

FRUEHAUF[®]

DESIGNED TO LAST

Quality | Load-bearing capacity | Strength | Safety | Value



OWNER'S MANUAL

OWNER'S MANUAL

Important data of your unit FRUEHAUF

OWNER _____

ORDER NUMBER _____

UNIT TYPE _____

MODEL _____

YEAR _____

SERIAL NUMBER _____

LOAD CAPACITY _____

TIRES _____

MEASURES _____

SUSPENSION TYPE _____

DELIVERY DATE _____

INDEX

- 5. MAINTENANCE PROCEDURE
- 7. TIRES CONTROL AND SELECTION
- 8. PROPER FITTING OF TIRES
- 11. MOUNTING OF TIRES
- 11. MAINTENANCE AND ADJUSTMENT OF BEARINGS
- 12. ADJUSTMENT OF WHEEL BEARINGS
- 13. AXLE ALIGNMENT
- 15. HENDRICKSON AIR SUSPENSION OPERATION
MANUAL
- 18. INSTALLATION OF AIR CONTROLS
- 19. AXLE ALIGNMENT
- 23. QUICK-ALIGN SYSTEM (FRUEHAUF STANDARD)
- 26. HEIGHT CONTROL VALVE
- 29. ADJUSTMENT PROCEDURE
- 31. CHECKING THE DRIVING HEIGHT OF THE TRAILER
- 32. DESIGN HEIGHT FOR COUPLING OF THE FIFTH
WHEEL WITH THE KING PIN
- 35. HEIGHT CONTROL VALVE ADJUSTMENT
- 37. ABS FOR TRAILERS
- 40. INTEGRATED ASSEMBLY OF THE ELECTRONIC
CONTROL UNIT (ECU) AND THE ABS RELAY VALVE
- 41. WHEEL SPEED PERCEPTION SYSTEM
- 42. GUIDELINES ON APPLICATIONS
- 43. MAINTENANCE OF AIR BRAKES
- 45. LUBRICATION
- 46. MAINTENANCE RECOMMENDATIONS
- 47. PERIODIC MAINTENANCE SERVICE
- 49. TORQUE TABLE (TIGHTENING TORQUE)
- 50. TABLE FOR MAINTENANCE SERVICE
- 52. RECOMMENDED PRACTICES
- 53. EXTREME OPERATING CONDITIONS

This maintenance manual describes the correct service and preventive procedures for the towing equipment manufactured by Fruehauf de México, S.A.de C.V., easing the inspection tasks that the driver and/or the owner must perform to properly maintain the vehicle and avoid expenses due to unproductive times due to repairs or misuse of the equipment.

We present to you a simple method to check and in some cases repair the most important components of the equipment, such as king bolt, wheels, rims, bearings, bearings, axles, pneumatic suspension, lights and brakes, as well as the recommended lubricants and how to lubricate the parts; also included are guides to carry out maintenance inspections in an orderly manner and finally, a quick diagnostic chart of faults that can be very useful for the driver and/or owner.

FRUEHAUF from Mexico, would like to emphasize that the warranty of the equipment it sells, as well as the performance thereof, is directly related to the application of the recommendations indicated in this manual.

For any questions or complaints, please contact the plant directly by phone or you can also write to:

servicioalcliente@fruehauf.mx and we will gladly assist you.

To find out the terms and conditions under which our Warranty Policies apply, as well as information about the maintenance of your unit, visit our website:

www.fruehauf.mx

“WE BEG YOU NOT TO LEAVE IT FOR LATER, AS THERE ARE THINGS THAT CAN SEEM VERY SIMPLE. HOWEVER, IF THEY ARE NOT CORRECTED, THEY CAN DAMAGE OTHER PIECES.”

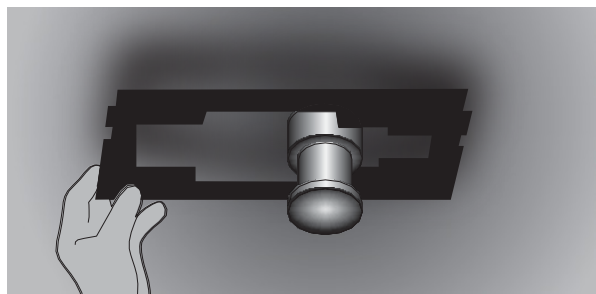


As any other Warranty, any repair or modification to the equipment, automatically voids it, unless there is a written agreement from the manufacturer. For more information, please refer to the Warranty Policy at www.fruehauf.mx

We firmly believe that, by applying this guide, you will keep your vehicle operating for much longer and in better condition. Remember that you have a friend at your FRUEHAUF dealer with whom you can consult any questions you have about the operation or operation of the semi-trailer.

MAINTENANCE PROCEDURE

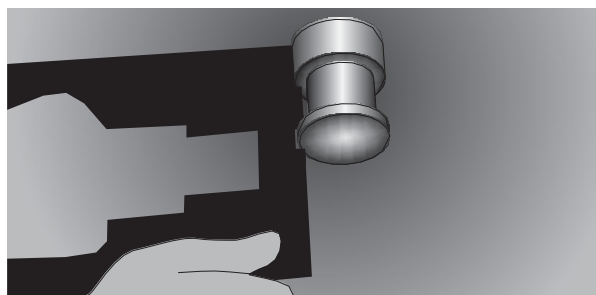
1. KINGBOLT:



Carefully inspect the kingbolt. If you notice wear, rough surfaces, burr or fractures of any kind, it should be changed immediately.

Check the iron, looking for BUCKLED surfaces; inspect wear, fractures and the trailer grip according to the recommendations of **SAE J2228**.

Any welding work on the plate must be carried out at the sites specified by the manufacturer and according to the procedures determined by the factory. We suggest that any repairs to the kingbolt or the iron be made at the authorized service workshops of the distributor or directly at the Service Workshop of the Coacalco Plant.



Under no circumstance, weld over the kingbolt to try to correct its wear. Since the kingbolt has been heat treated, any heating it undergoes will change its mechanical properties and its behavior cannot be predicted.



REMEMBER THAT FOR A SAFE OPERATION ANY DEFECTIVE KINGBOLT MUST BE REPLACED.

2. RIMS

The adjustment of the bolt nuts is checked according to the factory specifications in the pre-delivery service performed at the plant. This setting should be periodically inspected by the driver. During the normal operation of a unit, the adjustment should be checked at 100 km, after 500 km, and finally every 5,000 km. It is very important to adjust the nuts to the torque recommended by the factory.



Insufficient torque (tightening torque) in the wheel assembly can lead to damage to the rim, nut and cap, as well as damage to the rims. A very high torque can cause breakage of wheel bolts.



DO NOT FORGET TO SECURE THE CRANK IN PLACE, IN ORDER TO AVOID ACCIDENTS, SINCE IT IS LIKELY THAT IT CAN SPIN, CAUSING SERIOUS DAMAGE.

3. UNIVERSAL SUPPORTS (skids)

Specifications:

Quick to operate. Only 1.93 turns at high speed and 19.2 turns at low speed are required for each inch of travel; in other words, 29 turns at high speed to lower the leg 15”.

Lubrication of supports:

The skid supports and the gearbox are permanently lubricated at the factory. If you decide to add lubricant, you should only use the grease with No. STK 70046 from Fruehauf, for optimal performance. (Available in our Spare Parts Center)

TIRES CONTROL AND SELECTION

Despite the fact that our warranty does not cover tires, we consider that the investment made by our customers in that part of the unit is quite high and deserves good attention. For this reason, we allow ourselves to give some general recommendations from tire manufacturers.

The proper selection of tires has to do with the low cost over the service life. There are certain points that must be considered when choosing, taking care that all of them are fulfilled, since they are related to each other. Below, we mention some of them:

1. The type of vehicle and the operation to be performed should be considered.
2. The loads to which the tires will be subjected should be considered and never exceed the specified load capacity for each tire.
3. Take into account the speed and continuity of the operation.
4. Consider the type of drawing design that best suits the operation.
5. Buy tires of well-known brands and that ensure a good service.



CHECK THE CORRECT AIR PRESSURE OF THE TIRES ACCORDING TO THEIR SPECIFICATION.

PROPER FITTING OF TIRES

The correct mounting of the tires on your rims is of great importance. There are fully defined procedures for a good tire assembly recommended by most tire and rim manufacturers. Some practical tips for tire mounting are described below:

1. The tires are designed for a specific size and type of rim. If a larger rim is used, a larger rim should be used.

“Over-sizes create improperly supported over-loads and cause faster wear on the tire “footprint””

RIM FOR EACH WHEEL TYPE

Wheel	Disc Rim	Rim Inflation Pressure (PSI) (Cold Wheel) For Range (H)
Tubeless radial 11R22.5	8.25X 22.5	110
Tubeless radial 11R24.5	8.25X 24.5	110
Low Profile 295/75R 22.5	8.25 X 22.5	110
Low Profile 305/75R 24.5	8.25X 24.5	110

2. It is important to make sure that a new rim is tightened again after 100 to 200 km of installation.
3. Every newly assembled new tire should be visually checked, that the rim is not beaten or expired, in addition that the caps are not broken and that the nuts fit in the concavity of each rim hole.
4. Always use safety cages when inflating tires



The noise generated by the explosion of a tire can cause damage to the human ear.

5. Use rim parts that are of the same type.
6. Always keep the area where the tires are mounted clean. Make sure that all the surfaces of the rims are free of rust and dirt. Tires and rims last longer if they are clean.

TIRE INFLATION:

The excessive heat generated by tires that work at pressures lower than recommended and that carry cargo, causes deterioration in the tarpaulins of the tires and in turn decreases their resistance, which can cause bursting. This heat is due to bending and therefore the degree of heat increases with the increase of bending in the tires of the vehicle that is continuously driven at high speeds and is overloaded or with a very low tire air pressure.

High temperatures can reach dangerous levels.

When operating tires at temperatures above 120°C, the tire compounds weaken and loosen, if they hit the edge of a sidewalk, gaps or obstacles, they can suffer irreparable damage.

Excessive air pressure does not increase resistance or compensate for overload. In addition, it weakens the cord frame of the tire reducing before the blows of the road, the overpressure creates weakness in the cuirasses that become less resistant to impact. The presence of cracks increases and excessive stresses occur in the arches of the tires causing them to fail. Over-inflated tires are more vulnerable to cuts and punctures. Therefore, a large part of the life of a tire depends on how correctly it has been inflated; the following points should be taken into account:

- a. Check the inflation pressure on each trip with cold tires.
- b. Inflate to the recommended pressure for the maximum load being carried; for long trips you can increase the pressure by up to 10 lb/in² of pressure.
- c. Use as much as possible valve plugs that are of good quality, this protects the valve from dust particles. The covers must be made of heat-resistant material in order not to melt and stick on the valve.
- d. On new tires, check the pressure 24 hrs after inflating them. The growth of the rim can reduce the original pressure.
- e. Never reduce the air pressure to make the vehicle's handling smoother. This creates very high temperatures that destroy the tire.
- f. Never increase the pressure to compensate for overloading.
- g. We recommend using a self-inflating system. Check with your Sales Executive the right one for the suspension that your unit uses.

FITTING OF TIRES

- a. It is convenient to use tires of the same brand and the same size so that the flexibility of the tires is theoretically the same.
 - b. Tires of different "footprint" should not be mounted, because their rolling resistance is different.
 - c. Tires of the same type must be mounted.
 - d. Do not mount tires with a difference greater than 2.5 millimeters of remanence on the same axle.
-

MAINTENANCE AND ADJUSTMENT OF BEARINGS

The bearings of your equipment are lubricated with grease or oil. The life of the bearings of your unit, depends on three factors:

1. Correct lubrication (Fibrous grease) Multifak EP2M from Texaco or Oil type SAE G-80.
2. Cleaning.
3. Correct adjustment.

To check the condition of the bearings, the equipment must be empty and the brakes loose; lift the wheels of the equipment by placing the jacks as close to the wheels as possible;

Turn the wheels and check if they turn smoothly. If they do not turn, check if it is because of the brake pastes or because the bearings are too tight; misalign the pastes and test the rotation of the wheels again, if the wheel continues to be stuck it is due to over-adjustment in the bearings.

Check if there is excessive play at the end of the axles, this can be detected very easily by placing a bar like a lever under the wheel, raising and lowering the bar. If a movement is observed in the wheel, most likely the bearings are not properly adjusted and need replacement.

ADJUSTMENT OF WHEEL BEARINGS

1. The following procedure is for the correct adjustment of the wheel bearings:
 - a. Lift the trailer so that the wheels are not touching the ground. All brakes must be loose.
 - b. Use the wrench to loosen the lids of the wheel bearings and wipe off the grease.
 - c. Remove the key from the adjustment nut of the bearing.
2. If necessary take out wheels and bearings for inspection, carefully clean the bearings, nuts, hubs and axle tips with some solvent. Dry very well with dry air or with a clean cloth and protect the parts, so that they stay clean until the time of installation.
3. Install the wheel again.
4. To secure the bearings, adjust the nut to a torque of 125 lb-ft by turning the wheel in both directions in order to seat the bearings.
5. Return the nut a quarter turn until a hole in the axle is aligned with one of the nut to place the key. Install the key through the nut and the axle, bend the tip in a direction parallel to the shaft to avoid interference.
6. Lubricate the wheel cap seal ring and the wheel cap thread with oil or grease, tighten the wheel cap to a torque of 17 pound-feet.

The level of fat or oil should be checked regularly. If the wheel is removed to check brakes, check the seal, if it is not in good condition it must be changed. It is recommended to change the seals every 100,000 km.

AXLE ALIGNMENT

A correct alignment of the axles is of vital importance in the operation of your unit. This alignment should be checked periodically, especially if you have noticed uneven wear on the tires.

Critical parts of the suspension such as bushings, airbags, screws, etc. should also be checked.

To check the alignment of the trailer axles we suggest the following method:

1. It is essential that you park the trailer with the tractor in a flat and level place, start forward in a straight line about 2 meters at least twice, this to allow the set of trailer axles to adjust to the position in which they have been working. The trailer must be empty and the brake system must not be acting.
2. Lower the supports or skids of the trailer so that it is well level.
3. Unhook the tractor from the trailer, but leave the air connections so that the emergency brakes do not trip.
4. Once the trailer has been unhooked, the alignment is checked. Measure with a tape measure the distance between the king bolt and the tip of the pointed piece that is screwed on the bottom of each drum (distance A and B, the allowed tolerance between them is $\pm 1/8"$) (*See Figure 1*).

Repeat the operation for the right side of the axles and check if the measurements are equal, if they are not equal the axles should be aligned (See Figure 1).

5. If the front axle is aligned, measure the distances between the rear and front axles on the two sides. The distances D and C must be equal (See *Figure 1*).

If you need to align the trailer axles, release the screws on the adjustable tensioner and turn the tensioner to move the axle forward or backward as needed. Once the front axle is aligned, tighten the tensioner screws to a torque of 95 pound-feet to prevent any movement and check the alignment of the rear axle. The alignment of the rear axle must be carried out in the same way as the alignment of the front axle.

If the suspension has the QUICK-ALIGN system, it must use QUICK-ALIGN pivot bolt, which ensures the required torque.

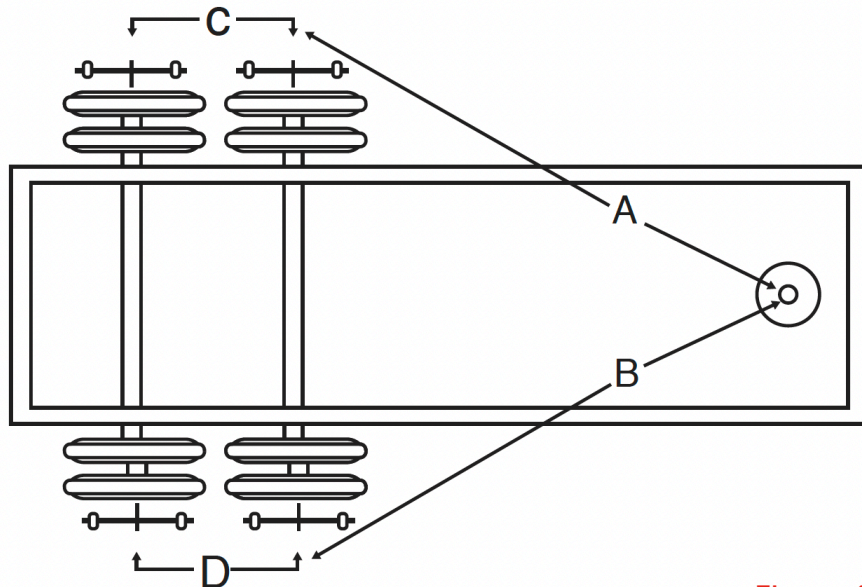


Figure 1

HENDRICKSON AIR SUSPENSION OPERATION MANUAL

The following instructions were described for the proper use of Hendrickson "HT" trailer suspensions.

IT IS IMPORTANT THAT THE INSTALLATION INSTRUCTIONS ARE READ AND UNDERSTOOD IN FULL BEFORE PROCEEDING TO INSTALL A SUSPENSION.

It is assumed that the chosen suspension is appropriate for the desired application (taking into consideration the ride height, axle capacity, axle travel, distance between them). As an additional information, in the correct selection of your suspension, check the technical guide of trailer air suspensions or contact our FRUEHAUF Service Workshop.



The use of welds on some of the suspension components is not allowed except where Hendrickson specifies it in his procedures (for example, assembly of the beam to the axle, on the alignment collar and from the hanger to the chassis).



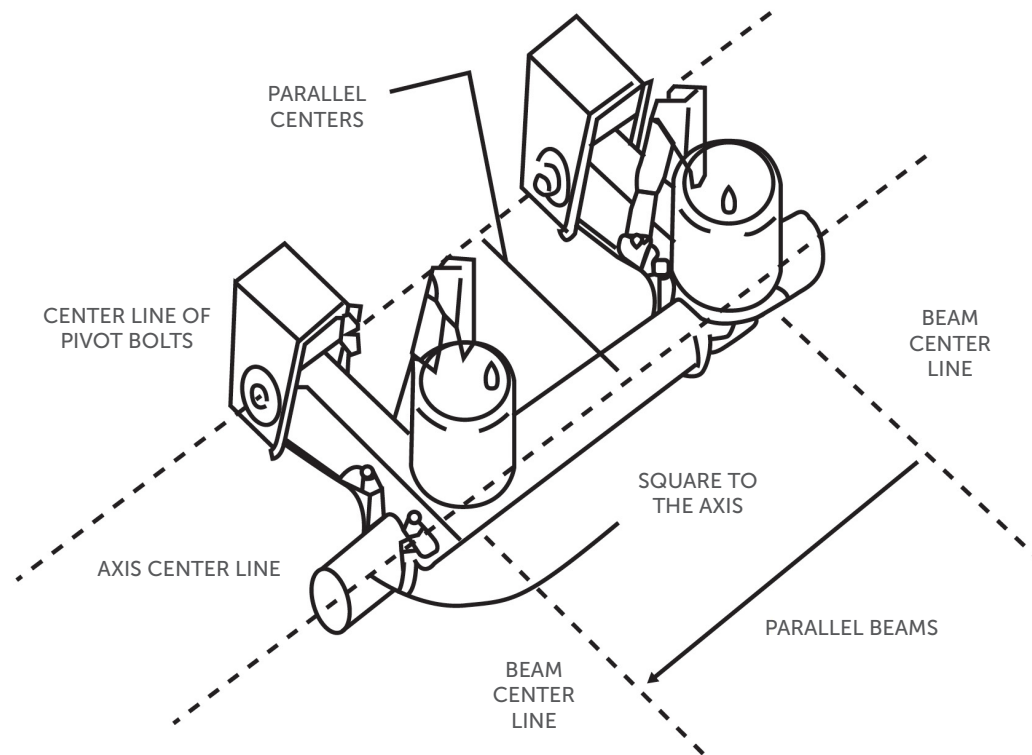
Modification of any component of the suspension is not allowed. If you receive a defective or incorrect component, it must be returned to Hendrickson from where the replacement will be sent.



"Incurring in any of the above cases will cause you to lose the warranty."

OBJECTIVES

The proper placement of the suspension components is crucial for the long life of your trailer and suspension. The three most important factors are:



1. Center lines of the beams.
The center lines of the beams should be parallel to each other. In the placement of the hangers to the chassis, there must not be a variation (between them) of more than 1/8' from the front to the rear of the suspension
2. Axle centerlines 1 Pivot connections. The y-axes centerlines of the pivot connections must be parallel horizontally and vertically.
3. The beams should be square with the axles. The beams should be at 90° with respect to the axes. Any failure in the placement of components can lead to the following problems in your trailer, as well as the cancellation of the product warranty:
 - a. Have the trailer tilt on its side
 - b. Bad bearing
 - c. Premature tire wear
 - d. Short suspension life

Figure 2

To ensure the quality and speed of the suspension assembly, Hendrickson recommends the use of an assembly scantillon for the correct location of the suspension on the axle.

As long as the assembly is carried out without said scantillon, the additional measures required will increase, increasing the risk of error or misunderstandings.

NECESSARY EQUIPMENT AND MATERIAL

The following is the equipment and material necessary for the assembly of a Hendrickson suspension for trailer:

1. Welding equipment and material.
2. Torque meter with torque capacity of 800 lbs-ft (necessary only if the hangers and beams are received disassembled).
3. Torque meter with capacity for 475 lbs-ft for the installation of the "U" screws.
4. Measuring instruments (tape, squares, inclinometers, etc.).
5. Crane or equipment with lifting capacity.
6. Hand grinder
7. Compressor
8. Air connections, hose and associated tool for assembly
9. Gage bar for mounting the suspension to the axle
10. Set of dice and keys, including the following:
 - a. 3/4"
 - b. 1 1/8"
 - c. 1 5/16" (depth)
 - d. 1 11/16" (for suspensions with pivot screws only)
11. Suspension assembly drawing supplied by Hendrickson
12. Clamping clamp with a minimum opening of 12.5"

INSTALLATION OF AIR CONTROLS

Hendrickson offers a variety of air control systems for trailer air suspensions. The installation procedure varies depending on the specified air control kit and the trailer air system. The diagram supplied with each kit shows the components and the arrangements on the air lines.

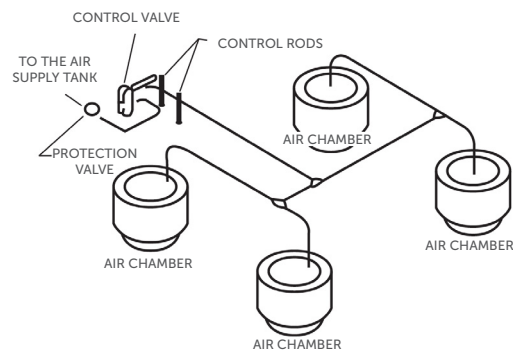
(Accessories and air lines are not provided).

The following notes apply to all Hendrickson trailer air control kits.

Do not add lubricants to the air system.

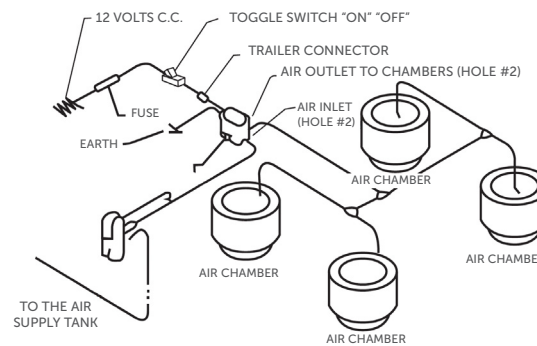
1. All connections must be leak-proof.
2. Avoid sharp bends or sharp bends in the air lines that may restrict airflow.
3. Plastic hoses and connections must be provided by the customer.

Figures 3, 4 y 5 are commonly used diagrams for air control kits.



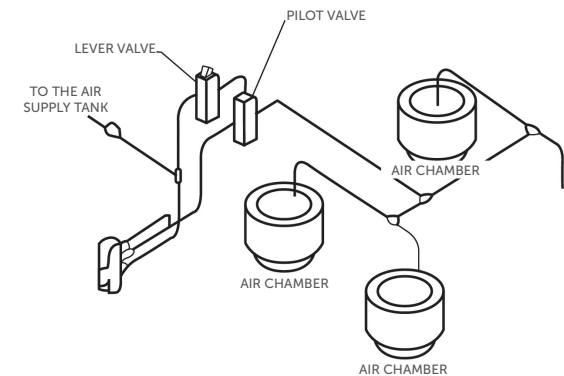
AK- STANDARD/AUTOMATIC
AIR CONTROL KITS

Figure 3



FOR AIR DISCHARGE WITH
ELECTRICAL SYSTEM

Figure 4



FOR MANUAL AIR DISCHARGE

Figure 5

AXLE ALIGNMENT

All Hendrickson air suspensions incorporate a rigid beam-to-axle connection, which in conjunction with our tri-functional bushing, provides a maintenance-free connection and correct alignment. Depending on the model of the suspension, the groove in the side plates of each hanger (See *Figure 6*) or of the "Y" type beams (See *Figure 7*) allow the pivot bolt to move backwards or forwards. Once the axle is properly aligned, all the alignment collars must be completely welded to their respective side plates to avoid misalignment later.

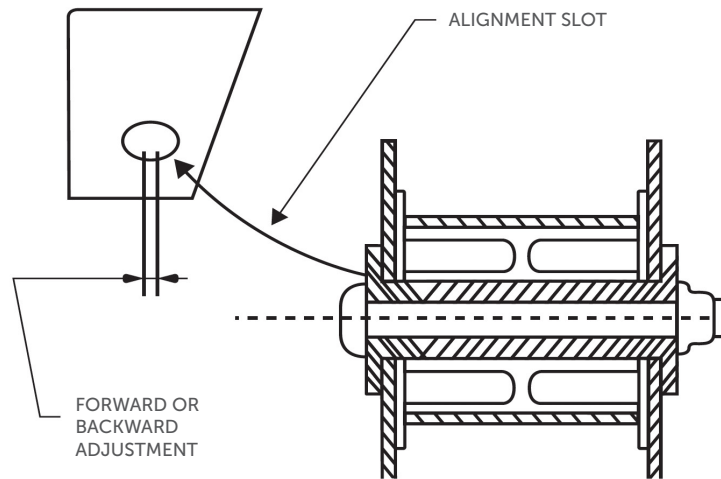


Figure 6

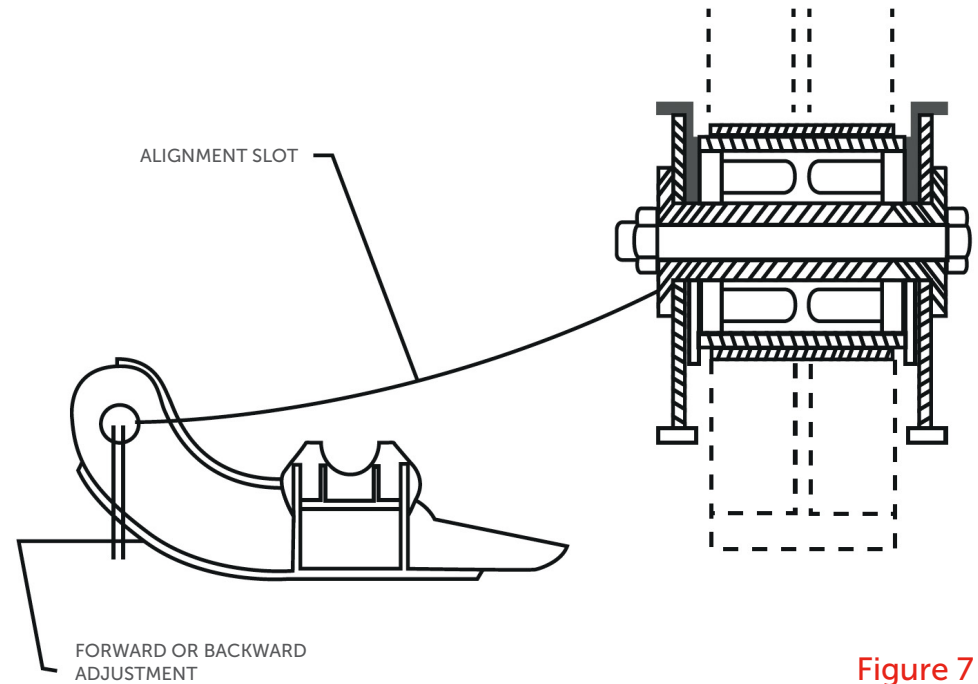


Figure 7

To align the trailer axles properly follow the procedure detailed below:

1. Place the suspension at the ride height specified in the suspension assembly drawing (see **Figure 8**). Adjust the skid, so that the trailer platform is or is relatively parallel to the surface where you are working.

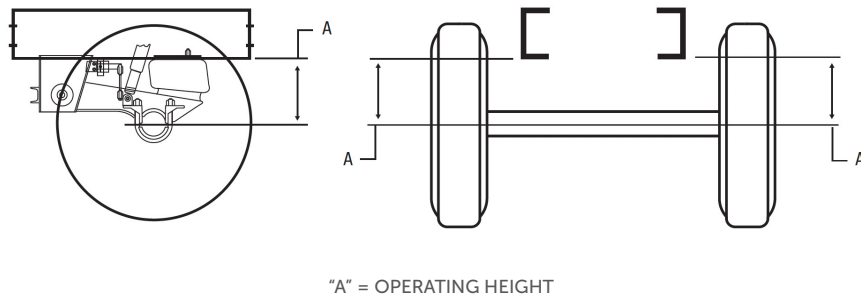


Figure 8

2. Inspect each set of tires. The rims of each yo-yo or dumbbell must match each other with a maximum of 1/8" variation between spokes and a maximum of 3/4" variation between the circumference of each rim.

NOTE: Alignment of the sliders or "sliders". If the suspension is installed on a slider, pull the tie rod of the safety bolts to bring the slider assembly, suspension and axles as close as possible to their operating condition. To achieve this, it is advisable to apply the trailer brakes and gently pull the trailer forward. Care should be taken not to over load the tri-functional bushings.

3. Secure the trailer and release the brakes, this will allow the wheels to turn while you place the suspension front or back.
4. Place a beam of the front suspension in such a way that the alignment collar is in the center of the alignment groove, apply a welding bead to the collar against the outer side plate of the hanger (See **Figure 9**) or the side plate of the beam (See **Figure 10**) depending on the model of the suspension.

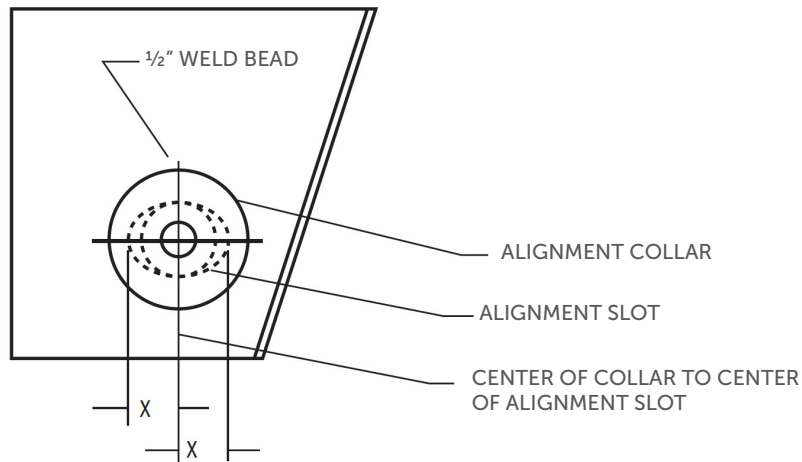


Figure 9

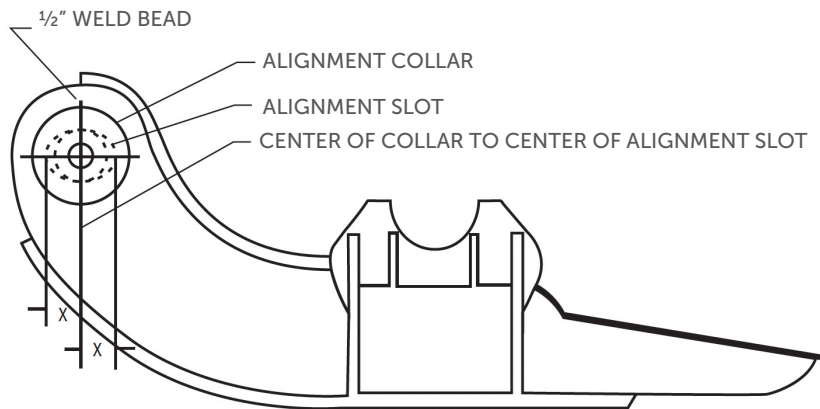


Figure 10

5. Measuring from the king bolt of the trailer move the beam on the opposite side to which the welding bead was applied forward or backward, until the distance from the king bolt to both terminals is equidistant (a maximum tolerance of 1/8" is considered acceptable). (See Figure 11)



Make sure that the movement of the axle is achieved without the bushing having a latent deflection. If additional movement of the axle is required, remove the welding spot applied in step 4 and adjust the shaft as required.

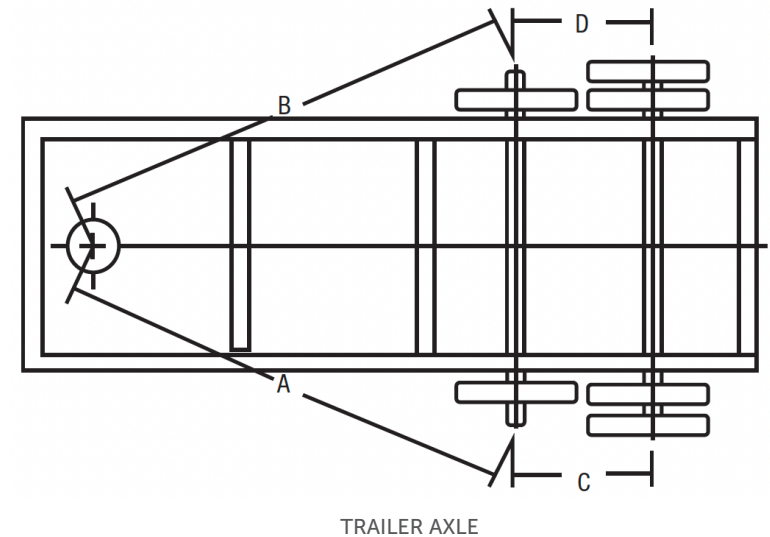


Figure 11

6. Check that the alignment is within the specified and weld the four alignment collars all around to their respective hanger side plates using a 1/4" weld bead. (See Figure 12)
7. For additional axles, adjust until both terminals of the additional axle are equidistant from the front axle (1/16" maximum tolerance is commonly considered acceptable in the distance between both axles, (See Figure 11) continue if within the specifications with steps 4 and 6.

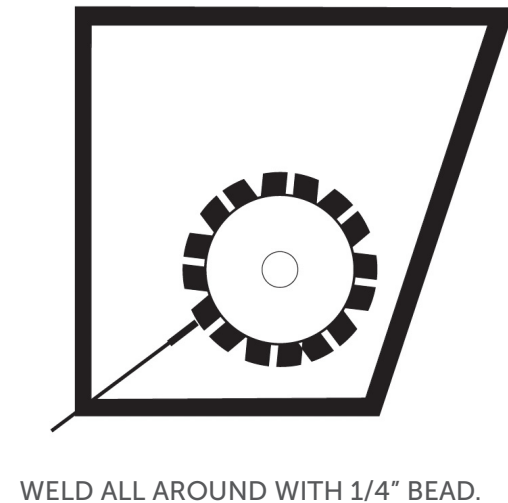
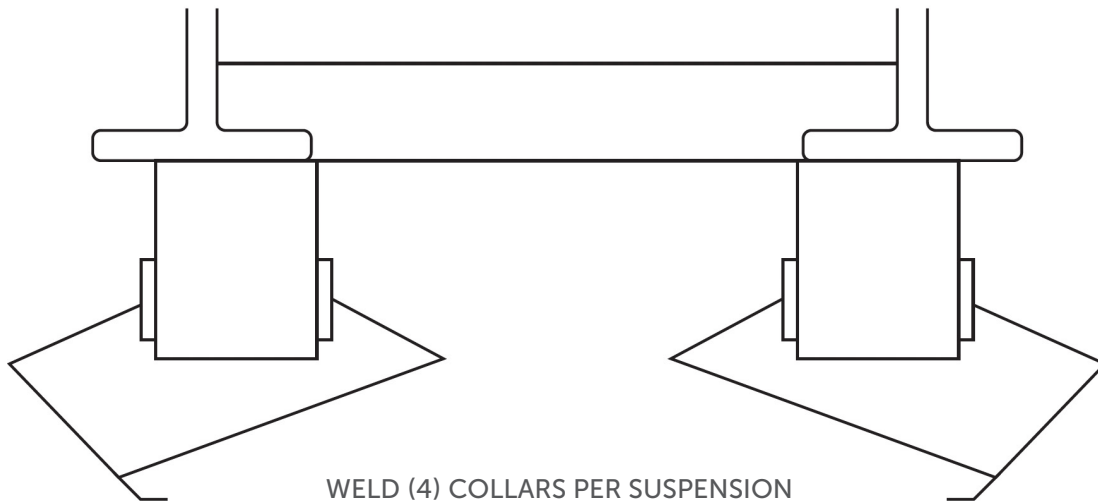


Figure 12

QUICK-ALIGN SYSTEM (FRUEHAUF STANDARD)

If a washer is not placed properly or has a reduced movement range of the shaft pin, the following steps will help you to correctly align the shaft:

1. Release the trailer brakes, there should be no pressure in the service brake line and in the emergency or supply brakes of the trailer, the minimum pressure should be 60 psi.
2. Check both axles pivot screws for proper tightening. The screws should be able to be rotated by hand, but the alignment washers should not rotate freely.
3. Place the square entries of the alignment washers at a twelve-o'clock position (vertically).
4. Adjust both axles pivot screws for a correct tightening of the same.



This adjustment of the axle pivot screws will prevent a compression of the pivot bushing.

5. Double check the alignment of the axle, if necessary, adjust with just one alignment washer.

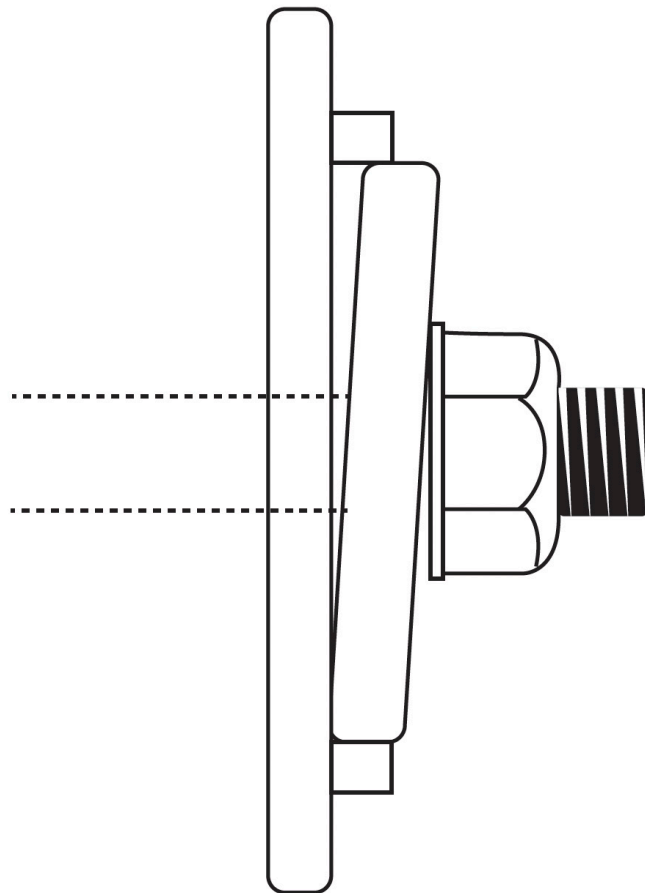


A washer can set a maximum position of 10:00 or 2:00 hours. If additional adjustment is required, turn the washer on the opposite hanger in the same way.

6. Continue to observe the axles adjustment indicators. If the indicators are still present, check the tightening of the pivot screws. The internal alignment washer can be tapped lightly with a hammer to ensure that the alignment movement is equally distributed.
7. After finishing the alignment, tighten the 475-525 lbs-ft (644-712 N-m) pivot connection. The outer nut will come off once the appropriate torque has been reached.

When all the installation instructions of the suspensions are followed, the QUICK-ALIGN pivot connection will give an adequate adjustment that will allow the axle to be aligned.

When subsequent alignment adjustments with Hendrickson's QUIK-ALIGN are required, extra care is required to avoid compression on the pivot bushing.



The compression of the pivot bushing can cause false readings that make it difficult to align the axle of the trailer. In addition, the compression of the pivot bushing could cause tilting in the trailer and problems of premature wear on tires.

Any of the following situations could indicate a compression in the pivot bushing:

- Alignment washer placed on top of the alignment guide
- Reduced movement of the shaft pin during alignment

Overlapped washer

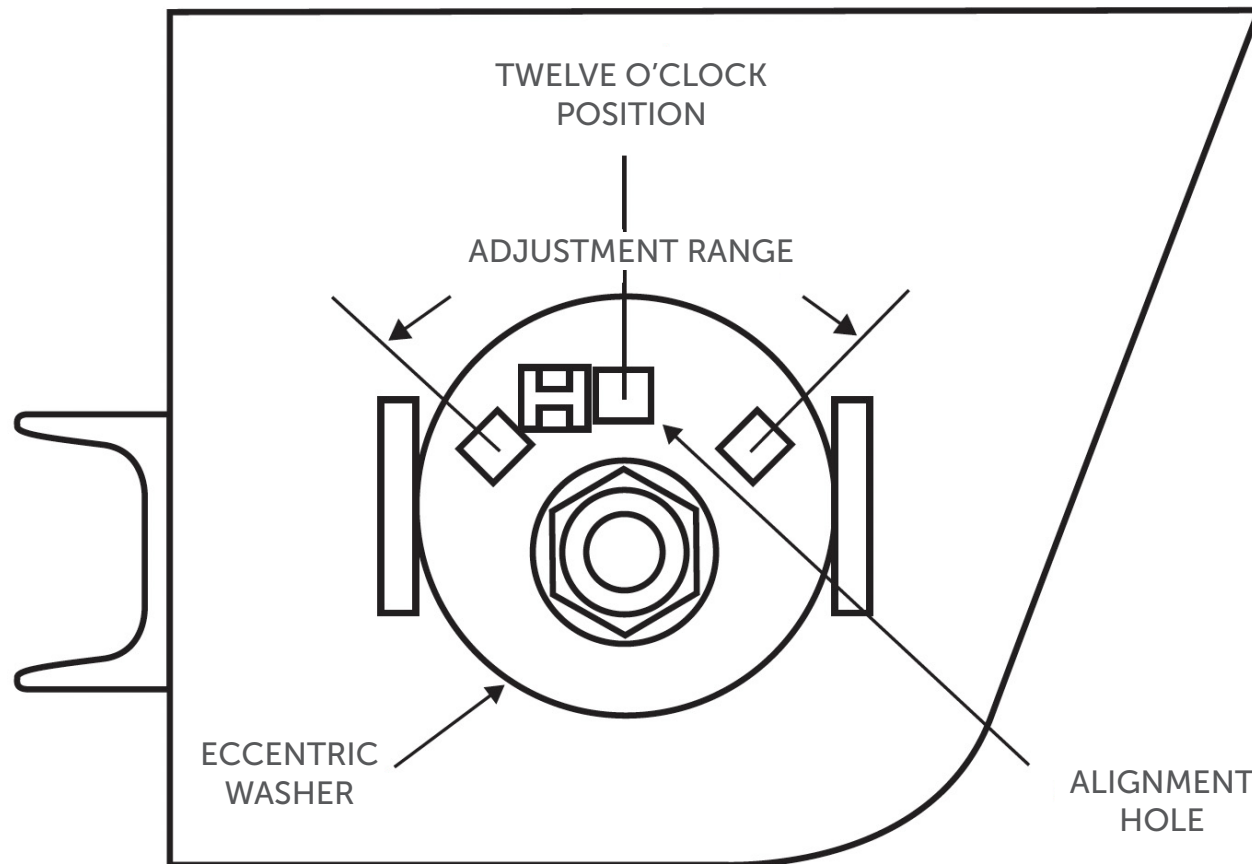
The alignment washer should lie flat with respect to the hanger over the entire alignment range. A covered washer indicates that it will not be able to move. This could also indicate a compression of the pivot bushing.

Reduced movement of the alignment washer

If an alignment is necessary, turn the 1/2" square inlet of the alignment washer. The alignment pin is necessary, this could indicate a compression of the pivot bushing.

Corrective action

The above procedure can be used for an initial alignment or a QUICK-ALIGN adjustment. If this procedure is used for a readjustment, then replace the nut and screw of each hanger with the QUICK-ALIGN Kit (S21052)



HEIGHT CONTROL VALVE

Introduction

All Hendrickson air suspension models are designed so that only one (1) height control valve is needed per trailer regardless of the number of axles. (See **Figures 13 and 14**). The reason for this is because of Hendrickson's patented design of the tri-functional bushing in conjunction with a fixed connection to the axle (welded and with the "U" screws properly tightened).

In the installation instructions of Hendrickson suspension models, it is required that the axle be installed perpendicularly to the trailer frame. The suspension beams and axle act as a torsion bar to stabilize your drive in curves. With the axle perpendicular to the trailer frame, the control valve maintains the driving height by loading or unloading the air from all the chambers simultaneously when necessary. If the trailer goes sideways it is because the frame is twisted or the rigid axle connection failed (misapplication of welding, fractured welding and/or lack of tightening torque).

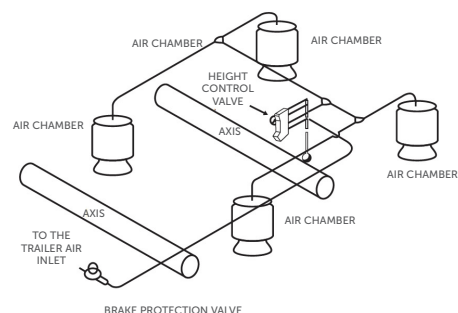


Figure 13

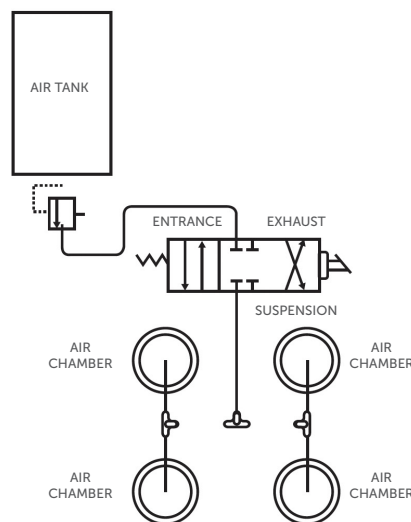


Figure 14



The use of two height control valves is not accepted; the use of two valves will automatically cancel the warranty, unless their use has been accepted in writing by the Hendrickson engineering department.

DEFINITION

The height control valve consists of a valve, a support for it, the fastening screws and the connections with the necessary size to connect it to the air lines of the system.

The height control valve must be installed on the height control valve holder, located on the hanger on the left side of the last axle. The control arm must be adjusted to the necessary size according to the selected suspension handling height.

INSTALLATION PROCEDURE

1. Most Hendrickson air suspensions are shipped with the height control valve holder pre-assembled at the edge of the hanger. Check the appropriate requirements of the length of the control lever and adjust it correctly (the short lever interrupts or suspends the supply at the mark, *(See Figure 15)*). Check the clamping screws of the height control valve and the HT universal bracket before tightening.
2. Attach the control valve to the control valve holder on the hanger. *(See Figure 16)*.

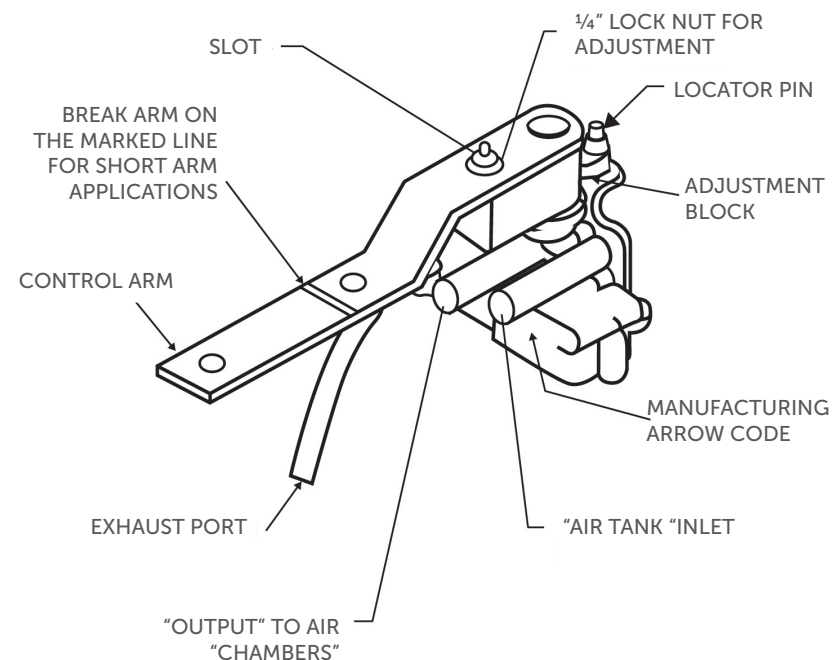


Figure 15



The discharge connection is attached from the factory. **DO NOT TURN IT.**

3. The outlet port located at the front on the valve body must always be connected to the air chambers (See *Figure 15*). The pipe must have the diameter according to the valve connections. (1/4" E.D. or 3/8" E.D.)
4. The outlet port located behind the valve body must be used with the connection to the supply tank (See *Figure 15*). The pipe must have the diameter according to the valve connections. (1/4" E.D. or 3/8" E.D.)
5. A plastic locator bolt is included with the height control valve to help simplify installation and adjustment of the handling height. (See *Figure 15*).
6. Use a drop of oil or "Loctite" to lubricate the threads of the connections.

DO NOT USE asphalt pipe or Teflon tape.

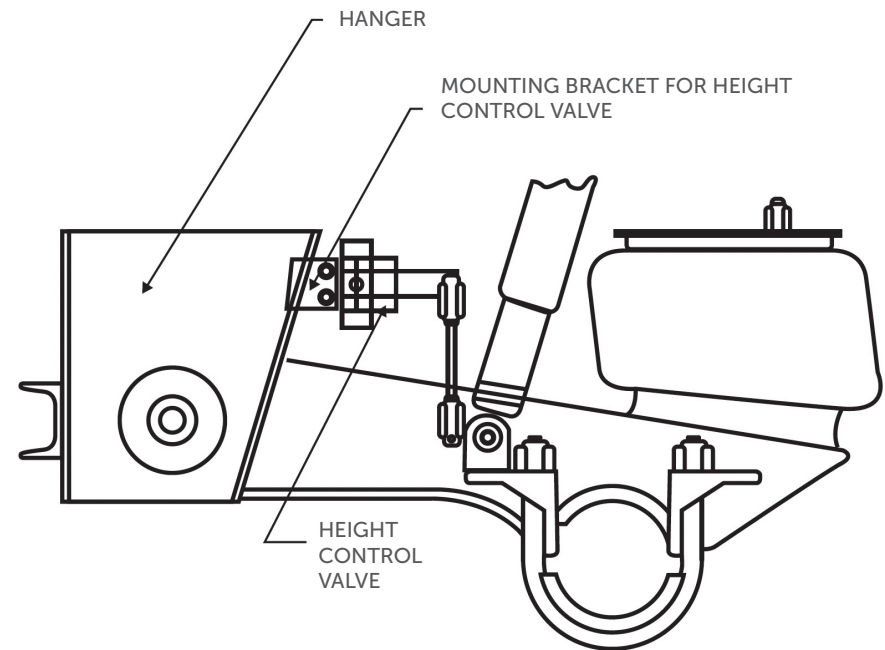


Figure 16

ADJUSTMENT PROCEDURE

1. Lock the tires and release the trailer brakes, the tires have to rotate freely in order to avoid a false adjustment.
2. The trailer must be unloaded relatively parallel at the level of a flat surface and must be supported on its skids or coupled to the tractor.
3. Connect the vehicle to the air supply at approximately the same pressure as your normal air supply system has.
4. Hendrickson model suspension systems are designed to operate at a range of ride height. The driving height is the distance from the centerline of the axle to the underside of the frame. If measuring from the top of the shaft add 2 1/2" so that the measurement is the specified driving height, if the axle diameter is 5".

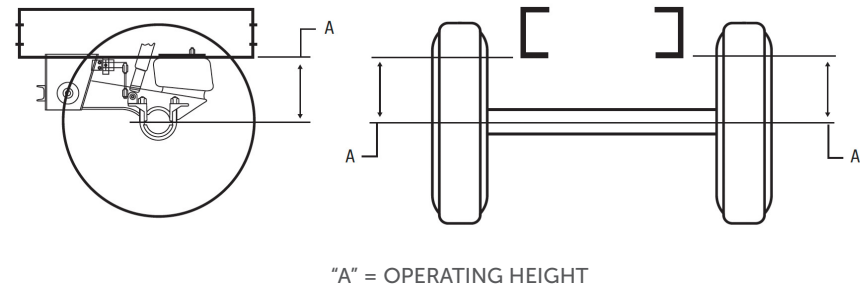


Figure 17

5. Remove the plastic locator bolt, raise or lower the control lever to increase or decrease the height until the operating height is obtained and reinsert the plastic locator bolt into the adjustment block and the control valve holder.
6. Individually secure the terminals of the control valve rod:
 - a. Bolted anchor. Cut the leveling bar and screw on both ends to keep the control valve in its neutral position when the suspension or the unit is at the specified driving height.
 - b. Anchoring with rubber terminals. When the trailer is at the specified driving height and the leveling arm is in its neutral position, cut (if necessary) the rod and insert it into the rubber terminals, then tighten the terminal screws.
7. If a minor adjustment of the valve is necessary, loosen the 1/4" padlock nut located on the control lever. This allows you to adjust the control lever approximately $\pm 1"$. Tighten the lock nut 2 to 4 pounds per foot.

If the axle was installed parallel to the trailer frame and the beams are parallel to each other, the handling height must be equal on both sides. Check by measuring this height.

CHECKING THE DRIVING HEIGHT OF THE TRAILER

PREPARATION

1. Place the trailer on a flat place and at a level that is free of stones and foreign objects.
2. Lock the wheels (*Photo 1*)
3. Check the air pressure in the tires. If necessary, inflate the tire(s) to the appropriate pressure. (*Photo 2*)
4. Maintain the pressure in the air system. (*Photo 3*)



Photo 1

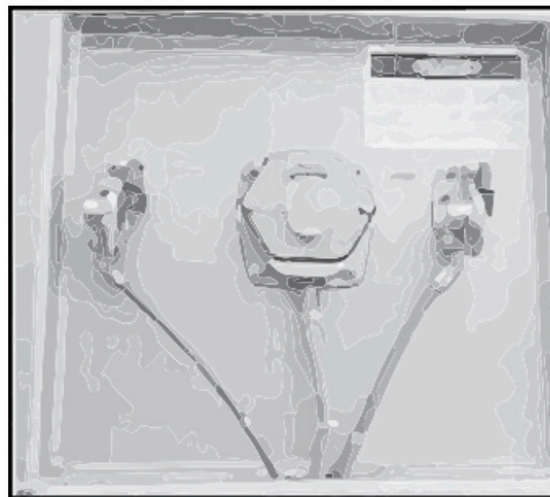


Photo 2



Photo 3

DESIGN HEIGHT FOR COUPLING OF THE FIFTH WHEEL WITH THE KING PIN

1. Check the trailer nameplate or contact the manufacturer for the height of the fifth wheel plate. *(Photo 4)*
2. Measure the height of the fifth wheel plate. The trailer may or may not be connected to the tractor during the measurement.



When the trailer and the tractor are disconnected the fifth wheel must be equal to the height of the fifth wheel plate of the trailer. If the height of the fifth wheel is not equal, then it is necessary to disconnect the trailer from the tractor. When the trailer is not connected to the tractor, measure the distance from the floor to the plate where the king bolt is mounted *(Photo 5)*

MADE IN MEXICO BY	
FRUEHAUF DE MÉXICO, S.A. DE C.V.	
VIA JOSÉ LÓPEZ PORTILLO No. 131	
COLONIA LA MAGDALENA COACALCO, EDO DE MÉXICO	
TEL. 5398 7800	
TYPE OF VEHICLE	<input type="text"/>
MODEL	<input type="text"/>
NIV.	<input type="text"/>
TYRES	<input type="text"/>
AXES	<input type="text"/>
POVN	<input type="text"/>
TOTAL LENGTH	<input type="text"/>
TOTAL WIDTH	<input type="text"/> m
TOTAL HEIGHT	<input type="text"/> m
TYPE OF SUSPENSION	<input type="text"/>
MANUFACTURING DATE	<input type="text"/>
QUANTITY	<input type="text"/>
VEHICULAR WEIGHT	<input type="text"/>

Photo 4

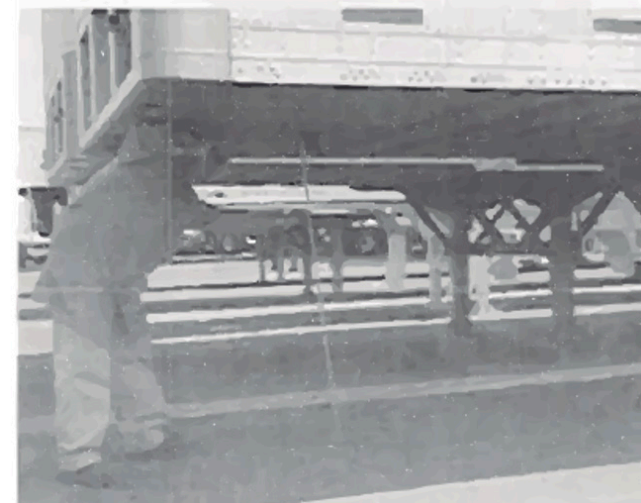


Photo 5

3. If necessary adjust the skid lever to raise the trailer to the design height of the king bolt. *(Photo 6)*.
4. Check the height measurement of the king bolt on the other side of the trailer.



Photo 6

SUSPENSION HANDLING HEIGHT MEASUREMENT

The design handling height is the distance between the bottom of the chassis or spar and the center of the axle.

The handling height is one of many factors that influence the distribution of loads. Even small adjustments to the ride height can impact the way the load is distributed between the axles.

Operating a suspension outside the ride height ranges reduces handling stability, can damage the load and increase suspension wear.

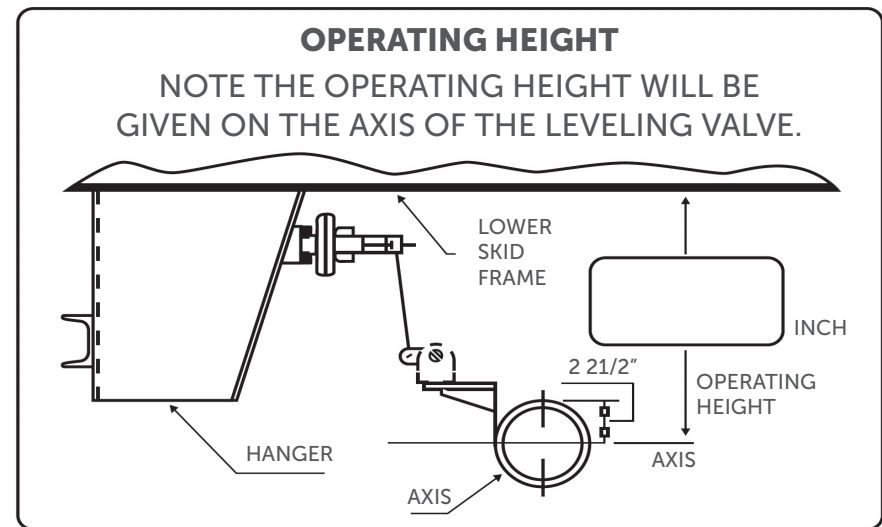
The ride height of the suspension is factory calibrated and **DOES NOT HAVE TO BE MODIFIED** for any reason.

The drive height at which your unit is calibrated is marked on the "DRIVE HEIGHT" sticker (*Fig. No. 1*) which is located on the frame (chassis) of the unit, near the rims.

SUSPENSION HANDLING HEIGHT MEASUREMENT

Check which of the axles has the leveling valve and on the axle where said valve is located there will be where the review of the suspension handling height will be carried out, according to Figure No. 18

To determine the handling height, add half the diameter of the shaft to the measurement obtained from the measuring tape: for example, for a shaft of 5" in diameter, 2.5" should be added to the measurement obtained.



HEIGHT CONTROL VALVE ADJUSTMENT

1. Realign the position of the valve arm for minor adjustments of the ride height.



Photo 7

2. Remove the plastic locator bolt.
3. Push the arm up to increase or push it down to decrease the height until the distance between the center of the axle and the vehicle frame is equal.



There must be a minimum of 80 psi of pressure in the reserve tank to open the brake protection valve and allow air flow to the height control valve.



There may be a delay of 5 to 10 seconds before the valve allows air to flow into or out of the air chambers.

4. After adjusting the operating height, reinstall the plastic locator bolt to the height control arm bracket.
5. If major repair is required, adjust or replace the arm and its joints.

There are three types of arms with their respective joints:

- a. Arm with clamp joints: Cut the arm (if necessary) and insert the joints and clamps at both ends. Tighten the clamps as required to hold the height control valve in its neutral position when the suspension is at its ride height.
 - b. Arm attached with screws: Cut (if necessary) and tighten the arms with the screws included in the Kit to hold the height control valve in its neutral position when the suspension is at its handling height.
 - c. Welded-together arm: Cut and weld both arms as required to hold the height control valve in its neutral position when the suspension is at its ride height.
6. If a minimum adjustment is required loosen the 1/4" nut located on the control arm, which will allow the arm to swing more or less 1". Tighten the 1/4" nut from 2 to 41bs. foot.

ABS FOR TRAILERS

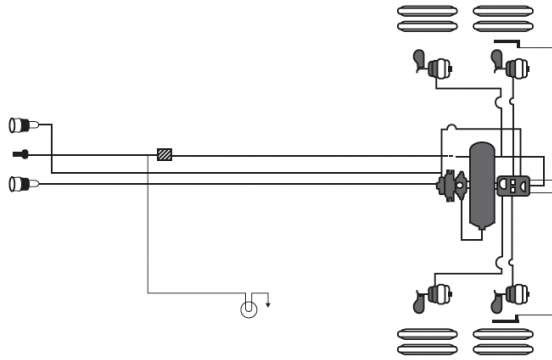
In addition to the proven advantages of ABS for tractors, the anti-lock braking system (ABS) for trailers has become a requirement by the Ministry of Communications and Transportation, which allows to increase safety and reduce operating costs.

It has been proven that the ABS system in trailers improves braking control and vehicle stability which can help:

- Reduce uneven tire wear
- Avoid accidents by reducing the movement of the trailer
fan
- Lower maintenance costs
- Reduce unproductive time
- Stabilizing insurance costs

With all these advantages, it is easy to see that the ABS system is an investment that will be more than repaid.

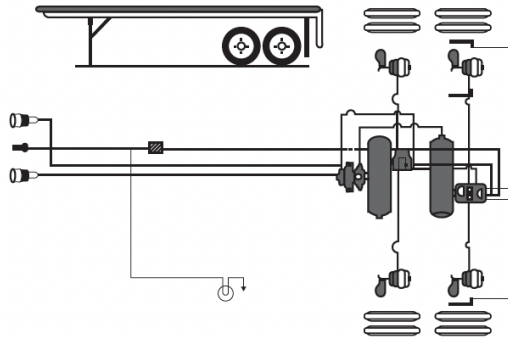
MODEL DIAGRAM



ABS CONFIGURATION

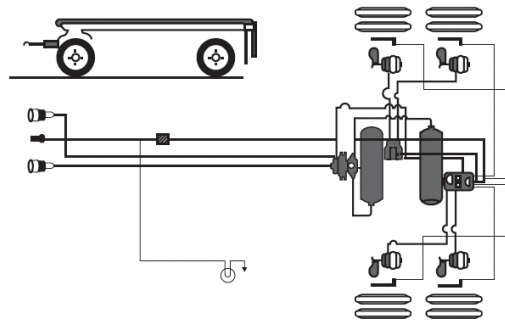
2S/1M
2 SENSORS 1
MODULATOR PER AXIS

MODEL DIAGRAM



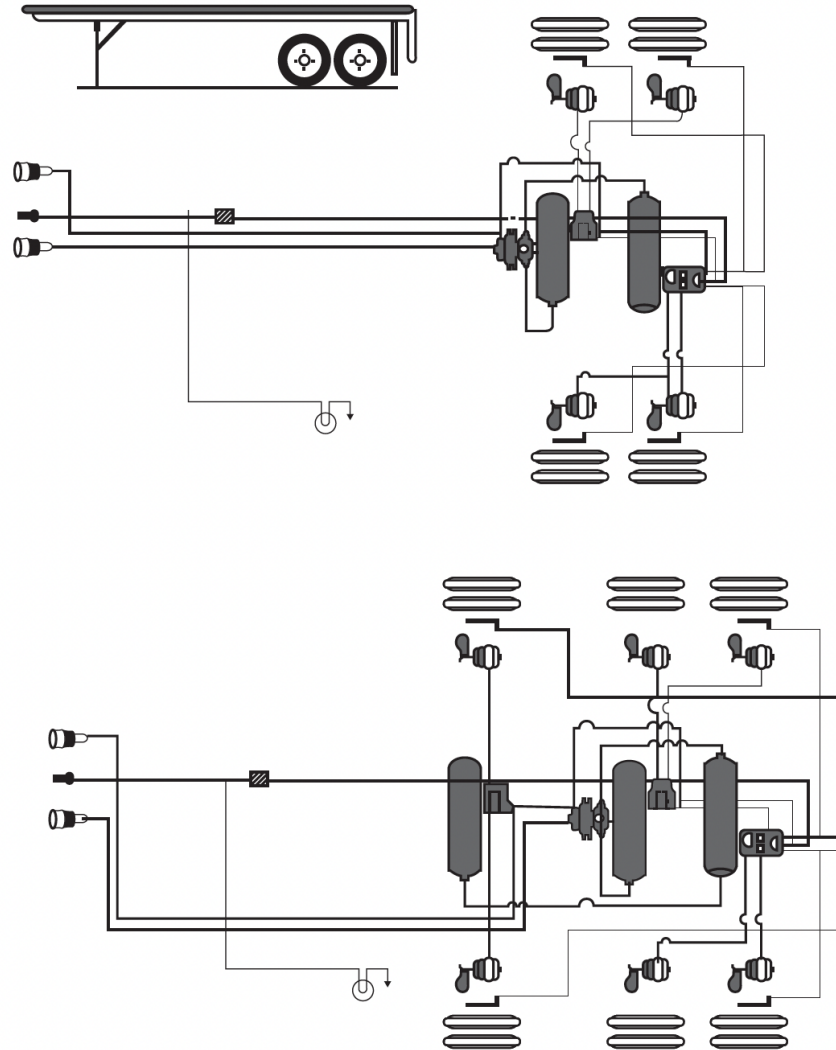
ABS CONFIGURATION

2S/2M
2 SENSORS 2
MODULATORS PER SIDE



4S/2M
4 SENSORS 2
MODULATORS PER AXIS

MODEL DIAGRAM



ABS CONFIGURATION

4S/2M
4 SENSORS 2 MODULATORS
PER SIDE

4S/3M
4 SENSORS 2 MODULATORS
PER AXIS PER SIDE

INTEGRATED ASSEMBLY OF THE ELECTRONIC CONTROL UNIT (ECU) AND THE ABS RELAY VALVE

The ECU contains a microcomputer that functions as the "brain" of the ABS. The compact design consists of an integrated set of an ECU and an ABS relay valve with strong positive-closing connectors. The electrical harnesses of the instantaneous plug are referenced to avoid erroneous assembly.

The assembly of the ECU and the ABS relay valve constantly analyzes the performance of the wheel end and adjusts the brake pressure accordingly to prevent the wheel from locking up. (*Photos 8 and 9*)

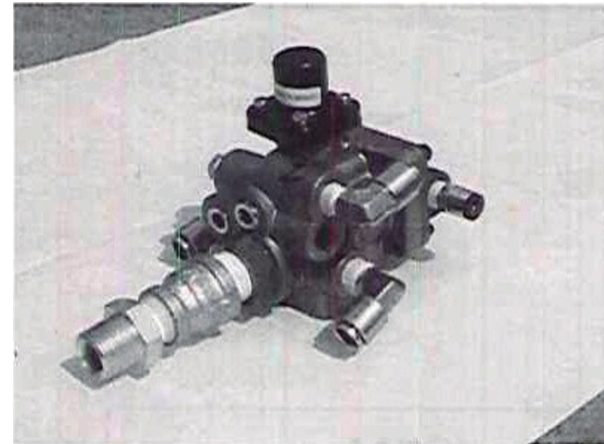


Photo 8

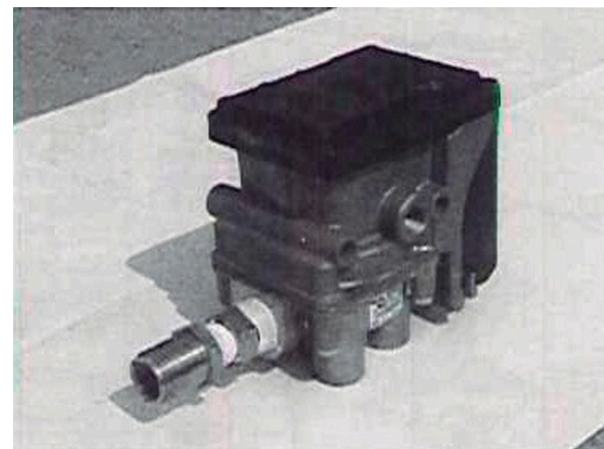


Photo 9

WHEEL SPEED PERCEPTION SYSTEM

Advanced sensors ensure constant and accurate monitoring of wheel speed.

The high intensity of its signals provides reliability and contributes to the elimination of electromagnetic and radio frequency interference (EMI/RFI)

Easy to install.

ABS for trailers can be installed in almost any trailer configuration, both in dry goods trailers, as well as refrigerated trailers and specialized trailers.

Easy Diagnoses.

The remote diagnostic unit can be installed on all systems to view faults (Optional).

GUIDELINES ON APPLICATIONS

Choosing the right ABS configuration for trailers is just as important as choosing the right ABS supplier. When deciding which configuration will be of most value, it should be taken into account that different applications require different ABS. That is why it is essential to choose the configuration that best suits your particular needs.

Because there are different ABS configurations to choose from, it is important to take the following points into consideration:

- The type of trailer that is specified.
- The number of axles.
- How it will be operated.
- How much braking performance and protection against uneven tire wear is required.

A general rule that should be remembered is that the more wheel speed sensors and relay valves an ABS configuration has, the greater the vehicle stability and protection against uneven tire wear that the system provides.

MAINTENANCE OF AIR BRAKES

No routine maintenance is needed on our ABS system. The ECU, ABS relay valve, sensors, wiring, and connectors are sealed and protected from the road environment. Naturally, regular preventive maintenance for the entire brake system and attention to the ABS indicator lamp are important.

A good maintenance of the air brake system depends on the constant inspection and repair of the components.

The interval between one and the other depends on the load and the operating time of your trailer.

At the end of this manual, maintenance recommendations are given that, when properly attended to, will provide continuous service on the equipment.

Below we will list certain adjustments, inspections and minor repairs that you can make. Any part or element found in poor condition must be replaced by genuine FRUEHAUF spare parts.

1. Air Tank

The first requirement in an air brake system is that there is clean air at the recommended pressure. The air tank must be drained daily to allow the water that condenses to escape.

After removing all the water that condenses, turn off the tap and check that the connections are tight and the hoses are secured.

Inspect the connecting fingers to verify their correct operation. With the unit connected to the tractor and with air in the system check that there are no air leaks, check the rubber seals and make sure that they are clean and have no oil, grease or dirt.

2. Pipes lines and connections.

Check the brake lines and connections for loose joints, cracks, cuts or deterioration in the joints. Immediately replace any defective parts or units.

3. Service and Emergency Cameras.

Check the external condition of the brake chambers, the adjustment, the forks and keys. Check for air leaks and dents in the chambers.



The disassembly and repair of any brake chamber is a complicated and dangerous job that should not be performed by any operator or mechanic without the necessary experience.

4. Air valves.

Check that the air valves are not leaking. If a leak is found, it must be replaced.

5. Connections and Brake Shoes.

Check all connections and moving parts of the brake system, replace all parts that are not operating correctly.

6. Brake drums.

Check the drums. Any amount of dust, rust or grime will need to be cleaned. If any oval or broken drum is found, it must be replaced.

7. Brake pads.

Check the thickness of the pastes to ensure good braking and avoid damage to the drums.

LUBRICATION

Your equipment, like any other type of vehicle, needs lubricants to obtain better operating conditions. The proper selection of lubricants, as well as their correct application at specific time intervals are of great importance for the life of all moving trailer components. Taking this into account FRUEHAUF provides information on lubrication as well as recommended lubricants.

1. Chassis.

Use Multifak EP2M grease from Texaco for all the spots that are equipped with greasers. Apply the grease with a pressure gun equipped with a nozzle that fits perfectly into the grease box.

Clean the greasers thoroughly before applying grease and apply enough grease to purge the old grease in the places to be lubricated.

The time when lubrication is performed should be used to inspect the parts of the vehicle.

2. Balls and cups.

The wheel bearings of your equipment are lubricated with grease or oil; these bearings do not normally require frequent inspections, as long as the grease or oil level is maintained. FRUEHAUF recommends a visual inspection and grease or oil change every time brake pastes are changed or every 100,000 km.

3. Skids

Under normal conditions the gearbox of the skids requires checking to lubricate them.

4. Lubrication of sparrowhawk arrows

Lubricate the bushings of the arrows.

5. Brake adjustment compensator (matraca)

The brake compensators are provided with grease fittings and must be lubricated at regular intervals. Apply enough grease to fill the inner space.

6. Fifth wheel of the tractor.

Lubricate the surface of the fifth wheel with good quality grease and wipe off any sand or any foreign material you find. Apply a thin layer of grease with your hand or with the spatula.



Never apply excessive amounts of grease on the fifth wheel, the amount that is going to move inside the hitch mechanism, which will cause interference in the coupling with the tractor.

MAINTENANCE RECOMMENDATIONS

In addition to the daily inspection that you should do before each trip, we recommend following the following recommendations to keep your vehicle in optimal service condition, reducing downtime for repairs.

It is very important to keep in mind that these inspections that FRUEHAUF recommends are taken based on averages that we have obtained from various types of operations of

our trailers. Therefore, you must follow them and adapt them to your operation.

In case of transporting hazardous materials, follow the inspection recommended by the NOM-06-SCT2/2011 standard.

PREVENTIVE MAINTENANCE

TYPE OF MAINTENANCE	RECOMMENDED FREQUENCY
PREVENTIVE MAINTENANCE TYPE A	6 months
Lubricant on axles	
Drums and balatas	
Brake system	
Pneumatic system	
Electrical system	
Calibration and tire remnant	
Carbody in general	
Leaks to the interior	



NOTE:

We recommend that the maintenance is carried out at the FRUEHAUF facilities by qualified personnel.

TYPE OF MAINTENANCE	FREQUENCY
PREVENTIVE MAINTENANCE TYPE B	1 year
Bearings	
Drums and balatas	
Brake system	
Pneumatic system	
Electrical system	
Calibration and tire remnant	
Body shell in general	
Leaks to the interior	
5th wheel coupler and king bolt wear	
Support train (skids)	
Bridges and chassis rods	
Hook drag	
Suspension (airbags, shock absorbers)	
Valves (leveler, exhaust, ABS)	

TORQUE TABLE (TIGHTENING TORQUE)

LOCATION	RECOMMENDED TIGHTENING TORQUE
1. CAPS	450 - 500 lb-ft
2. NUTS OF THE CAPS	450 - 500 lb-ft
a. UNIMONT NUTS	500 lb-ft
3. CAMERA SUPPORT NUTS	75 - 100 lb-ft
4. HOOK AND EYE DRAG	350 lb-ft
5. TORQUE OF PIVOT SCREW OR ALIGNMENT SCREW	Check on our website the manufacturer's manual according to the model of the suspension installed on your unit.

REPLACEMENT OF COMPONENTS

ACTIVITY	FREQUENCY KM	FREQUENCY MONTHS
Align trailer	90,000	6
Mechanical inspection	90,000	6
Pneumatic inspection	90,000	6
Greasing trailer in general	90,000	6
Grinding drum	180,000	12
Replacing brake pads with dual	180,000	12
Replacing brake springs and rollers	180,000	12
Replacing shock absorbers	180,000	12
Replace surelok spring	180,000	12
Service skid gear box	180,000	12
Replace spring of suspension air hoses	180,000	12
Replacing seals	180,000	12
Replacing bearings	27,0000	18
Replace drag hook	27,0000	18

ACTIVITY	FREQUENCY KM	FREQUENCY MONTHS
Replacing spear rubber bushings for dolly	27,000	18
Replace lance eyelet	27,000	18
Replace chamber and grinding wheel spare part	330,000	22
Replace inner tube for surelok	330,000	22
Replace sparrowhawk ball joint bushing	360,000	24
Replace automatic adjustment tensioner	360,000	24
Replacing air bags	360,000	24
Replace double brake chamber	360,000	24
Replace integrated ABS valve	540,000	36
Replace exhaust valve	540,000	36
Replace height leveling valve	540,000	36
Replace air chamber control valve	540,000	36

RECOMMENDED PRACTICES

FLOORS

Check the upper floor for loose or missing screws, separate lamination or warped floor boards, cross-members or other damage. It is recommended that flaxseed oil be used on the floor and then polished to keep them in good condition at least every 12 months. Wooden floors should be cleaned by sweeping frequently and should not be washed.

MATERIALS OF WELDED STRUCTURES

Due to the weather and road conditions, some damage to the external appearance of the product, such as oxidation or wear, could be generated in the products.

We suggest inspecting and coating surfaces as needed (approximately every 12 months).

Inspect all coupling and safety devices associated with the operation of multiple units must be before each coupling for safe operation.

For the loading of bulk products, we recommend the use of jacks, slings or fastening bands to keep the sides uniform; since when the loads move they could deform the sides.

Do not load corrosive chemicals, acids, caustics, brighteners, chlorides and similar substances.

Do not exceed the gross load capacity declared on the unit plate (GWR).

Add a protective layer of synthetic wax to create a barrier against road salt, dirt, snow, sleet and any other similar substances. We recommend washing the unit under high pressure after winter storms to rinse the accumulated in hard-to-reach places such as the wheels, mudguards and the underbody.

EXTREME OPERATING CONDITIONS

It is important that any of these practices invalidate the application of our warranty policy as they are considered as unforeseen conditions of use:

Floors should not be washed with water or pressure machines of the Karcher type or of a similar nature.

Extreme environmental conditions such as floods, snow, environments with high relative humidity, low temperatures can generate damage by freezing, oxidation, prevent the correct operation of brakes and light on the equipment.

The use of magnesium and calcium chlorides used to control snow and ice on many roads can result in rust and corrosion damage to the equipment if it is not cleaned after each trip.

Equipment that is fully loaded when not parked on a solid, level surface can suffer severe damage to the skate and its support system.

All the covers of all the air pipes must be maintained when

they are not in use, otherwise, dirt can be caused inside the equipment and not making good use of the installed filters.

Do not subject the product to stresses or impacts greater than those normally subjected during the use of public roads in good condition.

To find out more conditions that could invalidate the applicability of our Warranty Policy, we suggest you visit our website www.fruehauf.mx

RECOGNIZED **WORLDWIDE** FOR **QUALITY**
OF OUR TOWING EQUIPMENT



FRUEHAUF[®]



 www.fruehauf.mx  servicioalcliente@fruehauf.mx  55 5898 7800 | 800 633 9117

Vía José López Portillo N° 131, Col. La Magdalena, Coacalco, Edo. de México, C.P. 55700