



# OWNER/OPERATOR MANUAL

## *Advanced Design Intermodal Equipment*

**\* TRUSS TRAILERS \***

**\* LUMBER DUMPER TRAILERS \***

### **Service Notes:**

This operations manual describes the basic operations and maintenance procedures for PRATT trailer/chassis.

The information contained in this manual was current at the time of printing and is subject to change without notice or liability.

You must follow your company safety procedures when you service or repair equipment. Be sure you understand all the procedures and instructions before you begin work on the unit.

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# Operator Instructions

***Congratulations! You have just purchased the finest trailer on the road today.***

This manual has been prepared to assist you in retaining the safety, dependability, and performance that has been built into your PRATT trailer. It is essential that your trailer receives periodic inspections, maintenance, and service parts replacements.

This manual includes periodic safety checks that the trailer operator should perform.

It is important that every trailer owner and/or operator have an organized Trailer Preventative Maintenance program (TPM). The United States Department of Transportation requires by law that maintenance records be kept on every commercial highway vehicle. It is to your advantage to be able to show that regularly scheduled TPM inspection checks have been made on every piece of equipment operated.

To assist you in establishing your TPM program, a bill-of-material is included in the back of this manual, which lists the major components unique to your trailer. Please refer to this list for ordering parts. etc.

Not only will a regular TPM program assure you that you will get the most from your PRATT trailer, but also you may place yourself in a favorable legal position in the event of an accident involving this equipment.

You can get help in setting up and operating a trailer preventative maintenance program by sending for a "Maintenance Manual for Trailers and Containers". Write to the Truck Trailer Manufacturers Association, 1020 Princess Street, Alexandria, Virginia 22314.

## **IMPORTANT**

Read this manual carefully. Should you have any questions contact Pratt Industries, Inc. immediately for the answers.

**1-800-546-7728**

This manual should be kept with the trailer at all times and should be left with the trailer when it is sold.

Website: [www.prattinc.com](http://www.prattinc.com)  
Email: [buyparts@prattinc.com](mailto:buyparts@prattinc.com)

## Normal Trailer Use

This **PRATT** trailer was designed for operation within legal highway speed limits on reasonable road surfaces for the type of service it was built to perform in accordance with the following:

1. This trailer was built to carry cargo within the limitations of two weight ratings on the identification plate. These ratings, GA WR and GVWR, are:
  - a. The GAWR (gross axle weight rating) is the structural capability of the lowest rated member of the running gear components: suspension and spring system, hub, wheels, and drums, rims, bearings, brakes, axles, or tires.
  - b. The GVWR (gross vehicle weight rating) is the structural capability of the trailer when supported by the kingpin and axles with the load uniformly distributed throughout the cargo space. Caution! The maximum load indicated on the identification plate may or may not be a legal load on the highway you plan to use.
2. This trailer will carry a total payload of the Gross Vehicle Weight Rating (GVWR) less the weight of the trailer. The load must be uniformly distributed.
3. The cargo should be properly loaded, blocked, and braced to prevent load shifts and to comply with the following sections of the Department of Transportation Regulations, Subpart 1 - Protection Against Shifting of Falling Cargo:
  - Section 393-100 - General rules for protection against shifting or falling cargo.
  - Section 393-102 - Securement systems. To properly secure cargo, it is important that the working load limits of tie down assemblies be known, as well as the working load limit of the anchor point. See Table \_ for working load limits on trailer anchor points.
  - Section 393-104 - Blocking and bracing.
  - Section 393-106 - Front-end structure. Your trailer may or may not be equipped with a 'rated' bulkhead. It is your responsibility to ensure compliance with 393.106.

Beginning March 1, 1998 all trailers were required to have anti-lock brake systems on at least one axes per FMVSS-121 (49CFR 571.121). The type system used on your trailer is described on the Bill-of-Material accompanying this manual (a "4S-2M" system means there are 4 sensors and 2 modulator valves controlling the axles), (a "2S-1M" system is 2 sensors and 1 modulator valve). Refer to the manufacturer of the ABS system for specific information on the various components.

### **CAUTION!**

Operation of the trailer outside the limitations of this manual is against federal law and **PRATT Industries, Inc**, design criteria. Any operation exceeding the limitations stated will void any responsibility of **PRATT Industries, Inc**, for the results.

# PRATT Warranty Coverage

Effective 01/01/2003

ALL WARRANTY CLAIMS ARE SUBJECT TO PRATT INSPECTION FOR FINAL APPROVAL EVEN THOUGH AUTHORIZATION NUMBER HAS BEEN ISSUED FOR SOME ITEMS.

## U.S. and CANADA

### Five (5) YEAR - 100% Fabricated Frame parts and Labor

All container chassis, drop frames, drop decks, goosenecks, hydraulic chassis, platform and Single Drop, double drop, Eight (8) Axle, B-Trains, Log, Folding Pole, Telescopic, Low Boy and all special units rated for GVWR 63,000 to 100,000 pounds, the main beams, fabricated components, steel construction, workmanship are covered 100% for five (5) years. Unit must be used as designed; any modifications or loads that exceed the rated G.V.W.R. void all warranties.

### ONE (1) YEAR -100% PARTS and LABOR

All parts that are removable/replaceable and are limited to hydraulic system, airline system, electrical system, lights, suspensions, axles, brakes, wheels, hub and drums, referred to as **VENDOR SUPPLIED COMPONENTS**, are covered and warranted for one (1) year, 100% parts and labor. After this time period, the original equipment manufacturer of the above said components applies.

All hydraulic cylinders, telescopic cylinders, pneumatic cylinders are covered for thirty days (30 days) for 100% parts and labor. After this warranty period the terms of the warranty, that of the original equipment manufacturer has dictated by the vendor/supplier applies 100%.

During the warranty period, the customer, which is you, incurs all shipping and handling expenses, to and from any of the PRATT manufacturing locations, offices or to PRATT vendors/suppliers.

### OPTIONAL COMPONENTS COVERAGE

Tool Boxes, Side Kit Racks, Winch and Winch Track, All removable Bulkheads, Tire Carriers and other option items, providing the item was used as intended and no abuse or external damage has occurred. Aluminum floors are covered against splits and weld failure providing no abuse and correct loading practices have been performed. Wood floors are covered for ONE (1) Year providing the failure occurs at the finger joint. Break through, Wind Shake, Shrinkage; Splits at fasteners are not warranty items.

Transdeck Floors are covered for FIVE (5) Years against break through provided the correct loading practices are used as well as correct lift truck tire size. Cracks and chips in the top or bottom laminate are not covered by warranty. **TRANSDECK MUST APPROVE PRIOR TO ANY REPAIRS.**

### Warranty of VENDOR SUPPLIED COMPONENTS as of 01/01/2003

#### ELECTRICAL SYSTEMS:

Phillips Harness – One (1) year parts and labor, Two (2) year parts only.

Truck Light – One (1) year parts only.

Grote – One (1) year parts only.

All 4 - way, 6 - way and 7 - way plugs, One (1) year parts and (1) hour labor.

**Lights** - Truck Light, Grote marker lights and tag lights are not covered against failure. Truck Light super Forty, (26) months parts only. All parts must be returned.

Truck Light Super Forty, (26) months parts only. All parts must be returned

Truck Light L.E.D., Five (5) Years Parts only. All parts must be returned.

**NOTE:** The light and harness suppliers during manufacturing protect the electrical system against corrosion and at time of assembly. Corrosion is not considered a warranty item.

SUSPENSION AND COMPONENTS:

**Hendrickson Intraax all models:** Air springs 0-12 months parts and labor, 13 - 24 months parts only.

Shocks, 0-12 months parts and labor, 13-24 months parts only.

Bushings, 0-12 months parts and labor, 13-60 months parts only.

Hendrickson HT-230 and 250 all models: Air springs 0-12 months parts and labor, 13-24 months parts only.

Shocks, 24 months parts and labor

Bushings, 12 months parts and labor, 13-60 months parts only.

Button up Model Axles: Complete 12 month's parts and labor. Preset models, 0-60 month's parts and labor, except brake shoes which are 12 months excluding normal wear.

Air kits and Height Control valves: 12 months parts and labor. All other components, Hangers and Beam, 0-12 months Parts and labor, 13-60 months parts only.

**Neway Suspensions, All RL Models:** Major components (Hangers, Beams, Bushings) 0-12 months parts and labor, 13-60 months parts only.

Air controls (valves and regulators) 12 months' parts and labor.

Air spring: 0-12 months parts and labor, 13-24 months parts only.

Shocks: 12 months parts and labor.

**NOTE: LABOR ALLOWANCE WILL BE BASED ON NEWAY'S SCHEDULE, WHICH WILL BE GIVEN AT THE TIME OF AUTHORIZATION REQUEST.**

**Ridewell Suspension:** Ridewell must approve ALL claims prior to any work or replacement of items.

**Hutch Suspensions:** All models 0-12 month's parts and labor, 13-24 months parts only, providing proper maintenance has been performed.

**Reyco Suspensions:** Reyco must approve ALL claims prior to any work or replacement of parts.

AXLES AND COMPONENTS:

**Rockwell and Dana:** 0-12 months parts and labor, 13-60 months parts only. NOTE: The following items are cause for the warranty to be voided. If the axle is bent vertically. Incorrect lubrication or low oil level. bearing adjustment not properly maintained.

**Brake Drum:** 0-12 months excluding wear. Cracking providing heavy heat check marks are not present.

**Brake shoes:** 0-12 months against separation due to loose rivets, rim cracking and bending, excluding normal wear. The use of G-G brake lining is not recommended will cause excessive brake drum wear, which is not covered by warranty.

**Slack adjusters Automatic:** All 0-12 month parts and labor, 13-60 month parts only, providing proper adjustment procedure has been maintained.

**Air chamber:** Anchor Lock and M.G.M. 0-12 month parts and labor, 13-24 month parts only.

**Oil seals:** All brands 12 months parts and labor, or until first brake replacement.

**Bearings:** All brands 0-36 month's parts and labor-providing no over heat marks are present and proper torque has been maintained. ALL parts must be returned.

**Synthetic lubricant:** All bearings and seals are covered for 35 months parts and labor providing proper maintenance has been performed and no mixing of lubricant has occurred. All parts must be returned.

**Landing Gear:** Binkley all models 0-12 months parts and labor. All parts must be returned unless otherwise instructed.

**Air Systems:** Glad hands and valves are 0-12 month's parts and labor. All parts must be returned unless otherwise instructed.

NOTE: The use of Airline antifreeze and other contaminated voids all warranties.

**A.B.S. SYSTEM:** Wabco system 0-36 months parts and labor. All parts must be returned.

**NOTE: All other A.B.S., PRATT will handle systems through the manufacture. No approvals will be given until approval is obtained from the manufacture.**

**NOTE: A qualified technician must service all systems, and the use of airline antifreeze or other contaminates voids all warranties.**

**HYDRAULIC CYLINDERS AND VALVES:** Are warranted for 30 days. All warranties from 2-12 months must be approved by the manufacture.

All gas power equipment will be warranted directly by the manufacture, and must be approved and repaired by an authorized service center.

**Tires:** All warranties *must* be handled directly by the customer or dealer with the tire manufacture, not through Fontaine.

**Paint:** 0-12 months against bond failure that exceeds 25% of the unit, excluding chipping caused by chains and stones or other securing devices. Fontaine must approve each claim prior to any work being performed.

# PRATT INDUSTRIES, INC.

## SAMPLE WARRANTY

This is to certify that PRATT INDUSTRIES, INC warrants to the first purchaser only, the described new trailer manufactured by it to be free from defects in materials and workmanship, when properly maintained, and under normal use and service, which means the loading, unloading and transportation of uniformly distributed legal loads of no corrosive cargo, adequately restrained and secured in a manner which does not subject the trailer to strains or impacts greater than are imposed by normal use. Total weight of trailer and cargo must not exceed the gross vehicle weight rating (GVWR) set forth on the vehicle identification plate affixed to the trailer at the factory, and the loading of each axle must not exceed the gross axle weight rating (GAWR) listed on the same plate.

PRATT INDUSTRIES, INC sole obligation under this warranty shall be limited to the repair or replacement, at its option, of any defective part of said trailer, which is the result of defective material and/or defective workmanship of parts furnished and installed by PRATT INDUSTRIES, INC. This warranty will expire (specified time periods) from date of delivery, and repairs under this warranty shall be at repair facilities designated by PRATT INDUSTRIES, INC. Transportation expenses to the repair facility are to be borne by the Purchaser.

The warranty herein is expressly in lieu of any and all other warranties, expressed or implied. No implied warranty of merchantability is made and there are no warranties, which extend to use of the trailer for purposes beyond the description hereof. The warranty herein does not apply to, and PRATT INDUSTRIES, INC. makes no warranties, expressed or implied with respect to:

1. Tires .
2. Parts, accessories, or other goods manufactured by others.

PRATT INDUSTRIES, INC will assign to customer any warranties extended to PRATT INDUSTRIES, INC. by the maker or supplier of such goods.

3. Used goods delivered hereunder, regardless of manufacturer, all of which are deliverable "As Is" and "Where Is".
4. Any goods which after delivery hereunder have been repaired or altered by anyone other than has been authorized and approved by PRATT INDUSTRIES, INC. unless in manufacturer's reasonable opinion, such repairs are in no way responsible for the condition complained of.
5. Goods which are not defective but may wear out and have to be replaced during warranty period including for example, but without limitation thereto, light bulbs, electrical receptacle, paint and coatings, brakes, linings, drums and return springs, equalizer, torque rod, camshaft bushings, and camshafts, slack adjusters, brake cylinder diaphragms, springs, slider pads, wheel bearings, oil and oil seals, rim clamps and studs, gaskets and sealers, all types of floors, parts, and components, and the like.

### LIMITATIONS ON MANUFACTURERS LIABILITY

Manufacturer and Customer agree that Manufacturer shall have no liability for any cargo loss, loss of use or any other incidental or consequential damages arising out of this order, which are alleged to have been caused by any of the goods delivered hereunder. Customer and Manufacturer further agree that customer's sole remedy for any defects in new goods delivered hereunder, whether customer's claim arises under the warranty set forth above, or otherwise, shall be limited to the repair or replacement at manufacturers option within one (1) year after delivery of such goods to the first purchaser, of any defective goods, of which notice of the defects is given by Customer to Manufacturer immediately after such defect is or ought to have been discovered and which goods are returned to Manufacturer within ten (10) days after Manufacturer requests their return for inspection and/or repair or replacement.

THE PROVISIONS OF THIS WARRANTY SHALL BE INTERPRETED AND GOVERNED PURSUANT TO THE LAWS OF THE STATE OF FLORIDA and MICHIGAN.

**See the Warranty Statement on your trailer for Additional conditions and terms.**

TRAILER SERIAL NUMBER \_\_\_\_\_  
TRAILER MODEL NUMBER \_\_\_\_\_  
DATE OF DELIVERY \_\_\_\_\_

**PRATT INDUSTRIES, INC.**

## Operation of Rollerbed Trailer

These 68,000#GVWR, Panel and Truss Rollerbed Trailers have a flat profile, with a Hydraulic Neck Assembly, a sliding tandem, 6" air unlocking deck rollers, and 11R/22.5 tires. The deck rollers are spaced approximately 2 ft. apart. 3' on the front deck portions.

### ***Hydraulic neck assembly***

The hydraulic neck is an articulating arm with a hinged upper coupler plate. It's designed to be used in conjunction with the sliding tandem, ground level feature in its application. It is equipped with a self-contained, 12 volt, DC hydraulic pump to supply lifting power in specific situations. The objective is to create a more favorable angle of delivery by setting the trailer down to the ground, or near the ground, at the rear. This system is designed for use by articulating the arm while the tandem axles are locked in a forward position. This system will lift 12,500# from the initial position with the trailer tandems at the rear most position. The system will lift more weight as the tandems are shifted forward which transfers more weight behind the tandems and off the front of the trailer. The more you want to lift the farther forward you slide the tandems.

### ***Hydraulic neck operation***

The self contained, 12 volt, DC hydraulic pump in this system has a push-pull cable control switch to power the system up and down and allow gravity movement. The system has 5 positions, 2 towards the frame, 2 away from the frame and neutral. Two of the positions are power and two are gravity. The cable will activate the motor and pump when it is slid into one of the power positions.

#1-All the way towards the operator will lift the front end up.

#2-Mid way operator will gravity the fifth wheel to the ground when the tractor is removed from the trailer (never use #2 position, it will only allow air into the system).

#3- The middle is neutral with a ball seat that is released by pushing the red button inside the handle.

#4- Midway towards the frame and gravity will bring the front end down.

#5- All the way toward the frame will power the front end down.

**NOTE:** Recommend practice is to use #1 position to lift the trailer and #5 position to let the front end back down. Hold the handle in the power position being used and immediately return to the handle to neutral the moment the desired travel the front is achieved. Do not allow the handle to slide into the gravity positions. Do not allow the gravity positions to move the front end.

### ***Truck requirements for charging battery***

The trailer comes with a 12-volt battery as a power source for the hydraulic pump. A single post female electrical receptacle has been supplied by the manufacturer for charging this battery. This receptacle is located on the front bolster near the 7-way receptacle and is wired to the battery for charging, while the trailer is coupled to the truck. It is necessary to have the other end of this plug wired to the truck to charge this battery. This system requires power through a 30 AMP fuse in the fuse panel of the truck and minimum of a 6-gauge wire leading to the plug.

### ***Expanding the trailer (Expandables only)***

1. Remove the auxiliary air line from the storage fitting-located on the driver side at the front of the rear main frame-and connect it to the open fitting on the forward air chamber. This should immediately disengage the frame index pins.
2. Pull the truck forward until the holes in the inner frame and the index pins on the outer frame line up at the desired frame length.

3. Remove the auxiliary air line from the air chamber and replace it on the storage fitting. When the auxiliary air line is removed, the frame index pins should engage. Sometimes it is necessary to roll the truck back and forth, slightly, to align the pins.

**NOTE:** Always make sure the index pins are locked before loading the trailer and/or moving the trailer to another location.

4. Follow the expanding procedures above when returning the trailer to the closed length.

### ***Unloading procedures***

1. Get trailer in position to unload.
2. Unlock slider bogey lock located on the driver side front of the axles for positioning the bogey to the desired location on the main frame of the trailer by depressing the air assist device. The slide bogey lock mechanism is a double action lever. When the air assist is activated it will apply pressure to the mechanical lever that retracts the lock pins. The lock pins may not retract until they are unbound by the operator using the tractor to roll the trailer back and forth, relieving the pressure against the locking pins thereby allowing them to retract.

**NOTE:** Allow the air assist and the tractor to do the work. If you manually pull the lever out too far you could rack the lever mechanism.

3. Raise rear bumper by opening the vented ball valve next to the roller unlock valve. This will raise the rear safety bumper.
4. Unstrap and store the rear strap at the back of the trailer (this is done because this strap is difficult to unstrap when the trailer is in the ground-level position).
5. Get in truck and get shifter in reverse.
6. Start backing up with a fair amount of speed. (This is very important because you cannot start the process from a dead stop, you must be rolling in reverse to start the procedure.) Pull the tractor hand valve down, this will lock the trailer axles in place, and you will be sliding the main frame of the trailer over and through the slider bogey.

**NOTE:** When sliding the trailer into the ground level position, be sure to make this step a smooth, quick motion.

7. Apply the parking brake to the truck and trailer.
8. Lock the slider bogey to the main frame at the desired position. (The desired position can be anywhere along the slider range of motion).
9. Lift the front of the trailer by sliding the hydraulic cable into position #1 and raise the front end to the desired height.

**NOTE:** The operator should try to achieve an unloading angle that does not bend the truss package until it has touched the ground and is partially off the trailer.

10. At this point unstrap the load, store straps, and open the roller locking valve located roadside to the rear of the landing gear, the rollers will not unlock yet, because there is no air to the trailer. (Parking brake must be activated).

### ***Split unloading***

The back half of the rollers can be unlocked without unlocking the front half of the rollers for split loads. The unlocking device includes a pin that connects the front and rear lock pin bars. This pin is located on the road

side near the middle of the trailer. To operate; remove the pin on the lock bars. This will divide the lock bars. You may then use the roller lock valve to unlock the rear half of the rollers only.

**NOTE:** The hydraulic neck can be used when split unloading to lift the front end of the trailer, thus transferring weight to the tractor to maintain traction.

1. Get back in the truck and shift into the forward position. Apply air to the truck and trailer by releasing the parking brakes. This will also unlock the roller locking system in about 5 to 7 seconds.
2. With the tractor in a forward gear and the parking brake released, look in the mirror on the truck you can watch the product start to roll off. As product starts to roll, immediately drive forward until you have cleared the package completely. Driving forward as the product rolls off accomplishes two things in this step. The first is that eliminate the product's momentum as it is rolling off. This is the key to damage-free delivery. If the truck and trailer are pulling forward when the rollers unlock, the products has very little momentum, while rolling back because you have pulled up from under it. (When split unloading and the load is rolling off the trailer, the load should be far enough to the rear that damage shouldn't be a concern.) Second, by doing this successfully you greatly reduce the possibility of high centering the power unit when pulling forward.

**NOTE:** The Hydraulic Neck system should be in the raised position the entire time procedure is taking place. This ensures that the load is distributed between the trailer tires and the tractor coupler, which prevents the rear end of the trailer lifting the tractor by pivoting on the trailer tires. If you lose traction, use the hydraulic pump to lift the front of the trailer and transfer weight to the truck as explained previously.

3. Now that the product is on the ground and the trailer is out from under the load, you may put the trailer back into road position.
4. Lower the front of the trailer by sliding the hydraulic cable into position #4, gravity down. When the trailer is completely down, slide the hydraulic cable into position #5 to tighten the coupler plate right against the main frame of the trailer.

**NOTE:** DO NOT overpower the hydraulic system when tightening the coupler. Damage may occur to the hydraulic arm and cylinder mounts by over powering the system.

5. Follow the procedures for positioning the slide bogey. Unlock the bogey with the air valve. Re-enter the truck cab, pull the hand valve and lock the trailer brakes while driving forward. Position the bogey in the rear position. Lock the slide box in that position using the air valve.

**NOTE:** Check to make sure the slide bogey is locked in place. You may have to rock the trailer back and forth to engage all four pins.

6. Lower rear bumper back to road position by closing the ball valve.

**NOTE:** DO NOT hit the slide bogey too hard when sliding back to the road position. This may cause considerable damage and IS NOT covered under warranty if evidence of abuse is apparent.

7. If the trailer is an expandable, close the trailer to a legal length for traveling by following the Expanding Procedures.

**NOTE:** Check to make sure both frame index pins are locked in place.

8. Lock the rollers by closing the roller lock valves. Spin each roller to replace the roller locking pins.
9. If this was a split load, replace the pin in the lock bars.

### ***Bad job site conditions***

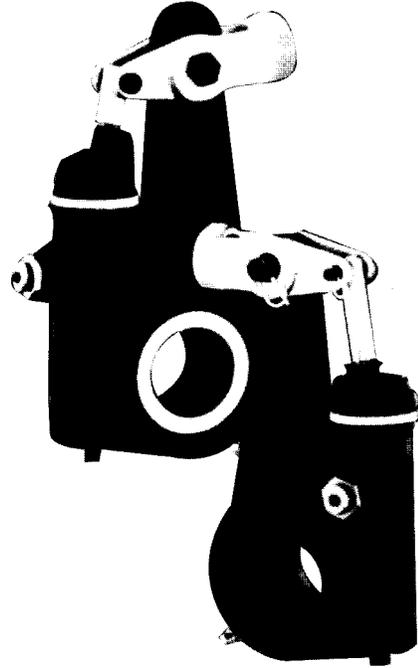
In muddy or rough terrain, power the hydraulic pump and lift front of the trailer to transfer weight on to the tractor (refer to the section on the Hydraulic Neck.) It is necessary to lock the slider bogey in the forward

position in these conditions, because the slide bogey may start to slide back under the trailer when you pull forward picking up on the tractor. By locking the slide bogey in the forward position, you eliminate this from happening in bad conditions.

## Self-Adjusting Slack Adjuster

### Operation

Upon brake application the slack adjuster rotates and moves the shoes into contact with the drum. The clearance notch (A) corresponds to the normal lining-to-drum clearance. As the brake application continues the rack (B) moves upwards and rotates the one-way clutch (C) which slips in this direction. As the brake torque increases the coil spring (D) load is overcome and the wormshaft is displaced axially releasing the cone clutch. When the brake begins its return stroke the coil spring load returns to normal and the cone clutch is again engaged. The rack is pulled back to its original position in the notch, and any additional travel brought about by lining wear causes the rack to turn the locked one-way clutch and rotates the wormshaft through the locked cone clutch. The worm shaft then rotates the wormwheel and camshaft, adjusting the brakes.



### Trouble Shooting

#### TIGHT OR DRAGGING BRAKES

##### Check Foundation Brake Components For:

- Control arm anchor bracket not positioned properly.
- Brake chamber not fully releasing
  - Spring brake not fully releasing.
  - Pushrod binding on chamber housing
  - Air supply not exhausting completely
- Extreme differences in lining-to-drum clearances between shoes on same wheel.
- Broken shoe return spring.

#### EXCESSIVE CHAMBER PUSH ROD TRAVEL

##### Check Foundation Brake Components For:

- Loose, broken or bent control arm anchor bracket.
- Worn camshaft bushings
- Binding camshaft.
- Worn clutch assembly.

### Operational Check

Functional operation of the slack adjuster can be performed on vehicle by:

1. Block wheels to prevent vehicle from rolling.
2. Check that the push rod is fully retracted; apply air to release spring brake.
3. Manually de-adjust brakes (turn adjustment hex counterclockwise) to create an excessive clearance condition. (A ratcheting sound will occur)
4. Make a full service brake application, on release; allow sufficient time for brake to fully retract. During the brake release, observe rotation of the adjustment hex (attaching a wrench on the hex will make this

rotation easier to see). This rotation indicates that an excessive clearance condition has been determined by the slack adjuster, and it is making an adjustment to compensate. On each subsequent brake release the amount of adjustment and pushrod travel will be reduced until the desired clearance is achieved.

5. See "In Service Checking Procedure" for proper pushrod stroke.

### ***Maintenance***

During normal chassis lube, adjusters should be inspected for damage. Check anchor brackets to ensure that they are tight.

During reline, check the de-adjustment torque. Place a torque wrench on the 7/16" adjusting hex. Turn the torque wrench counterclockwise and check that the clutch does not slip at a torque less than 13 Ft. Lbs. A ratcheting sound will occur while backing off. If clutch slips at a lesser torque, the adjuster must be replaced.

### ***Lubrication***

The Self-Adjusting Slack Adjuster should be lubricated in conjunction with the lubrication prescribed for vehicle chassis. The lubrication interval should not, however, exceed 5,000 miles or 3 months. No special grease is required, however the use of moly-disulphide loaded grease or oil is not recommended since it may lower friction capabilities in the adjusting clutch parts, and decrease automatic adjustment reliability.

### ***Inspection***

1. During normal lubrication intervals, visually inspect slack adjuster and anchor bracket for damage. Check that anchor bracket is tight and the control arm is in its "Full Release" position. (Refer to Step #3 "Installation Instructions")
2. Maintaining proper brake adjustment and brake balance cannot be accomplished by the slack adjuster alone. The condition of foundation brake components has a direct bearing on the effectiveness of brake adjustment; therefore, periodic inspection of these components is necessary.
  - a. BRAKE CHAMBERS  
Check that brake chamber mounting bolts are tight and proper alignment is maintained to avoid interference between chamber pushrod and chamber housing. Verify that the brake chamber pushrod length is equal on opposing brake chambers of the same axle
  - b. CAMSHAFT BUSHINGS  
Optimum brake adjustment cannot be achieved when worn bushings are used.
  - c. WHEEL BEARING ADJUSTMENT  
Accurate wheel bearing pre-load is necessary to maintain proper alignment between the brake drum and brake shoes.

# Coupling and Uncoupling

Knowing how to couple and uncouple correctly is basic to safe operation of combination vehicles. General coupling and uncoupling steps are listed below. There are differences between different rigs. So learn the details of coupling and uncoupling the truck(s) you operate.

## CAUTION!

INCORRECT COUPLING AND UNCOUPLING CAN RESULT IN SERIOUS INJURY OR DEATH.

### *Coupling Tractor-Semi trailers*

#### **Step 1 Inspect Fifth Wheel**

- Check for damaged/missing parts.
- Check to see that mounting to tractor is secure, no cracks in frame, etc.
- Be sure that the fifth wheel plate is greased as required. Failure to keep the fifth wheel plate lubricated could cause steering problems because of friction between the tractor and the trailer.
- Check if fifth wheel is in proper positioning for coupling.
  - Wheel tilted down towards rear of tractor.
  - Jaws open.
  - Safety unlocking handle in the automatic lock position.
- If you have a sliding fifth wheel, make sure it is locked.
- Make sure the trailer kingpin is not bent or broken.

#### **Step 2 Inspect Area and Chock Wheels**

- Make sure area around vehicle is clear.
- Be sure trailer spring brakes are on.
- Check that cargo (if any) is secured against movement due to tractor being coupled to trailer.

#### **Step 3 Position Tractor**

- Put the tractor directly in front of the trailer. (Never back under the trailer directly at an angle, because you might push the trailer sideways and break the landing gear.)
- Check position, using outside mirrors, by looking down both sides of the trailer.

#### **Step 4 Back Slowly**

- Back until fifth wheel touches the trailer.
- Don't hit the trailer.

#### **Step 5 Secure Tractor**

- Put on parking brake.
- Put transmission in neutral.

#### **Step 6 Check Trailer Height**

- The trailer should be low enough that it is raised slightly by the tractor when the tractor is backed under it. Raise or lower the trailer as needed. (If trailer is too low, tractor may strike and damage nose of trailer; if trailer is too high, it may not couple correctly.) Check that the kingpin and fifth wheel are aligned.

#### **Step 7 Connect Air Lines to Trailer**

- Check glad hand seals and connect tractor supply (emergency) airline to trailer supply (emergency) glad hand.
- Check glad hand seals and tractor control (service) airline to trailer control (service) glad hand.
- Make sure airlines are safely supported where they won't be crushed or caught while tractor is backing under trailer.

**Step 8 Supply Air to Trailer**

- From cab, push in "air supply" knob or move tractor protection valve control from the "emergency" to the "normal" position to supply air to the trailer brake system.
- Wait until the air pressure is normal.
- Check brake system for crossed airlines.
- Shut engine off so you can hear the brakes.
- Apply and release trailer brakes, listen for sound of trailer brakes
- Being applied and released. You should hear the breaks move when applied and air escape when the brakes are released.
- Check air brake system pressure gauge for signs of major air loss.
- When you are sure trailer brakes are working, start engine.
- Make sure air pressure is up to normal.

**Step 9 Lock Trailer Brakes**

- Pull out the "air supply" knob, or move the tractor protection valve control from "normal" to "emergency."

**Step 10 Back Under Trailer**

- Use lowest reverse gear.
- Back tractor slowly under trailer to avoid hitting the kingpin too hard.
- Stop when the kingpin is locked into the fifth wheel.

**Step 11 Check Connection for Security**

- Raise trailer landing gear slightly off ground.
- Pull tractor gently forward while the trailer brakes are still locked on the tractor.

**Step 12 Secure Vehicle**

- Put transmission in neutral.
- Put parking brakes on.
- Shut off engine and take key with you so someone else won't move the truck while you're under it.

**Step 13 Inspection of Coupling**

- Use flashlight if necessary.
- Make sure there is no space between upper and lower fifth wheel.
- If there is space, something is wrong (kingpin may be on top of closed fifth wheel jaws; trailer would come loose very easily.)
- Go under trailer and look into the back of the fifth wheel. Make sure the fifth wheel jaws have closed around the shank of the kingpin.
- Check that the locking lever is in the "lock" position.
- Check that the safety latch is in position over locking lever. (On some fifth wheels the catch must be put in place by hand.)
- If the coupling isn't right, don't drive the coupled unit; get it fixed.

**Step 14 Connect the Electrical cord and Check Air Lines**

- Plug the electrical cord into the trailer and fasten the safety catch.
- Check both airlines and electrical line for damage.
- Make sure air and electrical lines will not hit any moving parts of vehicle.
- Visually inspect to see that ABS light flashes and goes out when power cord is connected. If light stays on or comes on in use, have unit repaired at once.

**Step 15 Raise Front Trailer Supports (Landing Gear)**

- Use low gear range (if so equipped) to begin raising the landing gear.
- Once free of weight, switch to high gear range.
- Raise landing gear all the way up. (Never drive with landing gear
- Only part of the way up as it may catch on railroad tracks or other things.)
- After raising the landing gear, secure the crank handle safely.
- When full weight of trailer is resting on tractor:

- Check for enough clearance between rear of tractor frame and Landing gear. (When tractor turns sharply, it must not hit landing gear.)
- Check that there is enough clearance between the top of the tractor tires and the nose of the trailer.

## ***Uncoupling Tractor-Semitrailers***

***The following steps will help you uncouple safely.***

### **Step 1 Position Rig**

- Make sure surface of parking area can support weight of trailer.
- Have tractor lined up with the trailer. (Pulling out at an angle can damage landing gear.)

### **Step 2: Ease Pressure on Locking Jaws**

- Shut off trailer air supply to lock trailer brakes. Ease pressure on fifth wheel locking jaws by backing up gently (this will help you release the fifth wheel locking lever).
- Put parking brakes on while tractor is pushing against the kingpin.
- This will hold rig with pressure off the locking jaws.

### **Step 3: Lower The Landing Gear**

- If trailer is empty-lower the landing gear until it makes firm contact with the ground, turn crank in low gear a few extra turns; this will lift some weight off the tractor. (Do not lift trailer off the fifth wheel.) This will
  - - Make it easier to unlatch the fifth wheel;
  - - Make it easier to couple next time.

### **Step 4: Disconnect Air Lines and Electrical Cable**

- Disconnect airlines from trailer. Connect airline glad hands to dummy couplers at back of cab, or couple them together.
- Hang electrical cable with plug down to prevent moisture from
  - Entering it.
- Make sure lines are supported so they won't be damaged while driving the tractor.

### **Step 5: Unlock Fifth Wheel**

- Raise release handle lock.
- Pull the release handle to the "open" position.
- Keep legs and feet clear of the rear tractor wheels to avoid serious injury in case the vehicle moves.

### **Step 6: Pull Tractor Partially Clear of Trailer**

- Pull tractor forward until fifth wheel comes out from under trailer.
- Stop with tractor frame under trailer (Prevents trailer from falling to ground if landing gear should collapse or sink.)

### **Step 7: Secure Tractor**

- Apply parking brake.
- Place transmission in neutral.

### **Step 8: Inspect Trailer Supports**

- Make sure ground is supporting trailer.
- Make sure landing gear is not damaged.

**Step 9: Pull Tractor Clear of Trailer**

- Release parking brakes.
- Check the area and drive the tractor clear.

# Trailer Maintenance Procedures

THE IMPORTANCE OF FREQUENT INSPECTION AND PREVENTATIVE MAINTENANCE FOR ANY MACHINE CANNOT BE OVER EMPHASIZED: YOUR PRATT TRAILER IS NO EXCEPTION. PROPER CARE GREATLY REDUCES THE REPAIR COST AND THE AMOUNT OF DOWNTIME.

## ***Kingpin and Fifth Wheel Area***

Inspect the kingpin for excessive wear, rough edges, looseness, broken or chipped out areas and cracks. Any kingpin showing such condition must be replaced at once. Do not, under any circumstance, weld the kingpin to compensate for wear. Once a kingpin has been heated its physical characteristics are changed and its subsequent performance cannot be predicted.

Check and inspect the fifth wheel area for cracks, breaks, and for secure attachment to the trailer. Any welding performed in this area is to be restricted to those welds specified by PRATT and is to be performed in the manner prescribed by PRATT.

We suggest all repairs on the kingpin area be performed only by an authorized location referred by PRATT.

## ***Rear Impact Guards***

Your new PRATT Trailer has been designed & tested to meet the requirements of N.H.T.S.A. article 571.223 and 571.224.

The rear bumper should be checked during regular maintenance for cracks, bonds & etc. If repair is needed please refer to T.M.C. Recommended Practice 732(T).

## ***Wheel and Rim Care***

Standard wheels on your PRATT trailer are cast spoke or steel disc wheels. Wheel nuts are inspected and tightened to specifications at the factory and are checked again at pre-delivery. To maintain the correct torque on the wheels of a new trailer the nut torque must be checked periodically. During normal highway operation of a new trailer, this check should be made at the first 100,500, and 1,000 miles and every 5,000 miles thereafter. Severe service conditions may require more tightening. Loose wheel nuts may cause shimmy, uneven tire wear, and vibration. Elongated stud holes in the wheels may result from loose hub nuts. Wheel and hub nuts must be torqued to proper specifications to provide maximum service life.

## ***Spoke wheel installation and maintenance***

### **RIM MOUNTING INSTRUCTIONS:**

Rims must be correctly assembled, rim clamps must match the rim spacer width and rim clamp nuts must be correctly tightened to assure maximum service life and maximum safety.

1. All parts must be clean, free of rust, dirt and paint..
2. Slide the inside rim over the wheel so the 28° mounting surfaces mate. Be sure the valve stem is pointing out and is centered between two spokes.
3. Slide the rim spacer over the wheel and against the inner rim.
4. Slide the outer rim over the wheel. Be sure the valve system is pointing in and is centered between the same spokes as the inner valve stem.
5. Install the rim clamps and nuts. Lightly tighten the rim nuts while rotating the wheel.
6. Tighten the rim nuts a quarter turn at a time in order shown until tightened to the correct torque.

Recommended Torque Dry: 200 to 250 Ft. Lbs.

Recheck rim service.



3 SPOKE



5 SPOKE



6 SPOKE

clamps after first 50 to 100 miles of

**BRAKE**

**DRUM**

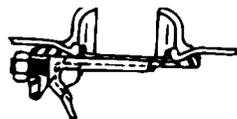
**ASSEMBLY TORQUE FOR DRUM BOLTS  
(Grade 5 or 8 Fasteners)**

THREAD SIZE		TORQUE FT-LBS MIN	REQUIRED FT-LBS MAX
1/2- 20	Rotate Belt	50	80
5/8-18 (Tapped Holes)	Rotate Belt	150	200
5/8-18 (Thru Holes)	Rotate Nut	75	100
3/4-10	Rotate Nut	130	165
3/4-16 (Wheels)	Rotate Nut	175	200
3/4-16 (Hubs)	Rotate Nut	100	225
1-14	Rotate Nut	175	225

Note: All Fastener parts must be clean and dry.

- The rim clamp does NOT have to heel against the face of the spoke. If the rim clamp does have a heel, the heel MUST NOT bottom out before reaching 80% of the recommended torque. DO NOT over torque. All that is required to properly hold the rims is 200 to 250 Ft. Lbs.

**CORRECT  
HEEL-LESS**



**CLAMP  
HEEL TYPE  
CLAMP**

*Recommended Torque 200 to 250 ft. lbs.*

**Over Torque Can Deform Rim Spacer and Damage Back Flange**

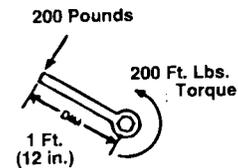
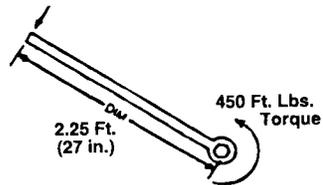
- Check alignment. Place a block of wood or object on the floor and rotate wheel. If variation exceeds 1/8", the rim is not properly mounted. To correct, loosen the nut on the side with the greatest deviation and tighten the nuts opposite. Recheck the torque as shown in step 6.
- Recheck the rim clamps after the first 50 to 100 miles of service.

## TORQUE FOR RIM NUTS

Torque for rim nuts or capnuts is expressed in foot pounds, and is the force exerted in pounds multiplied by the lever arm or wrench length in feet.

Example - 200 pounds x 2.25 ft. = 450 Foot Pounds.

200 Pounds

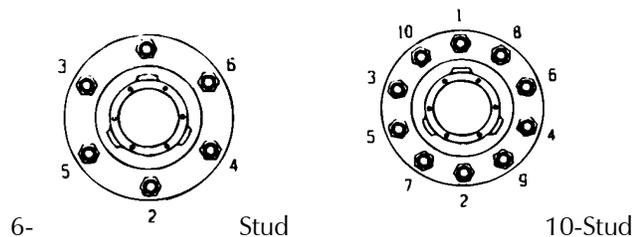


## Hub installation & maintenance

Disc Wheel Mounting Instructions for 6 & 10 Stud Hubs used with BALL SEAT Mounted Disc Wheels.

Rims must be correctly assembled, using the correct capnuts and must be correctly aligned to assure maximum service life and maximum safety.

1. All parts must be clean, free of rust, dirt or paint..
2. Position the inner wheel over the studs being careful not to damage the threads.
3. Install inner capnuts and tighten to 50 FT.LBS. in the sequence shown. Then tighten to full torque using the same sequence.



THREAD SIZE	TORQUE
Standard Capnut 3/4-16 and 1 1/8-16	450-500 FT. LBS.

4. Position the outer wheel over the inner capnuts being careful not to damage the threads.
5. Install the outer capnuts and tighten to 50 FT. LBS. in the sequence shown in Step 3. Then tighten to full torque using the same sequence.
6. **NOTE:** The torque listed is for dry threads with no lubricant.

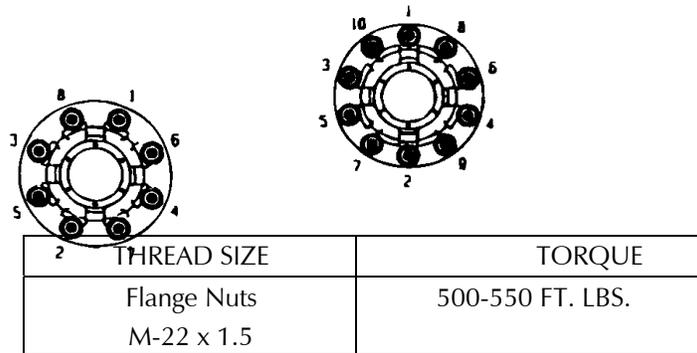
Proper capnut torque is important.

Insufficient torque can cause stud breakage and damage ball seats. Over torque can stress the studs and strip the threads.

7. After the first 50 to 100 miles of service the capnut torque should be rechecked.
  - a. Loosen the outer capnuts.
  - b. Check the torque of the inner capnuts in the tightening direction.
8. Tighten the outer capnuts to 50 FT. LBS. in the sequence shown in Step 4. Tighten to full torque using the same sequence.

**Disc Wheel Mounting Instructions for 8 & 10 Stud Hubs used with HUB PILOTED disc Wheels.**

1. All parts must be clean, free of rust, dirt or paint.
2. Position the inner wheel over the studs being careful not to damage the threads.
3. Position the outer wheel over the studs being careful not to damage the threads.
4. Install the flange nuts and tighten to 50FT.LBS. In the sequence shown.



Then tighten to full torque using the same sequence.

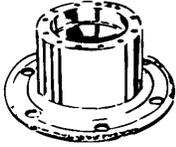
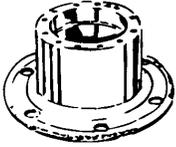
5. NOTE: The torque listed is for dry threads with no lubricant. Proper capnut torque is important. Insufficient torque can cause stud breakage and damage. Over torque can over stress the studs and strip the threads.
6. IMPORTANT-After the first 50 to 100 miles of service the capnut torque should be retighten to 500-550 Ft.Lbs.
7. Make sure the surface on the disc wheel, which is contacted by the flange nut, is flat.
8. Disc wheel mounting surfaces should not have more than 1 1/2 Mil. Thickness of paint. Excessive paint thickness can cause loose disc wheels.

Before installing the two-piece cone lock cap nuts, lubricate the contact surfaces between the cap nut and the washer with SAE30W oil. This will minimize corrosion between the mating surfaces.



Wheel stud on both the right and left side hubs of vehicles utilizing the hub piloted wheel system have right-hand threads.

**COMMON HUB PROBLEMS**

<p align="center"><b>BROKEN STUDS</b> CAUSE Loose cap nuts overloading</p> <p align="center"><b>WHAT TO DO</b> Replace stud. Follow Proper torque procedure. See page 16 or 17</p>	<p align="center"><b>STRIPPED THREADS</b></p>  <p align="center">CAUSE Loose wheel assembly</p> <p align="center"><b>WHAT TO DO</b> Replace stud. Follow proper torque procedure. See Page 16 or 17</p>
<p align="center"><b>WORN STUD GROOVE</b></p>  <p align="center">CAUSE Excessive torque</p> <p align="center"><b>WHAT TO DO</b> Replace stud. Follow Proper torque Procedure. See page 16 or 17</p>	<p align="center"><b>WORN MOUNTING FACE ON HUB</b></p>  <p align="center">CAUSE Stud turning in groove. Insufficient torque on back nut.</p> <p align="center"><b>WHAT TO DO</b> Replace stud. Follow proper torque procedure. See Page 16 or 17</p>

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
<b>I. SPOKE WHEELS</b>		
Uneven Tire Wear	<ol style="list-style-type: none"> <li>1. Excessive Rim Run out</li> <li>2. Loose Bearing Adjustment</li> <li>3. Loose or Worn Suspension Bushings</li> <li>4. Low Tire Pressure</li> </ol>	<ol style="list-style-type: none"> <li>1. Align Rims per step 8 page 16 And recheck rim clamp torque</li> <li>2. Check bearings for wear and Readjustment</li> <li>3. Check with Suspension Manufacturer</li> <li>4. Inflate to recommended Pressure</li> </ol>
Broken Back Flange	<ol style="list-style-type: none"> <li>1. Improper Rim Clamp Torque</li> <li>2. Overload</li> </ol>	<ol style="list-style-type: none"> <li>1. Review Rim mounting instructions and torque rim clamp nuts</li> <li>2. Correct operating conditions.</li> </ol>
Rim Slipping	<ol style="list-style-type: none"> <li>1. Improper Rim Clamp</li> </ol>	<ol style="list-style-type: none"> <li>1. Review rim mounting instructions and torque rim clamp nut.</li> </ol>

	2. Collapsed Rim Spacer	2. Caused by excessive torque. Replace spacer.
<b>II. HUBS</b>		
Broken Studs	1. Loose Capnuts  2. Overloading	1. Replace broken stud plus the Stud. On either side. If more Than two studs are broken, Replace entire set.  2. Replace broken stud, plus The stud on either side. If more Than two studs are broken Replace the entire set.
Stripped Threads on Studs or Capnut	1. Excessive Torque	1. Replace stud and follow torque Recommendations on page 16 or 17.
Damage Inner or Outer Capnuts	1. Loose Wheel Assembly	1. Replace capnuts, check for Proper stud standout and follow Torque recommendations on Page 16 or 17.
Damaged Threads on Stud or Capnut	1. Sliding Wheel on Threads	1. Replace studs or capnuts.
Worn Mounting Face On Hub	1. Loose Wheel Assembly	1. Replace hub and follow torque Recommendations on page 16 or 17.
Damaged Stud Groove	1. Loose Back Nuts	1. Replace hub and tighten back Nuts to 100 ft. lbs.
Stud Standout Wrong	1. Improper Stud or Wrong Brake Drum	1. Replace studs or drum. Recommended standout is 1.31 to 1.44 inches. When changing from cast to fused drum, studs may have to be changed

## **Tire Maintenance**

### **Inflation Pressure**

The most critical factor in tire maintenance is proper inflation. No tire or tube is completely impervious to loss of air pressure. To avoid the hazards of under inflation, lost air must be replaced.

Driving on any tire that does not have the correct inflation pressure is dangerous and will cause tire damage.

Any under inflated tire builds up excessive heat that may result in sudden tire destruction. The correct inflation pressures for your tires are a function of many factors including: load, speed, road surface and handling. Consult your tire dealer for the proper inflation pressures for your application.

Check inflation pressures on all your tires at least once a week, including spares, before driving when tires are cold, especially when vehicle is used by more than one driver.

**FAILURE TO MAINTAIN CORRECT INFLATION PRESSURE MAY RESULT IN SUDDEN TIRE DESTRUCTION, IMPROPER VEHICLE HANDLING, AND MAY CAUSE RAPID AND IRREGULAR TIRE WEAR. THEREFORE, INFLATION PRESSURES SHOULD BE CHECKED WEEKLY AND ALWAYS BEFORE LONG DISTANCE TRIPS.**

Pressure should be checked when tires are cold; in other words, before they have been driven on. The ideal time to check tire pressures is early morning. Driving, even for a short distance, causes tires to heat up and air pressures to increase.

Never bleed air from hot tires as your tires will then be under inflated. Make sure to check both tires in a dual fitment. Pressures should be the same.

Use accurate tire gauge to check pressures. (Do not use "Tire Billys" to hit tires as an inflation check. This is an unreliable method.)

For optimum tire performance it is usually best to use the tire inflation pressure recommended by the tire manufacturer for the particular axle load. Exceeding this pressure could result in reduced traction and tread life.



Tread Contact With Road

### **UNDER INFLATION**

Causes abnormal tire deflation which builds up heat and causes irregular wear.



Tread Contact With Road

### **OVER INFLATION**

Causes tires to run hard and be more vulnerable to impacts. It also causes irregular wear.



Tread Contact With Road

### **PROPER INFLATION**

The correct profile for full contact with the road for traction, braking capability and safety.

### **Tire Inspection**

While checking inflation pressures, it is a good time to **INSPECT YOUR TIRES. ANY TIME YOU SEE ANY DAMAGE TO YOUR TIRES OR WHEELS/RIMS, SEE ANY OF YOUR TIRE DEALERS AT ONCE.**

Before driving, inspect your tires, including the spare, and check your air pressures. If your pressure check indicates that one of your tires has lost pressure of four pounds or more, look for signs of penetrations, valve leakage, or wheel/rim damage that may account for air loss.

Always examine your tires for bulges, cracks, cuts or penetrations. If any such damage is found, the tire must be inspected by a Tire dealer at once. Use of a damaged tire could result in tire destruction, property damage and personal injury.

### **Drive carefully**

All times wear out faster when subjected to high speeds as well as hard cornering, rapid starts, sudden stops and frequent driving on surfaces, which are in poor condition. Surfaces with potholes or rocks and other objects can damage tires and cause vehicle misalignment. When you drive on such surfaces, drive on them carefully and slowly, and before driving at normal or highway speeds, examine your tires for any damage, such as cuts or penetrations.

### **Do not overload**

The maximum load that can be put on a truck tire is dependent upon the speed at which the tire will be used. Consult your Tire dealer and this data book for complete information on the allowable loads for your tires in your application. Tires which are loaded beyond their maximum allowable loads for the particular application will build up excessive heat that may result in sudden tire destruction, property damage and personal injury.

Do not exceed the gross axle weight ratings for any axle on your vehicle.

### **Drive at proper speeds**

The maximum speed at which tires can be operated is indicated in the tire manufacturer's data book. This speed varies for each type of tire and depends on the type of application. Consult your Tire dealer for assistance in determining the maximum speed for your application. **EXCEEDING THIS MAXIMUM SPEED WILL CAUSE THE TIRE TO BUILD UP EXCESSIVE HEAT, WHICH CAN RESULT IN SUDDEN TIRE DESTRUCTION, PROPERTY DAMAGE AND PERSONAL INJURY.** In any case, you should not exceed reasonable speeds indicated by the legal limits and driving conditions.

High speed driving can be dangerous and may be damaging to your tires.

**WHEN DRIVING AT HIGHWAY SPEEDS, CORRECT INFLATION PRESSURE IS ESPECIALLY IMPORTANT.** However, at these speeds, even with correct inflation pressures, a road hazard, for example, is more difficult to avoid and if contact is made, has a greater chance of causing tire damage than at lower speed. Moreover, driving at high speed increases the possibility of an accident, as a greater distance is required to bring your vehicle to a safe stop.

### **Balancing**

Under normal conditions, truck tires do not need to be balanced. Common practice is to check tire balance if a ride complaint is made by the driver. Before removing the tire-wheel assembly from the vehicle, check for radial and lateral run out. Excessive run outs can be caused by bent wheels and rims or improper mounting. If balance is still required, a simple static balance with bubble balance or a wall mounted axle bearing and hub type gravity balance should be sufficient.

### **Rotation**

Tires should be rotated only when necessary. If the tires are wearing evenly, there is no need to rotate. If irregular wear becomes apparent or if the wear rate on the tires is perceptively different (from axle to axle), then the tires should be rotated in such a manner as to alleviate the conditions.

### **Storage**

All tires should be stored in a cool dry place indoors so that there is no danger of water collecting inside them. Serious problems can occur with tube-type tires when they are mounted with water trapped between the tire and tube. Due to pressurization, the liquid can pass through the inner liner and into the casing plies.

This can result in sudden tire failure. Most of the problems of this nature have been due to improper storage, which allowed water to enter the casing. This is a particular problem with tube-type tires because of the difficulty in detecting water, which collected between the tire and tube. When tires are stored, they should be stored in a cool place away from sources of heat and ozone such as hot pipes and electric generators. Be sure

that surfaces which could deteriorate the rubber. TIRES EXPOSED TO THESE SUBSTANCES COULD BE SUBJECT TO SUDDEN FAILURE.

#### **Recommendations for the use of dynamometers**

Severe damage can result in the crown area of radial truck tires when run on dynamometers for extended periods. Quite often the damage is internal and not discovered until after the vehicle has been put back in service.

#### **Proper mounting on vehicle**

When wheel assemblies are mounted on a vehicle, be sure that the valves do not touch the brake drums or any mechanical part of the vehicle.

Tires mounted in duals must be matched so that the maximum difference between the diameters of the tires does not exceed 1/4 inch or a circumferential difference of 3/4 inch. Failure to properly match dual tires will result in the tire with the larger diameter carrying a disproportionate share of the load, which can cause sudden tire destruction.

#### **Dual spacing**

It is also important that sufficient space is provided between dual tires to allow air to flow and cool the tires and to prevent the tires from rubbing against one another.

To make sure dual spacing is correct, simply measure the two tires from center to center of the tread, and refer to the minimum dual spacing required by the tire manufacturer.

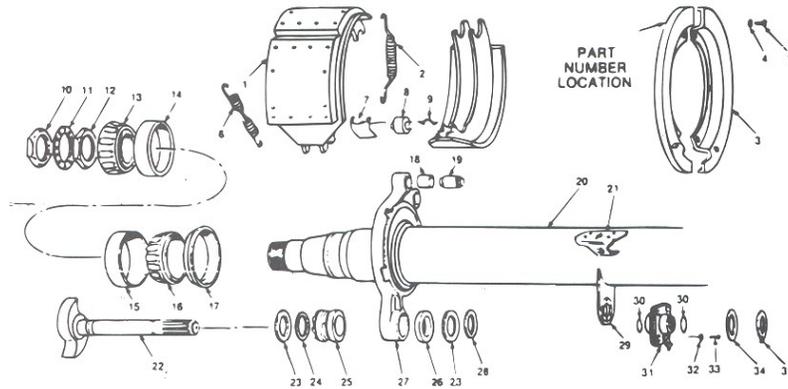
#### **Tire mixing**

#### ***IMPROPER TIRE MIXING CAN BE DANGEROUS.***

On vehicles with four or more wheel positions, radial and non-radial tires should not be mixed in a dual fitment.

*Trailer axle maintenance*

**TYPICAL AXLE  
ILLUSTRATIONS OF AXLE PARTS WITH PARTS LIST**



**TYPICAL 16.5" X 7" BRAKE INSTALLATION**

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Brake shoe and lining assembly	19	Pin-anchor
2	Spring-brake shoe retaining	20	Beam-axle
3	Dust shield	21	Bracket -chamber
4	Lock washer	22	Camshaft
5	Cap screw	23	Washer-camshaft
6	Spring-brake shoe return	24	"O" ring
7	Retainer-brake shoe roller	25	Bushing-spider
8	Roller-brake shoe	26	Seal-spider
9	Pin-shoe return spring	27	Spider-brake
10	Nut-wheel bearing outer	28	Lock ring
11	Lock washer-wheel bearing nut	29	Bracket -camshaft
12	Nut-wheel bearing inner	30	"O" ring
13	Cone bearing outer	31	Camshaft bushing assembly
14	Cup-bearing outer	32	Flat washer
15	Cup-bearing inner	33	Cap screw
16	Cone-bearing inner	34	Washer-camshaft
17	Seal-wheel bearing	35	Lock ring
18	Bushing-anchor pin		
Call us at: (800) 546-7728 for PRATT Website: <a href="http://www.prattinc.com">www.prattinc.com</a> Email: <a href="mailto:buyparts@prattinc.com">buyparts@prattinc.com</a>			

## Disassemble wheel end components

# CAUTION!

Do Not Work under the Trailer When the Vehicle is supported only by Jacks. Jacks Can Slip or Tip Over and Cause Injury.

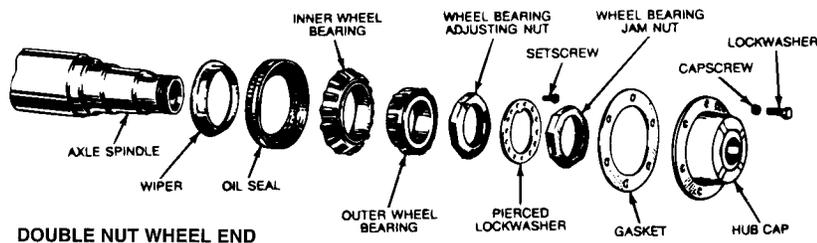
1. Jack up the vehicle under the axle being serviced.
2. Install jack stands under each corner of the vehicle to hold it in position.
3. Remove wheels or tires and rims from the axle using standard procedures.
4. If the axle has auxiliary spring brakes, carefully compress and lock the spring so that the spring cannot actuate during disassembly.

# CAUTION!

Carefully Follow the Service Instructions Supplied by the Spring Brake Manufacturer when you Work on This Component. The Spring Brake Activate and Cause Injury.

5. Release the slack adjusters or Stop master automatic adjustment so that the brakes retract and the drums or rotors will clear the linings.
6. On oil lubricated hubs, put an empty container under the hubcap to receive the leaking oil when the hubcap is removed in step 7.
7. Remove the cap screws holding the hubcap to the hub, the hub cap and gaskets from each spindle.
8. On double nut design wheel ends, remove the setscrew, outer jam nut; lock ring and bearing adjusting nut from each spindle. (See Below).

On single nut design wheel ends, remove the cotter pin or lock ring, and the adjusting nut from each spindle.



9. Remove the hubs and drums, or hubs and rotors if the axle has disc brakes, from the spindle using standard procedures.

**IMPORTANT: The outer wheel bearing can remain inside the hub when the hub is removed from the spindle. You must be careful that the bearing cones do not fall from the hub and become damaged.**

10. If the wheel bearing cups must be removed, use a bearing puller to remove the bearing cups and the wheel bearing seal from the hub.

11. If necessary, use a cold chisel to remove the wheel bearing seal wiper from the spindle. Put two or three notches around the wiper sleeve to expand the sleeve so that it can be easily removed. Discard the seal and wiper.

## **CAUTION!**

DO NOT PENETRATE THE WIPER WITH THE CHISEL. THE WIPER JOURNAL CAN BECOME DAMAGED.

### **Disassemble brakes**

If the axle has auxiliary spring brakes, carefully compress and lock the spring so that the spring cannot actuate during disassembly.

## **CAUTION!**

CAREFULLY FOLLOW THE SERVICE INSTRUCTIONS SUPPLIED BY THE SPRING BRAKE MANUFACTURER WHEN YOU WORK ON THIS COMPONENT. THE SPRING BRAKE CAN ACTIVATE AND CAUSE INJURY.

### **PREPARE PARTS FOR ASSEMBLING**

1. Cleaning Ground or Polished Parts:
  - a. Use a cleaning solvent to clean ground or polished parts and surfaces. Kerosene or diesel fuel oil can be used for this purpose. **DO NOT USE GASOLINE.**

## **CAUTION!**

BE CAREFUL WHEN USING CLEANING SOLVENTS. FOLLOW THE INSTRUCTIONS SUPPLIED BY THE SOLVENT MANUFACTURER TO PREVENT INJURY.

- b. Use a knife, if required, to remove gasket material from parts. Be careful not to damage the ground surfaces.
  - c. **DO NOT** clean ground or polished parts in a hot solution tank or with water, steam or alkaline solutions. These solutions will cause corrosion of the parts.
2. Cleaning Rough Parts:
  - a. Rough parts can be cleaned the same as ground or polished parts.
  - b. Rough parts also can be cleaned in hot solution tanks with a mild alkaline solution.
  - c. Parts must remain in the hot solution tanks until they are completely. Cleaned and heated.

## **CAUTION!**

BE CAREFUL WHEN USING HOT SOLUTION TANKS AND ALKALINE SOLUTIONS. FOLLOW THE INSTRUCTIONS SUPPLIED BY THE ALKALINE MANUFACTURER TO PREVENT INJURY.

- d. Parts must be washed with water until all the alkaline solution is removed.
3. Cleaning a Complete Axle Assembly:
  - a. A complete axle assembly can be steam cleaned on the outside to remove heavy amounts of dirt.

- b. Cover all openings in the axle before cleaning to prevent water from entering the assembly.

4. Drying Cleaned Parts:

- a. Parts must be dried immediately after cleaning.
- b. Dry parts with soft, clean paper or cloth rags.
- c. Except for bearings, parts also can be dried with compressed air.

**IMPORTANT: Bearings MUST NOT be dried by rotating with compressed air. Damage to the polished surfaces can occur.**

5. Preventing Corrosion and Rust on Cleaned Parts:

- a. Apply axle lubricant to cleaned and dried parts that are not damaged and are to be immediately assembled.
- b. If parts are to be stored, apply a special corrosion and rust preventing material to all surfaces. Also, cover the parts with a special paper or other material that prevents corrosion and rust.

6. Inspecting Parts:

It is important that you make a careful and complete visual inspection of all parts before assembly starts. Check all parts for wear or damage and repair or replace them as required. Replacement of these parts now will prevent failure of the assembly later.

7. Repairing and Replacing Damaged Parts:

Replace all parts that are worn or damaged. The following are some examples of when to repair or replace parts.

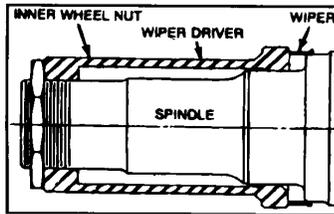
- a. Replace any fastener if its head has rounded corners.
- b. Replace any washer that is damaged.
- c. Replace all gaskets, oil seals and grease seals when you assemble the component.
- d. Repair all nicks, mars and burrs from parts having machined or ground surfaces. Use a fine mill file, India stone, emery cloth or crocus cloth for this purpose.
- e. Clean and repair the threads of all fasteners and holes. Use a die or tap of the correct size, a fine mill file or an India stone for this purpose.

**IMPORTANT: Threads must be clean and not damaged so that accurate adjustments and torque settings can be made.**

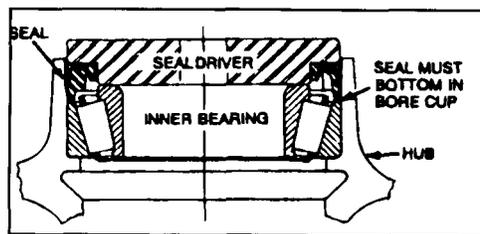
- f. DO NOT REPAIR DAMAGED AXLE BEAMS OR COMPONENTS BY WELDING. Repair welding will remove the heat treatment of the parts. Repair welding only can be made if the crack or damage is within the weld material of an attached part.

**Assemble and install wheel end components**

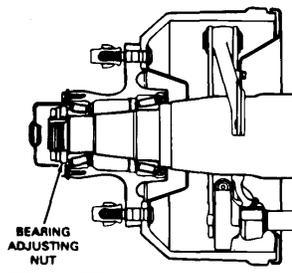
1. Assemble the brakes if necessary. See the Manufacturer's Maintenance Manuals for complete instructions:
2. Release the slack adjusters or the automatic adjusting bolt so that the brakes retract and the drums or rotors will clear the linings.



3. If necessary, install a new seal wiper on the spindle. Assemble the widest edge of the wiper evenly over the wiper journal and use a seal driver or installation sleeve of the correct dimension to install the wiper. The outer edge of the wiper must be installed level with the bearing journal. (See Figure above)
4. Replace the worn or damaged bearings. If the hub is grease lubricated, pack the bearings with grease, forcing the lubricant in the cavities between the rollers and cage from the large end of the cone.
5. Install the inner and outer bearing cups and cones in the correct bores in the hub. The bearing cups must be pressed tight against the shoulders in the hub.



6. Use a seal driver of the correct dimension to install the new seal in the hub until it is against the bottom of the seal bore. DO NOT CONTINUE TO HIT ON THE DRIVER AFTER THE SEAL HAS TOUCHED THE BOTTOM OF THE BORE. (See Figure Above)
7. If the hub is grease lubricated, pack the hub between the two bearings with grease, up to the smallest diameter of the bearing cups.
8. Install the hub and drum or hub and rotor on the spindle. You must be careful not to damage the oil seal or bearings.
9. Install the wheel bearing adjustment nut and adjust the bearings as shown in Wheel Bearing Adjustment. (See Figure Below)



10. Install the lock ring, jam nut and setscrew as shown.
11. Install the gasket, hubcap and cap screws. Tighten the cap screws to 15-20 Ft. Lbs. (20-27 Nom).
12. If the hubs are oil lubricated, fill the hub with the correct type of oil to the bottom edge of the plughole in the hubcap. Rotate the hub and check the oil level again.
13. Repeat steps 1 through 12 on the opposite wheel end.

14. Install the wheels or tires and rims. Follow the torque specifications supplied by the wheel manufacturer.
15. Adjust the brakes. (See Brake Adjustments.)

### Wheel bearing adjustment

Bearing wear can cause the adjustment of the wheel bearing to loosen.

The adjustment of used wheel bearings can be checked with a dial indicator using the following procedures:

1. Remove the hubcap and gasket.

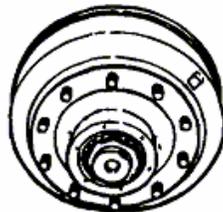
**NOTE: On oil lubricated wheel ends, put an empty container under the hubcap to receive the leaking oil when the hubcap is removed.**

2. Attach the base of the dial indicator to the end of the spindle with the stem pushing against the outer machined face of the wheel hub.
3. Check the wheel bearing endplay by pushing in on the wheel assembly while you rotate the wheel forward and backward until the indicator does not change. Make a note of the indicator reading.
4. Now check the endplay by pulling out on the wheel assembly while you are rotating the wheel forward and backward until the indicator does not change. The difference between the two readings is the wheel bearing end play.

If the wheel bearing end play is:

1. Less than .012" (.30 mm), the adjustment is acceptable.
2. Greater than .012" (.30 mm) but less than .040" (1.0 mm), the bearings can continue to be used if the bearings are not damaged.

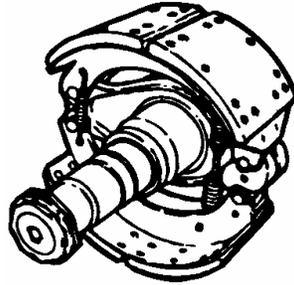
### Adjustment procedures



1. On wheel ends with single nuts, use the following procedures:
  - a. Remove the hubcap and gasket.

**NOTE: On oil lubricated wheel ends, put an empty container under the hubcap to receive the leaking oil when the hubcap is removed.**

- b. Tighten the adjusting nut to 100 Ft.Lbs. (135 N.m) torque while rotating the wheel to check that all the bearing surfaces are in contact.
- c. Loosen the nut completely and then tighten the nut to 50 Ft. Lbs. (68 N.m) torque. Then loosen the nut 1/8 to 1/6 turn.
- d. Install the cotter pin or lock ring to lock the nut in place. Bearing endplay must be within the limits of .001" and .005" (per TMC - RP618)



2. On wheel ends with double nuts (See Figure Above), use the following procedures:

- a. Remove the hubcap and gasket.

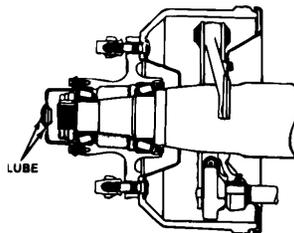
**NOTE: On oil lubricated wheel ends, put an empty container under the hubcap to receive the leaking oil when the hubcap is removed.**

- b. Tighten the adjusting nut to 100 Ft.Lbs. (135 N.m) torque while rotating the wheel to check that all the bearing surfaces are in contact.
- c. Loosen the nut completely and then tighten the nut to 50 Ft. Lbs. (68 Nom) torque. Then loosen the nut 1/6 to 1/4 turn.
- d. Install the nut lock ring and the jam nut. Tighten the jam nut to the correct torque as shown in the chart below.

NUT SIZE	FT. LB. TORQUE	
	Minimum	Maximum
<b>1 1/8" and 2 5/8"</b>	<b>200 (271 N.m)</b>	<b>300 (407 N.m)</b>
<b>2 5/8" and over</b>	<b>250 (399 N.m)</b>	<b>300 (407 N.m)</b>

- e. Install the setscrew into the open hole in the lock washer to prevent the loosening of the jam nut. Bearing end play must be within the limits of .001"(.03 mm) to .005"(.13 mm).

### Oil lubricated bearings



Lubricants: 80W-90

### Lubrication frequency

Check every 1000 miles (1,600 km) and change when oil becomes contaminated, seals are replaced, new brake lining is installed or one time a year.

### Lubrication procedures

#### Oil:

1. Fill the hub with oil to the bottom edge of the plug hole in the hubcap.

2. Rotate the hub and check the oil level again.
3. Replace the plug for the filler hole. (See Figure Previous Page)

**Grease:**

1. Only NLGI 000-00 semi-fluid (per TMC RP622)

**Axle alignment**

Use the following procedures to check the alignment of trailer axles:

**SINGLE AXLE TRAILERS**

1. Raise or lower the fifth wheel to put the trailer in a level position.
2. Remove the outer wheels or the outer tires and rims, depending on the wheel equipment.
3. Remove any parts from under the chassis that can interrupt measuring the distance between the king pin and the ends of the axle.
4. Attach a steel measuring tape to a hook and the hook over the kingpin.
5. Measure the distance "A" and "B" from the king pin to the ends of the axle. The difference between the "A" and "B" measurements must not exceed 1/8" (3.2 mm).

**TANDEM AXLE TRAILERS**

Measuring the alignment of tandem axle trailer is not very different from the measuring procedure for single axle trailers. The trailer must be correctly positioned before making the necessary measurements.

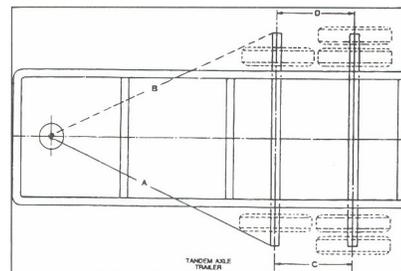
1. Move the trailer forward and backward over a level floor, two or three times with the last movement forward, to permit the suspension to become correctly aligned to center the front and rear wheel tracks.
2. Raise or lower the fifth wheel to put the trailer in a level position.
3. Remove the outer wheels or outer tires and rims.
4. Remove any parts from under the chassis that can interrupt measuring the distances between the king pin and the ends of the forward axle.
5. Attach a steel measuring tape to a hook and the hook over the king pin.
6. Measure the distances "A" and "B" from the king pin to the ends of the forward axle. The difference between "A" and "B" measurement must not exceed 1/8" (3.2 mm). See Page 31.
7. Measure the distance "C" and "D" between the front and rear axle centers.
8. The differences between "C" and "D" measurements must not exceed 1/16" (1.6 mm).

**HOW TO CORRECT THE ALIGNMENT OF AXLES**

To correct alignment measurements that are not within the limits, inspect the Suspension for worn, broken or loose parts. Adjustment to the suspension, and the replacement of worn or broken parts, must be made to put the axles into alignment.

**IMPORTANT: Carefully follow the service instructions made available by the suspension manufacturer when you work on this component.**

The limits of 1/16" (1.6 mm) and 1/8" (3.2 mm) are the maximum limits for correct alignment of the axles. These small limits make accurate measurements important



## ***Care and maintenance of springs***

The leaf springs are working, flexible components and the main supporting members of a trailer suspension. They cushion the trailer and its load from various road shocks and provide necessary stability. A reasonable amount of care and maintenance is required to provide satisfactory service life. The springs must be tightly clamped to the spring seat and the axle to prevent any movement between V-bolts, which results in misalignment of axles. It is important that spring V-bolts be checked for proper tightness regularly during the first few months of service or until such time as the spring leaves wear-in with usage. Thereafter, they should be checked periodically as a matter of normal maintenance.

To obtain maximum service from the springs on your trailer, the following steps should be followed.

1. The V-bolts are adjusted to the suspension manufacturers' specifications before delivery of your semi trailer. They should be retorqued at the end of 30 days of operation, but no later than 45 days. We suggest that you return the unit to your PRATT for this adjustment.
2. Retorque V-bolts at regular maintenance intervals. A loose V-bolt permits play that results in breakage. Checking the V-bolts frequently is a wise precaution since all V-bolts tend to stretch. All torquing should be with dry threads.
3. Broken spring leaves between the U-Bolts indicate loose U-Bolts. Replace the spring at the earliest opportunity.
4. Never replace only one leaf of a multiple spring. Replace the complete spring. Replacing a single spring leaf may often be false economy. If one leaf is broken, the rest of the leaves have fatigued and are probably ready to break also.
5. Always use hardened steel washers with-bolts and nuts. This provides uniform torque on the U-bolts.
6. Always replace U-bolts as a pair for best performance.
7. Cracked or broken springs outside the U-bolt are an indication of:
  - a. Repeated overload, or
  - b. Spring assembly has completes its normal life cycle. In either case, the entire spring assembly should be replaced.

Remember, failure to retorque the U-bolts can result in improper axle alignment, spring breakage, abnormal wear, and/or unsafe operating conditions. Make sure your suspension is always safe and road ready.

## ***Air ride suspension maintenance***

### **Checking trailer ride height**

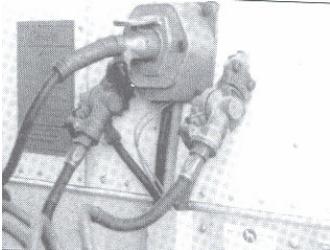
#### **PREPARATION**



1. Place the trailer on flat, level ground that is free of stones and debris.
2. Check air pressure in tires. If necessary, inflate tire(s) to proper pressure (figure 2).



3. Maintain pressure in the air system (figure 3).



### DESIGNED KINGPIN HEIGHT MEASUREMENT

1. Check the ID tag on the front bulkhead or contact the trailer manufacturer for the designed kingpin height.
2. Measure the trailer's kingpin height. The trailer may or may not be connected to a tractor during the measurement.

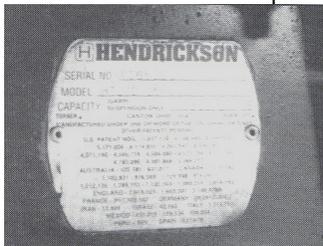
**NOTE: When the trailer and tractor are connected, the tractor's 5th wheel height must be equal to the designed kingpin height of the trailer. If the 5th wheel height does not equal the kingpin height, then disconnect the tractor from the trailer.**

**NOTE: When the trailer is not connected to a tractor, measure the distance from the ground to the kingpin mounting plate.**

3. If necessary, adjust the landing gear to place trailer at the designed kingpin height.
4. Verify the measurement of the kingpin height on the other side of the trailer.

### DESIGNED RIDE HEIGHT MEASUREMENT

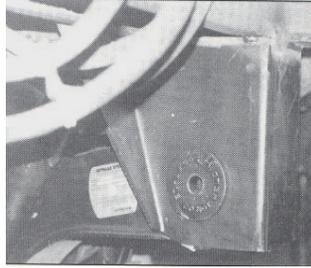
1. Locate the suspension ID tag on the front of the HT hanger, the front cross member of the HS slider bogie, or on the inside of the suspension beam for the Intraax (figures 4a for HT series and 4b for



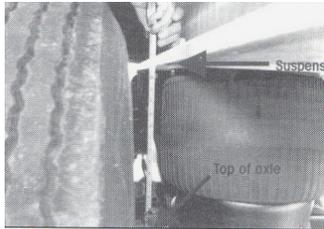
Intraax).

2. Check the indicated (underlined> number in the following examples to find the designed ride height.  
HT product: HT230- I4-00 I  
HS slider: HS190T-14-80 I A

Intraax: AA230TBA.1 I4A1A01...



3. Measure the ride height (figure 5). If necessary, adjust the height control valve. The designed ride height is the distance from the center of the axle to the mounting surface of the suspension.



**NOTE: To determine the ride height, add half of the axle's diameter to the measurement shown on the tape measure. For example, a 5" diameter axle would have 2-1/2" added to the measurement.**

#### **HEIGHT CONTROL VALVE ADJUSTMENT**

1. Realign the position of the lever arm for minor adjustments of the height control valve.
2. Remove the plastic locating pin.
3. Push the control arm up to raise or down to lower the ride height until the distance between the vehicle frame and the center of the axle matches the suspension ride height.

**NOTE: There must be a minimum of 80-psi air pressure in the air reservoir to open the brake protection valve and allow air to flow through the height control valve.**

**NOTE: A 5 to 10 second delay may occur before the height control valve will allow air to or from the air springs.**

4. After adjusting the ride height, reinsert the plastic locating pin into the adjusting block and bracket on the height control valve.
5. If addition a) or major adjustments are necessary, adjust or replace the linkage.

**NOTE: There are three (3) types of linkage for the height control valve.**

- a. Clamped-Type Linkage: Trim rod, if required, and insert into both the clamps and link ends. Tighten clamps as required to hold the height control valve in its neutral position when the suspension is at proper ride height.
- b. Bolted-Type Linkage: Trim, if required, and fasten both links together with the supplied fasteners as required to hold the height control valve in its neutral position when the suspension is at designed ride height.
- c. Welded-Type Linkage: Trim and weld both links together as required to hold the height control valve in its neutral position when the suspension is at proper ride height.

6. If minor adjustment is necessary, loosen the 1/4" lock nut located on the control arm, which will allow the control arm to oscillate approximately +/-1". Retighten the 1/4" adjusting lock nut from 2 to 4 ft-lbs.

### **Air brake maintenance**

Successful maintenance of the air brake system depends upon systematic inspection and repair at regular intervals. The length of these intervals depends upon the trailer operation and mileage.

Adjustments, inspections, and minor repairs that can be performed by you are listed below. These procedures must include immediate replacement of all worn or damaged parts.

#### **Reservoir tank**

The first requirement in an air brake system is clean air at proper pressure. The operator must open the drain cock on the underside of the reservoirs until all moisture has escaped. Drainage should be done periodically to remove water the sludge from the system. This is especially important in cold weather to forestall freezing and obstruction of the lines and valves. Each tank must be drained completely to insure removal of condensation. After removing moisture, close the drain cock and inspect reservoirs for looseness or damage. Make sure all connections are tight and brake lines are properly supported.

#### **Gladhands**

Inspect gladhands to insure proper operation without obstructions. With the trailer connected to the truck tractor and air in the system, coat the gladhands and mounting with soapsuds to make sure there is no leakage. Be certain gladhands seals are in good condition and not saturated with grease, oil or other foreign material. We recommended annual replacement of gladhands seals.

#### **Brake tubing, lines, fittings & hoses**

Visually inspect brake lines and hoses for loose connections, chafing, cracks, breaks, cuts, bruises, broken-out sections and deterioration. Replace immediately upon first sign of the above. Exercise extreme caution when working or welding around nylon tubing, if so equipped. It is recommended that tubing in areas where welding operations are performed be removed prior to welding operations, and reinstalled after welding is completed. If tubing removal is not practical, the tubing must be shielded from welding sparks and/or heat damage.

#### **Service and spring brake chambers**

Visually check air chamber clamp bands and mounting nuts for tightness. Torque chamber mounting nuts 75 to 100 ft. lb. Check chambers for damage or dents and sign of leaks.

## **CAUTION!**

Disassembly and repair of any spring brake is a dangerous and complex task, which should not be undertaken by an inexperienced mechanic. Special tools and information are required if serious personal injury is to be avoided. Refer problems of this sort to **Pratt**

#### **Air valves**

Inspect all air valves for leaks. If excessive leakage is found, the valve must be repaired or replaced. We recommend that air valves be replaced when necessary with new or rebuilt valves. Replacement maintenance and seal kits are available from Your PRATT Dealer. Call 1-800-546-7728 for the Pratt authorized Service Center nearest you. Inspect brake drums. Any accumulation of mud, dirt or rust on the drums should be removed. Any broken or cracked drums should be removed from service.

#### **Brake lining**

Inspect and check the brake lining thickness. Brake lining must be replaced if excessively worn or if coated with oil, grease, or foreign material.

## ***Hydraulic system maintenance***

### **Telescopic cylinder**

Check your cylinder periodically for oil leaks. A damp to light film of oil on the cylinder indicated good cylinder operation. After numerous cycles of the cylinder, a small accumulation of oil may be noticed and should not be mistaken for leakage around the stage packing.

The special recycling valve that is equipped on this system allows the tank to be completely full. The tank may be from  $\frac{3}{4}$  full to completely full. Do not let the fluid volume go below  $\frac{3}{4}$  full.

It is recommended that field service repairs to the cylinder be limited to adjusting packing. If other damage is apparent, contact **PRATT**.

### **Cylinder sleeve**

The cylinder sleeve should be checked periodically for damage. Any burrs or scratches found should be removed with a honing stone or emery cloth to prevent damage to the packing assembly.

### **Fittings, hoses and pipes**

Visually inspect fittings, hoses, and pipes for leaks, abrasions, crimping, breaks, cracking, or other deterioration. Replace immediately if any of the above signs of deterioration are visible.

## ***Lighting maintenance***

### **Lights and wiring**

The lighting system for your trailer is a heavy duty, 12-volt, 30 amp system. The 7way receptacle is located on the front of the trailer near the gladhands. The jumper cable from the truck tractor plugs into the trailer's 7-way receptacle to complete the electrical circuit to the trailer. The receptacle is equipped with a hinge type cover to protect it from exposure to dirt and water. Trailer lights are controlled by the same light switches that control the lights on the truck tractor.

Proper maintenance of the lighting system requires periodic cleaning of lamps and reflectors to assure maximum visibility of the tractor and trailer. Use a damp cloth to wipe the lenses. A dry cloth will cause the dirt to act as an abrasive and scratch the lenses. A daily cleaning can well be worth the time invested, plus, it is a good safety practice. Maintenance of the lighting and wiring system consists of an occasional inspection to see that all wiring connections are tight. Make sure the lighting units are securely mounted, and that the wiring is not pinched or damaged. Inspect lights, couplings, and sockets for their serviceability and replace as required.

# **CAUTION!**

CONNECTOR WIRING CHANGE: Notice to ALL Tractor Trailer Owners & Users: Federal Motor Vehicle Safety Standard No. 121, Air Brake Systems, was amended by the National Highway Traffic Safety Administration of DOT to require that truck tractors manufactured on or after March 1, 1997 provide constant power for a trailer's antilock brake system (ABS). Some manufacturers will provide this feature before the effective date.

These tractors using a single 7-way electrical connector will have constant power for ABS on the center pin when the key switch is on.

PRATT, as well as other tractor-trailer manufacturers and users who presently use the center pin for auxiliary power to equipment other than trailer ABS (for example, dome lights, backing light, bottom dumps, sliding undercarriages, air ride dump valves, etc.) will be affected by this change.

In certain uses of this constantly powered center pin connector, unexpected or unintended activation of this equipment may be hazardous or result in personal injury.

BEFORE connecting your trailer to a tractor, MAKE SURE that the constantly powered center pin WILL NOT UNINTENTIONALLY TURN ON TRAILER EQUIPMENT. If you have any questions about your present wiring,

or how to rewire your vehicles, you should contact the tractor manufacturer, auxiliary equipment manufacturer, and/or Pratt at 800-546-7728

### **Turn signal and hazard flasher system**

The turn signal lever and hazard flasher switch are located in the truck tractor. To operate the turn signals, the ignition switch must be in the ON position. The hazard flasher system is operated independently of the ignition switch in most cases. All turn signal lights can be made to flash simultaneously by pulling out the activating knob on the hazard flasher switch.

Two flasher units are used for the trailer. One unit is used in the turn signal circuit, and the other for the hazard flasher system located in the truck tractor. The most common problems with the turn signals and hazard flasher system are defective flashers, burned-out bulbs, blown fuses, defective switches, or faulty wiring.

### **Reflectors**

Reflectors are located on the front, sides, and rear sections of the trailer. They should be kept clean by wiping with a damp cloth. Replace any reflectors that are cracked or broken.

### **Stop, tail, turn, marker & identification lights**

To remove lens and bulb, insert a screwdriver under the lens flange and pry lens out of the soft housing. Disconnect from plug and wire assembly. To replace lens and bulb, reconnect the plug and wire assembly, tilt the lens slightly, and push lens into soft housing.

### **License lamp**

To remove license and bulb from the license lamp, remove three (3) screws and remove license cover. Follow same instructions as for the clearance, marker, and identification lamps above. Install cover with three (3) screws.

## ***Additional Maintenance requirements for Rollerbed Trailers***

Some required maintenance is directly the result of the trailer being a ground level rollerbed. These are additional items that require attention.

1. Make sure all working parts of the roller locking device are well fastened, lubricated and in good working order. A dry lubricant is highly recommended.
2. Keep all bearings working properly. Also keep the set screws tight on the bearings to keep the rollers adjusted properly in relation to the locking pins. These bearings are sealed and do not require lubricant. The rear deck roller and ground rollers utilize a bronze Teflon bushing that may require grease about every 3 months.
3. Check slider pads on the slide bogey. When they wear off, replace them to keep the bogey and the trailer main frame from sliding steel on steel. Parts can be ordered through ASI Commander parts department.
4. Lubricate, about once a month, inside the main frame where the slide bogey touches the main frame from the front stop blocks to the back stop blocks. **DO NOT USE GREASE** on the slide pads or the bottom flange of the main frame. All expandables require dry lubricant on the top flange of the inner beam once a month.

**NOTE:** A dry lubricant is highly suggested for these working parts especially in a cold climate and may even be used on the slider pad area.

1. The articulating Arm of the Hydraulic Neck pivots inside a sleeve under the main frame of the trailer & grease zerks are available for lubrication.
2. Insure that the ground wires are clean and are well contacted. DC power system requires proper grounding for maximum performance.

## **Lubrication**

### ***Note on lubrication***

Use a standard, LP-2 chassis grease for all for all lubrication points having fittings. Apply grease with a suitable pressure type grease gun that fits the lubrication fittings. The gun may need a flexible extension on it to enable you to reach certain fittings.

Clean each fitting and wipe off old accumulated grease before applying fresh lubricant.

When old grease is forced from the joint, the part has been adequately lubricated. Replace faulty or broken lubrication fittings. Use rags to clean all lubrication fittings before applying lubrication. The person doing the lubricating has an opportunity to inspect parts of the vehicle, which are relatively inaccessible. Any noticeable leaks of grease, excessive rusting of the chassis parts, broken, bent or damaged bolts and brackets, or other defective members should be reported for corrective action.

### ***Wheel bearings and hubs***

The wheel bearings on your semi trailer are oil lubricated. Oil lubricated bearings do not normally require service as they are continually lubricated. Pratt recommends a visual inspection of the lubricant every 1,000 miles.

Change when oil becomes contaminated, seals are replaced, new brake lining is installed, or once a year. To check the lubricant level, make sure the trailer is on level ground. Wipe the hubcap clean with a rag and inspect the lubricant level. The hub should be filled with all-weather oil SAE 80W-140 (or equivalent) to the level indicated by a mark on the hubcap. MINIMUM LEVEL ALLOWABLE - 1/4-inch mark. If the lubricant level is low, remove the center plug and add oil to proper level. DO NOT OVERFILL.

### ***Landing gear (two speed)***

Under normal operation conditions, your landing gear should never require lubrication. However, grease zerks are provided in the leg and the gearbox housing if necessary.

### ***Brake camshafts***

Lubricate the brake camshaft bearings with chassis grease. There are four fittings located on each axle.

### ***Brake shoes***

When brakes are relined, apply an even coat of lubricant or equivalent between contact face of anchor pin brushing, brake shoe area, and spider faces. Coat anchor pin completely. Wipe off all excess grease.

### ***Brake roller and cam heads***

When the wheels and hubs are removed, place a light film of lubricant on CAM roller follower shafts, journals, and the top and bottom surface of the S-cam.

### ***Suspension***

Suspensions used by PRATT do not require lubrication. Refer to the suspension specification sheet provided by the manufacturer for details on the correct maintenance of your suspension.

Check the fifth wheel locking jaws or hook (depending upon the model) and support brackets for lubrication fittings and lubricate as required.

### ***Hydraulic oil reservoir***

Whenever the hoist is lubricated, the condition and level of the oil in the reservoir tank should be checked. Dirty oil is the main cause of expensive pump and cylinder repairs. Dirty oil is detectable and should be replaced before considerable damage is done to the system. A sample from a dipstick will show its condition. Place a drop of the sample on a blotter, cloth or paper. Any noticeable residue means dirty oil.

### ***Reservoir level check***

Measure oil level with the trailer hoist cylinder in the center position. The trailer must be hooked up to the truck tractor. Remove the reservoir filler cap and inspect oil level. Use care in filling reservoir so that dirt or other foreign material does not get into the hydraulic system. Rectangular tank - fill to two inches below flange of reservoir. Cylinder tank - fill to four inches below flange of reservoir.

Do not overfill. Install reservoir filler cap.

There must be enough space to hold all the oil when the cylinder is retracted, with some space to allow for expansion when the oil is hot.

### ***Draining oil reservoir***

The hydraulic oil should be changed at least once a year or sooner if it becomes contaminated. Drain the system by removing the reservoir drain plug. Catch all oil in a suitable container. Reinstall the plug and fill reservoir to required level with the proper type of grade of oil.

### ***Oil recommendations***

- Use AW-46 oil for the hydraulic system.
- Detergent oils are not recommended because the additives attack the cylinder packing.
- Never use crank case draining, transmission oil, kerosene, fuel oil, water, or any non-lubricating fluids.
- Never thin oil with kerosene or fuel oil in winter operation. Either of these will cause packing to swell resulting in plungers sticking. Good low viscosity hydraulic oils are available on the market.

## **Trailer maintenance schedule**

### ***Trailer maintenance services required***

In addition to the pre-trip daily inspection, the services listed below are Pratt's suggested maintenance service interval guide for keeping your trailer in peak operating condition. These suggested service intervals will add thousands of operating miles and many years of trouble-free service to the life of your PRATT trailer.

### **SCHEDULED MAINTENANCE SERVICE**

#### **Each 5,000-Miles or Once a Month**

#### **(Whichever comes first)**

- Check kingpin and upper coupler.
- Check electrical and skid control (if applicable) for proper operation.
- Check secondary and parking brake system (if applicable) for proper operation.
- Check tires and wheels. (Torque wheel nuts to proper torque).
- Check axle oil level, add oil if required.
- Check wheel seals for leaks.
- Inflate tires to proper pressure.
- Drain moisture from air reservoirs
- Check accessories operated with air from brake system.
- Inspect brake system glad hands, hoses, tubing, chamber valves, and reservoirs for leaks or damage.
- Check chamber push rod travel and adjust brakes.
- Check lining thickness.
- Visually check axle alignment.
- Inspect splashguards.
- Check tire carrier, mounting and lock chain.
- Check hydraulic system for damage or leaks.
- Inspect U-Bolts and torque to specification.

**Each 20,000-Miles or Four Months  
(Whichever comes first)**

- Inspect brake drums and wheels.
- Inspect brake linkage and shoes.
- Inspect brake lines and hoses for chafing, looseness and deterioration.
- Test brakes for action, side pull, and synchronization.
- If equipped with skid control, run complete system check.
- Make soap suds test for air leaks in entire air system.
- Check axle alignment.
- Check undercarriage components.
- Check springs, hangers, and bushings.
- Inspect kingpin for excess wear, rough edges, looseness, broken out areas and cracks.
- Clean kingpin plate and all welds.
- Check all bolts, nuts and rivets for looseness.

**NOTE: All maintenance periods are recommendations based on average operating conditions. A trailer operated principally on gravel or dusty roads, or through unusual amounts of water may require maintenance more frequently and should be serviced as required.**

<b>NONSCHEDULED MAINTENANCE SERVICE REQUIRED</b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
Wheel removed, relining brakes, or if leaking oil	Replace wheel seals
Wheel removed, relining brakes, seal leaks or excessive end play	Adjust and clean wheel bearings
Tires show uneven wear	Inspect and rotate wheels
Wheel removed or relined	Lubricate earn heads, rollers, and anchor pins
Dog tracking or excess tire wear	Align axles
Annually, or if leaking	Replace gladhand seals
5/16" thickness or less to be replaced	Reline brakes
At brake reline, or more often if hard service	Diaphragms in air chambers
As Required	Steam clean complete chassis and inspect

Observe the day-to-day care recommendations. Watch for the symptoms described under Nonscheduled Maintenance above, and have any needed adjustments made promptly at your local **PRATT**. USE ONLY the recommended lubricants and parts conforming to **PRATT** specifications.

# Troubleshooting

## Analyzing & diagnosing trailer service

To directly assist in keeping your trailer on the road and rolling, the following troubleshooting guide has been prepared for your convenience. You can avoid serious delay and downtime in servicing your trailer if the cause of the trouble can be diagnosed and corrected quickly by you.

### **Spring parking brakes**

Certain points are covered in the Trouble Shooting Chart, which apply to service brakes and spring parking brakes. No effort is made to completely cover the entire air brake system, only the points which relate to spring parking brakes.

#### **(A) INSUFFICIENT SERVICE BRAKE APPLICATION WHEN SERVICE PEDAL IS DEPRESSED**

1. Restricted airflow or low air pressure to service chamber.
2. Worn Brake Lining or drums worn excessively.
3. Improper adjustment on slack adjuster and chamber push rod (earn brakes).
4. Automatic adjusters not operating properly on wedge foundation brakes.
5. Improper angle for slack adjuster and service push rod (earn brakes).
6. Bent or broken earn brackets or chamber mounting brackets (earn brakes).
7. Bent or broken chamber tubes (wedge brakes).
8. Broken non-pressure halves.
9. Mounting tube loose on wedge chamber to foundation brake.
10. Improper size actuators.
11. Ruptured diaphragm.
12. Air leaks in lines, fittings or valves, and at clamp ring.
13. Wrong wedge angle (wedge brakes).

#### **(B) INSUFFICIENT SPRING BRAKE APPLICATION**

While most of the causes listed for insufficient service brake applications will Apply here; there are a few more, which we should cover.

1. Spring brake not properly reset for full stroke.
2. Ruptured diaphragm or seal in spring brake section.
3. Broken spring.
4. Insufficient size of spring brake or proper output force.

#### **(C) EXCESSIVE LEAKAGE- SERVICE BRAKES APPLIED**

1. Leaking brake chamber diaphragm.
2. Leaking hose - tube - fittings.
3. Faulty valves
4. Clamp ring improperly installed.

#### **(D) EXCESSIVE LEAKAGE- SPRING BRAKES RELEASED BY AIR**

1. Leaking diaphragm or main seal in spring section.
2. Leaking push rod seal
3. Leaking hose - tube fittings.

#### **(E) DRAGGING BRAKES**

##### **(Service)**

1. Broken return spring in service section.
2. Service application air not exhausting properly or fast enough - clogged ports.
3. Restricted or collapsed hose or tubing
4. Broken brake shoe retracting spring
5. Camshaft linkage binding.

##### **(Spring Brakes)**

1. Leaking diaphragm or seal in spring brake section.
2. High hold-off pressure in spring brake section.

3. Spring brake not properly released manually.
  4. Reduction of service system pressure causing spring brakes to partially apply.
  5. Broken return spring in spring brake section (double diaphragm type).
- (F) SERVICE BRAKES APPLY WHEN SPRING BRAKES ARE RELEASED BY AIR**
1. Leaking push rod seal between spring brake and service section.
  2. Improper plumbing.
- (G) LEAK THRU SERVICE EXHAUST PORTS· SPRING BRAKES RELEASED BY AIR**
1. Leaking push rod seal between spring brake and service section.
- (H) SPRING BRAKE WILL NOT RELEASE (NORMAL OPERATION)**
1. Insufficient air pressure.
  2. Air leaks in spring brake air system.
  3. Restrictions in spring brake air system.
  4. Ruptured diaphragm and/or seal in spring brake section.
  5. Broken spring causing malfunction.
- (I) SPRING BRAKES CANNOT BE MECHANICALLY RELEASED**
1. Release bolt stripped or broken.
  2. Release bolt and wedged nut locked together.

**Brakes**

<b>ABS Blink Code Diagnostic Guide A.B.S WABCO</b>	
0	No faults: System Okay. No action needed.
3	Sensor BU1: Cable break, short circuit or out of adjustment. Check sensor, sensor cable and cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damaged to the tooth wheels.
4	Sensor YE1: Cable break, short circuit or out of adjustment. Check sensor, sensor cable and cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.
5	Sensor BU2: Cable break, short circuit or out of adjustment. Check sensor, sensor cable and cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.
6	Sensor YE2: Cable break, short circuit or out of adjustment. Check sensor, sensor cable and cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.
7	Ext. Modulator (RD): Short to power, cable break or open, short to ground or cable damage, or ECU/valve Assemble Failure. Check ABS valve and cable. Replace as required.
9	Ext. Modulator (BU): Short to power, cable break or open, short to ground or cable damaged, or ECU/valve Assembly Failure. Check ABS valve and cable. <i>Replace as required.</i>
10	ECU/Valve Assemble Modulator (YE): Short to power, cable break or open, short to ground or cable damaged, or ECU/Valve Assembly Failure. <i>Check ABS valve and cable. Replace as required.</i>
14	Power Supply, ECU/Valve Assembly: Over or under voltage, current low, or internal failure. <i>Repair vehicle power supply, check vehicle voltage output and connector; check ECU's configuration.</i>
15	EMI Failure, ECU/Valve Assembly: Internal failure. <i>Replace ECU.</i>

Note: If the blink code indicated there are no faults, but the trailer ABS indicator lamp continues to come on and stay on when you apply the brakes to the moving vehicle, there is an intermittent fault that must be repaired. Refer to Maintenance Manual #33 "Expert Mode Diagnostics."

<b>BRAKES WILL NOT RELEASE</b>	
<u><i>Probable Cause</i></u>	<u><i>Remedy</i></u>

1. Low Air Pressure	1. Check air line connections & verify sufficient air in tank
2. Brake shoes bound up at cams	2. Lubricate brake-operating parts.
3. Brake hoses restricted	3. Replace hoses.
4. Brake out of adjustment.	4. Adjust brakes.
5. Damaged brake assembly.	5. Contact PRATT
<b>NO BRAKES OR INSUFFICIENT BRAKES</b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
1. Source of air supply shut off at Tractor	1. Push control valve IN
2. Low brake line pressure	2. Check air pressure gauge on tractor - Inoperative compressor
3. Brake lines between tractor and trailer not properly coupled	3. Properly couple brake lines
4. Reservoir drain cock open	4. Close drain cock.
<b>SLOW BRAKE APPLICATION OR RELEASE</b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
1. Lack of lubrication	1. Lubricate brake operating parts
2. Excessive travel in brake chamber	2. Adjust brakes
3. Restriction in hose or line	3. Replace brake hose or line
4. Defective brake valve	4. Replace brake valve
<b>BRAKES GRABBING</b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
1. Foreign material on brake lining	1. Reline brakes
2. Brakes out of adjustment	2. Adjust brakes
3. Brake drum out-of-round	3. Replace brake drum
4. Damaged brake chamber or internal assembly	4. See your nearest Pratt Service
5. Leaky or broken hose between relay valve and brake chamber	5. Replace or repair as required
<b>BRAKES DRAGGING</b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
1. Out of adjustment	1. Adjust brakes
2. Binding cam, anchor pins or chamber rod end pin	2. Lubricate and free up
3. Damaged brake assembly or brake drum out-of-round	3. Replace. See PRATT

### ***Wheels, Tires and Alignment***

<b><u>PULLING HARD</u></b>	
<b><u>Probable Cause</u></b>	<b><u>Remedy</u></b>
1. Broken or cracked spring	1. Replace complete spring
2. Uneven load distribution	2. Rearrange load for proper distribution
3. Weak spring	3. Replace complete spring
4. Axle out of alignment	4. Align axles
<b><u>WHEELS, HUBS AND TIRES</u></b>	

<u>Probable Cause</u>	<u>Remedy</u>
1. Tire wobble due to uneven rim clamping	1. Torque tighten all rim clamps
2. Burnt, worn or damaged wheel bearings	2. Replace bearings
3. Bent wheel or rim	3. Replace wheel or rim
4. Bent axle	4. Replace or straighten axle
<b><u>SCUFFED TIRES</u></b>	
<u>Probable Cause</u>	<u>Remedy</u>
1. Over and under inflation	1. Inflate to proper pressure
2. Excessive speed on turns	2. Reduce speed
<b><u>DOG TRACKING</u></b>	
<u>Probable Cause</u>	<u>Remedy</u>
1. Leaf spring broken	1. Replace complete spring
2. Bent axle	2. Replace or straighten axle
3. Axles out of alignment	3. Align axles
<b><u>LOSS OF TIRE AIR PRESSURE</u></b>	
<u>Probable Cause</u>	<u>Remedy</u>
1. Puncture in tire	1. Repair or replace tire
2. Faulty valve or valve core	2. Replace valve assembly or core
<b><u>UNEVEN TIRE WEAR</u></b>	
<u>Probable Cause</u>	<u>Remedy</u>
1. Over and under inflation	1. Inflate to proper pressure
2. Loose wheel stud nuts or clamps	2. Tighten wheel stud nuts or clamps
3. Loose or tight wheel bearing adjustment	3. Adjust bearings
4. Axle bent or out of alignment	4. Straighten, align, or replace axle
5. Tires not properly matched	5. Match tires
6. Improper brake actuation	6. Correct brakes as required
7. Rapid stopping	7. Apply brakes slowly when approaching stop
8. High speed driving on turns	8. Reduce speed

### ***Landing gear; difficulty in turning handcrank***

<u>Probable Cause</u>	<u>Remedy</u>
1. Bent crank shaft	1. Straighten or replace shaft
2. Bent cross shaft	2. Replace shaft
3. Lack of lubricant or correct lubricant	3. Lubricate in accordance with lubrication chart
4. Gears or components damaged	4. Free up or replace
5. Jack screw nut jammed	5. Replace inner leg assembly

### ***Electrical System: Wiring, Fuses & Circuit Breakers***

<u>Probable Cause</u>	<u>Remedy</u>
1. Circuit breaker kicks off	1. Correct short. Splice or repair wiring
2. Wires burned	2. Replace wiring
3. Contact points dirty or corroded	3. Remove lamp unit and clean
4. Loss of ground at bulb	4. Repair as necessary

### ***Complete loss of trailer lights***

<u>Probable Cause</u>	<u>Remedy</u>
1. Broken main harness	1. Repair or replace wire
2. Blown fuse or breaker	2. Replace fuse
3. Broken ground lead between tractor and trailer	3. Check, repair or replace jumper cable if equipped
4. Loose or corroded connection in ground lead between tractor and trailer	4. Repair or replace

### ***Dim or Flickering Lights***

<u>Probable Cause</u>	<u>Remedy</u>
1. Battery on tractor not sufficiently charged	1. Charge battery
2. Damaged wire in jumper cable	2. Repair or replace wire
3. Dirty or corroded contact blades	3. Clean contact blades
4. Loose connection	4. Repair as necessary
5. Poor ground at socket	5. Repair as necessary

### ***Cylinder will not operate***

<u>Probable Cause</u>	<u>Remedy</u>
1. Insufficient oil level	1. Fill reservoir to proper level
2. Restriction of oil flow	2. Remove restriction
3. Pump is worn	3. Repair or replace pump
4. Hydraulic hose not connected	4. Connect a hose
5. Restricted control linkage	5. Check and repair linkage
6. Broken key or keyway in drive	6. Repair or replace key or keyway

### ***Cylinder will not hold***

<u>Probable Cause</u>	<u>Remedy</u>
1. Air in hydraulic system	1. Bleed system by making several cycles
2. Valve control level not in hold position	2. Check and repair linkage
3. Worn control valve	3. Replace or repair valve
4. Worn pump	4. Replace or repair pump

### ***Noisy Pump***

<u>Probable Cause</u>	<u>Remedy</u>
1. Air in hydraulic system	1. Bleed system of air
2. Restriction of oil flow	2. Drain tank and remove restriction
3. Insufficient oil supply	3. Fill reservoir
4. PTO running at excessive RPM	4. Lower PTO RPM's
5. Water in oil	5. Drain system and replace oil
6. Dirty or contaminated oil	6. Drain system and replace oil
7. Use of wrong viscosity or type oil	7. Drain. Replace with recommended oil
8. Worn or damaged pump	8. Replace pump









