READ complete manual CAREFULLY BEFORE attempting operation.
CONGRATULATIONS and THANK YOU for purchasing a Demco Grain Trailer.

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INTRODUCTION

At Demco we strive to design, produce and deliver the highest quality trailer on the market. Our employees have a strong background of knowledge and combined experience in manufacturing to put quality workmanship into our products.

In this manual you will find information covering all models of the Demco Grain Trailer line. Use the table of contents to locate specific areas of interest.

GENERAL INFORMATION

Demco requires that you and anyone else who will be operating and maintaining the trailer read and understand the guidelines in the manual for safe, efficient, and trouble free operations. Proper maintenance, adjustments and use will result in many years of service. Keep this manual handy for frequent reference and to pass on to new operators or owners. If assistance, information, or additional copies of the manual are needed, contact the nearest dealer, a distributor, or Demco.

PLEASE NOTE:

All documents within the manual referring to products not manufactured by Demco have been printed with the permission of the manufacturer specified.
PLEASE NOTE

All references to driver, passenger, front and rear of the trailer are determined from a position behind the trailer and facing forward.

PRODUCT DISCLAIMER

In this document you will find information based on available knowledge at the time of its publication. To be accurate with the information, every effort was made but may not cover all details or variations of a trailer or provide every possibility in connection with its production, operation and maintenance. A Feature and Option may be presented in the manual that is not relevant to this trailer. Demco assumes no obligation of notice, to holders of this document, with changes made to a product.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Demco is often making improvements and developing new designs. In doing so, we reserve the right to make changes and/or improvements without obligation for equipment sold beforehand. Self-modification to our trailers may affect the operation, function, and safety, so this is not advised. If a replacement part is necessary, Demco should supply it, please contact your nearest dealer or Demco.

DEMCO STATEMENT OF PRODUCT SAFETY

As a producer of agricultural and transportation equipment, Demco is fully aware of its responsibility of providing its customers products that perform their expected use, in a truly safe manner. Safety considerations shall be a fundamental and high precedence part of all engineering/design analysis and judgments involving Demco products. It is our stated policy that our products will be manufactured to coincide with the safety standards specified by the National Association of Trailer Manufacturers and/or any other officially recognized standards at the time manufactured. However, this statement should not be translated to mean that our product will uphold against a customer’s own carelessness or disregard for common safety practices specified in each product’s manual, nor will we be accountable for any such occurrence.
TRAILER INFORMATION

GAWR (Gross Axle Weight Rating): The maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating. Usually the tire or wheel rating is lower than the axle rating and determines the GAWR. The GAWR is listed on the VIN plate.

GVWR (Gross Vehicle Weight Rating): The maximum allowable gross weight of the trailer and its contents. The gross weight of the trailer includes the weight of the trailer and all of the items with it. GVWR is sometimes referred to as GTWR (Gross Trailer Weight Rating) or MGTW (Maximum Gross Trailer Weight). GVWR, GTWR and MGTW are all the same rating.

The sum total of the GAWR for all trailer axles may be less than the GVWR for the trailer, because some of the trailer load is to be carried by the tow vehicle, rather than by the trailer axle(s). The total weight of the cargo and trailer must not exceed the GVWR, and the load on an axle must not exceed its GAVR. The GVWR is listed on the VIN Plate.

VIN (Vehicle Identification Number): Identifies the trailer in four sections. The first section of three characters identifies the manufacturer. The second section consists of five characters (VIN positions 4-8), these are the attributes of the vehicle. The third section is one character which is the check digit. The fourth section consists of eight characters (VIN positions 10-17). The first character represents the vehicle model year, the second character represents the plant of manufacture. The third through eighth characters are a sequential production number. The VIN Plate is located on the main frame at the front, passenger side of the trailer.

PSI (Pounds Per Square Inch): The tire pressure measurement. The PSI is listed on the VIN Plate.

Empty Weight: Some information that comes with the trailer is not a reliable source for ‘empty’ weight. The shipping documents list average or standard weights and your trailer may be equipped with options. To determine the ‘empty’ or weight of your trailer, have trailer weighed at a commercial scale.

Kingpin: The coupler on the front of the trailer that connects to the fifth wheel plate of the tow vehicle.

Fifth Wheel Plate: A device on the tow vehicle that pulls and supports the weight of the trailer.

Trailer Lighting and Braking Connectors: A device that connects electrical power from the tow vehicle to the trailer. If your trailer has electric brakes, the connector will also supply power to the brakes from the tow vehicle.

Landing Gear: A device on the trailer that is often referred to as the ‘jack’, used to raise and lower the trailer and for storage of the trailer. To operate the landing gear, pull the crank shaft outward for high gear and push in for low gear speed. This is also the same handle, which will be used to open the hopper doors. Demco uses the Holland - Model Atlas 55 as standard equipment on the 34’ thru 42’ trailers. The Holland - Model Atlas 55 with Dropleg is used on the 24’, 28’ and 30’ trailers for improved swing auger clearance.

Registration Holder: This is located on the center of the kingpin. Use this to keep the registration with the trailer at all times. The registration holder is often referred to as the “manifest” holder.
SAFETY

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH!

THIS SYMBOL MEANS:

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

SIGNAL WORDS

Note use of following signal words DANGER, WARNING, and CAUTION with safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT SAFETY GUIDELINES

Every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury, study the following precautions and insist those working with you, or you yourself, follow them.

Operator should be a responsible adult. DO NOT ALLOW PERSONS TO OPERATE THIS UNIT UNTIL THEY HAVE DEVELOPED A THOROUGH UNDERSTANDING OF SAFETY PRECAUTIONS AND HOW IT WORKS.

DO NOT modify the trailer in anyway. Doing so may impair the function and/or safety and could affect the life of the trailer.

Never exceed the maximum capacity of the trailer. By doing so you risk damage to your Demco trailer. If it's ability to do a job, or to do so safely is in question DON'T TRY IT.

Review safety instructions with all users annually.

Replace any caution, warning, danger or instruction safety decal that is not readable or is missing. Location of such decals is indicated in this booklet.

Do not paint over, remove, or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice instructions on them.
1. Be sure that the installation area is clean and dry.
2. Be sure temperature is above 50°F (10°C).
3. Decide on exact position before removing the backing paper.
4. Remove smallest portion of split backing paper.
5. Align decal over specified area and carefully press the small portion with the exposed sticky backing in place.
6. Slowly peel back remaining paper and carefully smooth remaining portions of decal into place.
7. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.

SAFETY SIGN LOCATIONS

Types of safety sign and locations on equipment are shown in illustration below. Good safety requires that you familiarize yourself with various safety signs, type of warning, and area or particular function related to that area, that requires your SAFETY AWARENESS.

SAFETY SIGN CARE

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or have become illegible.
- Replacement parts that display a safety sign should also display current sign.
- Safety signs are available from Demco Spencer Plant.

HOW TO APPLY SAFETY DECALS

1. Be sure that the installation area is clean and dry.
2. Be sure temperature is above 50°F (10°C).
3. Decide on exact position before removing the backing paper.
4. Remove smallest portion of split backing paper.
5. Align decal over specified area and carefully press the small portion with the exposed sticky backing in place.
6. Slowly peel back remaining paper and carefully smooth remaining portions of decal into place.
7. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.
LOAD DISTRIBUTION SAFETY

The total weight of the load you put on the trailer, plus the empty weight of the trailer itself, must not exceed the trailer’s Gross Vehicle Weight Rating (GVWR). You must distribute the load on the trailer such that the load on any tire or axle does not exceed the tire load rating or the Gross Axle Weight Rating (GAWR). If you do not know the weight of you trailer you must weigh it at a commercial scale. See your VIN Plate for proper ratings. Not following these guidelines could cause serious injury or even death.

TIRE AND LUG NUT SAFETY

It is essential to inspect the trailer tires and wheels before each tow. Trailer tires are more likely to fail compared to car tires due to the heavier load the trailer carries. Please follow the list of guidelines and/or possibilities below that could cause serious injury or even death.

♦ Replace the tire before towing if the tire has a bald spot, cut, bulge, is showing any cords, or is cracked.
♦ If uneven tread is noticed, take the trailer to a dealer service center for an inspection. Tire imbalance, axle misalignment, or incorrect inflation could cause the uneven tread.
♦ To little of tread will not be adequate enough for traction and can cause loss of control on wet highways.
♦ Tire pressure that is improper causes an unstable trailer and could blowout the tire causing loss of control.
♦ Check the tire pressure before towing, while the tire is cold. For the recommended PSI, see the VIN Plate or the side wall of the tire.
♦ Always order and install tires and wheels with appropriate type and load capacity to meet or exceed gross weight of unit.

The inspection of the tire and wheel lug nuts is necessary since they are prone to loosen after first being assembled. Please follow the list of guidelines and/or possibilities below that could cause serious injury or even death.

♦ When towing a new trailer, check the lug nuts after the first 50 to 100 miles of driving.
♦ Metal creep between the wheel and the lug nuts will cause wheel to loosen and could come off. Check to make sure the lug nuts are tight before each tow.
♦ Improper torque could cause the wheel to separate from trailer. A torque wrench should be used to tighten the lugs nuts. If one is not available use a lug wrench then take to a trailer dealer or service garage to tighten them to the required torque.
BOLT TORQUE
TORQUE DATA FOR STANDARD NUTS, BOLTS, AND CAPSCREWS.

Tighten all bolts to torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt chart as guide. Replace hardware with same grade bolt.

NOTE: Unless otherwise specified, high-strength Grade 5 hex bolts are used throughout assembly of equipment.

Torque Specifications

Bolt Torque for Standard bolts *

<table>
<thead>
<tr>
<th>“A”</th>
<th>GRADE 2</th>
<th>GRADE 5</th>
<th>GRADE 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“A” lb-ft</td>
<td>“A” lb-ft</td>
<td>“A” lb-ft</td>
</tr>
<tr>
<td></td>
<td>(N.m)</td>
<td>(N.m)</td>
<td>(N.m)</td>
</tr>
<tr>
<td>1/4”</td>
<td>6 (8)</td>
<td>9 (12)</td>
<td>12 (16)</td>
</tr>
<tr>
<td>5/16”</td>
<td>10 (13)</td>
<td>18 (25)</td>
<td>25 (35)</td>
</tr>
<tr>
<td>3/8”</td>
<td>20 (27)</td>
<td>30 (40)</td>
<td>45 (60)</td>
</tr>
<tr>
<td>7/16”</td>
<td>30 (40)</td>
<td>50 (70)</td>
<td>80 (110)</td>
</tr>
<tr>
<td>1/2”</td>
<td>45 (60)</td>
<td>75 (100)</td>
<td>115 (155)</td>
</tr>
<tr>
<td>9/16”</td>
<td>70 (95)</td>
<td>115 (155)</td>
<td>165 (220)</td>
</tr>
<tr>
<td>5/8”</td>
<td>95 (130)</td>
<td>150 (200)</td>
<td>225 (300)</td>
</tr>
<tr>
<td>3/4”</td>
<td>165 (225)</td>
<td>290 (390)</td>
<td>400 (540)</td>
</tr>
<tr>
<td>7/8”</td>
<td>170 (230)</td>
<td>420 (570)</td>
<td>650 (880)</td>
</tr>
<tr>
<td>1”</td>
<td>225 (300)</td>
<td>630 (850)</td>
<td>970 (1310)</td>
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</table>

Bolt Torque for Metric bolts *

<table>
<thead>
<tr>
<th>“A”</th>
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<th>CLASS 9.8</th>
<th>CLASS 10.9</th>
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<tr>
<td></td>
<td>“A” lb-ft</td>
<td>“A” lb-ft</td>
<td>“A” lb-ft</td>
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<td></td>
<td>(N.m)</td>
<td>(N.m)</td>
<td>(N.m)</td>
</tr>
<tr>
<td>6</td>
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<td>13 (17)</td>
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<tr>
<td>7</td>
<td>15 (21)</td>
<td>18 (24)</td>
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<td>8</td>
<td>23 (31)</td>
<td>25 (34)</td>
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<td>61 (83)</td>
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<td>12</td>
<td>78 (106)</td>
<td>88 (118)</td>
<td>106 (144)</td>
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<tr>
<td>14</td>
<td>125 (169)</td>
<td>140 (189)</td>
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</tr>
<tr>
<td>16</td>
<td>194 (263)</td>
<td>216 (293)</td>
<td>263 (357)</td>
</tr>
<tr>
<td>18</td>
<td>268 (363)</td>
<td>--</td>
<td>364 (493)</td>
</tr>
<tr>
<td>20</td>
<td>378 (513)</td>
<td>--</td>
<td>515 (689)</td>
</tr>
<tr>
<td>22</td>
<td>516 (699)</td>
<td>--</td>
<td>702 (952)</td>
</tr>
<tr>
<td>24</td>
<td>654 (886)</td>
<td>--</td>
<td>890 (1206)</td>
</tr>
</tbody>
</table>

Torque figures indicated are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* GRADE or CLASS value for bolts and capscrews are identified by their head markings.
TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on your trailer axle. Torque is a measure of the amount of tightening applied to a fastener (nut or bolt) and is expressed as length times force. For example, a force of 90 pounds applied at the end of a wrench one foot long will yield 90 lbs/ft of torque. Torque wrenches are the best method to assure the proper amount of torque is being applied to a fastener.

**Note:** Wheel nuts or bolts must be applied and maintained at the proper torque levels to prevent loose wheels, broken studs, and possible dangerous separation of wheel from your axle.

Be sure to use only the fasteners matched to the cone angle of your wheel (usually 60 degrees or 90 degrees). The proper procedure for attaching your wheels is as follows:

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in the following sequence.
3. The tightening of the fasteners should be done in stages. Following the recommended sequence, tighten fasteners per wheel torque requirements diagram:

   ![Wheel Torque Diagram]

4. Wheel nuts or bolts should be torqued before first road use and after each wheel removal. Check and re-torque after the first 50 miles and again at 100 miles. Check periodically thereafter.

### WHEEL AND RIM TORQUE REQUIREMENTS

<table>
<thead>
<tr>
<th>Description</th>
<th>Application</th>
<th>Minimum Torque (lbs/ft)</th>
<th>Maximum Torque (lbs/ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2” Cone Nut</td>
<td>12” – 13” Wheel</td>
<td>50</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>14” – 15” Wheel</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>5/8” Cone Nut</td>
<td>Flat Disc Wheel</td>
<td>175</td>
<td>225</td>
</tr>
<tr>
<td>3/4” Hex Nut</td>
<td>Demountable Ring Clamp</td>
<td>210</td>
<td>260</td>
</tr>
<tr>
<td>3/4” Spherical Nut</td>
<td>Single Wheel</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Inner Dual</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>1-1/2” Spherical Nut</td>
<td>Outer Dual</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>5/8” Flange Nut</td>
<td>Wheels</td>
<td>275</td>
<td>325</td>
</tr>
</tbody>
</table>
Driving a vehicle while towing a trailer is completely different from driving the same vehicle without a trailer. Acceleration, manipulation and braking are all reduced. It takes longer to get up to speed; you need more room to turn and pass, and more distance to stop. You will need to spend time adjusting to the different feel and maneuverability of the vehicle with a loaded trailer. Because of the considerable differences in all aspects of manipulation when towing a trailer, the dangers and risks of injury are also much greater than when driving without a trailer. You are responsible for keeping your vehicle and trailer in control, and for all the damage that is caused if you lose control of your vehicle and trailer.

Before you start towing the trailer, you must follow all of the instructions for inspection, testing, loading and coupling. Also, before you start towing, adjust the mirrors so you can see the trailer as well as the area to the rear of it.

Drive slowly at first, 5 m.p.h. or so, and turn the wheel to get the feel of how the vehicle and trailer combination responds. Next, make some right and left hand turns. Watch in your side mirrors to see how the trailer follows the vehicle. Turning with a trailer attached requires more room. Stop a few times from speeds no greater than 10 m.p.h. Try using different combinations of trailer/air brakes and vehicle brakes. Note the effect that the trailer brakes have when they are the only brakes used.

TRAILER TOWING SAFETY GUIDELINES

- Before towing, check coupling, trailer brakes, tires, wheels and lights.
- Check the lug nuts and bolts for proper tightness.
- Check coupler tightness after towing 50 miles.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance.
- Allow plenty of stopping distance for your trailer and vehicle.
- Do not drive so fast that the trailer begins to sway due to speed.
- Allow plenty of room for passing. A rule of thumb is that the passing distance with a trailer is four times the passing distance without a trailer.
- Shift your automatic transmission into a lower gear for city driving.
- Use lower gears for climbing and descending grades.
- Do not ride the brakes while descending grades; they may get so hot that they stop working. Then you will potentially have a runaway vehicle and trailer.
- To conserve fuel, don’t use full throttle to climb a hill. Instead, build speed on the approach.
- Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
- Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve and power through the curve. This way, the towing vehicle remains “in control.”
- Do not apply the brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, will provide a stabilizing force.
OPERATION SAFETY

♦ Carefully study and understand the Owner's Manual and all safety decals before operating, servicing, adjusting or repairing.
♦ It is the owner/operators responsibility to read the manual and instruct other operators to read the manual before operating.
♦ Before towing, check kingpin, trailer brakes, tires, wheels and lights.
♦ Always follow state and local regulations regarding safety chains and auxiliary lighting when towing.
♦ Check the lug nuts and bolts for proper tightness.
♦ Keep wheels and lug nuts tightened to specific torque.
♦ Secure wheels when trailer is not being used.
♦ Assure tires are inflated evenly.
♦ Make sure the brakes are evenly adjusted.
♦ Visually inspect trailer for any loose bolts, worn parts, or cracked welds, and make necessary repairs. (Follow maintenance safety instructions included in this manual.)
♦ Securely attach to towing vehicle.
♦ Make sure that tow rating on vehicle is high enough for what is being towed.
♦ Check coupler tightness after towing 50 miles.
♦ Clean reflectors and lights and check to make sure that they are working.
♦ Use your mirrors to verify that you have room to change lanes or pull into traffic.
♦ Use your turn signals well in advance.
♦ Allow plenty of stopping distance for your trailer and vehicle.
♦ Do not drive so fast that the trailer begins to sway due to speed.
♦ Allow plenty of room for passing. A rule of thumb is that the passing distance with a trailer is four times the passing distance without a trailer.
♦ Always drive at a save speed and ensure that you are driving slow enough to make an emergency stop if necessary.
♦ No passengers allowed – Do not carry passengers anywhere on the trailer.
♦ Beware of bystanders, particularly children, always look around and make sure it is safe to start engine of tow vehicle or move the trailer. This is particularly important with higher noise levels, as you may not hear people shouting.
♦ When halting operations, even periodically, set towing vehicles parking brake, shut off engine, and remove the ignition key, to prevent unauthorized operation.
♦ Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
♦ A safe working environment is provided for the operator and bystanders just by following the recommended procedures throughout this manual.
♦ Be extra careful on inclines.
♦ Use lower gears for climbing and descending grades.
♦ Do not ride the brakes while descending grades; they may get so hot that they stop working. Then you will potentially have a runaway vehicle and trailer.
♦ To conserve fuel, don’t use full throttle to climb a hill. Instead, build speed on the approach.
♦ Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve and power through the curve. This way, the towing vehicle remains “in charge.”
♦ Do not apply the brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, will provide a stabilizing force.
♦ Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
♦ Shift your automatic transmission into a lower gear for city driving.
OPERATION SAFETY (continued)

- In addition to the design and configuration of a trailer, hazard control and accident prevention are dependent upon the knowledge, concern, and common sense of personnel involved in the operation, transportation, maintenance and storage of the trailer.
- Practice the operations and functions of your trailer. Don’t hurry the learning process or take it for granted.
- Untrained operators are not qualified to operate the trailer.
- If the operation safety is followed, along with a good maintenance program your trailer will provide you with years of trouble-free service.
- With ideal road conditions follow the posted speed limit but do not exceed 60 mph.

SERVICE AND MAINTENANCE SAFETY

Carefully read this section on trailer service and maintenance safety. Good maintenance is your responsibility. Performing maintenance according to the schedule will prolong the performance and life of your trailer and ensure the safety and liability of the operation. If you cannot perform the required maintenance talk to your dealer about having them done. Also check the relevant component manufacturer’s manual if available.

- Make sure there is plenty of ventilation. Never operate engine of towing vehicle in a closed building. Exhaust fumes may cause asphyxiation.
- Always block wheels and never use a jack as sole support.
- Always use proper tools or equipment for job at hand.
- Use extreme caution when making adjustments.
- Follow torque chart in this manual when tightening bolts and nuts.
- Openings in skin and minor cuts are susceptible to infection from brake fluid.
- After servicing, be sure all tools, parts and equipment are removed
- Do not allow grease or oil to build up on any step or platform.
- When replacing bolts, refer to owner’s manual for proper size and grade.
- Refer to bolt torque chart for head identification marking.
- When replacement parts are necessary for periodic service and maintenance, genuine factory replacement parts must be used to restore your trailer. Manufacturer will not claim responsibility for use of unapproved parts and/or accessories or other damages.
- If the trailer has been altered in any way from original design, any liability for injury or warranty will not be accepted by Demco.
- A fire extinguisher and first aid kit should be kept accessible while performing any service and maintenance on the trailer.

COUPLING THE TRAILER TO TOW VEHICLE

- Inspect Fifth Wheel
  1. Check for damage/missing parts.
  2. Check to see that mounting to tractor is secure, no cracks in frame.
  3. Be sure that the fifth wheel plate is greased as required. Failure to keep the fifth wheel plate lubricated could cause steering problems due to friction between the tractor and trailer.
4. Check if fifth wheel is in proper position for coupling. Wheel tilted down towards rear of tractor, jaws open, safety unlocking handle in automatic lock position.
5. If you have a sliding fifth wheel, make sure it is locked.
6. Make sure the trailer kingpin is not bent or broken.

♦ Inspect Area
1. Make sure area around vehicle is clear.
2. Be sure trailer spring brakes are on.
3. Check that cargo is secured against movement due to tractor being coupled to the trailer.

♦ Position Tractor
1. Put the tractor directly in front of the trailer. Never back under the trailer at an angle, you could push the trailer sideways and damage the landing gear.
2. Check position using outside mirrors and looking down both sides of the trailer.

♦ Back Slowly
1. Back up until the fifth wheel is just touching the trailer. Don’t hit the trailer.

♦ Secure Tractor
1. Put parking brake on and transmission in neutral.

♦ Check Trailer Height
1. The trailer should be low enough that it is raised slightly by the tractor when the tractor is backed under. Raise and lower the trailer as needed. If trailer is too low, the tractor may strike and damage the front of trailer. If the trailer is too high, it may not couple correctly.
2. Check that the kingpin and fifth wheel are aligned.

♦ Connect Air Lines to Trailer
1. Make sure airlines are safely supported where they won’t be crushed or caught while tractor is backing under the trailer.
2. Connect tractor emergency red airline to trailer emergency red glad hand. This provides continuous air supply to trailer.
3. Connect service blue airline to trailer service blue glad hand. This provides air to trailer only when brake is applied.

♦ Supply Air to Trailer
1. 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.
2. Wait until the air pressure is normal.
3. Check brake system for crossed airlines.
4. Shut engine off so you can hear brakes.
5. Apply and release trailer brakes, listen for sound of brakes being applied and released. You should hear the brakes move when applied and air escape when the brakes are released.
6. Check air brake system pressure gauge for signs of major air loss.
7. When you are sure trailer brakes are working, start engine.
8. Check again that the air pressure is up to normal.

♦ Lock Trailer Brakes
   1. Pull out the “air supply” knob, or move the tractor protection valve control from “normal” to “emergency”.

♦ Back Under Trailer
   1. Use lowest reverse gear.
   2. Back trailer slowly to avoid hitting the kingpin too hard.
   3. Stop when the kingpin is locked into the fifth wheel.

♦ Check Connection for Security
   1. Raise trailer landing gear slightly off the ground.
   2. Pull tractor gently forward while the trailer brakes are still applied.
   3. Check and make sure that the trailer is locked onto the tractor.

♦ Secure Vehicle
   1. Put parking brake on and transmission in neutral.
   2. Shut off engine and take key with you so someone else won’t move the truck while you are under it.

♦ Inspect Coupling
   1. Use flashlight if necessary.
   2. Make sure there is no spacing between trailer and fifth wheel. If there is a space something is wrong. **Kingpin may be on top of closed fifth wheel jaws; trailer will come loose very easily.** 
   3. Go under the trailer and look into the back of the fifth wheel. Make sure jaws are closed around the shank of the kingpin.
   4. Check that the locking lever is in the “lock” position.
   5. Check that the safety catch is in a position over locking lever. On some fifth wheels the catch must be put in place by hand.
   6. If the coupling isn’t right, fix before operating.

♦ Connect the Electrical Cord and Check Air Lines
   1. Plug the electrical cord into the trailer and fasten the safety catch.
   2. Check both airlines and electrical lines for signs of damage.
   3. Make sure air and electrical lines will not hit any moving parts on vehicle.

♦ Raise Trailer Landing Gear
   1. Use low gear to begin raising the landing gear, once free of weight, switch to high gear.
   2. Raise the landing gear all the way up. Never drive with the landing gear only part way up, one or both could catch on objects.
   3. After raising landing gear, secure the crank handle safely.
   4. When full weight of trailer is resting on tractor:
   5. Check for enough clearance between rear of tractor frame and landing gear. When the tractor/trailer makes a sharp turn, the landing gear must clear the back of the tractor.
   6. Check that there is enough clearance between the top of the tractor tires and the nose of the trailer.
UNCOUPLING THE TRAILER FROM TOW VEHICLE

♦ Position the Tractor and Trailer
  1. Make sure surface can support weight of trailer.
  2. Have the tractor aligned with the trailer, pulling out at an angle can cause damage to the landing gear.

♦ Ease Pressure on Locking Jaw
  1. Shut off trailer air supply to lock trailer brakes.
  2. Ease pressure on fifth wheel locking plate by backing up gently, this will help you release the fifth wheel locking lever.
  3. Put parking brake on while tractor is pushing against the kingpin. This will hold the tractor with pressure off the locking jaw.

♦ Inspect Area
  1. Make sure area around the vehicle is clear.

♦ Lower the Landing Gear
  1. 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 and easier to couple next time.

♦ Disconnect Airlines and Electrical Cables
  1. Disconnect airlines from trailer. Connect glad hands to dummy coupler at back of cab, or coupler them together.
  2. Hang electrical cable plug down to prevent moisture from entering the end.
  3. Make sure lines are supported so they won’t be damaged while driving the tractor.

♦ Unlock Fifth Wheel
  1. Pull the release handle to “open” position.
  2. Keep legs and feet clear of the rear tractor wheel to avoid serious injury in case the vehicle moves.

♦ Drive Tractor Partially Clear of Trailer
  1. Drive tractor forward until fifth wheel comes out from under the trailer.
  2. Stop the tractor frame under trailer; this prevents the trailer from falling to ground if landing gear should sink or fail.

♦ Secure Tractor
  1. Apply parking brake and place transmission in neutral.

♦ Inspect Trailer Landing Gear
  1. Make sure ground is supporting the trailer and landing gear is not damaged.

♦ Pull Tractor Clear of Trailer
  1. Release parking brake.
  2. Check the area and drive tractor clear of trailer.
MOUNTING THE SIDE DISCHARGE CHUTE

Position the hopper assembly with the bottom inside the door rail flange. Mark the top four hole positions for drilling, then open the side chute door and mark the bottom two hole positions and the rectangular opening for the grain unloading. Remove the assembly and drill 3/8” holes and cut out the rectangular opening. Bolt assembly to hopper and add rubber straps by bolting to the vertical braces.

Side Discharge Chute

Hopper: Top (attached to trailer)
Arrows (2) show where to mount rubber straps.

Hopper: Bottom
NOTE: The 2-speed gear used on the hopper is the same type that is used on our Holland 51,000 Jack. Please see page 25, for operating instructions.

<table>
<thead>
<tr>
<th>REF. NO.</th>
<th>PART NO.</th>
<th>QTY.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1ACF05F0000</td>
<td>2</td>
<td>3/8” Center Lock Nut</td>
</tr>
<tr>
<td>2.</td>
<td>1AFC08D0000</td>
<td>5</td>
<td>1/4”-20 Serrated Flange Nut</td>
</tr>
<tr>
<td>3.</td>
<td>1AFC08E0000</td>
<td>4</td>
<td>5/16”-18 Flange Nut</td>
</tr>
<tr>
<td>4.</td>
<td>1AFC12FBA05</td>
<td>2</td>
<td>3/8”-16 X 2” Long Hex Bolt</td>
</tr>
<tr>
<td>5.</td>
<td>1AFC17Q0000</td>
<td>2</td>
<td>1” Hex Nut</td>
</tr>
<tr>
<td>6.</td>
<td>1AFC37DA05</td>
<td>5</td>
<td>1/4”-20 X 1” Serrated Flange Bolt</td>
</tr>
<tr>
<td>7.</td>
<td>1AFC37EAAH5</td>
<td>4</td>
<td>5/16”-18 X 1 1/2” Serrated Flange Bolt</td>
</tr>
<tr>
<td>8.</td>
<td>1AHMSNLCCA0</td>
<td>1</td>
<td>Hinge, Hopper Stop</td>
</tr>
<tr>
<td>9.</td>
<td>1AJGGEARBOX</td>
<td>1</td>
<td>Gear Box Assembly</td>
</tr>
<tr>
<td>10.</td>
<td>30010135</td>
<td>1</td>
<td>Two Speed Lock</td>
</tr>
<tr>
<td>11.</td>
<td>3G000105</td>
<td>1</td>
<td>Bolt-On 2-Speed Crank Hanger</td>
</tr>
<tr>
<td>12.</td>
<td>3G000106</td>
<td>1</td>
<td>2-Speed Hopper 1” Crank Shaft</td>
</tr>
<tr>
<td>13.</td>
<td>3G000107</td>
<td>1</td>
<td>2-Speed Bolt-On Crank Coupler</td>
</tr>
</tbody>
</table>
The spring brake priority immediately provides supply air to release the spring brakes, the internal Pressure Protection Valve opens to also fill the reservoir at approximately 80 psi.

Complies with all changes to FMVSS 121, Docket 90-3 Effective October 8, 1992.

Designed for use with a single reservoir on a typical single or tandem axle trailer.

May also be used with two 1,400 cubic inch (nominal) reservoirs on tandem axle trailers.

Mounting Hardware on page 61 & 62

Piping examples on pages 71, 72, 74, 75 & 76.

**PLUG UNIT ASSEMBLY 1105815** for pressure protection.

**PLUG UNIT ASSEMBLY 110520** for movable seat.

**REPAIR KIT 110501**

For complete information view the Sealco website at www.sealcocvp.com

<table>
<thead>
<tr>
<th>Part Number</th>
<th>PORT SIZES (NPT)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supply</td>
<td>Control</td>
</tr>
<tr>
<td>110500</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
<tr>
<td>110505</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
<tr>
<td>110510</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
</tbody>
</table>
CAUTION: Block wheels before servicing trailer air brake system. Drain reservoirs before removing airlines, hoses, valves, or servicing valve plug units. Consult spring brake manufacturer’s safety recommendations before working on spring brake chambers.

**LEGEND**

SBCV = Spring Brake Control Valve

---

**Does air leak from exhaust port of SBCV?**

- No
  - **Are air reservoirs slow to fill with air?**
    - No
    - **Parking brakes release slowly or not at all?**
      - No
      - **When supply line is charged, does air leak out of control glad-hand or out of exhaust port of foot valve or hand valve?**
        - Yes
        - **Clean or replace check valve in control port of SBCV.**
        - No
      - **Eliminate cause for restrictions.**
    - Yes
      - **Check for sufficient air pressure at spring brake chamber. Is there a minimum of 70 P.S.I.?**
        - Yes
        - **If Sealco SBCV, install new pressure protection plug unit assembly. Replace valve if other-make SBCV.**
        - No
      - **Check for sufficient supply pressure from tractor at trailer supply glad-hand. Is there at least 95 P.S.I.?**
        - Yes
        - **Adjust tractor governor cut-in pressure to 105 P.S.I.**
        - No
      - **Clean line filter and/or filter screen.**
  - Yes
    - **If Sealco SBCV, install new exhaust plug unit assembly. Replace valve if other-make SBCV.**

---

CONTACT your Sealco Regional Manager or Sealco Technical Services at (602) 253-1007
CAUTION: Block wheels before servicing trailer air brake system. Drain reservoirs before removing airlines, hoses, valves, or servicing valve plug units. Consult spring brake manufacturer’s safety recommendations before working on spring brake chambers.

---

**LEGEND**

SRV = Spring Relay Valve  
CLV = Control Line Valve  
TPV = Tractor Protection Valve

---

**TRoubleshooting Guide**

**Trailer Service / Supply For 121 System**

**Legend**

- **SRV** = Spring Relay Valve
- **CLV** = Control Line Valve
- **TPV** = Tractor Protection Valve

**Flowchart Description**

1. **Does air leak from exhaust port of SRV?**
   - **No**
   - **Yes**
     - **Readjust**

2. **Do service brakes release slowly and/or drag?**
   - **Yes**
   - **No**
     - **Are slack adjusters over-adjusted?**
       - **Yes**
       - **Eliminate cause for restriction**
       - **No**
       - **Check foot valve hinge pin and plunger for binding. Check for restrictions in control line from foot valve to TPV and airline from TPV to trailer control glad-hand.**

3. **Are service brakes slow to apply or don’t apply at all?**
   - **Yes**
   - **No**
     - **Are slack adjusters need adjusting?**
       - **Yes**
       - **Adjust**
       - **No**

4. **Do slack adjusters need adjusting?**
   - **Yes**
   - **No**
     - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
       - **Yes**
       - **Eliminate cause for restrictions (if any)**
       - **No**

5. **Are slack adjusters over-adjusted?**
   - **Yes**
   - **No**
     - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
       - **Yes**
       - **Eliminate cause for restrictions (if any)**
       - **No**

6. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
   - **Yes**
   - **No**
     - **Are there restrictions in tractor control line from foot valve to TPV and airline from TPV to trailer control glad-hand.**
       - **Yes**
       - **Possible air system imbalance between tractor and trailer, consult tractor for use of duplex test gauge No. 110384 for air system balance test.**
       - **No**

7. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
   - **Yes**
   - **No**
     - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
       - **Yes**
       - **Eliminate cause for restrictions (if any)**
       - **No**

8. **Are air reservoirs slow to fill.**
   - **Yes**
   - **No**
     - **Does this problem occur only when towed by a certain tractor?**
       - **Yes**
       - **Did you check for restrictions in tractor control line from foot valve to TPV and airline from TPV to trailer control glad-hand?**
         - **Yes**
         - **Replace SRV or if Sealco replace exhaust plug unit if applicable.**
         - **No**
         - **Possible air system imbalance between tractor and trailer, consult tractor for use of duplex test gauge No. 110384 for air system balance test.**
       - **No**
         - **Replace SRV or if Sealco replace exhaust plug unit if applicable.**

9. **Does air leak when spring brakes are applied or released?**
   - **Yes**
   - **No**
     - **Does air leak only when spring brakes are released?**
       - **Yes**
       - **Check for faulty spring brake chambers(s) with leak between service & emergency sections.**
       - **No**
       - **Replace SRV or if Sealco replace exhaust plug unit if applicable.**

10. **Does service brakes release slowly and/or drag?**
    - **Yes**
    - **No**
      - **Are service brakes slow to apply or don’t apply at all?**
        - **Yes**
        - **Do slack adjusters need adjusting?**
          - **Yes**
          - **Adjust**
          - **No**

11. **Are service brakes slow to apply or don’t apply at all?**
    - **Yes**
    - **No**
      - **Are slack adjusters need adjusting?**
        - **Yes**
        - **Adjust**
        - **No**

12. **Are slack adjusters over-adjusted?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

13. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

14. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

15. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

16. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

17. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

18. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

19. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

20. **Are there restrictions in control line; i.e., severe bends, kinks, or blockages?**
    - **Yes**
    - **No**
      - **Are there restrictions in control line; i.e., severe bends, kinks, or blockages? (control line must be at 0 P.S.I. to fully release service brakes.)**
        - **Yes**
        - **Eliminate cause for restrictions (if any)**
        - **No**

---

**Contact**

Contact your Sealco Regional Manager or Sealco Technical Services at (602) 253-1007
HOW TO BRAKE WITH ABS

Do what good drivers have always been doing: brake just the way you always have. Apply brakes as normal to stop in time. When your ABS starts working, don’t release your brakes, maintain brake pressure.

- **If driving with a single trailer, doubles or triples...**
  Watch your trailer(s) through your mirrors and correct brake pressure as necessary to keep in a straight line.

- **If only your tractor has ABS...**
  Use your rig’s brakes as necessary to straighten out your trailer if it swings out. Watch the trailer through your mirrors to make sure it follows your tractor properly.

- **If only your trailer has ABS...**
  Use your rig’s brakes as necessary to maintain control and keep your combination in its lane.

**Avoid rapid “pumping” of the brakes.** During a brake application that could result in a wheel lock, Meritor WABCO ABS automatically releases and applies the brake up to five times per second, obviously much faster than you could do pumping the brake pedal.

Always remember that **you are the most important element in the safe operation of your vehicle.** ABS is not an excuse to take unnecessary risks. Always drive carefully and stay a safe distance away from the vehicle in front of you.

---

**TRAILER ABS**

1. Turn on vehicle ignition
2. Begin to drive the vehicle
3. Does the trailer mounted ABS warning lamp come on above 4 mph or come on and stay on during the entire braking application?
   - Yes
     - If the lamp comes on above 4 mph, or if it remains on during the entire braking application, there is a malfunction. Your vehicle should be serviced as soon as possible after completing the trip.
   - No
     - System is OK

**NOTE:** Depending how the ABS is powered, the lamp may come on briefly at ignition and then go off, or briefly flash each time you apply the brakes on a moving vehicle.
Easy-Stop™
and
Enhanced Easy-Stop with PLC Trailer ABS
Blink Code Diagnostic Guide

Easy-Stop
2S/1M Basic
ECU/Modulator Valve Assembly

Easy-Stop 2S/1M, 2S/2M*, 4S/2M*, 4S/3M* Basic
ECU/Modulator Valve Assembly

*External modulator valve and cable required.

Enhanced Easy-Stop with PLC

2S/1M Basic ECU/Single Modulator Valve Assembly

2S/2M Basic ECU/Dual Modulator Valve Assembly

2S/2M, 4S/2M, 4S/3M* Premium ECU/Dual Modulator Valve Assembly

*External modulator valve and cable required.

This publication covers all Enhanced Easy-Stop ECU/Valve Assemblies and Easy-Stop ECU/Valve Assemblies with serial numbers 3080002746 and higher. For Easy-Stop ECU/Valve Assemblies with serial numbers 3080002745 or lower, please call 1-800-535-5560 for assistance. Serial numbers are located on the bar-code label on the side of the ECU/Valve Assembly.
Most Easy-Stop ECUs have a blink code lamp on the top of the ECU. Some early version 2100 Basic ECUs do not have a blink code switch or remote diagnostic tool. Instead, power the ECU, the LED lamp on top of the ECU/Valve Assembly will repeatedly flash the blink code if there is a fault.

Enhanced Easy-Stop blink codes may be accessed by ignition circuit and counting flashes on the trailer ABS indicator lamp on the side of the trailer.

To access blink codes:
- Turn ignition ON for one second.
- Turn OFF for one second,
- Turn ignition ON and count the flashed on the ABS Lamp.

With Enhanced Easy-Stop, the blink code tool and the ABS Lamp on the trailer do not function simultaneously.
## Easy-Stop Troubleshooting and Repair

<table>
<thead>
<tr>
<th>BLINK CODE</th>
<th>CAUSE OF FAULT</th>
<th>ACTION REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No faults</td>
<td>System okay. No action required</td>
</tr>
<tr>
<td>3</td>
<td>Sensor BU1: Cable break, short circuit or out of adjustment.</td>
<td>Check sensor, sensor cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.</td>
</tr>
<tr>
<td>4</td>
<td>Sensor YE1: Cable break, short circuit or out of adjustment.</td>
<td>Check sensor, sensor cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.</td>
</tr>
<tr>
<td>5</td>
<td>Sensor BU2: Cable break, short circuit or out of adjustment.</td>
<td>Check sensor, sensor cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.</td>
</tr>
<tr>
<td>6</td>
<td>Sensor YE2: Cable break, short circuit or out of adjustment.</td>
<td>Check sensor, sensor cable connection; adjust sensor; or check for excessive hub runout, a sensor gap that is too wide or damage to the tooth wheels.</td>
</tr>
<tr>
<td>7</td>
<td>Ext. Modulator (RD): Short to power, cable break or open, short to ground or cable damaged, or ECU/Valve Assembly failure.</td>
<td>Check ABS valve and cable. Replace as required.</td>
</tr>
<tr>
<td>9</td>
<td>Easy-Stop: External Modulator (BU) Enhanced Easy-Stop: Internal Modulator Failure, Inlet Valve #2: Short to power, cable break or open, short to ground or cable damaged, or ECU/Valve Assembly Failure.</td>
<td>Easy-Stop: Check ABS valve and cable. Replace as required. Enhanced Easy-Stop: Verify proper installation. If code continues, contact Meritor WABCO for assistance.</td>
</tr>
<tr>
<td>10</td>
<td>Easy-Stop: ECU/Valve Assembly Modulator (YE) Enhanced Easy-Stop: Internal Modulator Failure, Inlet Valve #2: Short to power, cable break or open, short to ground or cable damaged, or ECU/Valve Assembly Failure.</td>
<td>Easy-Stop: Check ABS valve and cable. Replace as required. Enhanced Easy-Stop: Verify proper installation. If code continues, contact Meritor WABCO for assistance.</td>
</tr>
<tr>
<td>11</td>
<td>Internal Modulator Failure, Outlet Valve. Enhanced Easy-Stop Only.</td>
<td>Verify proper installation. If code continues, contact Meritor WABCO as assistance.</td>
</tr>
<tr>
<td>14</td>
<td>Power Supply: Over or under voltage, current low, or internal failure.</td>
<td>Repair vehicle power supply, check vehicle voltage output and connector; check ECU’s configuration.</td>
</tr>
<tr>
<td>15</td>
<td>ECU – Internal Failure Internal failure.</td>
<td>Internal failure, contact Meritor WABCO.</td>
</tr>
<tr>
<td>16</td>
<td>SAE J1708 Failure</td>
<td>Internal failure, contact Meritor WABCO.</td>
</tr>
<tr>
<td>17</td>
<td>Generic SAE J2497 Failure</td>
<td>Internal failure, contact Meritor WABCO.</td>
</tr>
<tr>
<td>18</td>
<td>Generic I/O Failure</td>
<td>Verify proper electrical installation. Check power supply. Make necessary corrections.</td>
</tr>
</tbody>
</table>

**Note:** (Easy-Stop only) If the blink code indicates 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*.

For further information on blink code diagnostics, refer to Maintenance Manual 33 (Easy-Stop), Maintenance Manual No. 0180 (Enhanced Easy-Stop) or call: Meritor WABCO at **800-535-5560**.
TO REMOVE TRACTOR FROM TRAILER:

1. Position the trailer so that the landing gear shoes will rest on a firm level surface when landing gear is extended.
2. Shift landing gear to high gear and extend landing gear until shoes contact ground.
3. Shift landing gear to low gear and lift trailer approximately (1) inch.
4. Unlock fifth wheel, uncouple air lines, and drive the tractor out from under the trailer.

TO CONNECT TRACTOR TO TRAILER:

1. Ensure that the trailer is at a sufficient height to allow coupling of the tractor and trailer.
2. Connect air lines from tractor to trailer, then lock trailer brakes and back tractor under trailer, then lock fifth wheel.
3. Retract landing gears to fully retracted position.
4. Store crank on the crank holder.

LUBRICATION – STANDARD:

When manufactured, the landing gears have been adequately greased with high quality lubricant. It will be necessary to periodically supplement this lubricant to maintain satisfactory performance. Use a molybdenum type grease with appropriate temperature range for your operating conditions. Gearbox leg has (3) grease fittings; leg without gearbox has (2) grease fittings.

1. Prior to lubrication, extend legs approximately (2) inches from maximum retracted position.
2. For optimum performance, every (6) months lube both legs at all grease fittings.
3. Add 1/4-lb grease at each grease fitting.

LUBRICATION – NoLube:

No additional grease is required.
TROUBLE SHOOTING:

In normal trailer operating service, certain components such as shafts, bushings, bearings, gears, and screw and nut assemblies are subject to wear and will require replacement. However, under extreme usage condition exceeding AAR-931 Durability Requirements the same components may require replacement more frequently.

Landing gears hard to crank—check the following:

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cross driveshaft in a bind or tight between shafts.</td>
<td>Bolts must be loose and cross driveshaft free to move in slots provided.</td>
</tr>
<tr>
<td>2. To determine which leg turns hard</td>
<td>Remove cross driveshaft bolt and crank each leg on the jack shaft.</td>
</tr>
<tr>
<td>3. Inadequate lubrication.</td>
<td>(See Lubrication Instructions).</td>
</tr>
<tr>
<td>4. Alignment.</td>
<td>Legs must be timed together, parallel to each other and perpendicular to the trailer crossmembers.</td>
</tr>
<tr>
<td>5. Upper housing or retracting tube may be bent.</td>
<td>Replace damaged part.</td>
</tr>
<tr>
<td>6. Screw and nut assembly may have excessive wear and be hard to turn or inoperable.</td>
<td>Disassemble and inspect for wear. If screw and/or nut show considerable wear, then replace entire retracting tube assembly.</td>
</tr>
<tr>
<td>7. Check for proper clearance between pinion and bevel gear.</td>
<td>Minimum end play 1/32&quot;.</td>
</tr>
<tr>
<td>8. Excessive wear or damage to pinion, bevel, input, idler and/or output gears.</td>
<td>Replace damaged gears.</td>
</tr>
<tr>
<td>9. Landing gear jack shafts and/or shift shaft binding.</td>
<td>Check to see if trailer mounting bracket has sufficient size clearance hole to miss landing gear boss or shift shaft.</td>
</tr>
<tr>
<td>11. Damaged thrust bearing.</td>
<td>Replace.</td>
</tr>
<tr>
<td>13. Damaged shift lock boss and/or shaft bearing boss.</td>
<td>Grind weld as required and re-weld.</td>
</tr>
<tr>
<td>14. Weld blow through where strut bracket is welded to housing. (With no-load on landing gear, the retract tube should have free play inside housing.)</td>
<td>Press boss back into position.</td>
</tr>
<tr>
<td>15. Impact to jack shaft end has pressed bearing boss into gearbox half.</td>
<td></td>
</tr>
</tbody>
</table>

Trouble Shooting/General:

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Right-hand leg (gearbox leg) operates but left-hand leg does not move.</td>
<td>Broken cross driveshaft bolt or damaged cross driveshaft. Replace damaged part.</td>
</tr>
<tr>
<td>2. Legs will not operate when turning jack shaft.</td>
<td>Damaged pinion or bevel gear. Replace damaged part.</td>
</tr>
<tr>
<td>3. Right-hand leg will not operate, shift shaft will turn but jack shaft does not turn.</td>
<td>Damaged input, idler, and/or output gear. Replace damaged part.</td>
</tr>
<tr>
<td>4. Leg locked and will not turn.</td>
<td>Bent retracting screw or damaged riser nut and screw. Replace entire retracting tube assembly.</td>
</tr>
<tr>
<td>5. Right-hand leg will not stay fully shifted in low gear.</td>
<td>Shift lock ball and shift lock spring missing or damaged shift lock spring. Replace missing or damaged part.</td>
</tr>
<tr>
<td>6. Noisy gearbox.</td>
<td>Check that shift shaft movement is 1&quot; when shifted between gears.</td>
</tr>
</tbody>
</table>
CAUTIONS:

Landing gears are designed to meet T.T.M.A. recommended practice RP-4 and A.A.R.-931 requirements.

When operating the landing gears, it is necessary to observe some cautions. By doing so you will ensure long trouble free service.

1. Do not over extend or over retract landing gears.
2. Never drop trailer on landing gears. Always extend landing gears until sand shoes contact ground, then lift trailer approximately 1 inch before removing tractor from trailer.
3. Always ensure that landing gear shoes or foot pads will rest on a hard ground surface or concrete pad. If necessary, place shoes on a support plank to prevent the landing gears from sinking into the ground surface. (This is especially important with liquid cargo where a shift in the contents could overturn the trailer!).
4. Always retract landing gears fully before moving the trailer.
5. Always store the crank on the crank holder after extending or retracting the landing gear.
6. Replace all damaged or missing parts.
7. Failure to replace worn or damaged riser nut and retracting screw assembly could cause a failure.
## ATLAS 55 Standard - Parts List

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Upper Housing LH</td>
<td>N/A</td>
<td>- -</td>
</tr>
<tr>
<td>1B</td>
<td>Upper Housing RH</td>
<td>N/A</td>
<td>- -</td>
</tr>
<tr>
<td>3</td>
<td>Collar</td>
<td>XB-LG0544</td>
<td>1 1</td>
</tr>
<tr>
<td>4</td>
<td>Thrust Bearing</td>
<td>XB-BRG-013-77</td>
<td>1 1</td>
</tr>
<tr>
<td>5</td>
<td>Washer - FL 2” OD x 1.19” ID x .13” THK</td>
<td>XB-PW-016-62</td>
<td>1 1</td>
</tr>
<tr>
<td>6</td>
<td>Pin - DIA .38” x 2”</td>
<td>XX-CRP-V-06365</td>
<td>1 2</td>
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<tr>
<td>7</td>
<td>Bevel Gear</td>
<td>LG2884</td>
<td>1 1</td>
</tr>
<tr>
<td>8</td>
<td>Pinion Gear</td>
<td>LG1823-02</td>
<td>1 1</td>
</tr>
<tr>
<td>9</td>
<td>Groove Pin - DIA .38” x 1.50”</td>
<td>XB-GP-014-18</td>
<td>1 1</td>
</tr>
<tr>
<td>10</td>
<td>Ftg - Grease .25”-28 Self Tapping</td>
<td>XB-GRF-022-16</td>
<td>2 3</td>
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<tr>
<td>11</td>
<td>O-Ring, #319</td>
<td>2024100000100</td>
<td>1 1</td>
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<td>12</td>
<td>Jack Shaft LH - Universal Mount</td>
<td>LG2964-01</td>
<td>1 -</td>
</tr>
<tr>
<td></td>
<td>- I-Beam Mount, 6.50”</td>
<td>LG2964-04</td>
<td>1 -</td>
</tr>
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<td></td>
<td>- I-Beam Mount, 10.00”</td>
<td>LG2964-05</td>
<td>1 -</td>
</tr>
<tr>
<td></td>
<td>- Conventional Mount</td>
<td>LG2964-02</td>
<td>1 -</td>
</tr>
<tr>
<td></td>
<td>- Reverse Mount</td>
<td>LG2964-03</td>
<td>1 -</td>
</tr>
<tr>
<td>13</td>
<td>Pin - Spring DIA .25” x 1.5” (Not Required)</td>
<td>N/A</td>
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<td>15</td>
<td>Top Cover</td>
<td>2111100004080</td>
<td>1 1</td>
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<tr>
<td>16</td>
<td>Self-Tapping Screw .25” x .20 x .5” Lg</td>
<td>XB-STS-008-11</td>
<td>2 9</td>
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<tr>
<td>17</td>
<td>Screw, Hex Cap .38”-16 x 2.25” Lg GR5</td>
<td>XB-HHC-050-42</td>
<td>1 2</td>
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<tr>
<td>18</td>
<td>Self-Locking Nut .38”-16 - Sandshoe</td>
<td>XB-SLN-012-04</td>
<td>2 3</td>
</tr>
<tr>
<td></td>
<td>- Low Profile RCF</td>
<td>XB-SLN-012-04</td>
<td>3 4</td>
</tr>
<tr>
<td></td>
<td>- RCF</td>
<td>1 2</td>
<td></td>
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<tr>
<td>19</td>
<td>Washer .38” Std Type A</td>
<td>XB-PW-016-03</td>
<td>2 -</td>
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<tr>
<td>20</td>
<td>Gearbox Half, Outside w/Hole for Grease Fitting</td>
<td>LG2996</td>
<td>- 1</td>
</tr>
<tr>
<td>22</td>
<td>Output Gear</td>
<td>LG2980</td>
<td>- 1</td>
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<tr>
<td>23</td>
<td>Jackshaft RH - Universal Mount</td>
<td>LG2963-01</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>- I-Beam Mount, 6.50”</td>
<td>LG2963-04</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>- I-Beam Mount, 10.00”</td>
<td>LG2963-05</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>- Conventional Mount</td>
<td>LG2963-02</td>
<td>- 1</td>
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<tr>
<td></td>
<td>- Reverse Mount</td>
<td>LG2963-03</td>
<td>- 1</td>
</tr>
<tr>
<td>24</td>
<td>Gear, Drive, High Speed - Machined</td>
<td>2040100000060</td>
<td>- 1</td>
</tr>
<tr>
<td>25</td>
<td>Gear, Drive, Low Speed - Machined</td>
<td>2040100000050</td>
<td>- 1</td>
</tr>
<tr>
<td>26</td>
<td>Groove Pin, Type E DIA .38” x 2.00” Lg</td>
<td>XB-GP-052-21</td>
<td>- 1</td>
</tr>
<tr>
<td>27</td>
<td>Shift Shaft - Universal</td>
<td>2111100003400</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>- I-Beam &amp; Conventional</td>
<td>2111100003410</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>- Reverse</td>
<td>2111100003420</td>
<td>- 1</td>
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<tr>
<td>30</td>
<td>Idler Gear</td>
<td>LG2975</td>
<td>- 1</td>
</tr>
<tr>
<td>32</td>
<td>Boss, Hex Lock - Oversized</td>
<td>2022100000180</td>
<td>- 1</td>
</tr>
<tr>
<td>33</td>
<td>Hex Lock Boss - Sealed</td>
<td>LG2926-10</td>
<td>2 1</td>
</tr>
<tr>
<td>34</td>
<td>Idler Shaft Bushing (Included in Item #23)</td>
<td>LG3005</td>
<td>- 2</td>
</tr>
<tr>
<td>35</td>
<td>Boss Bearing - Sealed (Included in Item #20)</td>
<td>LG0659-10</td>
<td>- 3</td>
</tr>
</tbody>
</table>

### For technical assistance please go to www.safholland.us or call 800.876.3929
MECHANICAL SUSPENSION
INSTALLATION AND MAINTENANCE INSTRUCTIONS

DuraLite® Series
Installation, Maintenance and Warranty Information

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XL-MS175 Rev. C
Page 30
The DuraLite suspension is available in three hanger bracket mounting styles: straddle mount, under mount and flange mount. The DuraLite suspension may be used as a single axle, tandem axle or triple axle. The base suspension is the single axle – adding a multi-axle conversion kit converts the single axle to a tandem and a second multi-axle kit will make a triple axle suspension. The DuraLite suspension is available in overslung (axle below the spring) or underslung (axle above the spring) configuration.

The following instructions provide the minimum requirements for installing the Holland DuraLite® suspension. It is the responsibility of the installer to determine the proper location of the suspension, to provide an adequate structure to support the suspension, to insure adequate clearances with other components and to determine if the rated capacity is adequate for the applications.

NOTES, CAUTIONS AND WARNINGS

You must read and understand all of the safety procedures presented in this manual before starting any work on the suspension.

Proper tools must be used to perform the maintenance and repair procedures described in this manual. Many of these procedures require special tools.

Failure to use the proper equipment could result in personal injury and/or damage to the suspension.

Safety glasses must be worn at all times when performing the procedures covered in this manual.

Throughout this manual, you will notice the terms “NOTE,” “IMPORTANT,” “CAUTION” and “WARNING” followed by important product information. So that you may better understand the manual, those terms are as follows:

**NOTE:** Includes additional information to enable accurate and easy performance of procedures.

**IMPORTANT:** Includes additional information that if not followed could lead to hindered product performance.

**CAUTION** Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, may result in property damage.

**⚠️ CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**⚠️ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

INSTALLATION PREPARATION

The proper installation of the suspension is critical to assure trouble free operation. Before proceeding with suspension installation, check the tire size and trailer design to make sure that there is lateral tire clearance and a vertical tire clearance of at least 4 1⁄2” when the trailer is empty. Vertical tire clearance may be adjusted by using different height spring seats or high, medium or low arch springs. Holland DuraLite suspensions are rated at 22,400 pounds GAWR (Gross Axle Weight Rating) with one, two or three leaf springs and 24,000 pounds GAWR with heavy duty leaf springs. (Holland does not supply springs.) For leaf spring selection and mounting height information, see Tables 1, 2 and 3 on page 12.

Check that adequate clearance is provided to all components of the trailer, including but not limited to tires, brakes and air lines.

**IMPORTANT:** The suspension hangers must be on the same centers as the spring seats and springs, within the tolerances shown. The springs must be square with the axles and located the same distance from the axle centerline within the tolerances shown.

Failure to correctly install the components can lead to the following trailer problems: trailer lean, improper tracking, premature tire wear and shortened suspension life. Failure to comply with these installation instructions without written permission will void the suspension warranty.

WARRANTY

Refer to the complete warranty for the country in which the product will be used. A copy of the written warranty is included with the product as well as on the Holland Group web site (www.thehollandgroupinc.com).

It may also be ordered directly from the address shown on the back cover.
LOCATE HANGER BRACKETS (ALL STYLES) ON TRAILER FRAME

NOTE: The hanger bracket location instructions on this page are to be used for all 3 hanger bracket styles; under mount, flange mount and straddle mount. After the hanger brackets have been properly located and tack welded to the trailer frame, proceed to Page 3 for Under Mount, Page 4 for Flange Mount or Page 5 for Straddle Mount installation instructions.

1. Identify and mark hanger bracket locations on bottom of trailer frame referencing the dimensions provided in Figure 1 (single axle) or Figure 2 (tandem axle) or Figure 3 (triple axle). Hanger spacing is always measured from center line to center line of hanger (Figure 1). The front and rear hangers are always located an equal distance from the center hanger and should not vary from dimension shown more than plus or minus 1/16". Hangers must be located on both sides of sub-frame in exactly the same distances from front and rear of trailer frame. Hangers on one side of sub-frame must not be in front of or behind corresponding hangers on other side of sub-frame by more than plus or minus 1/16".

IMPORTANT: Frame surface where hanger brackets are to be attached must be clean and free of any surface rust. Use wire brush or light-duty grinder to clean surface.

2. Position hanger brackets on frame according to location marks determined in Step 1. Position and tack weld all hangers in position and double check dimensions before completing welding of hangers (Figure 1, Figure 2 and Figure 3).

3. DuraLite suspension hangers may be installed with any low hydrogen welding process compatible with high strength low alloy steel, such as AWS A5.18 ER70xx, SMAW or flux cored welding. Use a low hydrogen process for all welds, including tack welds. Make sure the weld process is compatible with the trailer structure.

IMPORTANT: Hangers must be mounted in proper alignment with one another and must not be cocked or tilted in respect to the sub frame mounting surface.

---

**Figure 1 (Under mount style shown)**

---

**Figure 2 (Under mount style shown)**

---

**Figure 3 (Under mount style shown)**
**INSTALL UNDER MOUNT STYLE HANGER BRACKETS**

**IMPORTANT:** The under mount style hanger brackets must be located on the trailer frame to match the axle spring center (*Figure 4*).

1. Install a 1¼ inches schedule 40 pipe or 1.66 OD x .109 standard mechanical tubing through the front and center hangers. The pipe brace should be 6 inches longer that the spring centers. Tack weld the pipe brace in place (*Figure 4*).

2. Add diagonal braces between the front, center and rear hangers and the frame of the trailer (*Figure 4*).

3. Check that all components are located in the correct position. Weld the suspension hangers in place as shown in *Figures 5a, 5b and 5c*. Weld the pipe braces and diagonal braces in place as shown in *Figure 4*.

---

*Figure 4*

DIAGONAL BRACES REQUIRED ON FRONT, CENTER & REAR HANGERS (Not Included)

1-¼" PIPE – SCHEDULE 40 or 1.66 OD x .109 TUBING (Not Included)

WELD TUBE INSIDE WITH 3/4 WELDS ON THE HORIZONTAL CENTER LINE OF THE TUBE, AS SHOWN ON FRONT & CENTER HANGERS.

---

*Figure 5a*

Stop welds 1/4" from edge

---

*Figure 5b*

Stop welds 1/4" from edge

---

*Figure 5c*

Stop welds 1/4" from edge
1. Install a 1 1/4 inches schedule 40 pipe or 1.66 OD x .109 standard mechanical tubing through the front and center hangers. The pipe brace should be 6 inches longer than the spring centers. Tack weld the pipe brace in place (Figure 4).

2. Add diagonal braces between the front, center and rear hangers and the frame of the trailer (Figure 4).

3. Check that all components are located in the correct position. Weld the suspension hangers in place as shown in Figures 5a, 5b and 5c. Weld the pipe braces and diagonal braces in place as shown in Figure 4.
1. Install a 1 ¼ inches schedule 40 pipe or 1.66 OD x .109 standard mechanical tubing through the front and center hangers. The pipe brace should be 6 inches longer than the spring centers. Tack weld the pipe brace in place (Figure 4).

2. Check that all components are located in the correct position. Weld the suspension hangers in place as shown in Figure 5a, 5b and 5c. Weld the pipe braces in place as shown in Figure 4.

**INSTALL STRADDLE STYLE HANGER BRACKETS**

**WELD TUBE INSIDE WITH 3/4 WELDS ON THE HORIZONTAL CENTER LINE OF THE TUBE, AS SHOWN ON FRONT & CENTER HANGERS.**

**SPOOL CENTERS (±1/16”)**

**Figure 4**

**Figure 5**

**Figure 5a**

**Figure 5b**

**Figure 5c**

**SECTION C-C**

**TYP 12 PLCS**

**ALL VERTICAL WELDS ARE BEVEL WELDS INSTEAD OF FILLETS AND FLUSH AS SHOWN.**

**WELD NO. 1**

TACK WELD 4 PLCS PER HANGER

**WELD NO. 2**

TYP 2 PLCS PER HANGER
(WELDS MUST BE CONTINUOUS - DO NOT STOP AND RESTART)

**WELD NO. 3**

TYP 2 PLCS PER HANGER
(WELDS MUST BE CONTINUOUS - DO NOT STOP AND RESTART)

**TIE THIS WELD INTO WELD #2**

**BEGIN WELDS HERE**

**BEGIN WELDS HERE**
**IMPORTANT:** The axle seats and bottom plates that are welded to the axle are compatible with all low hydrogen welding processes suitable for welding to steel axles.

**NOTE:** See below for underslung axle style instructions.

**OVERSLUNG AXLE STYLE**

1. The axle seats should be located on the spring centers within ±1/16". The axle seats should be the same distance from the center of the axle within the same tolerance. The camshaft should be oriented per the axle manufacturers specification. *(NOTE: When the cams are forward, the cam must be below the horizontal centerline when axle seats of 2" or shorter height are used.)*

2. Clamp the axle seats and bottom plates to the axle. Check that any gap between the axle seat riser and the axle, and the bottom plate and the axle does not exceed 1/8" *(Figure 6)*. If a greater gap is present, these parts may be clamped to the axle or adjusted to fit by grinding the axle seat. Using the axle manufacturer's recommendations, weld the axle seats and bottom plates to the axles *(Figure 7)*.

**UNDERSLUNG AXLE STYLE**

1. The axle seats should be located on the spring centers within ±1/16". The axle seats should be the same distance from the center of the axle within the same tolerance. The camshaft should be oriented per the axle manufacturers specification. *(NOTE: When the cams are forward, the cam must be below the horizontal centerline when axle seats of 2" or shorter height are used.)*

2. Clamp the axle seats to the axle. Check that any gap between the axle seat riser and the axle does not exceed 1/8" *(Figure 8)*. If a greater gap is present, the axle seats may be clamped to the axle or adjusted to fit by grinding. Using the axle manufacturer's recommendations, weld the axle seats to the axles *(Figure 9)*.
OVERSLUNG AXLE STYLE
Proceed to Page 8 for Underslung axle style instructions.

NOTE: It is recommended, but not required, to install the fasteners with the nuts on the outside (closest to tires). Lubrication may be used on all threaded fasteners, but is not required unless the fasteners have minor surface rust.

Install Torque Arms and Springs

1. Install the spring liner supplied with the springs, on top of the springs. Place the springs on top of the spring seats on the axle (Figure 10). Place the top plate on top of the spring. Install the springs on the axles with the appropriate U-bolts, nuts and washers. The U-bolts will fit into the detents stamped into the top plate (Figure 10). The U-bolt threads may be lubricated before tightening the U-bolts.

IMPORTANT: On tandem axle suspensions the big hook end of the spring should be arranged to fit in the equalizer (Figure 11a). On single axle suspensions it should point to the rear (Figure 11). Arrange the springs so that they are on the correct centers ±.03 inches and perpendicular to the axle.

2. Tighten the U-bolts to 275 to 300 foot pounds of torque using an alternating pattern (Figure 10a). Check the spring centers and adjust if necessary.

CAUTION DO NOT directly strike the springs with a steel hammer; use a rubber hammer or wooden block to avoid damaging the springs.

3. Install the axles with springs into the suspension hangers. Install the 5/8 inch spring retainer bolts and spacers in the front and rear hangers, and the equalizer on tandem axles to hold the springs in place. Tighten these 5/8 inch bolts to 35 to 50 foot pounds (Figure 11).

CAUTION DO NOT overtighten as this may damage the spacers.

4. Install the torque arms between the hangers and the spring seats on the axles. It is recommended that the adjustable torque arms be installed on the road side and the fixed (cast) torque arms be installed on the curb side (Figure 12). Install the 7/8 inch nuts and bolts to secure the torque arms in place and torque to 275 to 300 foot pounds (Figure 12).

5. With the suspension installed, check that there is (1/8˝ ± 3/32˝) clearance between the springs and the sides of the hangers and that all the springs are contacting the bottoms of the hangers (Figure 12a).

6. Install the decal, XB-SP0001 in clear view on the road side of the vehicle as close as practical to the suspension.
UNDERSLUNG AXLE STYLE

NOTE: It is recommended, but not required, to install the fasteners with the nuts on the outside (closest to tires). Lubrication may be used on all threaded fasteners, but is not required unless the fasteners have minor surface rust.

Install Torque Arms and Springs

1. Install the spring liner supplied with the springs, on top of the springs. Position the springs under the spring seats on the axle (Figure 10). Position the bottom plate under the spring. Assemble the springs to the axles with the appropriate U-bolts, nuts and washers. The U-bolt threads may be lubricated before tightening the U-bolts.

IMPORTANT: On tandem axle suspensions the big hook end of the spring should be arranged to fit in the equalizer (Figure 11a). On single axle suspensions it should point to the rear (Figure 11). Arrange the springs so that they are on the correct centers ±.03 inches and perpendicular to the axle.

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CAUTION: DO NOT directly strike the springs with a steel hammer; use a rubber hammer or wooden block to avoid damaging the springs.

3. Install the axles with springs into the suspension hangers. Install the 5/8” spring retainer bolts and spacers in the front and rear hangers, and the equalizer on tandem axles to hold the springs in place. Tighten these 5/8” bolts to 35 to 50 foot pounds (Figure 11).

CAUTION: DO NOT overtighten as this may damage the spacers.

4. Install the torque arms between the hangers and the bottom plates on the axles. It is recommended that the adjustable torque arms be installed on the road side and the fixed torque arms be installed on the curb side (Figure 12). Install the 7/8” nuts and bolts to secure the torque arms in place and torque to 275 to 300 foot pounds (Figure 12).

5. With the suspension installed, check that there is (1/8” ± 3/32”) clearance between the springs and the sides of the hangers and that all the springs are contacting the bottoms of the hangers (Figure 12a).

6. Install the decal, XB-SP0001 in clear view on the road side of the vehicle as close as practical to the suspension.
After suspension installation, and periodically thereafter, the axles should be aligned to insure proper tracking of the trailer and to avoid excessive tire wear. For best results, the use of axle and kingpin extensions is recommended.

1. When aligning axles, the suspension should be in a natural relaxed state, free of any “binds.” Before taking measurements, and to achieve this relaxed condition, make sure the vehicle is unloaded. Then roll it back and forth on a level floor. Avoid brake application (including the parking brake). Vehicle must be level from side-to-side, as well as from front-to-rear. The upper coupler should be at the ride height.

2. Maintain the air system at normal operating pressure (greater than 80 psi). **DO NOT** drain the air tank.

3. Check that the ends of the springs are contacting the bottom wear pads in all hangers.

4. Loosen the 5/8” clamp bolts on the adjustable torque arms.

5. Align the front axle with the kingpin by adjusting the front adjustable torque arm.

6. Align the rear axle with the front axle in the same manner.

7. Tighten the clamp bolts on the adjustable torque arm and track rod ends to 80 – 95 ft. lbs. of torque.

**FINAL INSPECTION**

1. Verify that the hanger brackets to mounting sub-frame and axle seat welds have been completed per specifications (Figures 5a, 5b and 5c).

2. Check all suspension fastener connections for proper torque settings (Figures 15 and 16).

3. Check adjustable torque arm clamp nuts to be certain that 85 – 95 ft. lbs. torque is maintained.

4. Check for proper suspension mounting height. Adjust with axle seat shims if necessary (Figure 14).

5. Check for proper 4½” vertical tire clearance (Figure 14). Check for lateral tire clearance.

6. Verify that the front axle alignment does not exceed a maximum variation of 1/8” kingpin to front axle and a maximum variation of 1/16” axle to axle on any additional axles (Figure 13).
DuraLite® suspensions, by design, require a minimum of maintenance. However, suspensions in “over-the-road” operations require periodic checks to be certain of continued trouble free performance. We recommend, after an initial loaded run-in period of at least 1,000 miles, that you recheck the trailer alignment and correct if required. Routine visual inspections and appropriate maintenance of suspension is required every six months or 25,000 miles, whichever comes first. Furthermore, all fasteners, especially U-bolts, should be retorqued to the following specifications.

1. Check 3/4-16 U-bolt nuts to be certain that 275–300 ft. lbs. torque is maintained.
2. Check 1-14 equalizer bolt to be certain that 450–500 ft. lbs. torque is maintained.
3. Check 7/8-14 torque arm bolts to be certain that 275–300 ft. lbs. torque is maintained.
4. Check adjustable torque arm clamp nuts to be certain that 85–95 ft. lbs. torque is maintained.
5. Check spring retainer hold down bolts to be certain that 35–50 ft. lbs. torque is maintained.

**WARNING**

Failure to maintain proper fastener torque values could result in suspension component damage and/or possible loss of vehicle control.

*Figure 15  Overslung Axle Model*

*Figure 16  Underslung Axle Model*
LEAF SPRING SELECTION

Holland DuraLite suspensions are rated at 22,400 pounds GAWR (Gross Axle Weight Rating) with one, two or three leaf springs, and 24,000 pounds GAWR with heavy-duty three leaf springs. (Holland does not supply springs.)

The following widely available leaf springs are suitable for use with DuraLite suspensions:

### TABLE 1

<table>
<thead>
<tr>
<th>SPRING TYPE</th>
<th>SINGLE LEAF</th>
<th>TWO LEAF</th>
<th>THREE LEAF</th>
<th>THREE LEAF HD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Arch</td>
<td>SP0363</td>
<td>SP0326</td>
<td>SP0356</td>
<td>SP9365-01</td>
</tr>
<tr>
<td>Medium Arch</td>
<td>–</td>
<td>SP0325</td>
<td>SP0355</td>
<td>–</td>
</tr>
<tr>
<td>High Arch</td>
<td>SP0360</td>
<td>SP0324</td>
<td>SP0354</td>
<td>SP0365</td>
</tr>
</tbody>
</table>

### MOUNTING HEIGHT SPRING SEAT SELECTION

**IMPORTANT:** It is the installer’s responsibility to select the correct mounting height. There should be 4½” of vertical tire clearance with an unloaded vehicle. In addition, clearance must be provided at the side front and rear of the tires to prevent tire contact during suspension movement. The mounting heights, shown below, are nominal values and may vary due to variations in the leaf springs and other components.

### CONVENTIONAL (OVERSLUNG) MOUNTING HEIGHT

**TABLE 2**

<table>
<thead>
<tr>
<th>SPRING SEAT AND U-BOLT KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPRING SEAT HEIGHT 1/4˝</td>
</tr>
<tr>
<td>SPK0031 SPK0032 SPK0033 SPK0034 SPK0035 SPK0036 SPK0037</td>
</tr>
<tr>
<td>Medium Arch 14-1/2˝ 15˝ 15-1/2˝ 16˝ 16-1/2˝ 17˝ 17-1/2˝</td>
</tr>
<tr>
<td>High Arch 16˝ 16-1/2˝ 17˝ 17-1/2˝ 18˝ 18-1/2˝ 19˝</td>
</tr>
</tbody>
</table>

**IMPORTANT:** Mounting heights should not exceed 17-1/2˝ for best performance. Mounting height should provide a minimum of 4-1/2˝ of tire clearance with an empty vehicle. Table 2 applies to under mount or flange mount hangers on a multi-axle suspension. For single axle suspensions, subtract 1/2˝ from the above heights. For straddle mount hangers, subtract 1/2˝.

### UNDERSLUNG MOUNTING HEIGHT

**TABLE 3**

<table>
<thead>
<tr>
<th>UNDER SLUNG MOUNTING HEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPRING SEAT HEIGHT 1/4˝</td>
</tr>
<tr>
<td>SPK0045 SPK0046 SPK0047 SPK0048</td>
</tr>
<tr>
<td>Low Arch 4-1/2˝ – – –</td>
</tr>
<tr>
<td>Medium Arch 5-1/2˝ 5˝ 4-1/2˝ –</td>
</tr>
<tr>
<td>High Arch 7˝ 6-1/2˝ 6˝ 5-1/2˝</td>
</tr>
</tbody>
</table>

**IMPORTANT:** Mounting heights less than 4-1/2˝ are not suggested due to lack of clearance between the axle and trailer frame. Mounting height should provide a minimum of 4-1/2˝ of tire clearance with an empty vehicle. Sufficient clearance should be provided for axle movement. Table 3 applies to under mount or flange mount hangers with a multi-axle suspension. For single axle suspensions, subtract 1/2˝ from the above heights. For straddle mount hangers, subtract 1/2˝ from the above heights.
RL Series Top Mount Suspensions for Fixed Frame Trailer Applications

Maintenance Manual

For Parts Information, refer to Parts List (Part No. XL-AR405-01).
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</tbody>
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## INTRODUCTION

This manual provides you information necessary for the care, maintenance, inspection, and safe operation of SAF-HOLLAND’s RL Series trailer air suspensions.

The SAF-HOLLAND Trailer Air Suspension is designed and engineered to provide trouble-free service. In the event of minor breakdown, such as a loss of air in the air springs, there are safety features designed into the suspension that will allow the vehicle to be driven CAUTIOUSLY at slow speed, to the nearest service facility.

This suspension uses air drawn from the tractor air system to pressurize the air springs. The height control valve regulates the air pressure required for varying loads and maintains the design ride height. This suspension can provide a cushioned ride throughout the load range, from empty to fully loaded.

The suspension also provides excellent side-to-side and axle-to-axle loading which helps equalize and control braking.

## WARRANTY

Refer to the complete warranty for the country in which the product will be used. A copy of the written warranty is included with the product as well as on the SAF-HOLLAND Web Site (www.safholland.us)

It may also be ordered directly from the address shown on the back cover.

## NOTES, CAUTIONS, AND WARNINGS

You must read and understand all of the safety procedures presented in this manual before starting any work on the suspension.

Proper tools must be used to perform the maintenance and repair procedures described in this manual. Many of these procedures require special tools.

Failure to use the proper equipment could result in personal injury and/or damage to the suspension.

Safety glasses must be worn at all times when performing the procedures covered in this manual.

Throughout this manual, you will notice the terms "NOTE," "IMPORTANT," "CAUTION," and "WARNING" followed by important product information. So that you may better understand the manual, these terms are as follows:

- **NOTE**: Includes additional information to enable accurate and easy performance of procedures.

- **IMPORTANT**: Includes additional information that if not followed could lead to hindered product performance.

- **CAUTION**: Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, may result in property damage.

- **WARNING**: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- **CAUTION**: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
SERIAL NUMBER TAG INFORMATION

Model Identification

The RL Series Suspension Serial Tag is normally located on the roadside frame bracket (FIGURE 1).

NOTE: This manual applies to the suspension series or the models listed on the front cover. However, we urge you to determine your specific model number, write that information below and refer to it when obtaining information or replacement parts.

NOTE: Refer to the serial number tag attached to the frame bracket for information.

Model Nomenclature

The sample tag shown below will help you interpret the information on the SAF-HOLLAND, USA, Inc. serial number tag. The model number is on the first line along with the suspension capacity. The second line contains the parts list number and serial number (FIGURE 2).

FIGURE 2 Serial Number Tag

HOLLAND USA, INC.

MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:

5,637,119 5,938,665 5,955,216 6,151,539 5,354,091
5,315,106 5,568,163 5,583,321 5,579,525 5,510,096
5,201,898 5,288,100 6,241,266 5,924,712 4,858,576
6,005,946 6,053,578 6,116,520 6,388,322 4,838,866
6,396,236 4,871,188

MODEL NO. CAPACITY (LBS)

RL-250-16 25,000

PART NO. SERIAL NO.

11090---

CONSULT SPECIFICATION FOR CAPACITY AND RECOMMENDED APPLICATION.

NOTE: Some models have an additional designation after the ride height.

Example: RL-230-16-HMS (see below)

RL-250 - 16 - HMS

Special Features

HMS - Hanger Mounted Shocks
SBF - Shock Below Frame
SS - Single Stud Air Spring
OFS - Offset Stud Air Spring

Ride Height

12” (305mm)
13” (330mm)
14” (356mm)
15” (381mm)
16” (406mm)
17” (432mm)

Axle Capacity & Suspension Series

22,500 RL-228 Series
23,000 RL-230 Series
25,000 RL-250 Series
30,000 RL-300 Series

FIGURE 1 Serial Number Tag Location

SERIAL NUMBER TAG
LOCATED ON ROADSIDE FRAME BRACKET
Model Nomenclature  continued

To correctly identify the model requiring replacement parts, check the serial tag for any special feature designations (in bold below, also FIGURE 3). Identify suspension characteristics by breaking down each part number as shown in the examples below:

Example 1:

RL-230-17-3-SS  -  230 = 23,000 lbs. axle capacity
- 17 = 17” ride height
- 3” = axle travel (up)
- SS = Single stud air spring

Example 2:

RL-230-15-4-HMS  -  230 = 23,000 lbs. axle capacity
- 15 = 15” ride height
- 4” = axle travel (up)
- HMS = Hanger Mounted Shock
  (only available with models having 4” of axle travel)

Example 3:

RL-250-17-3-SBF  -  250 = 25,000 lbs. axle capacity
- 17 = 17” ride height
- 3” = axle travel (up)
- SBF = Shock Below Frame

Example 4:

RL-300-15-OFS  -  300 = 30,000 lbs. axle capacity
- 15 = 15” ride height
- OFS = Offset Stud Air Spring
  (only available with models having 14”, 15”, and 16” ride heights)

How to Identify Your Suspension Model

When ordering replacement parts, it is important to identify the correct suspension model by noting any special feature designation. Refer to special feature designation at the end of the model number below the serial number tag on page 3.

If the serial number tag is missing, suspension model verification can be achieved by noting the characteristics of each suspension series.

Identifying an RL-228 Series: The equalizing beam has a distinctive shape at the air spring mounting plate area at the rear of the beam (see FIGURE 3).

Identifying an RL-230 Series: The equalizing beam has a distinctive shape (see FIGURE 3).

Identifying an RL-250 Series: Due to many variations within the RL Series family, closer inspection may be required to determine which model you have. The RL-250 standard suspension is shown below in FIGURE 3. If closer examination is required, check the shock absorber part number, which will be located at the base of the shock to assist in determining the ride height.

Identifying an RL-300 Series: Due to many variations and close resemblance to the RL-250 Series suspension, the RL-300 Series suspension requires closer examination by checking the shock absorber part number, which will be located at the base of the shock to assist in determining the ride height.

To correctly identify your specific model requiring replacement parts, proceed (1) by identifying the style of equalizing beam (FIGURE 3); and (2) by identifying the shock’s mounting orientation and part number.

**IMPORTANT:** If you find you need further assistance with identifying your specific suspension model, reference XL-AR405-01, RL Series - Parts List.

FIGURE 3

Equalizing Beam Styles

RL-228

[Diagram of RL-228]

RL-230

[Diagram of RL-230]

RL-250/300

[Diagram of RL-250/300]
**Common Replacement Parts Come in Service Repair Kits (SRKs)**

To simplify ordering the correct number of common replacement parts, Service Repair Kits were formed to offer you proper components having correct quantities, making maintenance easier by doing tasks correctly the first time.

The RL Series suspension provides Service Repair Kits (SRK's) for the replacement of pivot/axle connections (*FIGURE 4*).

**IMPORTANT:** For easier field replacement of RL Series frame brackets the EZAlign (non-welded) style frame bracket must be used to replace a welded alignment style frame bracket. Kit includes all pivot connection components, except the pivot bushings.

**IMPORTANT:** Check the head of the pivot bolt. Bolts have 1051, 1055 or 1069 on the bolt head, reducing the number of possible kits associated with your type of bolt (see *Pivot and Axle Connection Service Repair Kit Chart* on page 5 of XLAR40501).

---

**Pivot and Axle Connection Rubber Bushings**

**IMPORTANT:** When replacing the rubber bushings at these connections be sure the proper SAF-HOLLAND SRK (Service Repair Kit) is used as they contain all necessary parts to service one axle. It may be advantageous to service both pivot and axle connections at the same time. (See *Pivot and Axle Connection Service Repair Kit Chart* on page 5 of XLAR40501.)

**NOTE:** The SAF-HOLLAND Bushing Service Tool, Part No. 505 44 012 (*FIGURE 5*), is available to ease removal and replacement of bushings. Contact your SAF-HOLLAND distributor or Parts List for details.

**IMPORTANT:** It is recommended that the vehicle be unloaded before beginning service procedures.

---

**FIGURE 5**

**Bushing Service Tool**

PART NO. 505 44 012
OPERATION AND MAINTENANCE INSTRUCTIONS

The RL Series Trailer Air Suspension models covered in this manual are controlled by a single height control valve (standard air control system). When properly adjusted, the height control valve will maintain a constant ride height by controlling the air pressure in the air springs to support the load being carried.

The trailer air pressure must be maintained in excess of 75 psig (5.2 bars) before operation. 75 psig (5.2 bars) is required to open the Air Pressure Protection Valve, which maintains safe air brake pressure in the event of an air loss in the suspension system.

In the event that an air loss should occur, it is recommended the Height Control Valve Linkage be disconnected to assure all air springs are completely deflated. The trailer can be temporarily operated on the air spring’s internal rubber bumpers, which carry the load if there is tire clearance. In the event of inadequate air pressure, operate the trailer CAUTIOUSLY, at a slow speed, to the nearest place of repair. To deflate the air suspension, refer to page 15, step 2.

Before transporting the vehicle to a service center, check tire clearances. DO NOT operate the vehicle if any tire(s) is rubbing the vehicle.

**WARNING** Tire clearance must be maintained between tires and the nearest point of contact on the suspension or vehicle. Fire or loss of vehicle control could occur if clearances are not maintained which, if not avoided, could result in death or serious injury.

**IMPORTANT**

**ROUTINE MAINTENANCE AND DAILY INSPECTION**

**Daily Inspection**

Daily or before each trip, check the suspension to be sure it is fully operational. Visually inspect air springs for sufficient and equal pressure and to see that suspension is set at proper ride height. See page 10 for ride height measurement and re-setting instructions. Service as necessary.

**Initial 5,000 Mile (8,000 km) Service Inspection**

1. Suspension ride height (underside of frame to centerline of axle) MUST BE WITHIN $\pm 1/4"$ OF RECOMMENDED DESIGN HEIGHT. See page 10 for instructions on measuring ride height.

**CAUTION** An improperly set ride height could result in suspension component damage and/or poor vehicle ride performance.

2. After initial 5,000 miles (8,000 km) of service, inspect bolts and nuts at the pivot and axle connections to assure they are properly torqued. Check all other nuts and bolts for proper torque. Retorque as necessary thereafter.

3. With vehicle on level surface and air pressure in excess of 75 psig (5.2 bars), all air springs should be of sufficient and equal firmness.

**NOTE:** Check all air control system fittings for air leaks by applying a soapy water solution and checking for bubbles at all air connections and fittings.

---

**Routine Physical Inspections**

Every 100,000 Miles* (160,000 km) or 1 year, whichever comes first

When servicing vehicle brake system, inspect suspension components per pre-operational checklist on page 7. Also check all other suspension components for any sign of damage, looseness, torque loss, wear or cracks. Repair, tighten or replace damaged part(s) to prevent equipment breakdown.

**Visual Inspection Procedure**

**IMPORTANT:** A schedule for physical and visual inspections should be established by the operator based on severity of operation or damage to the vehicle could occur.

**IMPORTANT:** During each pre-trip and safety inspection of the vehicle, a visual inspection of the suspension should be done or damage to the vehicle could occur.

Visually check for:

- **Bolt movement** - loose dirt, rust or metal wear around bolt head and nut.
- **Air springs** - clearances, wear damage, and proper inflation.
- **Shock absorbers** - leaking or damaged.
- **Cracked parts or welds**.
**PRE-OPERATIONAL CHECKLIST**

**Prior to placing unit in service, check the following items:**

1. Build air pressure above 75 psig (5.2 bars). With the vehicle shut off, check the system for air leaks.

2. With the vehicle on a level surface and air supply pressure in excess of 75 psig (5.2 bars), check the air springs for equal firmness.

3. Check the shock absorbers for proper installation. The 3/4" shock absorber nuts must be torqued to specifications (see **TABLE 1 Torque Chart** on page 8).

4. The 1/2" and 3/4" air spring mounting nuts must be torqued to specifications (see **TABLE 1 Torque Chart** on page 8).

5. Check for 1" (25mm) minimum clearance around the air springs with vehicle loaded (**FIGURE 6**).

6. The 1/8" axle connection nuts must be torqued to specifications (see **TABLE 1 Torque Chart** on page 8).

7. The suspension ride height should be within ±1/8" of the recommended design height. See "Height Control Valve Adjustment" on page 10 for the proper setting.

8. Visually check the welding of all axle adapters to axles — 1/2" (13mm) minimum fillet weld required (**FIGURE 6**).

9. Visually check the welding of all curbside fixed alignment pivot connections on both sides of frame bracket (**FIGURE 8**).

   If welds are not present, weld the alignment plates in-board and out-board of the frame bracket per SAF-HOLLAND NS-65-07-01 specification—consult SAF-HOLLAND publication XL-AR553-01 and as shown in **FIGURE 8**. Weld all around with 5/16" (8mm) weld.

**IMPORTANT:** The EZ-Align design maintains proper alignment under correct torque without welding; DO NOT weld alignment blocks (**FIGURE 7**).

**NOTE:** EZ-Align pivot connections (non-welded) are on roadside and fixed alignment pivot connections (welded) are on curbside. However, some manufacturers use EZ-Align on both sides. See page 14 for "EZ-Align (Non-welded) Connection Axle Alignment" procedure.

10. A 1/8" pivot nut must be torqued to specifications (see **TABLE 2 Pivot Bolt Torque Chart** on page 8).

**FIGURE 6**

RL Series Suspension Pre-Operational Checklist Items
TABLE 1
Torque Chart

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TORQUE FT. LBS.</th>
<th>TORQUE NM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>150</td>
<td>203</td>
</tr>
<tr>
<td>11/8&quot; (Axle Conn.)</td>
<td>800</td>
<td>1083</td>
</tr>
<tr>
<td>11/8&quot; (Pivot Conn.)</td>
<td>See Table 2</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; - Air Spring</td>
<td>30 - 40</td>
<td>41 - 54</td>
</tr>
<tr>
<td>3/4&quot; - Air Spring</td>
<td>40 - 45</td>
<td>54 - 61</td>
</tr>
</tbody>
</table>

BOLT SIZE  SOCKET SIZE

<table>
<thead>
<tr>
<th>1/2&quot;</th>
<th>3/4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>11/8&quot;</td>
</tr>
<tr>
<td>11/8&quot;</td>
<td>11/16&quot;</td>
</tr>
</tbody>
</table>

*Deep Well Socket

**IMPORTANT:** Torque requirements listed are for clean and lubricated threads.

Use of special lubricants with friction modifiers, such as Anti-Seize or Never-Seize, without written approval from SAF-HOLLAND Engineering will void warranty and could lead to premature bolt failure or other component issues.

TABLE 2
Pivot Bolt Torque Chart

<table>
<thead>
<tr>
<th>IDENTIFIER</th>
<th>NEW PIVOT BOLT</th>
<th>OLD PIVOT BOLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt Head Marking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Silver</td>
<td>Black</td>
</tr>
<tr>
<td>Surface Appearance</td>
<td>Dry</td>
<td>Wet - Oily</td>
</tr>
<tr>
<td>Torque Specification</td>
<td>550 FT. LBS. (745 Nm)</td>
<td>800 FT. LBS. (1083 Nm)</td>
</tr>
</tbody>
</table>

**WARNING** DO NOT torque old pivot bolt to the new torque specification of 550 ft. lbs. (745 Nm). Pivot may loosen causing premature wear or fracturing of the bolt and other suspension components that could result in a loss of vehicle control and could cause serious injury or death.

**CAUTION** DO NOT torque new pivot bolt to the old torque specification of 800 ft. lbs. (1083 Nm). Removal or loosening of pivot bolt for service, repair, or axle alignment may become difficult if the new bolt is torqued to 800 ft. lbs. (1083 Nm).

**FIGURE 7**
EZ-Align (Non-welded) Axle Alignment

NON-WELDED STYLE SIDE VIEW

**IMPORTANT:**
The EZ-Align design maintains proper alignment under correct torque without welding. See page 49 for “EZ-Align (Non-welded) Connection Axle Alignment” procedure.

**FIGURE 8**
Welded Adjustable Axle Alignment

WELDED STYLE SIDE VIEW

**IMPORTANT:**
Alignment Block (with hidden collar) pre-welded to frame bracket (both sides) by suspension manufacturer. DO NOT cut weld.

Alignment Block with D-shaped hole. DO NOT weld alignment block to alignment collar on frame bracket.

**DO NOT** weld pivot bolt assembly to alignment collar on frame bracket.
The Air Control System shown (FIGURE 9) depicts a standard RL Series tandem piping diagram.

The air control system of the RL Series suspension uses air drawn from the tractor air system to pressurize the suspension's air springs. The suspension, working with the air control system, provides optimum suspension performance only when all air control system components are installed and operating properly.

The height control valve regulates the air pressure required for varying capacities of load. It is critical to make sure the height control valve is set at the proper suspension ride height (FIGURE 11). See pages 10-12 for height control valve detail.

A pressure protection valve is attached to the air reservoir and must be used to maintain proper air pressure. See page 13 for maintenance.

**IMPORTANT:** Air pressure protection valve maintains safe brake pressure. Approximately 75 psig (5.2 bars) opens valve, 65 psig (4.5 bars) closes valve (FIGURE 9).

---

**FIGURE 9**

Air Control System

- **Pressure Protection Valve**
  - For proper installation and maintenance, see page 13.

- **Height Control Valve**
  - For adjustment and maintenance procedures, see pages 10 and 11.

- **Height Control Valve Linkage**
  - For proper length and assembly, see page 12.

- **Linkage Bracket**
Adjustment Procedure for a One HCV System

**WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

1. Prior to adjustment, the vehicle must be in an unladen condition on a level floor and supported on a king pin stand or coupled to a tractor (FIGURE 10). If supported with a king pin stand, front of trailer must be supported at operating height.

**FIGURE 10**
Trailer Supported at Fifth Wheel Height

2. Disconnect height control valve linkage to lower mounting bracket (FIGURE 14, page 12), move control arm to "up" (45°) position and hold for 10-15 seconds to raise vehicle (FIGURE 12). Return control arm to center (neutral) position (FIGURE 13).

**FIGURE 11**
Obtaining Proper Ride Height

---

4. With the control arm in the center (neutral) position (FIGURE 13), insert locating pin into the adjusting block and bracket on the height control valve (FIGURE 12). Loosen the 1/4" adjusting lock nut located on the adjusting block (FIGURE 12). This will allow the control arm to move up and down approximately 1" (25mm).

5. Reconnect the lower linkage, and torque to 30-40 in. lbs. (3.75-5 Nm).

6. Retighten the 1/4" lock nut at the adjusting block to 30-40 in. lbs. (3.75-5 Nm).

7. Remove locating pin inserted in Step 4, then raise vehicle to remove the jack stands.

**NOTE:** The height control valve may be used as an improvised jack by disconnecting the linkage at the lower bracket. Move control arm 45° to an "up" position to raise vehicle and remove jack stands. Move control arm 45° to "down" position, completely exhausting system, then reconnect lower linkage, and torque to 30-40 in. lbs. (3.75-5 Nm). The suspension system will return to and maintain the proper ride height.

---

3. Place jack stands between the trailer frame and ground. Place one stand on each side at proper ride height (FIGURE 11). With jack stands in position, move control arm to 45° "down" position and lower vehicle and deflate all air from air springs and system. Return control arm to center (neutral) position and recheck for proper "A" ride height (FIGURE 11).
**Height Control Valve Inspection**

**IMPORTANT:** DO NOT grease height control valve.

1. Visually inspect the valve and linkage on a regular basis for proper clearance, operation and adjustment.

2. Dirt or foreign particles in the air line may harm the internal workings of the valve. Even though it contains a protective filter to eliminate foreign matter, normal air brake system maintenance should be practiced.

3. Drain moisture from air tank periodically. In severe cold weather an air dryer and/or an alcohol evaporator is recommended to avoid valve freezing and damage.

**Height Control Valve Performance Check**

**IMPORTANT:** Proper inspection can eliminate unnecessary replacement of height control valve.

1. Apply air system pressure in excess of 75 psig (5.2 bars).

2. Disconnect lower connection of the link assembly from mounting bracket (*FIGURE 14*).

3. Move control arm up to 45° for 10-15 seconds - air should flow to air spring(s) (*FIGURE 13*).

4. Move control arm to center (neutral) position - valve should shut off air flow (*FIGURE 13*).

5. Move control arm down 45° for 10-15 seconds - air should exhaust (*FIGURE 13*).

6. Move control arm to center (neutral) position - valve should shut off air flow.

7. Valve is good if performance is as noted.

**NOTE:** If the valve does not perform correctly, replace the valve.

8. Reconnect lower link assembly to mounting bracket and torque to 30-40 in. lbs. (3.75-5 Nm).

---

**FIGURE 13**

Height Control Valve Performance Check

---

**IMPORTANT:** If 75 psig (5.2 bars) air system pressure cannot be achieved, check pressure protection valve and vehicle air compressor to see if they are operating properly. Also check the air lines for obstructions caused by dirt particles, foreign debris, ice, etc.

---

*continued*
Check Height Control Valve Linkage for Proper Length and Assembly

1. With suspension set at proper ride height, determine length of link assembly required ("A" Dim.) (FIGURE 15). This can be achieved by measuring the distance from center line of height control valve arm hole to center line of lower connection bracket hole (FIGURE 14).

**IMPORTANT:** "A" measurement must be taken with suspension set at proper ride height (see FIGURE 11 on page 10).

**FIGURE 14**
Linkage Length

2. Determine length of rod required ("B" Dim.) by subtracting 13/8" (35mm) from "A" Dim. (FIGURE 15).

**Example:**
13 3/4" (349mm) "A" Dim. minus
13/8" (35mm) = 123/8" (314mm)
"B" Dim. is the length of the Rod required.

3. If new rod link is required, cut rod to length required; remove any sharp edges that may cause damage to the rubber link ends during assembly.

**FIGURE 15**
Determine Length of Link Assembly

4. Assemble clamps, link ends and rods as shown (FIGURE 15). Insert rod into link end equal distance both ends, observing the minimum and maximum tolerances. Be certain the link ends are aligned to each other (FIGURE 15).

5. With link ends properly aligned and link assembly at required length, tighten clamps.

6. Install link assembly.

**IMPORTANT:** 5/16" washers must be inserted between nut and control arm or axle tab bracket. 5/16" washer between bolt head and rubber link. Torque to 30-40 in. lbs. (3.75-5 Nm) (FIGURE 16).

**FIGURE 16**
Link End Assembly
PROPER INSTALLATION

The new Air Pressure Protection Valve (PPV) (FIGURE 17A) should be installed so that the air supplied from the Air Reservoir enters the port marked “IN” on the PPV. If the Optional valve is used (FIGURE 17B), the arrows on the bottom of the valve should point away from the Air Reservoir towards the air suspension, while making sure the Cap is in the upright (TOP) position.

Install air lines to the air suspension and support lines where necessary (FIGURE 9), using clip supports, grommets and bulkhead fittings. When installing pressure protection valve (PPV), use a drop of oil or loctite to lubricate threaded connections. DO NOT USE a pipe compound or teflon tape as they may clog valve. After PPV has been installed, pressurize air system with a constant supply of air in excess of 75 psig (5.2 bars), and check all connections for air leaks (FIGURE 9).

PERIODIC MAINTENANCE

**IMPORTANT:** Air pressure protection valves maintain safe brake pressure; only optional valve (905 54 107) cleans air by using a removable filter. Set at factory, approximately 75 psig (5.2 bars) opens the valve and 65 psig (4.5 bars) closes valve. (Attach PPV onto air reservoir—see FIGURE 9).

Drain all moisture from the Air Reservoir at regular intervals. Check the PPV for proper air flow. If optional PPV is used replace the filter every 3 months or when the air flow is reduced (FIGURE 17B).

The PPV must be checked for proper operation during each brake system inspection. The purpose of the valve is to maintain at least brake operating pressure in event of a serious air leak in the suspension system.

To test the PPV, charge the air system to 90+ psig and disconnect air line supply from downstream (suspension) side of PPV. Air should stop flowing through the PPV before the spring brakes begin to apply or before the tank pressure is reached.

**IMPORTANT:** If air does not stop flowing, replace the pressure protection valve.
**IMPORTANT:** Axle alignment can only be achieved if the frame bracket pivot holes are the same distance from the kingpin, left and right. Axle alignment should always be done while the trailer is empty.

1. To properly align the suspension, the trailer should be pulled in a straight line for a sufficient distance to insure there are no binds in the suspension.

2. Alignment can be achieved with an optical device designed especially for this purpose or manually by the following manner: Measure the distance from the kingpin to the center line of the spindles on the front axles. It is recommended that spindle extensions be utilized. Dimensions A and B must be equal within 1/8” (3mm). Dimension E is equal to the distance between the trailer center line and the axle center line (FIGURE 18).

**FIGURE 18**
Slider Suspension Alignment

![Slider Suspension Alignment Diagram]

A = B ± 1/8” (3mm)
C = D ± 1/16” (1.6mm)
E = ≤ 1/16” (1.6mm)

**EZ-Align (Non-welded) Connection Axle Alignment**

1. Loosen the 11/8” pivot bolt connection nut (FIGURE 19).

**IMPORTANT:** DO NOT remove weld from bolt head.

2. Rotate bolt head clockwise to move axle forward (A arrows); counterclockwise to move axle rearward (B arrows) (FIGURE 19).

3. Retorque the pivot bolt connection nut, no weld required (see FIGURE 7 on page 8). See TABLE 2 Pivot Bolt Torque Chart on page 8.

**IMPORTANT:** DO NOT weld EZ-Align pivot bolt (alignment block) assembly to alignment collars on frame brackets (FIGURE 20).
Suspension Air Springs

**IMPORTANT:** Air springs must be replaced with the proper air spring for your application. Check the flexible member and piston for the part number. If the part number is not available, refer to FIGURE 2 on page 3 to identify your specific model or refer to the OEM vehicle build specifications.

**NOTE:** For further assistance with air spring part number identification contact SAF-HOLLAND technical assistance at 888-396-6501.

**IMPORTANT:** It is recommended that the vehicle be unloaded before beginning service procedures.

1. Support vehicle frame with adequate jack stands. Set jack stand height at approximately 2" (51mm) above the suspension’s specified ride height (FIGURE 11 on page 10).

**WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

**NOTE:** The height control valve may be used as an improvised jack by disconnecting the lower height control valve (HCV) linkage and moving the HCV control arm to “up” position to raise vehicle (FIGURE 13 on page 11). With vehicle raised above the height specified in step 1, position jack stands under vehicle frame at OEM specified locations and move control arm to “down” position to lower vehicle onto jack stands. Hold control arm down until air springs are completely exhausted.

**CAUTION** Failure to completely exhaust air springs prior to removal may result in unexpected air spring movement which, if not avoided, may result in minor or moderate injury.

2. Exhaust air from suspension system by:
   
   • Automatic control - use height control valve by disconnecting link at lower connection, then rotate control arm to exhaust (approx. 45° down) position, or
   
   • Disconnect air supply line from air spring.

**IMPORTANT:** If air spring has a leak and is deflated, step 2 must still be performed.

3. Disconnect and remove old air spring assembly (FIGURE 21).

4. Install new air spring assembly and torque fasteners (see Torque Charts on page 6).

5. Reconnect air supply line and link connections.

6. Recharge air system in excess of 75 psig (5.2 bars), and check system for leaks.

Suspension Air Springs continued

**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any leaks. If air leaks are detected, repair as required. Failure to eliminate the air leaks may compromise the suspension performance.

**FIGURE 21** Suspension Air Spring

**NOTE:** Refer to RL Series Parts List, X:AR405-01 for correct part replacements.

**Shock Absorbers**

**IMPORTANT:** Shock absorber must be replaced with the proper shock absorber. Check shock for part number. If part number is not available, refer to FIGURE 2 on page 3 to identify your specific model (the last two digits of the model number relate to ride height), or refer to the OEM vehicle build specifications.

1. It is recommended the vehicle be unloaded. Block vehicle to prevent rolling.

**WARNING** Failure to check tires prior to beginning maintenance could allow vehicle rollaway which, if not avoided, could result in death or serious injury.

2. Vehicle must be at model’s specified ride height or below to assure that tension is relieved on shocks.

3. Remove upper and lower mounting bolts and shock absorber (FIGURE 22).

4. Replace with correct shock absorber and fasteners.

5. Torque nuts to 150 ft. lbs. (203 Nm) lubricated.

6. If ride height was changed, you must return the ride height to your model’s ride height requirement.

**FIGURE 22** Shock Absorber

*continued*
### Pivot and Axle Connection Rubber Bushings

**IMPORTANT:** When replacing the rubber bushings at these connections be sure the proper SAF-HOLLAND SRK (Service Repair Kit) is used as they contain all necessary parts to service one axle (2 kits per tandem). Refer to Service Repair Kit section of RL Series Suspension Parts List (XL-AR105-01) for proper SRK. It may be advantageous to service both pivot and axle connections at the same time.

**NOTE:** The SAF-HOLLAND Bushing Service Tool, Part No. 505 44 012 is available to ease removal and replacement of bushings. Contact your SAF-HOLLAND distributor or Parts List for details.

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**FIGURE 23**
Bushing Service Tool

![Image of Bushing Service Tool](part_no_505_44_012)

**PART NO. 505 44 012**

**IMPORTANT:** It is recommended that the vehicle be unloaded before beginning service procedures.

1. Support vehicle frame with adequate jack stands. Set jack stand height at approximately 2" (51mm) above the suspension’s specified ride height (**FIGURE 11** on page 10).

**WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

**NOTE:** The height control valve may be used as an improvised jack by disconnecting the lower height control valve (HCV) linkage and moving the HCV control arm to “up” position to raise vehicle (**FIGURE 13** on page 11). With vehicle raised above the height specified in step 1, position jack stands under vehicle frame at OEM specified locations and move control arm to “down” position to lower vehicle onto jack stands. Hold control arm down until air springs are completely exhausted.

**CAUTION** Failure to completely exhaust air springs prior to removal may result in unexpected air spring movement which, if not avoided, may result in minor or moderate injury.

2. Exhaust air from the suspension system by:
   - Automatic control — use height control valve by disconnecting link at lower connection, then rotate control arm to exhaust (approx. 45° down) position, or
   - Disconnect air supply line from air spring.

3. If servicing all equalizing beam bushings, equalizing beam must be completely removed.

**NOTE:** If servicing the front pivot bushing only and using the SAF-HOLLAND Bushing Service Tool, remove the pivot bolts and rotate front of equalizing beams downward to gain access to bushing.

4. Disconnect air spring and shock absorber at lower connections.

5. Disconnect height control valve linkage at lower connection (**FIGURE 14**, page 12).

6. Disconnect front pivot and axle connection hardware then remove equalizing beam (**FIGURE 24**).

---

**FIGURE 24**
Pivot and Axle Connections

![Image of Pivot and Axle Connections](pivot-and-axle-connections)

7. Inspect axle adapters for wear, cracks and failed welds. Axle adapters should have a 1/2" (13mm) (3 pass) fillet weld (refer to proper SAF-HOLLAND NS-65-83 or NS-65-86 specifications for RL Series). Replace all worn or cracked axle adapters.

8. Inspect equalizing beams for wear, cracks and failed welds. Replace cracked equalizing beams.

**IMPORTANT:** NEVER repair a cracked equalizing beam. **DO NOT** weld cracks. Secondary weld failures during use may cause loss of vehicle control.

**WARNING** Failure to replace a cracked equalizing beam may cause loss of vehicle control which, if not avoided, could result in death or serious injury.

continued
**Pivot and Axle Connection Rubber Bushings continued**

9. Press out old bushing(s) using a Bushing Service Tool, Part No. 505 44 012.

**IMPORTANT**: **DO NOT** use an open flame or other heat source to remove the bushings.

10. Clean out all foreign material from bushing receptacle(s). Lubricate new bushing(s) with approved lubricant, or a soap and water solution.

**IMPORTANT**: **DO NOT** use oil-based lubricant or brake fluid, as it can cause damage to the rubber.

---

**FIGURE 25**
Equalizing Beam Bushings Location

**FIGURE 26**
Centering Bushings in Equalizing Beam

**Top View of Beam**

---

**FIGURE 27**
Wear Washer Locations

**Pivot Connection**

WEAR WASHERS

OUTSIDE OF SUSPENSION FRAME BRACKET

---

Axle Connection

WEAR WASHERS

SUSPENSION AXLE ADAPTER

11. Press new bushing(s) in beam. Bushing(s) must be centered in beam receptacles. It may be necessary to push bushing past center approximately 1” (25.4 mm) and then re-center the bushing to relieve the rubber (**FIGURES 25 and 26**).

12. Re-install equalizing beam with new wear washers, bolts and nuts. Be sure to install wear washers in proper locations (**FIGURE 27**). Position at ride height and properly torque fasteners (see Torque Charts on page 8).

13. Reconnect air springs, shock absorbers and height control valve linkage. Properly torque fasteners (see Torque Chart on page 8).

14. Remove jack stands. Build system air pressure in excess of 75 psig (5.2 bars) and check for leaks in air system at all connections.

**IMPORTANT**: It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required. Failure to eliminate the air leaks may compromise the suspension performance.

---

continued
**Equalizing Beam**

**IMPORTANT:** It is recommended that the vehicle be unloaded before beginning service procedures.

1. Support vehicle frame with adequate jack stands. Set jack stand height at approximately 2" (51mm) above the suspension’s specified ride height (**FIGURE 11** on page 10).

**WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

**NOTE:** The height control valve may be used as an improvised jack by disconnecting the lower height control valve (HCV) linkage and moving the HCV control arm to “up” position to raise vehicle (**FIGURE 13** - page 11). With vehicle raised above the height specified in step 1, position jack stands under vehicle frame at OEM specified locations and move control arm to “down” position to lower vehicle onto jack stands. Hold control arm down until air springs are completely exhausted.

**CAUTION** Failure to completely exhaust air springs prior to removal may result in unexpected air spring movement which, if not avoided, may result in minor or moderate injury.

2. Exhaust air from the suspension system by:
   - Automatic control — use height control valve by disconnecting link at lower connection, then rotate control arm to exhaust (approx. 45° down) position, or
   - Disconnect air supply line from air spring.

3. Disconnect air springs, shock absorbers and height control valve linkage at the lower connections.

4. Disconnect front pivot and axle connection hardware then remove equalizing beam(s) (**FIGURE 28**).

5. Install new equalizing beam(s) with new wear washers, bolts and nuts. Be sure to install wear washers in proper location (**FIGURE 27**). Position at ride height and properly torque fasteners (see *Torque Charts* on page 8).

6. Reconnect air springs, shock absorbers and height control valve linkage. Properly torque fasteners (see *Torque Charts* on page 8). Check air system connections, including air springs for leaks.

**IMPORTANT:** It is the responsibility of the air system installer to secure all air lines and check for any air leaks. If air leaks are detected, repair as required. Failure to eliminate the air leaks may compromise the suspension performance.

7. Remove jack stands. Build system air pressure in excess of 75 psig (5.2 bars).

**Frame Bracket**

When replacing frame bracket(s), see RL Series Suspension Parts List Manual, XLAR405-01, for correct Service Repair Kit.

1. Place jack stands at necessary height.

**WARNING** Failure to properly support suspension during maintenance may allow suspension to fall which, if not avoided, could result in death or serious injury.

2. Remove tires.

3. On the side of the trailer frame, mark the mounting location of the frame bracket to be replaced.

4. Remove old frame bracket.

**IMPORTANT:** Carefully air are the welds connecting the frame bracket to the frame. Do not use frame if frame material is damaged. Repair the frame and then install the frame brackets.

**WARNING** Failure to repair damaged frame may cause damage to suspension with possible loss of vehicle control which, if not avoided, could result in death or serious injury.

5. Install a new frame bracket per location marks, and weld per SAF-HOLLAND NS-65-07-CI specification.


7. Reinstall tires and other suspension components, then remove jack stands.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause and Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>All air springs flat (no air).</td>
<td><strong>Insufficient air pressure to suspension.</strong> Build air pressure in excess of 75 psig (5.2 bars). Malfunctioning air pressure protection valve - test the valve using instructions on page 13. Replace if necessary. Check air compressor. HCV control valve not working - follow HCV inspection procedure (see page 11).</td>
</tr>
<tr>
<td><strong>Air leakage from the suspension air system or the air brake system.</strong></td>
<td>Test for air leakage due to loose fittings or damaged air lines, air springs, brake actuators or control valve. Tighten loose fittings to stop leakage and/or replace worn or damaged parts.</td>
</tr>
<tr>
<td>Air springs deflate rapidly when vehicle is parked.</td>
<td><strong>Air leakage from the suspension air system.</strong> Test for air leakage due to loose fittings between air tank and air suspension or damaged air lines, air springs or height control valve. Apply a soapy solution to connections and air springs if necessary to check for bubbles (leaks). Tighten loose fittings to stop leakage and/or replace worn or damaged parts with new ones.</td>
</tr>
<tr>
<td>Ride height too high or too low.</td>
<td><strong>Height control valve out of adjustment.</strong> Re-adjust the height control valve.</td>
</tr>
<tr>
<td>Air springs ruptured.</td>
<td><strong>Tire, tire rim or brake component rubbing air spring.</strong> Check inside to inside tire dimension. There must be 1&quot; (25.4mm) minimum clearance around air spring. If not, it may be necessary to reinstall suspension. Use tire rim back spacers to provide more clearance.</td>
</tr>
<tr>
<td>Air spring failed.</td>
<td><strong>Continual or repeated over-extension of the air spring.</strong> Visually inspect for broken or loose shock absorber or shock absorber mounting bracket. Reconnect loose parts and replace any defective parts. Check the adjustment of the height control valves (see page 10).</td>
</tr>
<tr>
<td>Air spring(s) worn out. Replace.</td>
<td><strong>Air leak or damaged line.</strong> Locate and repair. Air spring punctured or leaking - replace with proper air spring. Then check for proper clearance around air spring, 1&quot; (25.4mm) minimum. Also check shock absorbers.</td>
</tr>
<tr>
<td>“Temporary Operation.” If air loss occurs in the air suspension system and after attempts to repair have failed to correct the problem, it is recommended that the Height Control Valve Linkage be disconnected and all air exhausted from the system. There is an internal rubber bumper built into the air spring which makes it possible to operate the vehicle cautiously while driving at a reduced speed to the nearest place of repair.</td>
<td></td>
</tr>
<tr>
<td>Restricted air lines(s) between the height control valve and the air spring(s).</td>
<td>Disconnect the height control valve linkage and rotate the actuating lever to the 45° down position. If the air spring(s) remain inflated, check for pinched or blocked line(s).</td>
</tr>
<tr>
<td>Front pivot connection worn and loose.</td>
<td><strong>Welded pivot alignment plate(s) not welded.</strong> Weld per installation instructions (see NS-65-78 and also FIGURE 8 on page 8).</td>
</tr>
<tr>
<td>Front pivot bolt loose.</td>
<td><strong>Worn pivot alignment plate(s).</strong> If alignment plates are worn, replace and realign axles (see page 14).</td>
</tr>
<tr>
<td><strong>EZ-Align pivot alignment block(s) worn.</strong> If alignment blocks are worn, replace and realign axles (see page 14).</td>
<td><strong>Excessive lateral axle walk.</strong> 3/4&quot; (19mm) is maximum. Axle connection bolts loose - properly tighten, see step 6 on page 7. Axle adapter welds failed - replace adapters or remove old welds and reweld. Refer to proper SAF-HOLLAND specifications for applicable model. Front pivot and/or axle connection bushings worn - replace with proper SRK (see RL Series Suspension Parts List Manual, XLAR405-01).</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible Cause and Remedy</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Shock absorber failures.</strong></td>
<td><strong>Over-extending shock absorbers.</strong> Suspension set at improper ride height - re-adjust height control valve. Suspension mounted at wrong ride height - check specification sheet, or refer to page 10 for correct ride height and adjustment procedure. Wrong length or improper replacement shock absorber(s) - replace if necessary (see page 15).</td>
</tr>
</tbody>
</table>
| **Excessive tire wear.**      | **Alignment plates are not welded, are worn, or the axle is out of alignment.** Inspect for damage and replace components as necessary or realign and weld to specifications on welded style alignments. Realign and tighten to specifications on EZ-Align (non-weld) style alignments (see page 8).  
**Loose or worn bushings at pivot or axle connection.** Inspect for damage and replace components as necessary (see pages 16 and 17), or if loose, tighten connection(s) to proper specification (see page 8). Then, check axle alignment and realign if necessary (see page 14). If worn, replace with proper Service Repair Kit (see RL Series Suspension Parts List Manual, XL-AR405-01).   
**Worn bushing tube ends and/or face of wear washers at axle connections.** Contact SAF-HOLLAND Service Department.   
**Suspension not properly installed.** Contact SAF-HOLLAND Service Department and/or check Trailer manufacturer for proper suspension installation; correct where necessary. |
LUBRICATION

Wheel-End Lubrication

This section provides information on lubricating Meritor trailer axle wheel-ends with either grease or oil. Figure 13.2.

![Figure 13.2](image)

Oil Lubricated

1. The most common oils used in Meritor trailer axle wheel-ends have a designation of API-GL-5 (American Petroleum Institute – Gear Lubricant No. 5). This oil is also approved under military specification MIL-2105D. Refer to Table O in this section.

2. In addition to the GL-5 oils listed, oils with API grades GL-1, GL-2, GL-3 and GL-4 can also be used in trailer axle wheel-ends. These oils cannot be used in drive axles, or any application which employs hypoid, amboid, spiral, bevel, or planetary gearing.

3. Oil viscosity should be suitable for the climate in which the axle will be operated.
   
   a. Low viscosity single grade gear oils, such as SAE 75W (Society of Automotive Engineers), should only be used in cold climates. Oil seals must be in excellent condition when using low viscosity oils to insure against loss of these thin fluids.
   
   b. Multigrade oils, such as 80W/90, should be used where vehicles operate in both warm and cold climates.

4. Do not use thinning agents such as kerosene, gasoline, or other solvents that lower the viscosity of lubricants.

5. The recommended frequency of wheel-end oil changes depends on such factors as environment, speeds, and loads imposed on axle. For example, applications such as container chassis service put limited stress on wheel-end lubricant, allowing maintenance intervals to be extended. Other applications, such as off-highway dump trailer service, put severe stress on the wheel-end lubricant, requiring that maintenance be performed more frequently. The following information is therefore intended as a general guideline:
   
   a. General – Change oil whenever it is contaminated or when wheel-end cavity is disrupted by removing spoke wheel or hub.
   
   b. Standard-Duty Service – For standard-duty on-highway service, change oil every 100,000 miles or 12 months, whichever comes first.
   
   c. Heavy-Duty Service – For heavy-duty on-highway, off-highway or combined on/off highway service, change oil every 30,000 miles or 6 months, whichever comes first.

6. Guidance for lubricating a wheel-end with approved gear oil (Table O) is as follows:
   
   a. Note that detailed guidance for installing components such as seals, bearings, hubcaps and hubs is located in the “Assembly” section of this manual.
   
   b. Coat bearing cones with oil.
   
   c. Apply a light film of NLGI #1 or #2 grease (not oil) to axle spindle bearing journals to help protect them from fretting corrosion. Figure 13.3.
d. Fill wheel-end with an approved gear oil to hubcap fill line. Note that oil must be given sufficient time to settle prior to final check of oil level. This is especially important in cold conditions. **Figure 13.4.**

7. Inspect wheel-end oil level at least every 1,000 miles (1,600 km). To check, make sure vehicle is on level ground then clean hubcap window and observe oil level. Add lubricant if oil level is down more than 0.25 inch (6.3 mm) from fill line. **Figure 13.5.**

**CAUTION**

It is important not to overfill the wheel-end cavity with lubricant. Wheel-end oil level should never exceed the middle of the hubcap. Also, make sure any excess oil is wiped away since it can contaminate brake linings and cause poor brake performance.

Greasing the Axle

On each axle there are six grease zerks that need to be greased every six months or every 10,000 miles. The grease zerks are located by the arrows shown below.

**Rollers on Hopper Doors**

Generously lubricate rollers and grease universal joints monthly. This will help to force moisture and dirt from the bearings.

**CAUTION**

Make sure any excess grease or oil is wiped away since it can contaminate brake linings and cause poor brake performance. If necessary, clean the disc or the drum and replace contaminated linings.
WIRING

Junction Box

Demco Grain Trailers use a Truck-Lite 88 sealed wiring harness. A 7-pole nose box is used in conjunction with the wire harness.

Trailer Lights

The table below provides wire color codes for all trailers:

<table>
<thead>
<tr>
<th>Color</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>Left Turn</td>
</tr>
<tr>
<td>Brown</td>
<td>Tail Lights</td>
</tr>
<tr>
<td>Green</td>
<td>Right Turn</td>
</tr>
<tr>
<td>White</td>
<td>Ground</td>
</tr>
<tr>
<td>Red</td>
<td>Stop Light</td>
</tr>
<tr>
<td>Blue</td>
<td>A.B.S</td>
</tr>
<tr>
<td>Black</td>
<td>Clearance, Cluster and License Plate</td>
</tr>
</tbody>
</table>

CLEANING THE TRAILER

It is imperative trailers constructed of steel be kept clean of salt and other harmful elements. Failure to wash your trailer regularly and properly care for the paint and body may void any paint warranty claims if the trailer shows signs of neglect or abuse.

When cleaning the trailer use a mild soap and rinse. Wash underneath both slope areas, kingpin, suspension areas and outside walls.

Keeping your trailer clean will help rid your trailer of salt and other harmful elements. This will help keep your trailer looking new and improve it’s resale value.

VISUAL INSPECTION

For safe operating conditions and longer component life make these visual inspections before the trailer is released for work. Remember the Department of Transportation mandates you do this inspection.

1. Check the angle of the chassis.
   To get conditions for least tire wear, a loaded trailer must travel parallel to the highway. A level angle of the chassis permits correct wheel chamber without toe-in or toe-out.

2. Check the tires.
   The tires of each dual wheel must be matched to a minimum of 0.125” (3.2 mm) of the same rolling radius and a minimum of 0.75” (19 mm) of the same rolling circumference. The tires also must have equal air pressures.

3. Check the brake drums and linings.
   Both wheel ends of each axle must have the same type of lining and drum equipment. Both tandem axles also must have the same kind of lining and drum equipment.

NOTE: Always follow the brake lining specifications supplied by the vehicle manufacturer.

4. Check the thickness of the brake lining.
   The thickness of the brake lining must be the same on each shoe of the brake and on each side of the axle.

5. Check the brake system.
   Apply the brake and check for air leaks at the brakes, air tanks, hoses and valves. When the brakes are applied, the brake shoes must move quickly and the lining must press against the drum. When the brakes are released, the brake shoes must retract fully.

6. Check for leaking lubricant at the wheel ends.
   Leaking lubricant is caused by worn or damaged seal, or wrong gasket or seal installation.
GRAIN TRAILER
LIMITED GENERAL WARRANTY
This warranty applies to all grain trailers manufactured by Demco. All goods manufactured by Demco shall be free from all defects in materials or workmanship under normal use and service, with loads not to exceed Manufacturer’s rated capacity and speed. Applied only to the original owner, as evidenced by a completed warranty registration on file at Demco, for a period ending 12 months from the date of delivery.

THE WARRANTY REGISTRATION MUST BE COMPLETED AND RETURNED TO DEMCO WITHIN 30 DAYS OF DELIVERY OF THE PRODUCT TO THE ORIGINAL OWNER OR ALL WARRANTIES WILL BE NULL AND VOID.

All claims, for defective goods arising under this limited warranty, must be made in writing immediately upon discovery, but in no event, later than 12 months from the date of delivery to the original owner.

The limited warranty is the sole and exclusive warranty made or given by Demco in connection with the manufacture of sale of goods and is in lieu of all other warranties of any type or kind whatsoever, whether expressed or implied, written or oral. The provision hereof may not be modified, altered, or extended except in writing signed by an authorized representative of Demco.

♦ This warranty applies only to parts or components manufactured by Demco, which is defective in material or workmanship.
♦ This warranty does not cover normal maintenance, service or adjustments.
♦ This warranty does not cover depreciation or damage as a result of accident, negligent handling, inadequate maintenance, or improper operation.
♦ This warranty does not cover damage due to unauthorized modifications or repairs by purchaser prior to Demco inspection and approval.
♦ This warranty does not cover any purchased components such, as but not limited to; couplers, tires, axle assemblies, suspensions or any nonstandard feature or items specified by the purchaser.
♦ This warranty does not expand, enlarge upon, or alter in any way, the warranties provided by the manufacturers of purchased components.

In the event that a claim shall arise under this limited warranty, Demco may at its option repair the affected goods, replace the affected goods, or refund an equitable portion of the purchase price of the affected goods. The purchaser understands and agrees that, in the event of a defect in material or workmanship, the remedies are limited to repair or replacement, at Demco’s option, such part or parts which examination shall disclose to manufacturer’s satisfaction to have been defective.

All affected goods shall be held for inspection by Demco or its representatives and no claim hereunder shall be payable in connection with repairs made by purchaser prior to Demco’s inspection or without Demco’s prior consent.

No claim shall be payable under this limited warranty unless purchaser shall provide Demco with the following information in writing in a timely manner:
♦ VIN (Vehicle Identification Number) of affected goods.
♦ Number of days, weeks or months affected goods in service.
♦ Location of affected goods.
♦ Description and pictures of alleged defect.

In no event shall company be liable to purchaser for indirect, incidental or consequential damages or injuries including, but not limited to downtime, cost of labor or materials, loss of profits to purchaser’s business or goodwill, resulting from breach of warranty hereunder and all damages resulting from defective goods, whether arising in tort, contract, or warranty except as specifically herein provided are waived by purchaser.

With respect to all other parts not manufactured by Demco, the respective manufacturers warranty will be assigned to the purchaser.

<table>
<thead>
<tr>
<th>Part</th>
<th>Warranty Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle Beam</td>
<td>limited 5 years</td>
</tr>
<tr>
<td>Axle Hub &amp; Bearing Assembly</td>
<td>limited 1 year</td>
</tr>
<tr>
<td>Spring Suspension</td>
<td>limited 5 years</td>
</tr>
<tr>
<td>Air Ride Suspension</td>
<td>limited 3 years</td>
</tr>
<tr>
<td>Landing Legs</td>
<td>limited 2 years</td>
</tr>
<tr>
<td>Anti-Lock Braking System</td>
<td>limited 3 years or 300,000 miles</td>
</tr>
<tr>
<td>Lights</td>
<td>limited 1 year</td>
</tr>
<tr>
<td>Valves</td>
<td>limited 6 months</td>
</tr>
</tbody>
</table>

Tire Warranty can be found in the manifest holder on the kingpin.

There are no warranties for used products or products that have been repaired, altered, modified, overlooked, subjected to misuse, negligence, accident or ordinary wear and tear.

Operator is required to check wheel nuts, U-Bolts, radius rod bolts, and all other fasteners. Axle alignment, tire wear, tarp wear, and oil level in hubs must be inspected. If needed, operator should make proper adjustments to insure ill life of equipment. These item’s need to be checked the first 100 miles and again at 500 miles and periodically thereafter. These inspections and adjustments are very important and must be performed.

State and Federal Laws require a daily inspection of this vehicle by the operator.

Demco products are sold without any express warranty except as set forth by this warranty.

This warranty is effective March 1, 2008 and supersedes all previous Demco, warranty policies.
### DEMCO

**GRAIN TRAILER LIMITED WARRANTY REGISTRATION**

Your new Grain Trailer is covered by a limited warranty. 
To initiate the warranty this form MUST be completed and returned to Demco within **30 days** of delivery.

**PLEASE PRINT OR TYPE**

<table>
<thead>
<tr>
<th>Owner’s Name</th>
<th>Vehicle Identification Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO Box / Street Address</td>
<td>Trailer Description</td>
</tr>
<tr>
<td>City, State, Zip</td>
<td>Dealership Name</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>City, State, Zip</td>
</tr>
<tr>
<td>Date of Purchase</td>
<td>Telephone Number</td>
</tr>
<tr>
<td>Intended Use: □ Rental □ Personal □ Farm/Ranch □ Commercial □ Government</td>
<td>Dealer Representative</td>
</tr>
</tbody>
</table>

The Owner’s Manual has been given to me and explained. I have read and fully understand the safe operation and the proper servicing and maintenance of the above trailer and the terms of the limited warranty shown inside the manual.

Purchaser’s Signature: ________________________________    Date: _________________

Pre-Delivery Service: This trailer was carefully prepared for delivery, inspected and adjusted according to factory recommendations before delivery to the retail purchaser.

Delivery Service: The limited warranty was explained and a copy was presented to the retail purchaser along with the Owner’s Manual.

Dealer Representative Signature: ________________________________

**Please mail to the following:**

**DEMCO**

4010 320th street

BOYDEN, IA 51234