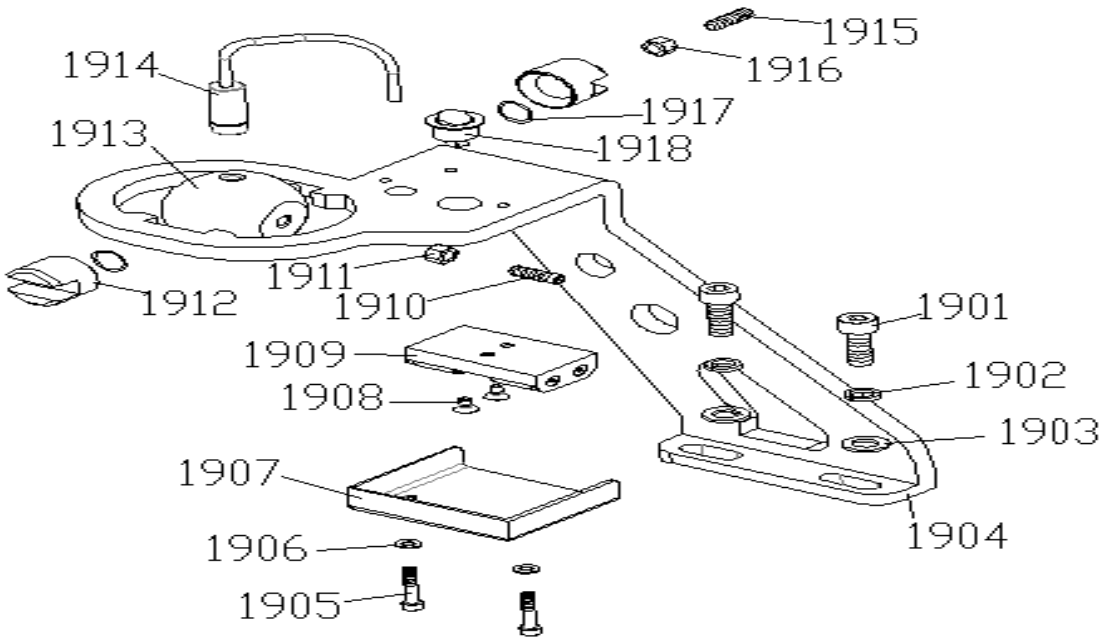


#	Part Number	Description
1701	5328451	Bead breaker lower cable assembly
1702	5328451	Bead breaker lower cable assembly
1703	5328451	Bead breaker lower cable assembly
1704	5328487	Synchronizing cable wheel
1705	5328475	Synchronizing wheel bushing
1706	5328451	Bead breaker lower cable assembly
1707	5328451	Bead breaker lower cable assembly
1708		A-type circlip for shaft
1709		Synchronous wheel spacer
1710		A-type circlip for shaft
1711		A-type circlip for shaft
1712		Handle welding pieces
1713	5328453	Bead breaker upper cable assembly
1714		Hexagon socket cap screws
1715	5328486	Synchronization gear
1716	5328453	Bead breaker upper cable assembly
1717		Inner hexagon cylinder end set screw
1718		Locking position piece
1719		Ratchet shaft cover
1720		Steering shaft
1721		Compression spring
1722		Top tight shaft
1723		Ratchet welding pieces
1724		Handle sleeve
1725		Lock nut connection
1726		Flat washer
1727		Two-position three way mechanical valves
1728		Hexagon socket cap screws
1729		1-type non-metal insert hexagonal lock nut
1730		Control box assembly
1731		Pressure pipe clamp
1732		Hexagon socket cap screws
1733		Hexagon socket cap screws

1734		Flat washer
1735		Elastic washer
1736		Hex nut
1737	5328488	T handle
1738		Hex nut
1739		Hex nut
1740		Hexagon socket cap screws
1741		Reducer connection
1742		Lock nut tee
1743		Lock nut tee
1744		Three position five-way valve
1745		Adjustable elbow
1746		Copper silencer
1747		Three position five-way valve
1748		Three position five-way handle control valve
1749		Adjustable elbow
1750		Lock nut elbow
1751		Copper silencer
1752	5328481	Articulating air valve assembly
1753	5328482	Control box cover
1754		Synchronous hexagonal shaft
1755		Two three-way mechanical valves



#	Part Number	Description
1801		Hex nut
1802		Elastic washer
1803		Flat washer
1804		Gas pressure limiting valve rack
1805		Lock nut elbow
1806		Plastic filling and pressure limiting valve
1807		Hexagon socket cap screws
1808	5328460	Full flow inflation valve assembly



#	Part Number	Description
1901		Hexagon socket cap screws
1902		Elastic washer
1903		Flat washer
1904		Laser support welding pieces
1905		Hexagon socket cap screws
1906		Flat washer
1907		Battery cover
1908		Cross recessed countersunk head screw
1909		Cell box
1910		Hexagon socket set screw
1911		Hex nut
1912		Top support
1913		Laser support
1914	5328483	Laser light
1915		Hexagon socket set screw
1916		Hex nut
1917		O-ring
1918	5328470	Rocker switch

Maintenance Log

1645 Lemonwood Drive
Santa Paula, CA 93060 USA