CONTINENTAL
RAILWORKS

MANUAL

INSTALLATION – OPERATION – PARTS – SERVICE

60 SERIES FRONT HI-RAIL UNIT

(56,000 to 89,000 lbs GVWR TRUCKS)

G-60 FRONT
LS-60 REAR

May 2022
Revision 2

CONTINENTAL RAILWORKS
7380 Vérité, St-Laurent, QC, Canada, H4S 1C5
Phone : 514-956-8081 Fax : 514-956-0737

INTRODUCTION

The following installation, operation, parts, and service manual has been prepared to be used with the Continental Railworks **60 SERIES** hi-rail unit on a 56,000 to 89,000 lbs GVWR heavy truck.

All Continental Railworks hi-rail kits are designed to make operation and service as simple as possible. There is no adjustment required when varying loads are placed on a vehicle. The use of independent mounting plates provides for easy complete unit removal and re-installation when required, as well as a complete range of adjustment to tailor the hi-rail unit to the vehicle.

At any time technical assistance can be obtained from the hi-rail manufacturer. A simple phone call to Continental Railworks can eliminate many time consuming problems or questions. Technical assistance is available Monday to Friday, from 8:30 a.m. to 4:30 p.m. ET, by calling **(514) 956-8081**, emailing **admin@continentalrailworks.com**. Support personnel are frequently available during off-peak hours as well, so please do not hesitate to call outside the hours listed above, including nights and weekends. It is also possible to leave a message at any time, and your call will be returned as soon as possible.

GENERAL INFORMATION

GENERAL DESCRIPTION

The Continental Railworks 60 Series is designed for tandem/tridem axle heavy trucks with a GVWR between 56,000 and 89,000 lbs. For this application, the 60 Series is the only model currently available that does not require manual locking mechanisms such as pins, levers or cables. The hydraulic actuation effectively and automatically locks and unlocks the hi-rail unit in position, in both raised and lowered positions.

Drop forged 14” guide wheels offer good service life due to the depth of hardness. Material selection in key areas (pins, slots, structural assemblies) ensure adequate wear resistance and improve the overall service life of the hi-rail unit.

Rubber aeon timbrens contribute to maintaining proper rail contact over crossings or irregular rail sections. Braking is achieved using front air brakes (front standard, rear optional) or hydraulic brakes (front and rear available).

The combined weight of the 60 Series hi-rail, mounting plates and all necessary valves is approximately 2400 lbs for a G-60 front and LS-60 rear combination.

OPTIONS

Options are available upon request; please contact Continental Railworks for more details.

Rear Air Brakes

Front air brakes are standard on all G-60 hi-rail units, but rear brakes are available if required. The same components are used on the rear unit as on the front unit. Plumbing the air lines to the rear brakes is detailed in the Pneumatic Brake Valve Kit section of the manual.

Auxiliary Hydraulic Brakes (Front)

Front air brakes can be substituted for hydraulic brakes if the chassis is equipped with hydraulic brakes. The brakes are powered by a separate hydraulic power pack and are pressure adjustable. Details can be found in the Auxiliary Hydraulic Brake Kit section of the manual.

Auxiliary Hydraulic Brakes (Front and Rear)

Front and rear (optional) air brakes can be substituted for hydraulic brakes if the chassis is equipped with hydraulic brakes. The brakes are powered by a separate hydraulic power pack and are pressure adjustable. Details can be found in the Auxiliary Hydraulic Brake Kit section of the manual.

Hydraulic Power Pack

A hydraulic power pack can be supplied to substitute the typical PTO/pump hydraulic power source, used to deploy and retract the hi-rail. Electrical and hydraulic schematics can be found in the Appendices.

Emergency Hand Pump

Continental Railworks offers an optional emergency hand pump to complement the hydraulic PTO/pump setup. This can be used to deploy or retract the hi-rail in the event of an electrical or mechanical failure at the main hydraulic power source. Hydraulic schematics can be found in the Appendices.

Track Signal Shunt Kit

Continental Railworks offers an option to temporarily shunt track signals by overriding the spindle insulators on demand through a switch in the cab. Details can be found in the Track Signal Shunt Kit section of the manual.

Pneumatic Suspension Kit

Continental Railworks offers an option to allow proper chassis air bag adjustability when installing hi-rail on an air ride truck. Regulating the air pressure in the suspension is required to maintain proper traction on track. Details can be found in the Pneumatic Suspension Kit section of the manual.

APPROVED CHASSIS MODELS

International 7600
Freightliner M2, 114SD
Western Star 4700SB
Etc

Truck needs to have front frame extensions (integral recommended) for installation of front hi-rail.

See mounting envelope in Appendices for minimal space requirements.

INSTALLATION

SPECIAL CONSIDERATIONS

VEHICLE CONDITION

Prior to installing hi-rail, it should be determined that the vehicle is in good working order. More specifically, the vehicle's suspension and frame need to be inspected and in good condition.

VEHICLE REAR SUSPENSION

If the vehicle is equipped with rear air bag suspension, a Pneumatic Suspension Kit will be required to bypass the chassis' OEM leveling valve. This will ensure that the vehicle provides consistent and reliable traction while on rail. Vehicles equipped with leaf springs or rubber suspension only require proper height and pre-load adjustment.

EXHAUST TAILPIPE

If the truck is equipped with a horizontal exhaust system, the exhaust tailpipe may need to be modified to make room for the rear hi-rail. It is recommended to have this performed at a specialized shop, especially for a Diesel engine, where the manufacturer's guidelines are more stringent. This manual does not cover exhaust tailpipe modifications.

MODIFICATIONS TO HI-RAIL OR MOUNTING COMPONENTS

Although the mounting components delivered with the hi-rail are custom to every vehicle, there might be unforeseen interferences with some vehicle components (frame mounted equipment, radiators, hood hinges, bumper mounts, etc). Modifications to the mounting components are allowed, but please contact Continental Railworks for guidance. Modifications to the hi-rail units should not be required, and would void the warranty if performed without Continental Railworks' consent.

! SAFETY WARNING !

DO NOT WELD ON THE VEHICLE FRAME. - TAKE PROPER INSULATION MEASURES IF WELDING ON THE VEHICLE IS REQUIRED, INCLUDING DISCONNECTING BOTH BATTERY CABLES.

REFER TO BOLT TORQUE TABLE IN APPENDIX 1, AND TO MANUFACTURER'S SPECIFICATIONS FOR WHEEL STUDS

NEVER REUSE NYLOC LOCKING NUTS OR STOVER LOCKING NUTS

CONTACT CONTINENTAL RAILWORKS PRIOR TO MODIFYING ANY PART OF THE HI-RAIL OR MOUNTING HARDWARE

DO NOT ATTACH OTHER EQUIPMENT OR ACCESSORIES TO THE HI-RAIL OR MOUNTING PLATES

FRONT UNIT INSTALLATION

Continental Railworks provides a universal mounting bracket system that is designed to adapt the hi-rail to any chassis. Refer to the drawings in the Appendices for more details.

CHASSIS PREPARATION

1- Start by ensuring the chassis is parked on a flat and level surface.

2- Remove the front bumper and place in a safe location to avoid damage. The bumper may be reinstalled at the end of the front hi-rail installation.

3- Remove the frame mounted tow hooks. Tow hooks may be reinstalled at the end of the front hi-rail installation.

4- Remove the frame mounted bumper brackets. Reinstall at the end of the front hi-rail installation if required.

5- Disconnect the truck batteries.

6- For ease of access and an easier alignment, it is recommended to raise the chassis on 12” blocks for the duration of the hi-rail installation and alignment.

FRONT CAM MODIFICATION

The Continental Railworks 60 Series front rail gear is now delivered with extended cams. The front cam assembly is designed for chassis that have an axle to end of frame distance greater than 48”.

If the distance is 48” or less, the front cam arms can be shortened by observing the following steps:

1- Start by removing items 1 (Spring Hanger Pins) and items 2 (Spring Hanger Mounts) from both sides.

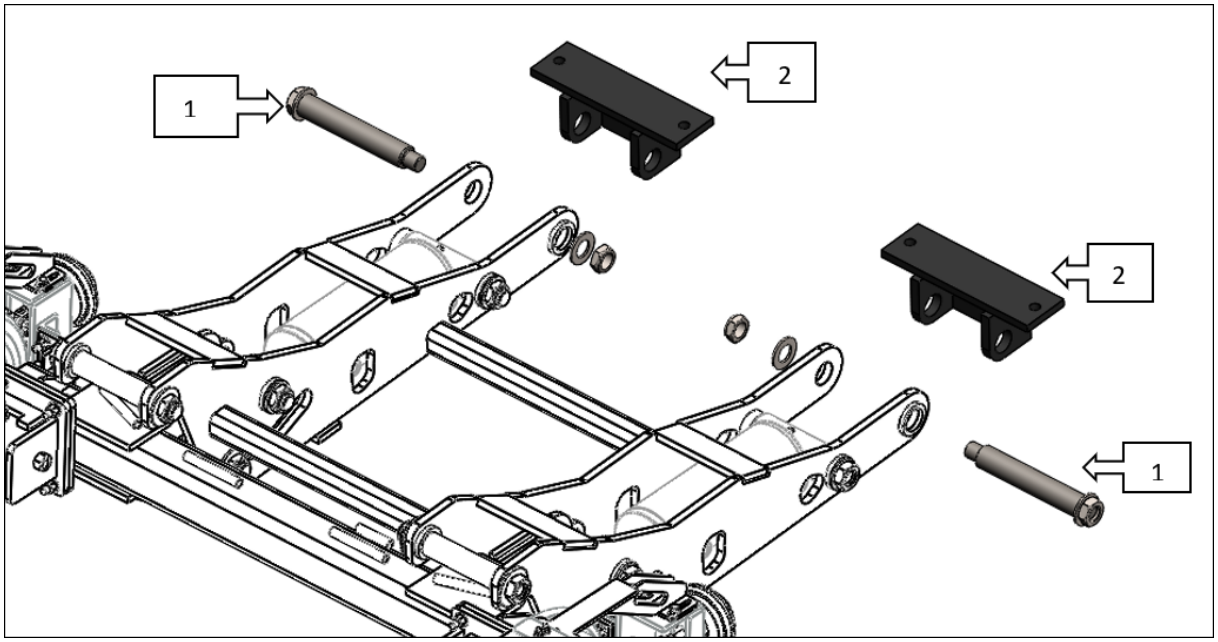


Figure 1: G-60 front components – Long cam plates

2- Measure back ¾” from the reinforcement on the cylinder pin (Item 3) and make a vertical line as shown below. Repeat this on all 4 cam plates.

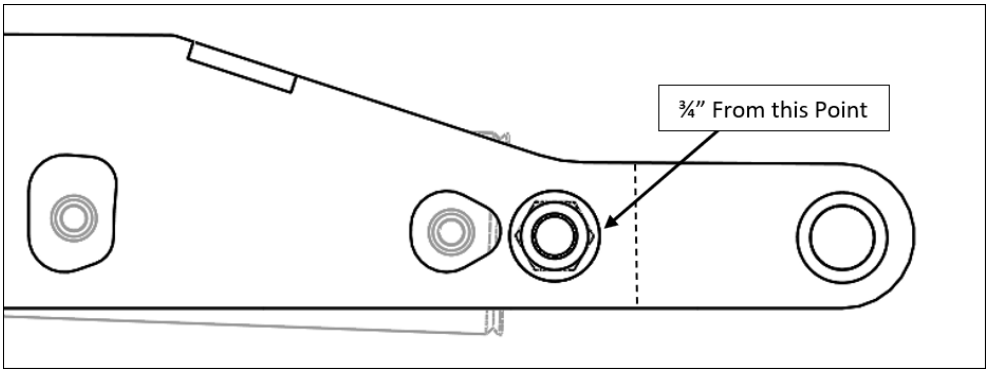


Figure 2: Cam modification cut line

3- Trim the cam plates at the line made previously.

4- Grind the cut edges smooth and round the corners.

5- Remove items 3 (Cylinder Pins – 1 per side) and items 4 (Cylinder Spacers – 2 per side).

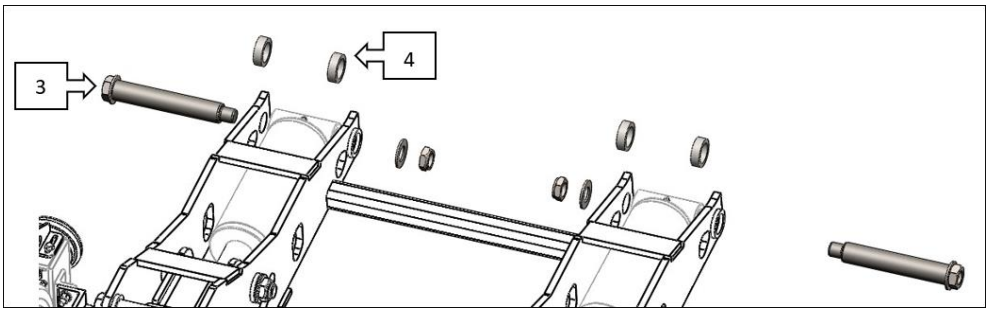


Figure 3: G-60 front components

6- Reinstall items 2 (Spring Hanger Mount) between the cam plates and cylinder bushing on each side then reinstall items 3 (Cylinder Pins) and reinstall the hardware.

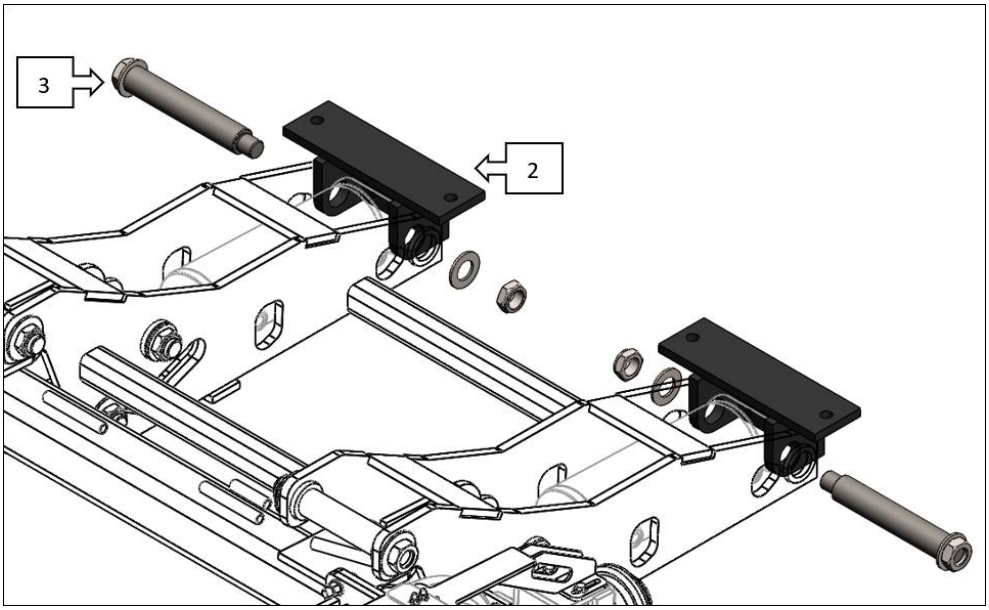


Figure 4: G-60 front components - Short cam plates

INSTALLATION – UNIVERSAL FRONT MOUNTING BRACKETS

Continental Railworks provides a Universal Front Mounting Bracket system that is designed to adapt to the majority of heavy chassis and to provide optimal ground clearance and liftoff. Refer to the drawings in the Appendices for details and nomenclature.

The image below shows the front hi-rail properly positioned, at 11” above the ground. Pin heights and cam plate heights shown are +/- ½”.

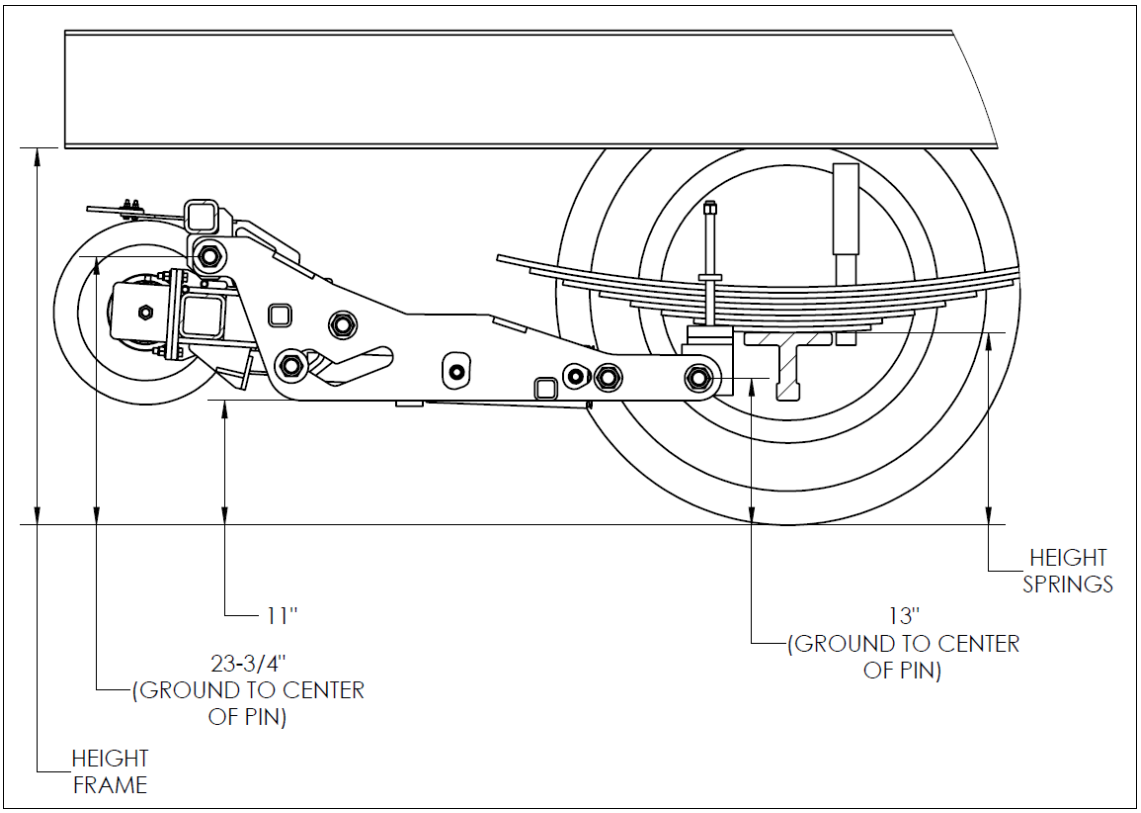


Figure 5: G-60 front mounting height

INSTALLATION – UNIVERSAL FRONT SPRING HANGERS

1- Remove the front spring hangers from the rear of the front hi-rail unit.

2- Remove the following items form the spring hangers:
   a. Item 5 – Nyloc nuts
   b. item 6 – Jam nuts
   c. item 7 – Flat washers
   d. item 8 – Top 1” shim
   e. item 9 – Rubber pad
   f. item 10 – Rubber bushings

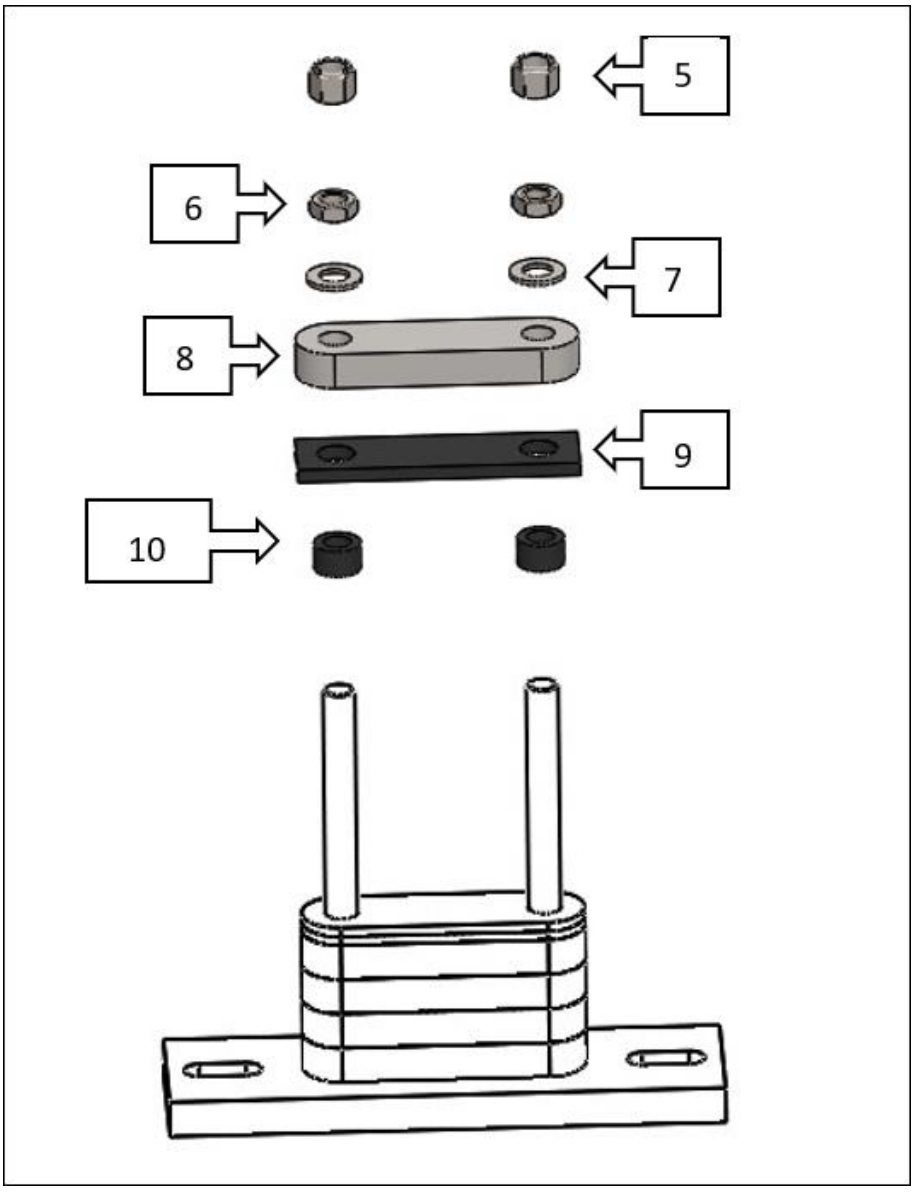


Figure 6: Spring hanger components

3- Measure from the ground to the bottom of the leaf springs. Then subtract 13” from the measurement that was just taken. This will give you the amount of shim required for the rear pin to be at 13” from the ground.
NOTE – The Height of the spring hanger without any spacer is 4-1/2”

4- With the proper amount of shim added, re-install the rubber spacers onto the threaded rods.

5- Position the spring hangers a minimum of 1” away from axle or shock absorber and not to exceed 8” from the front of the axle.
NOTE – Chassis equipped with tapered leaf springs. The shims should be positioned on the flat sections of the leaf and not hanging over the edge.

6- Raise the spring hangers up until the spacer contact the bottom of the leaf spring and the reinstall the rubber pad and 1” spacer.

7- Using the supplied jam nuts, tighten by hand until the rubber pad starts to deform.

8- While holding the jam nut in position, tighten the ¾”-10 nuts over the jam nuts. Torque nuts adequately. Refer to the Bolt Torque Table in the Appendices.

9- If required, cut the excess threaded rods, leaving a minimum of 1/2" above the nuts.

10- Position the front hi-rail under the front of the truck and lift it until the spring mounting brackets on the hi-rail touch the spring hangers installed on the truck.

11- Align the hi-rail to the spring hangers and the reinstall the supplied 5/8” grade 8 hardware. Do not tighten at this step.

12- Ensure the hi-rail is centered on the truck’s leaf springs, by measuring the overhang of the spring hangers over the spring mounting brackets.

13- Once centered tighten the two (2) 5/8” grade 8 bolts, making sure the square washers are directly over the slots in the spring hangers.

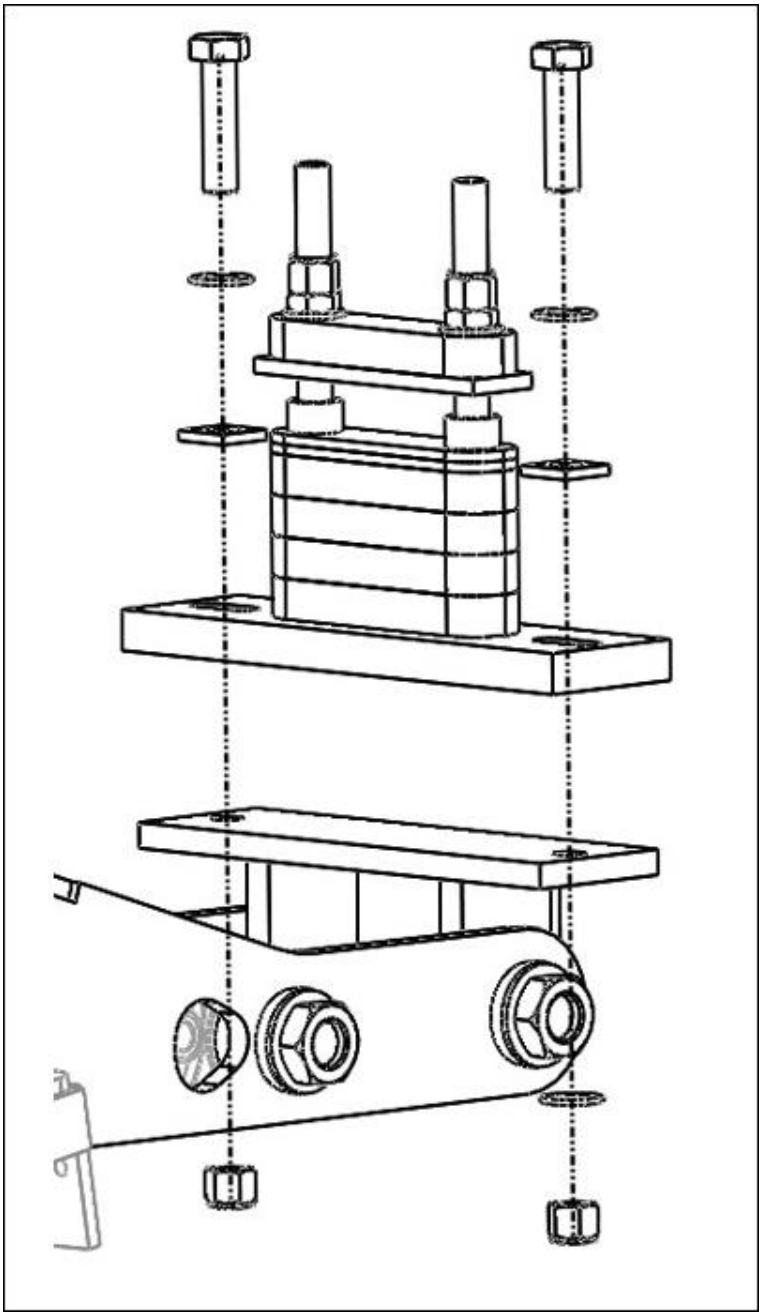


Figure 7: Front hi-rail to spring hanger connection

INSTALLATION – UNIVERSAL FRONT CROSS TUBE

The G-60 is supplied with a front cross tube that can be used in two height positions. The cross tube is centered on the hi-rail with equal amounts of side shims (see alignment section for details).

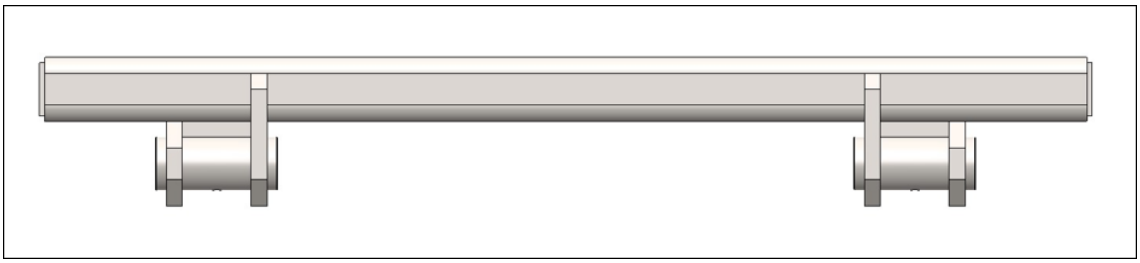


Figure 8: Front cross tube

Depending on the chassis or equipment installed, the hi-rail may need to be slid forward on the leaf springs to allow clearance between the cams and components below the frame. It is recommended to verify clearances considering the full front axle suspension stroke (frame to bump stops).

If the rail gear needs to be slid forward, loosen the spring hangers and slide forward until the front pin heights are obtained. Secure the spring hangers as previously explained.

1- Using a pallet jack or forklift, raise the front of the rail gear until the front pin is 23-3/4" from the ground.

2- Verify that the underside of the cam is parallel to the ground and at 11" off the ground.
NOTE – Depending on the frame height of the chassis, the cross tube may need to be rotated to get the pin to the correct height.

3- Measure between the underside of the frame extensions to the top of the cross tube and then cut solid flat bar shims to fill the space.
NOTE – Shims should be the same width of the cross tube and long enough to extend past the width of the frame rail.

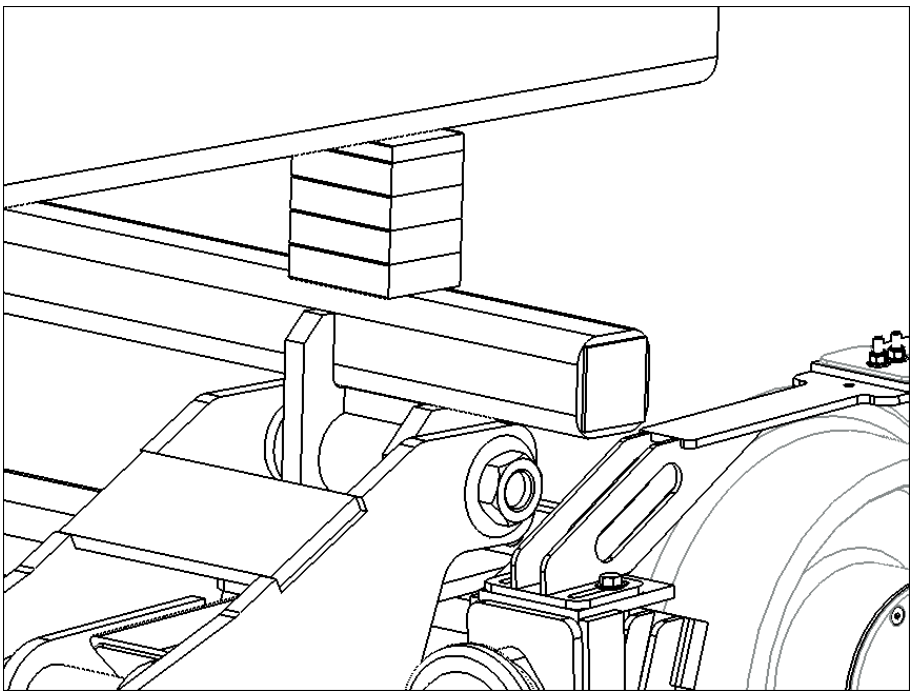


Figure 9: Shims between cross tube and frame

4- Tack the shims in place on the cross tube and ensure they are level and in contact with the frame.

5- Center the front cross tube to the frame.

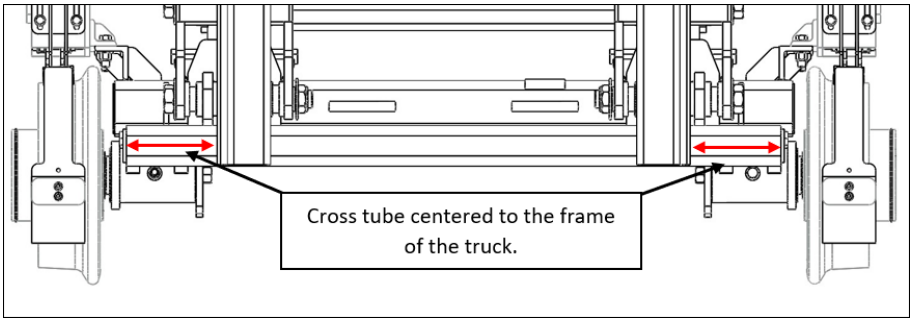


Figure 10: Front cross tube centered

6- Tack the shims and the cross tube to the frame of the truck on both sides of the frame extensions.
NOTE – Do not fully weld at this point. Tack the unit well enough to keep it from falling. This will be fully welded after alignment.

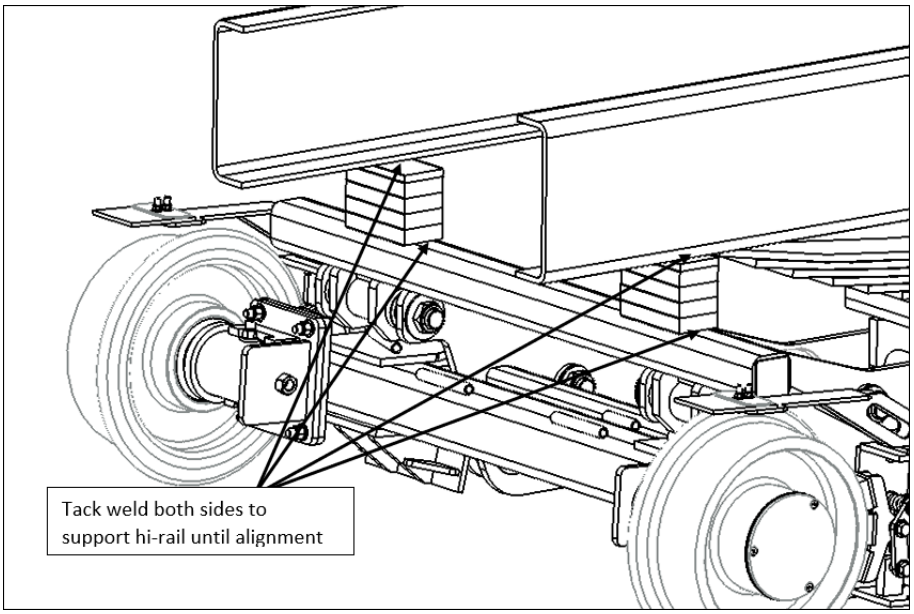


Figure 11: Tack weld locations

7- If required, reinstall the front bumper mounts, front bumper, and tow hooks.

REAR UNIT INSTALLATION

CHASSIS PREPARATION

7- Inflate tires to recommended pressure.

8- Prior to measuring the frame height, ensure the air bags are properly inflated, if equipped.

9- Disconnect the truck batteries.

10- Ensure the rear axles are aligned laterally to the truck frame. If the axles are misaligned by more than 1/2", have the axles aligned and centered.

11- For ease of access and alignment, it is recommended to raise the chassis on 12” blocks for the duration of the hi-rail installation and alignment.

INSTALLATION

The LS-60 hi-rail models are manufactured to adapt to truck frame widths of 35” or less. They accommodate different frame heights, 31” and greater, using height shims at installation and for weight adjustment. All measurements should be taken with the air bags and tires properly inflated.

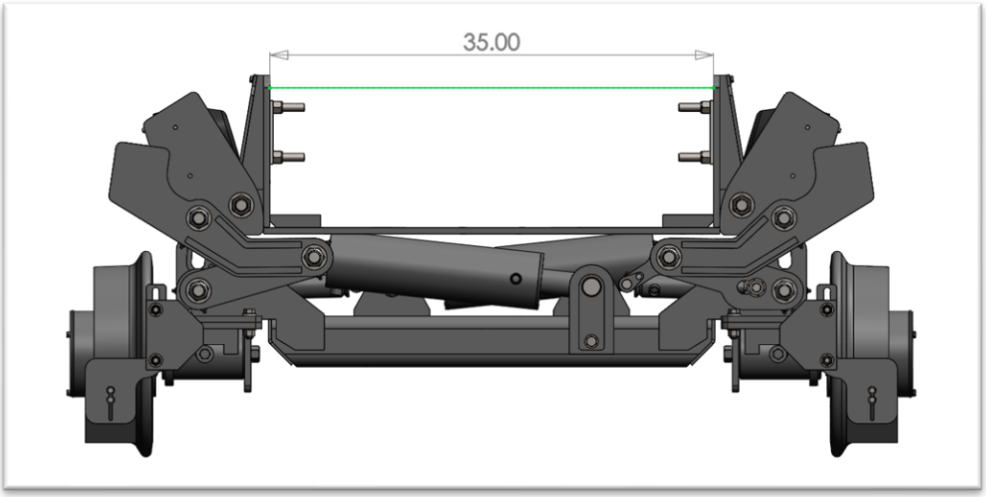


Figure 12: Mounting plate dimension

1- If installed, remove the spring plate and spring from the upper link assembly, the inner spring plate from the mounting plate assembly, and conserve hardware.

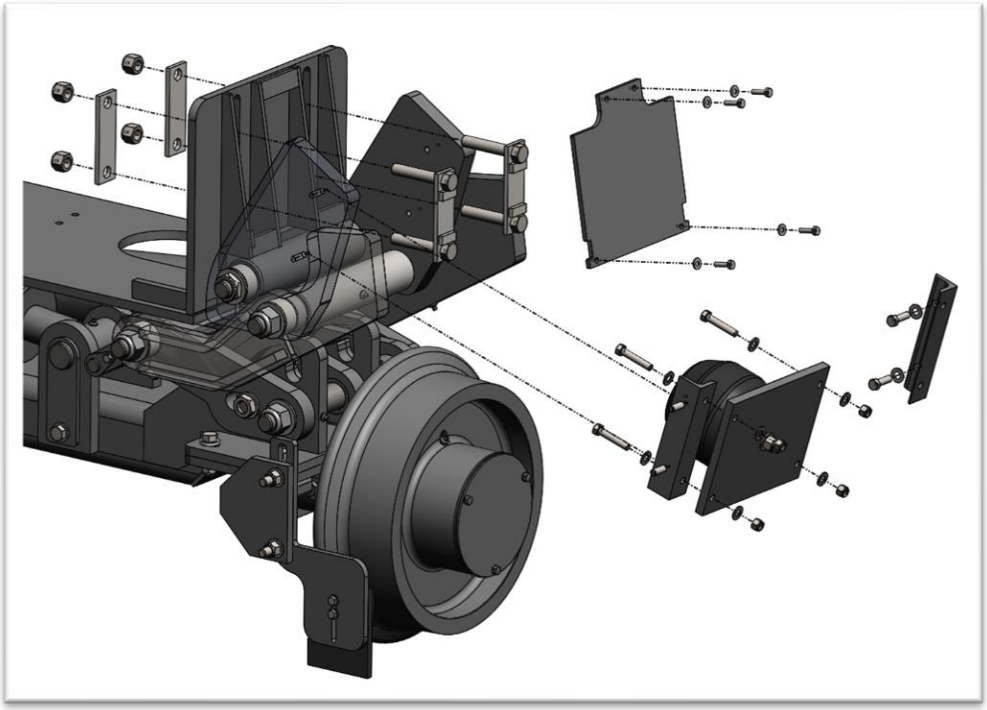


Figure 13: Disassembly for installation

2- Measure the distance from the ground to the underside of the vehicle frame where the rear unit will be installed (front edge of mounting plate at 24” from center of the rear axle as shown in the image below).

3- If the frame height is higher than 31” unladen, refer to the table below for the height of shims to be used

Note – Chassis equipped with air bag suspension should refer to the “Bare and Unladen Chassis” Table, whether the installation occurs on a loaded or unloaded chassis.

BARE AND UNLADEN CHASSIS (NO BODY OR CRANE INSTALLED)	
DIMENSION UNDERSIDE OF FRAME TO GROUND	SHIM THICKNESS
31 "	0"
32"	1"
33"	2"
34"	3"

NOTE: For 3" and over, confirm with the factory

LOADED CHASSIS (BODY OR CRANE INSTALLED)	
DIMENSION UNDERSIDE OF FRAME TO GROUND	SHIM THICKNESS
29"	0"
30"	1"
31"	2"
32"	3"

NOTE: For 3" and over, confirm with the factory

Figure 14: Frame Height vs Shim Thickness

4- Fabricate the required height shims following one of these methods:
   a. Solid flat bar of proper thickness, painted
   b. Flat bar stack, painted individually and welded at the ends
   Note – The purpose of painting the shims is to prevent rust that may lead to the steel plates swelling and causing failure in the assembly on the truck.
   Note – The shim height may need to be adjusted when adjusting the hi-rail for wheel weights.

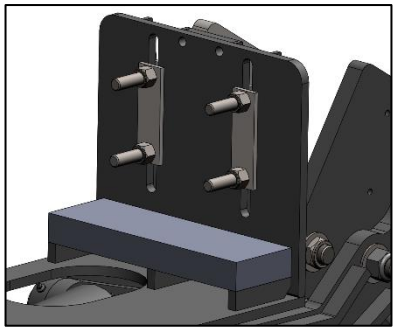


Figure 15: Solid flat bar

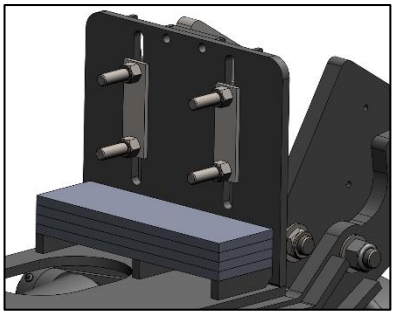


Figure 16: Flat bar stack

5- Measure the frame width and inside of rim to frame distance on both sides.

6- Select the provided width shims of proper thickness. Alternatively, fabricate the required width shims by using 13-3/4” wide x 10-1/2” tall flat plates of proper thickness, painted.
   Note – The thickness of each width shim should be selected to center the hi-rail to the rearmost axle’s tires as best as possible.
   Note – The hi-rail will be shipped with two (2) 1/4" thick shims and four (4) 1/8” thick shims, for a total of 1”.

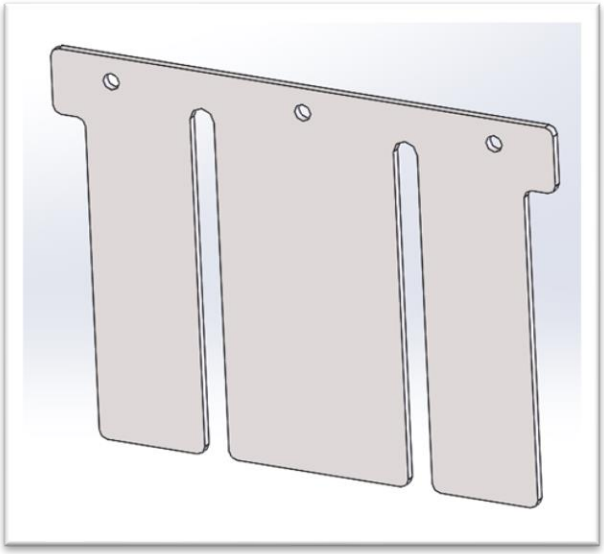


Figure 17: Width shims

7- Position the height shims on the mounting plate.

8- Position the width shims against the inside of the mounting plate so they come in contact with the outside of the truck frame.

9- Ensure the truck frame is clear of any obstructions (mounted accessories, cross member bolts, etc) from 23” to 37” rear of the rearmost axle center line.

10- Raise the retracted LS-60 to the underside of the chassis frame.

11- Position the front edge of the mounting plates at 24” from the center of the rear axle on a tandem chassis, position the front edge of the mounting bracket 4” behind the spring hanger on a single axle chassis as shown below.
Note – Having the mounting plate installed closer to the axle will prevent the hi-rail from functioning as it should and may lead to premature failure.

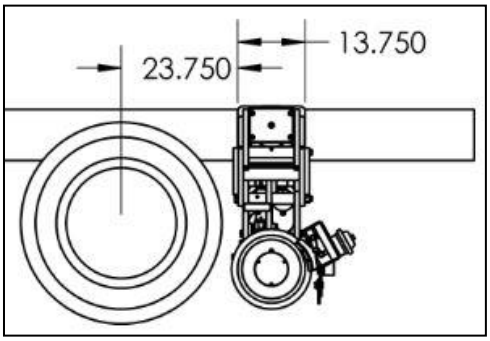


Figure 18: Location of Rear Mounting Plates

12- Using the bottom plate of the mounting plate as a reference, measure the hi-rail squareness to the axle by verifying the distance to a fixed point on the truck’s rear suspension. Adjust as required until the hi-rail is parallel to the truck axle.

13- Ensure the mounting plates make contact with the bottom of the chassis frame and clamp in place securely.

14- Mark and drill holes for securing, with the bottom holes at 1” above the lower truck frame rail radius.

15- The top holes need to be positioned 3-15/16” higher than the lower holes. The captive bolt plate washer can be used as a template. See image below for full bolt pattern.

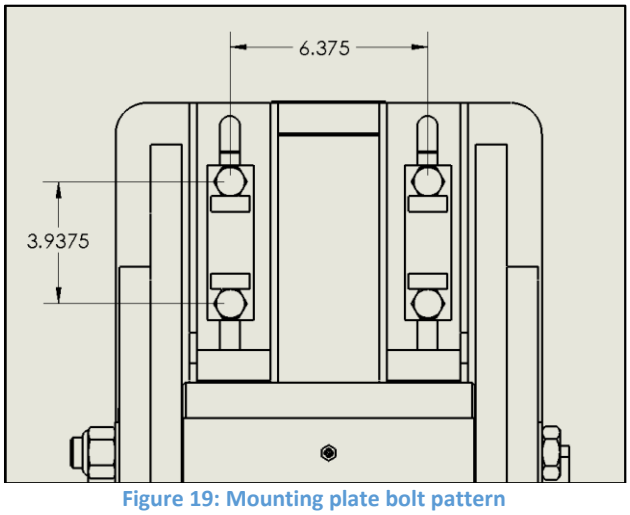


Figure 19: Mounting plate bolt pattern

16- Secure to the vehicle using the supplied captive bolts assembly.

17- The heads of the captive bolts need to be inserted from the outside of the mounting plate.

18- Secure using the provided flat bar plate, washers and nylon insert lock nuts.

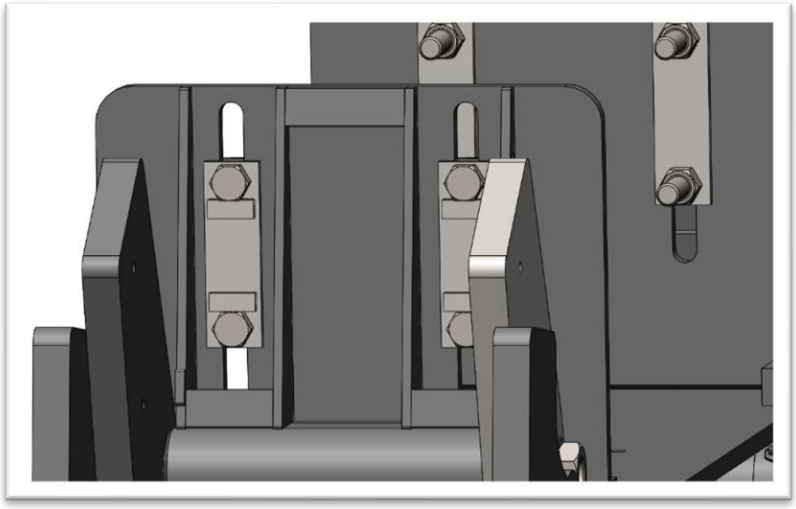


Figure 20: Captive bolt assemblies and hardware

19- Do not fully tighten at this point.

20- Reinstall the spring plate and spring on the upper link assembly, and the inner spring plate on the mounting plate assembly.

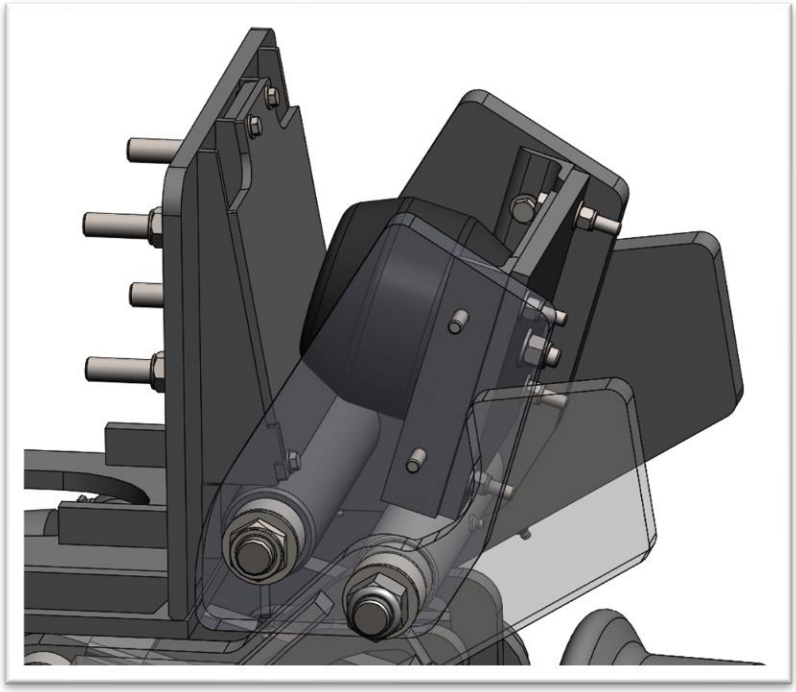


Figure 21: Spring components reassembled

STEERING WHEEL LOCK

1- Clean all surfaces with adequate cleaning solution to ensure proper adhesion of the Velcro pads.
Note – Because of the different chassis models and equipment, the exact location of the Velcro pads is left unspecified.

2- Install a narrow Velcro tape (hooks) on the dash to hold the Velcro lock when not in use.

3- Install a narrow Velcro tape (hooks) on the steering column.

4- Install a narrow Velcro tape (hooks) on the steering wheel.

5- Cover both Velcro tapes with the wide Velcro steering lock pad (loops) and ensure adequate adhesion.

NOTE – Ensure that the installation of the steering wheel lock does not interfere with the normal operation of the steering wheel, turn signal indicators, or any other function located on the steering wheel or steering column.

HYDRAULICS

PTO / PUMP SETUP

The hi-rail system requires a working pressure of 2500 psi and a flow rate of 5 - 10 gpm. The system may not function adequately at a pressure below 2500 psi. The system will function at a lower flow rate but will function more slowly.

In all cases, the minimum hydraulic hose to be used is a steel braided 1/4" diameter hose, with a minimum working pressure of 4000 psi. Hoses run along the vehicle must be adequately secured to the body or frame of the vehicle and kept well away of any moving or rotating parts.

The LS-60 models hi-rail feature either a "joystick" setup with control valve handles running through a mechanical linkage, or a valve block that houses key hydraulic components. The cartridge valves used are factory set to the correct values and should not be tampered with. Contact Continental Railworks directly for assistance if required.

Refer to the hydraulic schematic in the Appendices and to the following steps:

For the Joystick Setup:

1- Install the front and rear control valves in a suitable location, preferably on the driver's side of the vehicle and close to the hi-rail units.

2- Run a ½" hydraulic hose from the pressure source (either PTO / Pump or a diverter valve) to the front hydraulic control valve and connect it to the pressure port (P) of the control valve to allow flow through the valve.

3- Run a ½" hydraulic hose from the discharge port (T) of the front control valve to the side pressure port (P) of the rear control valve.

4- Run a ½" hydraulic hose from the side discharge port (T) of the rear control valve to the return line to the tank.

5- Run a ¼" hydraulic hose from the discharge port of the flow control valve directly to the tank (drain line), avoiding any backpressure.

6- Connect the two ports on the front hydraulic control valve to the front hydraulic cylinders, through T fittings splitting the flow to both cylinders.
   a. Connect the A port to the piston side of the cylinders (retraction).
   b. Connect the B port to the rod side of the cylinders (deployment).

7- The rear control valve and other hydraulic components are connected at factory. Ports and hoses can be identified if connections need to be interrupted, and should be as follows:
   a. Locking cylinders
      i. A1 capped / B1 connected to 4-way T fitting.
      ii. A4 capped / B4 connected to 4-way T fitting.
      iii. 4-way T fitting connected to 3-way T fitting feeding both locking cylinders.
      iv. 4-way T fitting connected to flow control valve.
   b. Deployment cylinders
      i. A2 (valve) to V2 (PO check valve) – C2 (PO check valve) to Left Cylinder Deploy Side
      ii. B2 (valve) to V1 (PO check valve) – C1 (PO check valve) to Left Cylinder Retract Side
      iii. A3 (valve) to V2 (PO check valve) – C2 (PO check valve) to Right Cylinder Deploy Side
      iv. B3 (valve) to V1 (PO check valve) – C1 (PO check valve) to Right Cylinder Retract Side

8- Secure all hoses in a way to avoid pinching or rubbing, but also to allow enough play for the hi-rail units to travel their full range of motion.

9- Verify the entire system for leaks.

For the Block Manifold Setup:

10- Install the front and rear control valves in a suitable location, preferably on the driver's side of the vehicle and close to the hi-rail units.

11- Run a ½" hydraulic hose from the pressure source (either PTO / Pump or a diverter valve) to the front hydraulic control valve and connect it to the pressure port (P) of the control valve to allow flow through the valve.

12- Run a ½" hydraulic hose from the discharge port (T) of the front control valve to the pressure port (P) of the rear control valve.

13- Run a ½" hydraulic hose from the discharge port (T) of the rear control valve to the return line to the tank.

14- Connect the two ports on the front hydraulic control valve to the front hydraulic cylinders, through T fittings to split the flow to both cylinders.
    a. Connect the A port to the piston side of the cylinders (retraction).
    b. Connect the B port to the rod side of the cylinders (deployment).

15- Connect the four ports on the rear hydraulic control valve to the valve block mounted on the hi-rail mounting plate.
    a. The hoses between the valve block and cylinder are already installed.
    b. Connect the left side ports of the control valve to the valve block.
        i. Connect the left A port to the VA1 port on the valve block.
        ii. Connect the left B port to the VB1 port on the valve block.
    c. Connect the right side ports of the control valve to the valve block.
        i. Connect the right A port to the VA2 port on the valve block.
        ii. Connect the right B port to the VB2 port on the valve block.

16- Connect the T port on the valve block to the return line to the tank.

17- Secure all hoses in a way to avoid pinching or rubbing, but also to allow enough play for the hi-rail units to travel their full range of motion.

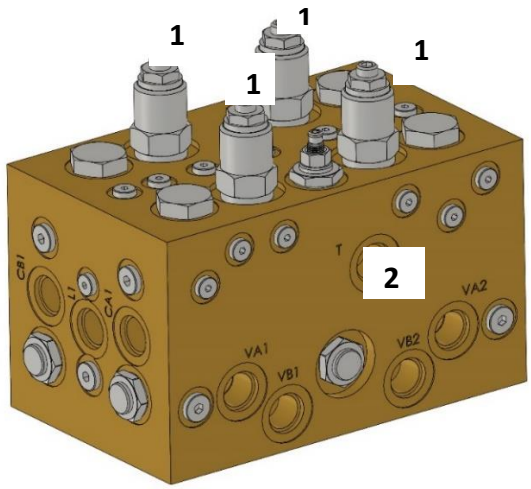
18- Verify the entire system for leaks.

TROUBLESHOOTING

LS-60 VALVE BLOCK

If the hi-rail deployment or locking cylinders do not act as they should when actuating the hi-rail, refer to the table below.

Units with Gold or Silver Block	
PROBLEM	**POTENTIAL FIX**
The locking cylinders retract when actuating the control valves, but do not extend when the control valves are released.	The valve bloc's flow control might be closed or too restrictive. Close it all the way and open it to about 1/8 to 1/4 turn.
	The valve bloc's flow control might be clogged or contaminated. Open it all the way and actuate the valves a few times to flush out the obstruction. Close it all the way and open it to about 1/8 to 1/4 turn.
The locking cylinders retract and deploy (quickly) but the deployment cylinders do not move.	The valve bloc's flow control might be opened too much. Close it all the way and open it to about 1/8 to 1/4 turn.
The deployment cylinders do not move simultaneously when both control valves are actuated.	The valve bloc's flow control might be opened too much. Close it all the way and open it to about 1/8 to 1/4 turn.
	The valve bloc's sequence valves might be out of adjustment. Contact Continental Railworks for assistance.
	The Metering in the Railgear control valve maybe off, Contact Continental Railworks for more information.



1- Adjustable Sequence Valve
2- Adjustable Flow Control

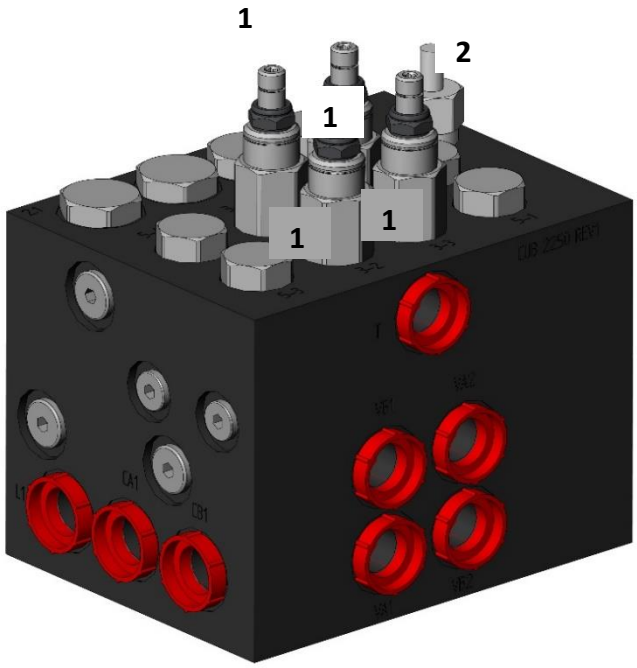
Normal Operation:

The two locking cylinders should retract simultaneously when the left or right control valve lever are actuated (deploy or retract). They should extend to both locked positions (hi-rail completely retracted or deployed) when the control valve levers are released. The extension of the locking cylinders should happen in approximately 1 second.

The deployment cylinders should deploy and retract simultaneously when both control valves are actuated.

NOTE: DO NOT TIE ANYTHING INTO THE T PORT OF THE VALVE BLOCK.

Units with Black Block	
PROBLEM	**POTENTIAL FIX**
The locking cylinders retract when actuating the control valves, but do not extend when the control valves are released.	The valve bloc's flow control might be closed or too restrictive. Close it all the way and open it to about 1-1/8 to 1-1/4 turn.
	The valve bloc's flow control might be clogged or contaminated. Open it all the way and actuate the valves a few times to flush out the obstruction. Close it all the way and open it to about 1-1/8 to 1-1/4 turn.
The locking cylinders retract and deploy (quickly) but the deployment cylinders do not move.	The valve bloc's flow control might be opened too much. Close it all the way and open it to about 1-1/8 to 1-1/4 turn.
The deployment cylinders do not move simultaneously when both control valves are actuated.	The valve bloc's flow control might be opened too much. Close it all the way and open it to about 1-1/8 to 1-1/4 turn.
The Metering in the Railgear control valve maybe off, Contact Continental Railworks for more information.	The valve bloc's sequence valves might be out of adjustment. Contact Continental Railworks for assistance.



1- Adjustable Sequence Valve
2- Adjustable Flow Control

Normal Operation:

The two locking cylinders should retract simultaneously when the left or right control valve lever are actuated (deploy or retract). They should extend to both locked positions (hi-rail completely retracted or deployed) when the control valve levers are released. The extension of the locking cylinders should happen in approximately 1 second.

The deployment cylinders should deploy and retract simultaneously when both control valves are actuated.

Note: Do not tie anything into the T port of the valve Block.

HYDRAULIC POWER PACK SETUP

An electric / hydraulic power pack can be supplied to replace the PTO / Pump on the vehicle and provide adequate performance to power the hi-rail. The power pack will provide approximately 2.5 gpm, which translates in a slower deployment and retraction than with a typical PTO / Pump.

In all cases, the minimum hydraulic hose to be used is a steel braided 1/4" diameter hose, with a minimum working pressure of 4000 psi. Hoses run along the vehicle must be adequately secured to the body or frame of the vehicle and kept well away of any moving or rotating parts.

Refer to the hydraulic schematic in the Appendices and to the following steps:

1- Install the front and rear push button remotes in a suitable location, preferably on the driver's side of the vehicle and protected from the elements.

2- Install the power pack in a suitable location, either under the hood or in a compartment of the vehicle's service body.

3- Connect the two push button remotes to the pump mounted electric directional valves, identifying each one as front and rear.

4- Connect the front pump mounted directional valve ports to the front hi-rail cylinders, through a T fitting to split the flow to both cylinders.

5- Connect the rear pump mounted directional valve ports to the rear hi-rail cylinders, through a T fitting to split the flow to both cylinders.

6- Test the system to ensure the remote buttons actuate the proper functions (up – down / front – rear).

7- Adjust the pump pressure to 2500 psi.

8- Secure all hoses in a way to avoid pinching or rubbing, but also to allow enough play for the hi-rail units to travel their full range of motion.

9- Verify the entire system for leaks.

PNEUMATIC BRAKE VALVE KIT

(STANDARD WITH AIR BRAKE CHASSIS)

General Description

The Continental Railworks Pneumatic Brake Valve Kit has been designed to isolate the hi-rail air brakes from the chassis' main air brake system. It features brake pedal proportionality and pressure adjustability to fine tune the braking performance on rail.

The valve kit is designed to be installed between the frame rails of the vehicle.

Part number for replacement of the Pneumatic Brake Valve Kit is H105A020 (front brakes or front and rear brakes).

Operation

On Rail

The Pneumatic Brake Valve Kit is designed to replicate the proportionality of the chassis' main brake system, based on the input from the foot pedal. No additional input is required from the operator for the hi-rail brakes to apply.

The hi-rail brake application force can be adjusted by varying the air pressure with the supplied regulator (pre-set to 50 psi).

On Road

The supplied ball valve assembly is designed to completely isolate the hi-rail brakes from the chassis brakes when closed.

It is recommended to close the ball valve when operating the vehicle off rail.

! SAFETY WARNING !

ALL MODIFICATIONS TO THE CHASSIS AIR BRAKE SYSTEM PERFORMED BY THE INSTALLER MUST CONFORM TO FMVSS 121 (US VEHICLES) OR CMVSS 121 (CANADIAN VEHICLES)

ENSURE AIR LINES AND WIRES ARE SECURED PROPERLY TO PREVENT PINCHING OR RUBBING WHICH MAY LEAD TO FAILURE

Installation

Contents of Kit

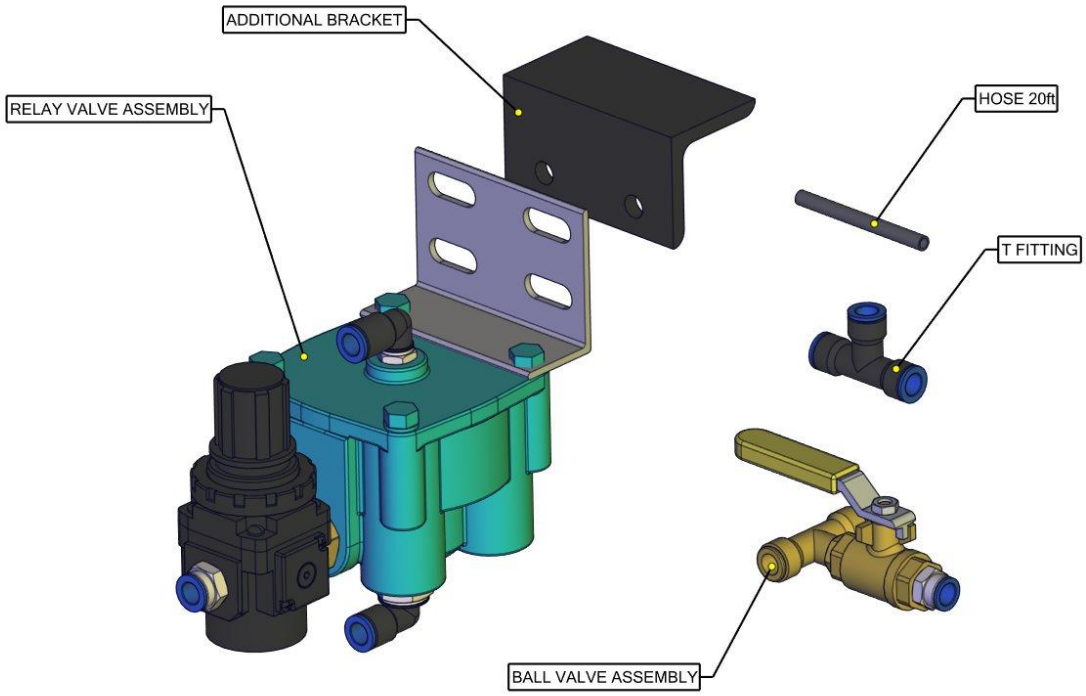


Figure 22: Pneumatic Brake Valve Kit

INCLUDED

- RELAY VALVE ASSEMBLY
- ADDITIONAL BRACKET
- 20ft of 3/8” HOSE
- T FITTING (for optional rear brakes)
- BALL VALVE ASSEMBLY

Note: Components may be slightly different in appearance.

NOT INCLUDED

- Various fittings for connection to chassis air system
- Various fittings for connection of the hi-rail brakes
- Mounting hardware

Location and Mounting

1- Find a suitable location between the vehicle's frame rails to mount the valve kit. The valve kit needs to be accessible relatively easily for pressure adjustment.

NOTE – The relay valve needs to be mounted vertically, with the exhaust pointing down and the service port pointing up.

2- Secure the valve assembly to one of the vehicle's cross members using the mounting bracket located on the relay valve. An additional angle bracket is also provided for more mounting options.

3- Ensure the pneumatic brake valve assembly will not interfere with the vehicle's body, crane, or other accessory.

Plumbing

REFER TO THE PNEUMATICS SCHEMATICS IN THE APPENDICES FOR DETAILS

1- Find an adequate air source to power the system:

a. The system needs to feed from the secondary or auxiliary air tanks.
b. The air source needs to be pressure protected.
c. DO NOT CONNECT DIRECTLY TO MAIN CHASSIS AIR BRAKE PRESSURE LINE.
d. DO NOT CONNECT TO THE CHASSIS' PRIMARY AIR TANK CIRCUIT.

2- Using 3/8" air brake tubing, make the following connections:

a. Connect the main air source to the fitting on the regulator attached to the SUPPLY port on the relay valve.
b. Connect the bottom DELIVERY port of the relay valve to the hi-rail brakes:

i. For a front brake only application, connect the DELIVERY port fitting to the front hi-rail air brake chambers through the T fitting installed on the hi-rail unit that splits the flow adequately between the left and right side chambers.
ii. For a front and rear brake application, connect the DELIVERY port fitting to the supplied T fitting, then connect the T fitting to the front and rear hi-rail air brake chambers through the T fittings installed on the hi-rail units.
NOTE – Ensure the air hose lengths going to the front and rear T fittings are approximately the same length to provide adequate brake timing.

3- Locate an adequate air brake signal line between the foot pedal and the OEM relay valve.

4- Install the supplied ball valve assembly on the main signal line.

NOTE - The ball valve needs to be accessible so the operator can shut the system off if/when required. The ball valve assembly is supplied with DOT rated fittings. DO NOT REPLACE FITTINGS ON THE BALL VALVE ASSEMBLY.

5- Run an air line between the ball valve and the SERVICE port of the relay valve assembly.

6- Pressurize the system and verify for air leaks.

Adjustment

1- The regulator is supplied already adjusted to 50 psi.

2- Perform a track test with the vehicle and assess the hi-rail brakes' performance.

3- Adjust the pressure value as required to provide enough braking force without locking the wheels in usual track conditions.

TRACK SIGNAL SHUNT KIT

(OPTIONAL)

GENERAL DESCRIPTION

The Continental Railworks Track Signal Shunt Kit has been designed to allow temporary or permanent track signal shunting by essentially removing the hi-rail insulation. Its purpose may be for testing of track signals or to comply with company policy.

The shunt kit is designed to be wired either through a switch in the cab (not supplied) to allow temporary shunting, or to be wired direct to allow permanent shunting.

Part number for replacement of the Track Signal Shunt Kit is E077A300 (individual shunt).

INSTALLATION

Contents of Kit

INCLUDED

- 2 or 4 x Individual assembled plastic bushings and hardware
- 1 x Installation / Operation manual

Note: Components may be slightly different in appearance.

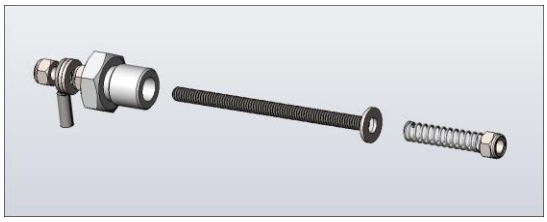


Figure 23: Shunt - Exploded View

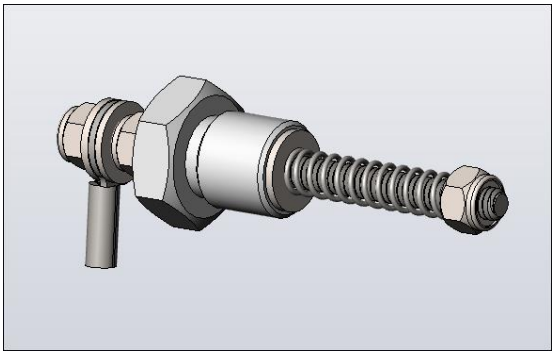


Figure 24: Shunt - Assembled

NOT INCLUDED

- 14-16 awg electrical wire
- Momentary or Maintained switch (if required)

Location and Mounting

1- The assembled plastic bushings can be installed once the hi-rail installation is complete and the rail gauge adjustment has been performed. Installing the bushings prior to performing the gauge adjustment may restrict the spindles from moving and prevent proper gauge adjustment.

2- The shunt kit can be installed either on the front or rear hi-rail unit. Installation on the front hi-rail is generally recommended due to the proximity to the cab and better accessibility for inspections.

3- Thread the plastic bushing through the ¾" nut welded to the back of the spindle housings, until the bolt head makes contact with the spindle. Proper contact can be verified by following the "Adjustment" instructions that follow.

Electrical

1- Using 14-16 awg electrical wire, connect the two terminals on the assembled plastic bushings. Connection can be established as follows:
   a. Wire directly from one side to the other, to allow permanent track signal shunting, or;
   b. Wire to a momentary switch installed in the cab, to allow momentary track signal shunting, or;
   c. Wire to a maintained switch installed in the cab, to allow maintained track signal shunting.

2- Ensure all wires are properly secured and kept away from moving parts.

Adjustment

1- With all electrical connections complete, perform a resistance test by measuring resistance between each wheels of the axle where the shunt kit is installed. The resistance value can be taken between the two rail wheels by poking through the paint layer.

2- With a megohmmeter, ensure values are as follows:
   a. Shunt position (switch ON or hard wired): Lower than 22 kΩ
   b. Insulated position (switch OFF): Higher than 22 kΩ

3- If values are not satisfactory, review all wiring connections and ensure the plastic bushing is inserted so that the bolt head comes in contact with the spindle.

Length Adjustment

Depending on the hi-rail model or the state of alignment (spindles pushed to one side), the effective length of the shunt may need to be adjusted. A ¼" washer on the spindle side of the threaded rod can be removed to shorten the shunt to the appropriate length.

See the drawing in the Appendices for details and measurements.

PNEUMATIC SUSPENSION KIT

(OPTIONAL WITH AIR BRAKE CHASSIS)

GENERAL DESCRIPTION

The Continental Railworks Pneumatic Suspension Kit has been designed to provide a means of regulating the chassis' air bag pressure to ensure a constant ride height and wheel pressure while traveling on rail. It offers additional guidance / traction adjustability and is adaptable to many suspension types.

Some single axle trucks require a different system that diverts the air pressure going to the OEM leveling valve. This manual covers both systems:

Part number for replacement of the Pneumatic Suspension Override Kit is H105E003 for tandem axle trucks.

Part number for replacement of the Pneumatic Suspension Override Kit is H105E004 for single axle trucks with air bag pressure sensors.

! SAFETY WARNING !

AIR NEEDS TO BE SOURCED FROM SECONDARY OR AUXILIARY AIR TANK

ENSURE AIR LINES AND WIRES ARE SECURED PROPERLY TO PREVENT PINCHING OR RUBBING WHICH MAY LEAD TO FAILURE

INSTALLATION – H105E003 TANDEM AXLE TRUCKS

Contents of Kit

Figure 25: Suspension Assembly with Regulator

INCLUDED

- Suspension Assembly with Regulator

Note: Components may be slightly different in appearance.

NOT INCLUDED

- 3/8” OD Nylon Air Brake Tubing (SAE J844 compliant)
- Various fittings for connection to chassis air system
- Electrical proximity switch for hi-rail
- Electrical relays, wire and connectors
- Mounting hardware

Note: The electrical proximity switch for hi-rail (sending signal to the air valves) is not supplied. The choice of the type of switch is left to the customer / installer.

Location and Mounting

1- Find a suitable location between the truck frame rails or in a compartment of the vehicle to mount the valve assembly.

2- Secure the mounting bracket to the vehicle in a way that allows access to the pressure regulator unit.

Note – The valve kit needs to be mounted with the quick exhaust valve (release port EXHAUST) pointing down, as shown in pictures and drawings below.

3- Select and install a proximity switch for the rear hi-rail.

Note – Mechanical proximity switches are not recommended for reliability reasons. Continental Railworks recommends the use of either magnetic or induction proximity switches.

Note – The proximity switch needs to be installed on the rear hi-rail so the system adjusts as soon as possible (rear hi-rail gets deployed first).

Electrical

Refer to the electrical schematic in the next pages and to the following steps:

1- Select and install a method of activating the system:
   a. A proximity switch installed on the rear hi-rail unit (magnetic or induction type recommended)
   b. A toggle switch installed in the cab (not recommended)

2- The air solenoid valves need to be energized to redirect air pressure from the leveling valves (normal mode) to the air regulator (override mode).

3- Install a 12V automotive relay close to the Pneumatic Suspension Override Kit.

4- Feed the relay from the chassis' IGNITION ON circuit.

5- Connect the relay with:
   a. The two (2) solenoid valves in parallel
   b. The hi-rail sensor / switch in series with the solenoid valves

Plumbing

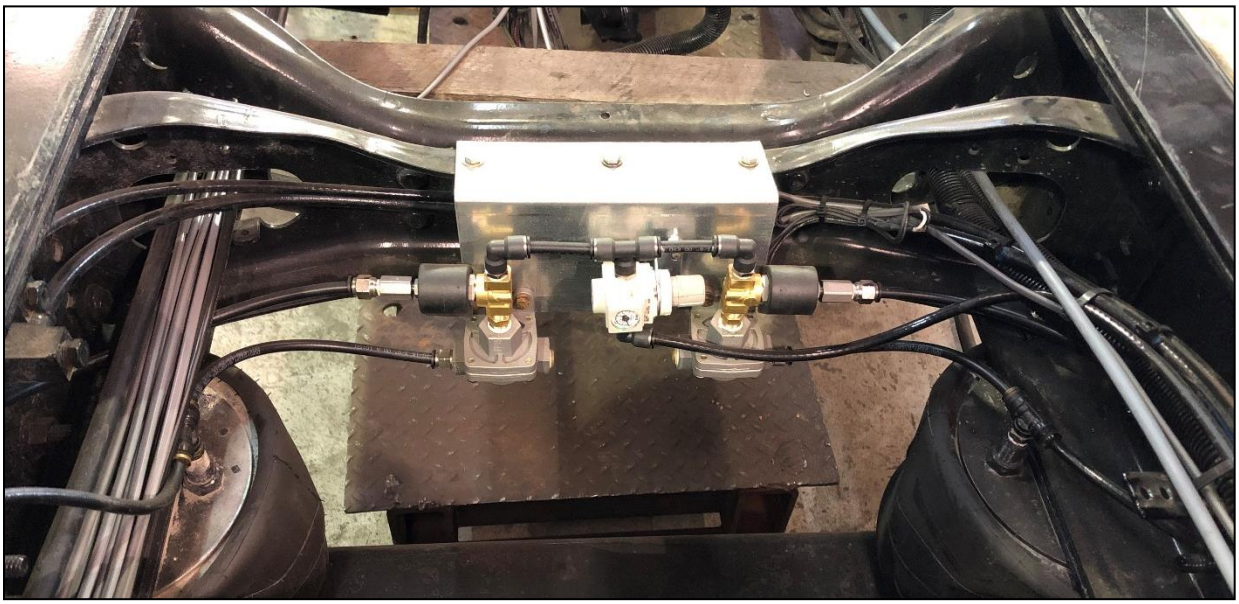


Figure 26: Typical air line routing

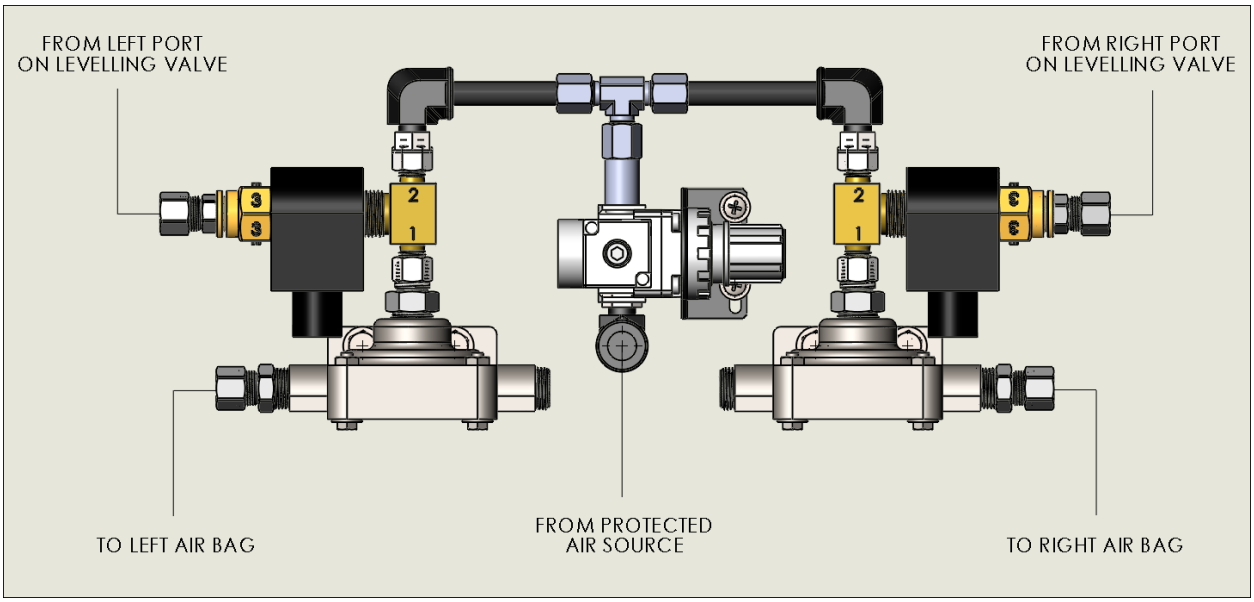


Figure 27: Simplified representation

Refer to the pneumatic schematic in the next pages and to the following steps:

7- Find an adequate air source to power the system:

   a. The system needs to feed from the secondary or auxiliary air tanks
   b. The air source needs to be pressure protected
   c. DO NOT CONNECT DIRECTLY TO MAIN CHASSIS AIR BRAKE SYSTEM
   d. DO NOT CONNECT TO THE CHASSIS' PRIMARY AIR TANK CIRCUIT

NOTE – The most convenient and safe place to connect the air source is to tee off from the supply line of the load leveling valve.

8- Using 3/8" air brake tubing, make the following connections:

   a. Connect the main air source to the Pressure Regulator Unit.
   b. Connect the left side output from the chassis' leveling valve to the left side Port #3 on the air solenoid valve.
   c. Connect the right side output from the chassis' leveling valve to the right side Port #3 on the air solenoid valve.
   d. Connect the left side chassis air bags to the DELIVERY port on the left side quick exhaust valve.
   e. Connect the right side chassis air bag to the DELIVERY port on the right side quick exhaust valve.

9- Pressurize the system and verify for air leaks.

Contents of Kit

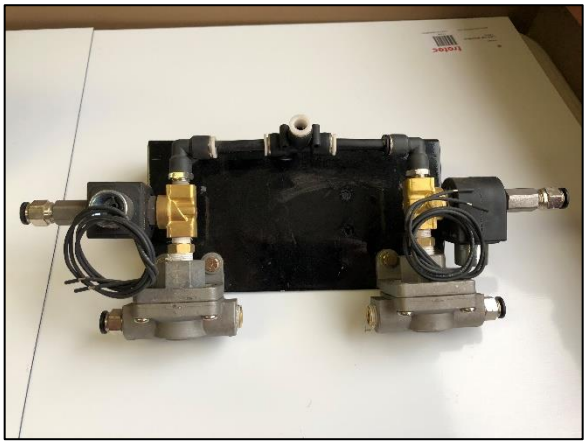


Figure 28: Suspension Assembly

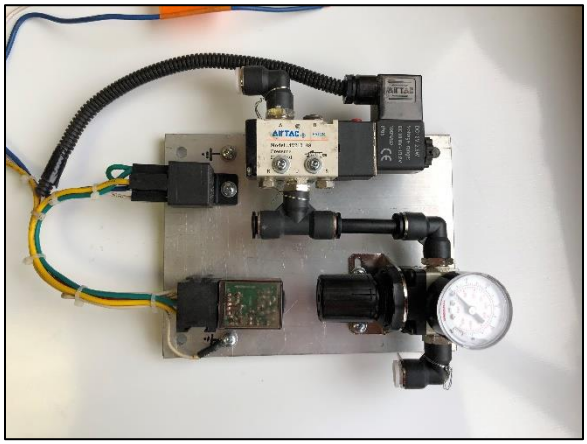


Figure 29: Diverter Valve Assembly

INCLUDED

- Suspension Assembly
- Diverter Valve Assembly with Regulator

Note: Components may be slightly different in appearance.

NOT INCLUDED

- 3/8” OD Nylon Air Brake Tubing (SAE J844 compliant)
- Various fittings for connection to chassis air system
- Electrical proximity switch for hi-rail
- Electrical relays, wire and connectors
- Mounting hardware

Note: The electrical proximity switch for hi-rail (sending signal to the air valves) is not supplied. The choice of the type of switch is left to the customer / installer.

Location and Mounting

1- Find a suitable location between the truck frame rails or in a compartment of the vehicle to mount the Suspension Assembly.

2- Secure the mounting bracket to the vehicle.

Note – The valve kit needs to be mounted with the quick exhaust valve (release port EXHAUST) pointing down, as shown in pictures and drawings below.

3- Fins a suitable location inside the vehicle cab or inside a compartment to mount the Diverter Valve Assembly.

4- Secure the plate to the vehicle in a way that allows access to the pressure regulator.

5- Select and install a proximity switch for the rear hi-rail.

Note – Mechanical proximity switches are not recommended for reliability reasons. Continental Railworks recommends the use of either magnetic or induction proximity switches.

Note – The proximity switch needs to be installed on the rear hi-rail so the system adjusts as soon as possible (rear hi-rail gets deployed first).

Electrical

Refer to the electrical schematic in the Appendices and to the following steps:

1- Select and install a method of activating the system:

a. A proximity switch installed on the rear hi-rail unit (magnetic or induction type recommended)
b. A toggle switch installed in the cab (not recommended)

2- The air solenoid valves need to be energized to redirect air pressure from the leveling valves (normal mode) to the air regulator (override mode).

3- Connect the IGN + wire to the vehicle's ignition on circuit.

4- Connect the GROUND VIA SENSOR wire to the proximity switch's ground lead.

5- Connect the TO SUSPENSION OVERRIDE VALVE wire to the solenoid wires on the Suspension Assembly (in parallel).

Plumbing

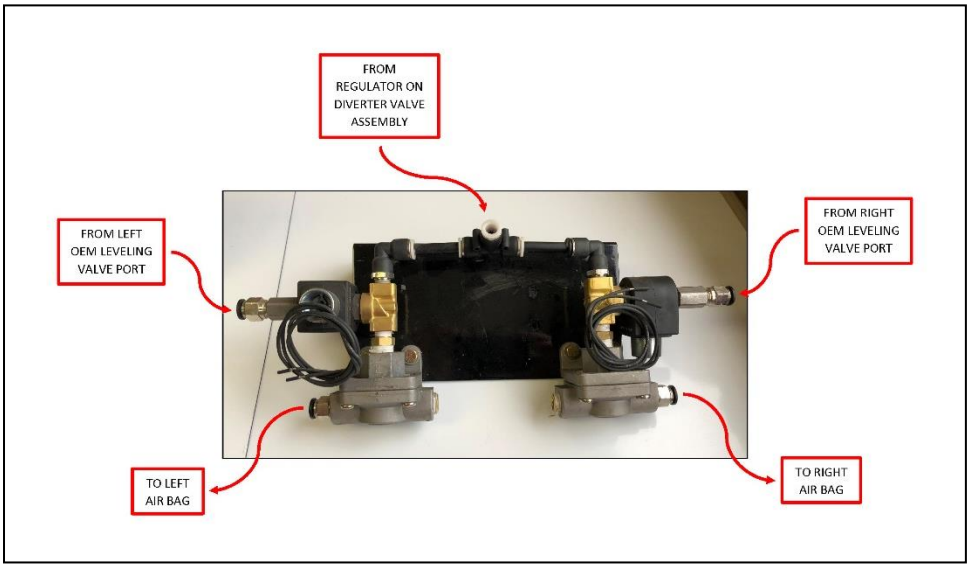


Figure 30: Suspension Assembly

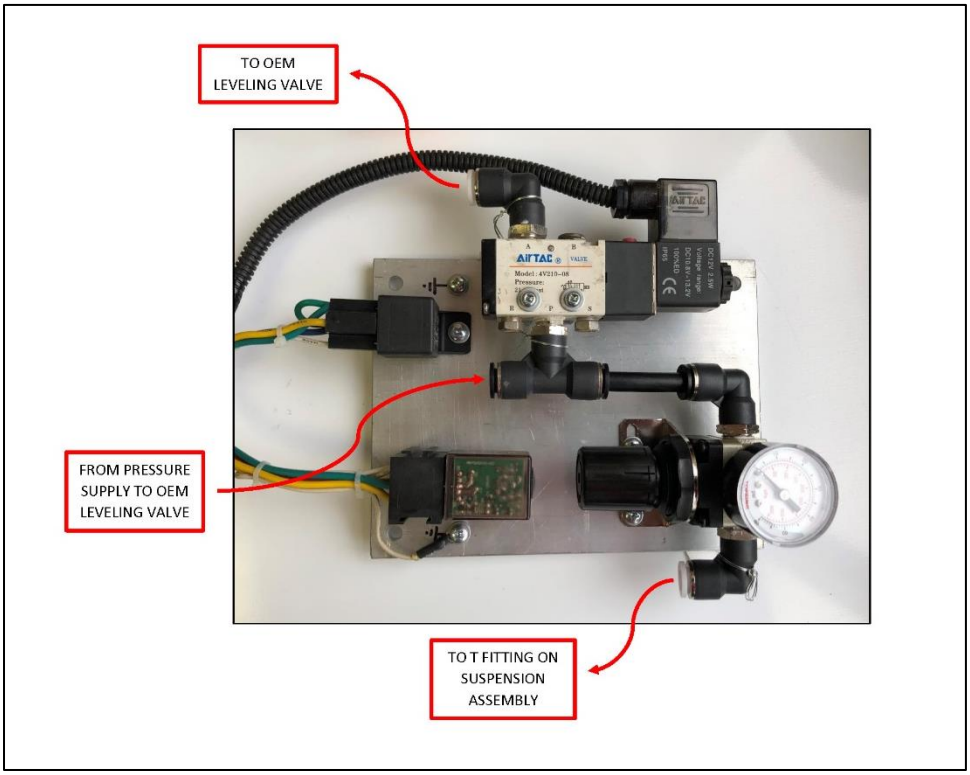


Figure 31: Diverter Valve Assembly with Regulator

Refer to the pneumatic schematic in the next pages and to the following steps:

1- Using 3/8" air brake tubing, divert the air pressure going to the OEM leveling valve.

   a. Connect the air line leading to the leveling valve (pressure source) to the P port of the 5-way solenoid valve.
   b. Connect an air line to feed the OEM leveling valve from the A port on the 5-way solenoid valve (neutral state).

2- Using 3/8" air brake tubing, connect the Diverter Valve Assembly to the Suspension Assembly
   a. Connect an air line between the air regulator on the diverter valve assembly to the T fitting on the Suspension Assembly

3- Using 3/8" air brake tubing, make the following connections:

   a. Connect the left side output from the chassis' leveling valve to the left side Port #3 on the air solenoid valve.
   b. Connect the right side output from the chassis' leveling valve to the right side Port #3 on the air solenoid valve.
   c. Connect the left side chassis air bags to the DELIVERY port on the left side quick exhaust valve.
   d. Connect the right side chassis air bag to the DELIVERY port on the right side quick exhaust valve.

4- Pressurize the system and verify for air leaks.

ADJUSTMENT

1- With the vehicle on rail (hi-rail deployed) and all air and electrical connections complete, perform initial adjustment to the Pneumatic Suspension Override Kit assembly as follows:

   a. Ensure that the chassis air tanks are full before performing any tests or adjustments.
   b. Pull up on the pressure regulator knob and adjust to approximately 25 psi.
   c. Adjust air pressure as required in 5 psi increments until the tire contact patch reaches an acceptable dimension (see individual hi-rail manuals for details).

      i. Raise pressure to increase contact patch and traction.
      ii. Lower pressure to reduce contact patch and traction.

2- Ensure there are no air leaks in the system.

3- Ensure the air lines and wiring are properly secured and kept away from moving or rotating parts of the vehicle.

4- Perform a track test with the vehicle and ensure proper suspension functionality both on road and on rail.

G-60 FRONT SIDE TO SIDE ALIGNMENT

While adjusting the alignment, if the front hi-rail needs to be adjusted side to side, it can be done as follows:

1- Start by deploying the front hi-rail until the wheels touch the ground (supported).

2- Remove the Nyloc nuts and washers from the front pins.

3- Loosen the two (2) 5/8” bolts that hold the cams to the Spring hangers on both sides.

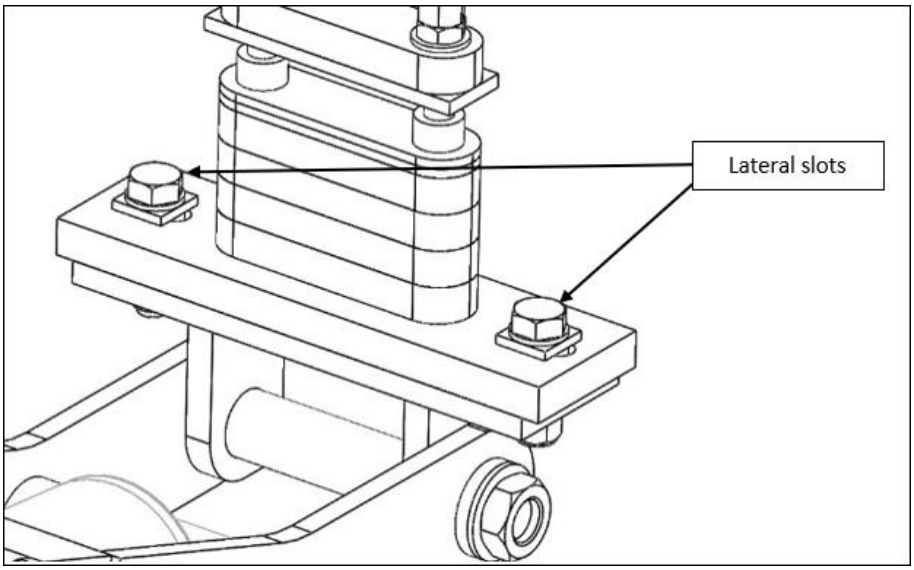


Figure 32: Spring hanger bolts

4- Slide the front pins out far enough to remove the shims. The pins should not be more than halfway out during alignment.

5- Rearrange the shims to move the hi-rail side to side as required, using a pry bar to stack the hi-rail against the shims.

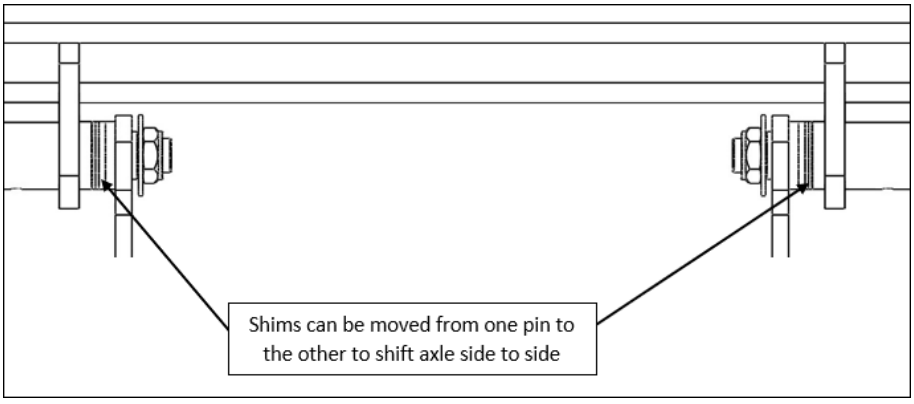


Figure 33: Front cross beam shims

6- Reinstall the pins, washers and Nyloc nuts.

7- By measuring the spring hangers on the leaf springs and spring mounting brackets on the hi-rail, ensure that the rear of the hi-rail has moved side to side by the same amount as the front.

8- Torque the two (2) 5/8" bolts on both sides of the spring hangers.

ALIGNMENT PROCEDURE

The simplest method of aligning the hi-rail unit to the vehicle is to use a set of parallel strings attached to heavy mobile objects on the floor, such as jack stands or pylons (string line).

The goal is to achieve the following:

- The rear hi-rail unit is centered on the rear axle.
- The center of the rear truck wheel is the same distance to the center of the rear hi-rail wheel on both sides of the vehicle.
- The front hi-rail unit is centered on the rear axle.
- The center of the rear truck wheel is the same distance to the center of the front hi-rail wheel on both sides of the vehicle.

The directions for aligning the vehicle are as follows. **Please refer to the alignment diagram in the Appendices**. **Use the Alignment and Pressure Data Form in the Appendices to record final values.**

Note – A straight edge (approximately 2' in length) can be clamped onto the hi-rail wheels in order to adjust the wheels' toe-in and toe-out.

1- Ensure the vehicle is on a hard-flat surface with the front wheels pointing straight ahead. Place 2" minimum blocks under all wheels.

2- Lower the front hi-rail unit completely.

3- Lower the rear unit completely.

4- Set up pylons at the four corners of the vehicle.

5- Attach 2 high tension strings of exactly equal length (dimension A) to the pylons, running them along the length of the vehicle (strings are not required along the front and rear of the vehicle).

6- Position the pylons so that the strings are an equal distance from each rear rim (dimension C), an equal distance from each side of the frame rails at the front (dimension E), and the pylons are an equal distance apart front and rear (dimension B).

7- Adjust the rear hi-rail toe-in and toe-out so that the wheel faces are parallel to the strings on both sides.
    a. This can be performed by adjusting the swiveling spindle housings.
    b. Once adjusted, the spindle housing can be welded to the axle with a 1" tack weld on the front face of the axle to allow easy replacement.
    c. No tolerance is given between the front and rear of each wheel to string measurement. Toe alignment needs to be perfect to minimize wheel wear and flanging.

8- Measure and confirm that the distance from the rear hi-rail wheel to the string is equal on both sides of the vehicle (dimension D).
    a. This measurement depends on the width shims used at installation.
    b. A tolerance of 1/16" is acceptable, provided that the same measurement is achieved when aligning the front hi-rail.
    c. The hi-rail gauge needs to be adjusted and maintained by sliding the spindle in the spindle housing (a 3/4" threaded rod can be used through the nut welded at the back of the spindle housing).
    d. An inside distance of 53-1/2" between the flanges of the hi-rail wheels must be maintained while performing this adjustment.
    e. Once the gauge is adjusted, a ½" washer can be welded to the spindle housing to transform the adjustment slot into a hole and lock in the adjustment.
    f. A tolerance of 1/16" is acceptable on gauge measurement.

9- Adjust the front hi-rail toe-in and toe-out so that the wheel faces are parallel to the strings on both sides.
    a. This can be performed by adjusting the swiveling spindle housings.
    b. Once adjusted, the spindle housing can be welded to the axle with a 1" tack weld on the back face of the axle to allow easy replacement.
    c. No tolerance is given between the front and rear of each wheel to string measurement. Toe alignment needs to be perfect to minimize wheel wear and flanging.

10- Adjust the front hi-rail so that the distance from the front hi-rail wheel to the string is equal on both sides of the vehicle (dimension D).
    a. This can be performed by shifting the whole hi-rail unit from side to side (there are lateral slots at the spring mounts, and enough play at the front pins).
    b. The hi-rail gauge needs to be adjusted and maintained by sliding the spindle in the spindle housing (a 3/4" bolt can be used through the nut welded at the back of the spindle housing).
    c. An inside distance of 53-1/2" between the flanges of the hi-rail wheels must be maintained while performing this adjustment.
    d. Once the gauge is adjusted, a ½" washer can be welded to the spindle housing to transform the adjustment slot into a hole and lock in the adjustment.
    e. A tolerance of 1/16" is acceptable on gauge measurement.

11- Ensure all mounting plate adjustment bolts are properly tightened and torqued after adjusting the unit. Refer to the bolt torque chart in the Appendices.

12- Install shims (rings of various thicknesses supplied) on the front main support pins to lock the Alignment Adjustment in place. The shims should be installed between the mounting plate bushing and the hi-rail cam plates, towards the outside of the vehicle, on both pins.

13- Tighten the gauge adjustment bolts on the front and rear hi-rail units, locking the wheel spindles in place.

14- Perform a track test on the unit ensuring there is no excessive flanging.

PRESSURE ADJUSTMENT

The rear unit may require adjustment to allow for the proper balance between traction and guidance. The following adjustment procedure is for an empty, unladen vehicle, but should remain adequate as the vehicle gets loaded up.

1- With the vehicle on track, measure the length of the tire contact patch of the rearmost axle with the rail head. The measurement should be between 10” and 14”, ideally around 12”

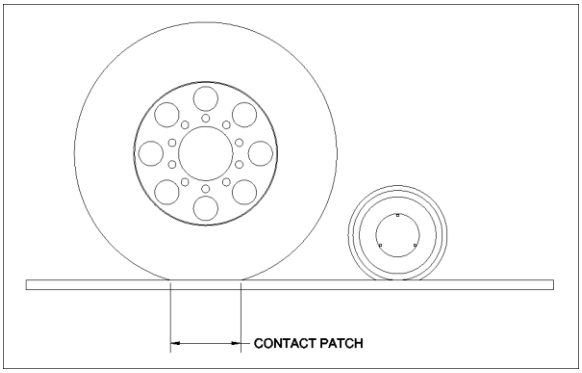


Figure 34: Tire contact patch

2- If less than 10”, the traction of the vehicle must be increased. This is achieved by performing the following steps:

   a. Deploy the hi-rail on track.
   b. Loosen the captive mounting bolts by loosening the nylon insert locknut from in between the frame rails.
   c. Slowly retract the hi-rail deployment cylinders. The hi-rail mounting plate and height shims should separate from the truck frame.
   d. Remove the previously installed height shims from between the truck frame and mounting plate.
   e. Adjust the thickness of the height shims (reduce thickness).
   f. Reinstall the height shims on the mounting plate.
   g. Slowly deploy the hi-rail deployment cylinders until fully stroked.
   h. Measure the length of the tire contact patch.
   i. Repeat as required until a contact patch of around 12” is achieved.
   j. Tighten all mounting bolts. Refer to the bolt torque chart in the Appendices.

3- If more than 14”, the traction of the vehicle must be decreased. This is achieved by performing the following steps:

   a. Deploy the hi-rail on track.
   b. Loosen the captive mounting bolts by loosening the nylon insert locknut from in between the frame rails.
   c. Slowly retract the hi-rail deployment cylinders. The hi-rail mounting plate and height shims should separate from the truck frame.
   d. Remove the previously installed height shims from between the truck frame and mounting plate.
   e. Adjust the thickness of the height shims (add thickness).
   f. Reinstall the height shims on the mounting plate.
   g. Slowly deploy the hi-rail deployment cylinders until fully stroked.
   h. Measure the length of the tire contact patch.
   i. Repeat as required until a contact patch of around 12” is achieved.
   j. Tighten all mounting bolts. Refer to the bolt torque chart in the Appendices.

4- Note that the rubber springs and links are designed to operate with the springs fully compressed and the upper links making contact with the vertical portion of the mounting plate as shown below.

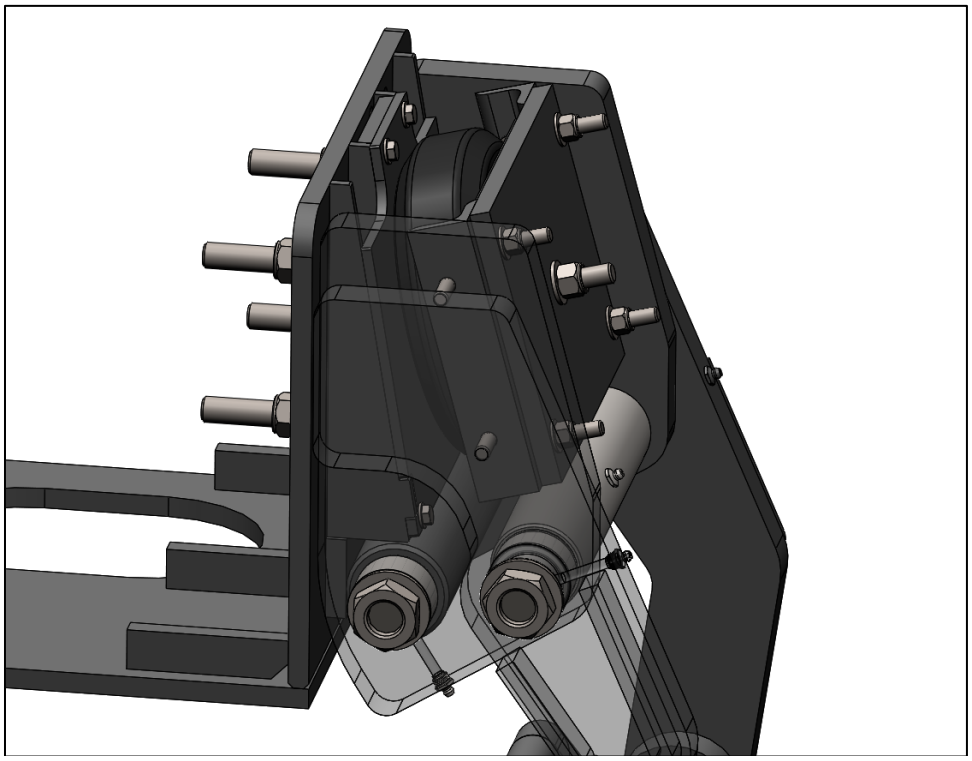


Figure 35: Rubber spring compressed

5- After adjusting the wheel weights, the height shims should be welded to the hi-rail mounting plate. It is recommended to only tack weld for easier future adjustment.

6- After wheel pressure adjustment is performed, the captive bolt assemblies need to be welded to the mounting plate to prevent the hi-rail unit to slide down in its mounting slots. See image below for tack weld locations.

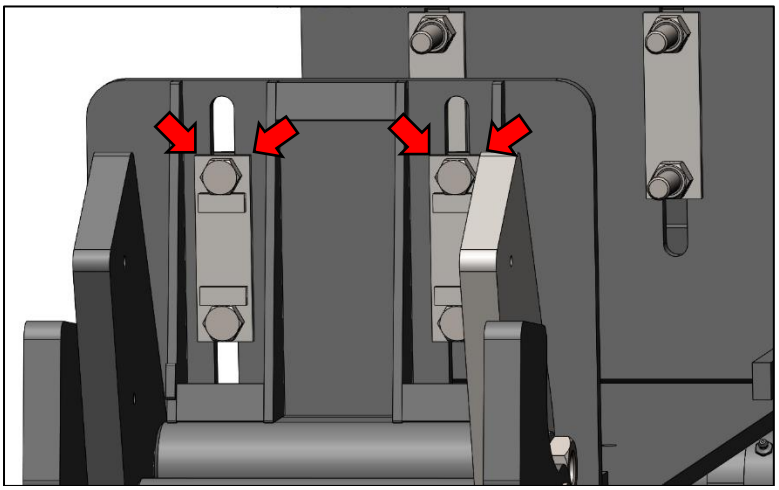


Figure 36: Welded captive bolt assemblies

TRACK TEST

When putting the vehicle on track, first lower the rear unit and then lower the front unit after re-positioning the vehicle as required (see OPERATION section below for details).

Verify the following items:

1- Ensure the units raise and lower easily, and that hydraulic hoses are all of adequate length and that hydraulic fittings have adequate clearance.

2- Ensure the hi-rail units deploy completely, forming a straight and linear connection from the top of the unit all the way to the wheel.

3- Adjust the front and rear rail sweep brackets as necessary so that the rubber sweeps just contact the rail with the hi-rail in the lowered position.

4- Verify that there is 2” to 3” of clearance between the front tires and the rail head.

5- Verify that there is an 8” to 10” contact patch on the rearmost tires with the rail, with the vehicle empty. (This dimension will increase with a loaded vehicle).

6- Ensure the vehicle tracks properly down the track, and that there is no excessive flanging of the hi-rail wheels.

7- Ensure there is no excessive vibration of the vehicle when on track.

FINALIZING ALIGNMENT / ADJUSTMENT

Once the weights are set, the alignment is set, and the unit was track tested the following places must be welded and finalized:

- Weld spindle housing cross bolts – Weld the thick washer installed on the ½" spindle housing cross bolt to the spindle housing, on both sides, to transform the gauge adjustment slot into a hole to lock in the gauge adjustment.

- Weld spindle housings – Tack weld (about 1") the spindle housing top plate to the axle plate, to lock in the toe adjustment.

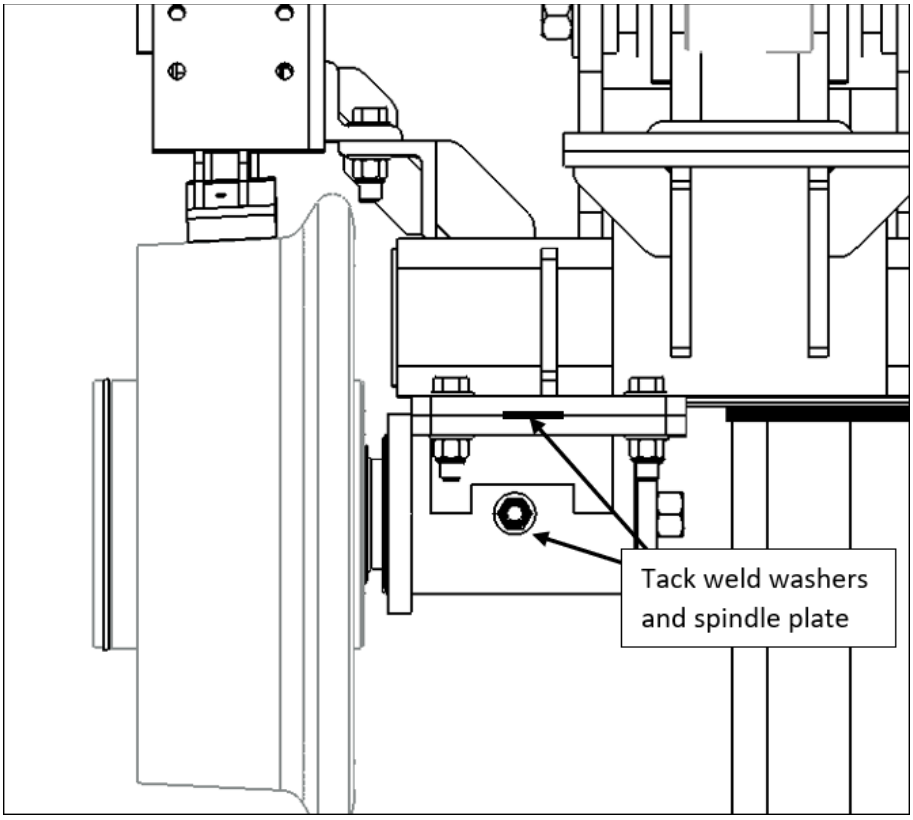


Figure 37: Tack welds on spindle housings

- Weld spring hangers – Tack weld the spring hanger washers to lock in the side to side adjustment

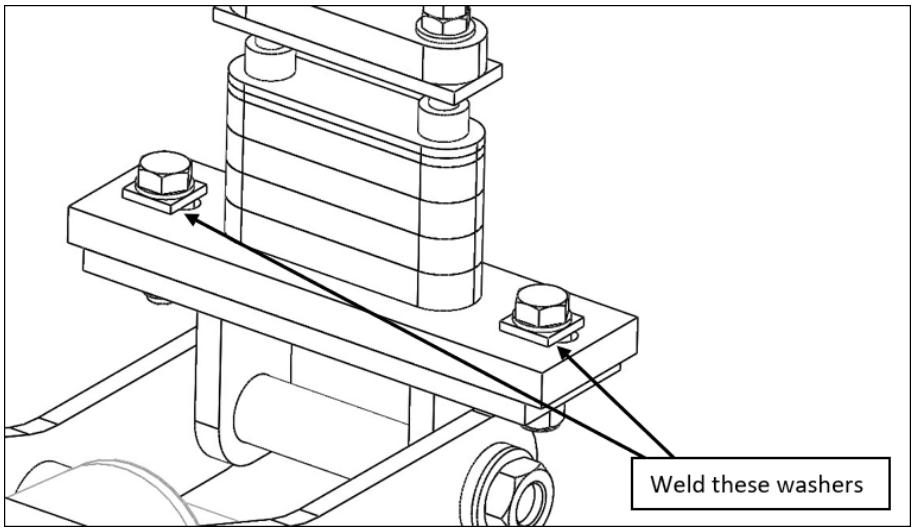


Figure 38: Tack welds on spring hangers

OPERATION

ON ROAD

A few factors should be taken into consideration when operating a hi-rail vehicle on road:

VEHICLE DIMENSIONS

Once modified with hi-rail, the vehicle's dimensions, ground clearances and approach / departure angles change considerably. Operators should be familiar with the truck's new dimensions.

VEHICLE PAYLOAD

The addition of hi-rail to a vehicle reduces its available payload. The operator needs to be conscious of the weight of the vehicle in operating conditions to determine the remaining payload.

ON RAIL

To place the vehicle on track, the vehicle must be positioned parallel to the rails over a level crossing or a similar access point in a rail yard where the track is approximately level with the pavement. The vehicle must be placed on the track rear unit first, so that the front unit can be steered into position afterwards as required.

REAR UNIT OPERATION

1- Position the vehicle so that the rear hi-rail wheels are directly over the track and aligned with the track rails.

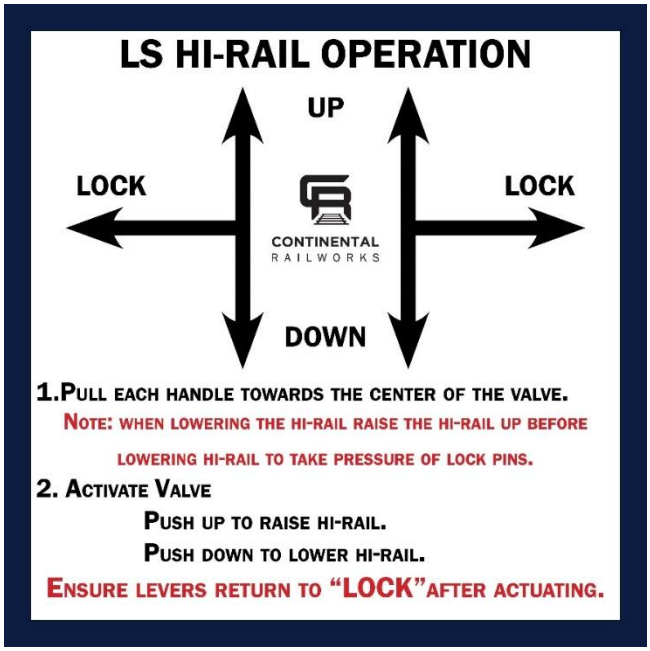
2- Turn on PTO / pump or turn on the dash mounted switch to activate power pack.

3- Using the rear rail gear control valve, Raise the rear rail gear to take any pressure of the safety pins.

Note – The rear hi-rail unit has an automatic locking and unlocking mechanism. It is not necessary to manually disengage any hooks, pins, or levers.

4- Lower the hi-rail unit to engage the hi-rail wheels with the track. Adjust the position of the vehicle if necessary to ensure proper alignment.

5- Stroke the cylinders completely when lowering the hi-rail until the control valve or pump relieves. Ensure the cylinders are completely stroked and the cylinder pins have moved into their locking slots.



FRONT UNIT

1- Adjust the position of the vehicle if necessary so that the front hi-rail wheels are directly over the track and aligned with the track rails. Turn the vehicle steering wheel so that the tires are pointed straight ahead.

2- Turn on PTO / pump or turn on the dash mounted switch to activate power pack.

3- Actuate the front hydraulic valve or push button remote to lower the front hi-rail unit.
Note – The front hi-rail unit has an automatic locking and unlocking mechanism. It is not necessary to manually disengage any hooks, pins or levers.

4- Lower the hi-rail unit to engage the hi-rail wheels with the track. Adjust the position of the vehicle if necessary to ensure proper alignment.

5- Stroke the cylinders completely when lowering the hi-rail until the control valve or pump relieves. Ensure the cylinders are completely stroked and the cylinder pins have moved into their locking slots.

STEERING WHEEL LOCK

The steering wheel lock must be engaged when the unit operates on rail. The wheels are to be locked straight ahead to ensure proper operation of the vehicle on track.

1- After the vehicle has been placed on track, position the steering wheel so that the wheels are pointed straight ahead.

2- Lock the steering wheel in position by removing the Velcro pad from its stowing location on the dash and applying it over the steering column and steering wheel corresponding Velcro pads.

Speed Limits

The maximum speed limit of a vehicle equipped with a model G-60 hi-rail unit is 40 kilometers per hour (25 miles per hour) on tangent (straight) sections of track, and 30 kilometers per hour (20 miles per hour) on curved sections of track. This is the maximum speed limit of the unit in ideal conditions, and this speed limit must be reduced during poor weather conditions, reduced visibility, slippery track surfaces, or when being operated on poorly maintained rail.

Despite this speed limit, local railway dictated speed limits must also be observed, and must be followed if lower than 40 kilometers per hour.

Remember to perform regular braking distance tests, initially and as track or weather conditions change.

Track Curvature

The maximum track curvature a truck equipped with G-60 hi-rail depends on numerous factors (truck wheelbase, hi-rail wheelbase, rear axle spread, rear axle length, tire sizes, tread type, etc). Continental Railworks can assist in determining the maximum track curvature for a given vehicle.

! PLEASE DRIVE SAFELY !

SERVICE

RECOMMENDED MAINTENANCE INTERVALS

ITEM	FREQUENCY	DESCRIPTION
Nuts and Bolts	Every week	Inspect for loose fasteners. Tighten.
Grease Fittings	Every month	Lubricate as required.
Wheels	Every month	Inspect for excessive wear in tread or flange, cracking or pitting. Replace as required.
Wheel Bearings	After 8 hours of operation	Remove hub caps. Visually inspect bearings. Adjust and lubricate bearings as required.
	Every 6 months	Remove wheels and bearings. Clean bearings and inspect for excessive wear, burning, pitting or discoloration. Replace as required. Repack and reinstall.
Wheel Insulators	Every month	Visually inspect for damage.
	Every 6 months	Inspect for excessive wear or cracking. Replace as required.
Wheel Spindles	Every 6 months	Inspect surfaces for excessive wear, burning, pitting or discoloration. Replace as required.
Inner Tubes	Every 2 years	Inspect surfaces for excessive wear. Replace as required.
Inner Tube Wear Rings	Every 2 years	Inspect for excessive wear. Ensure a good fit with inner tube. Replace as required.
Axle and Frame Assemblies	Every month	Visually inspect for damage, cracks or broken welds. Repair or replace as required.
	Every 2 years	Inspect all pins for excessive wear. Replace as required. Inspect all holes and slots for excessive wear. Repair or replace as required.
Rubber Springs	Every 6 months	Visually inspect for cracks or deformation. Replace as required.
Hydraulics	Every day	Inspect for leaks.
	Every month	Inspect for leaking or damaged hoses, fittings or cylinders. Repair or replace as required.
Pneumatic Components	Every week	Inspect for leaks.
	Every month	Inspect for leaking or damaged hoses, fittings or cylinders. Repair or replace as required.
Electrical Components	Every week	Inspect for proper connections or loose wires.
	Every month	Test for proper resistance and functionality of the system.

WHEEL WEAR

The hi-rail wheels need to be replaced when worn as follows:

5/16” wear on flange
3/16” wear on tread

Wheel wear gauges are available on request.

WHEEL BEARING ADJUSTMENT

Wheel installation procedure

1- Press bearing cups into wheel
2- Insert grease seal at the back of the wheel
3- Pack bearing cone with grease
4- Insert one cone over the spindle
5- Slide wheel onto the spindle
6- Insert the other bearing cone over the spindle
7- Insert wheel washer over the threaded end of the spindle
8- Thread the castle nut onto the spindle
9- Torque lightly
10- Shake the wheel and ensure there is no play
11- Turn the castle nut counterclockwise by half a turn
12- Turn the castle nut clockwise by a quarter turn
13- Adjust the castle nut to line up a notch with the hole in the spindle
14- Insert and lock the cotter pin
15- Add grease between the bearings through the grease fitting until grease flows through the bearings
16- Reinstall hub cap gasket and hub cap with bolts and lock washers

SPINDLE REMOVAL

If the spindles need to be removed or replaced, it is recommended to melt the black plastic insulator before prying out the spindle from the spindle housing. The plastic insulator swells up by absorbing moisture and locks the housing and spindle together. The insulator will need to be replaced when removing a spindle.

BRAKE SHOE ADJUSTMENT

The brake boxes feature an adjustable linkage that allows for slack adjustment. The yoke can be moved down on the threaded rod from the air chamber / hydraulic cylinder in order to maintain a space between the wheel and brake shoe of about 1/8”.

BRAKE SHOE REPLACEMENT

Brake shoes need to be replaced when the compound is worn to about 5/16” (when the rivet is showing). When installing a new brake shoe, ensure it is oriented the right way, with the vertical plate with a hole towards the inside as pictured below.

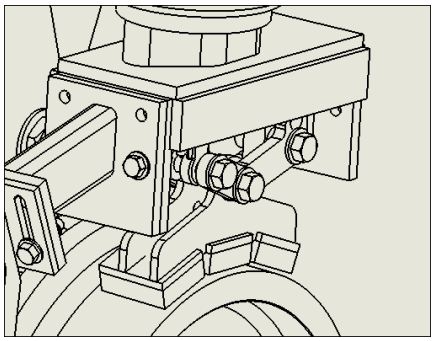


Figure 31: Brake shoe installation

GREASE POINTS

All pins (pivoting or traveling through a slot) feature a grease fitting.

Pins and slots should be greased every month to ensure a smooth operation and to minimize wear.

RECOMMENDED GREASE

Continental Railworks uses and recommends the use of Castrol Pyroplex Blue 2 (Product Code: 55178 (US) – 01050-18 (Canada)).

RECOMMENDED HYDRAULIC FLUID

For best performance in cold weather, Continental Railworks recommends the use of low viscosity – low temperature hydraulic fluid such as Petro Canada Hydrex XV or Shell Tellus S4 VX.

LOCKING PIN REPLACEMENT ON REAR UNIT

The LS models of rail gear are equipped with mechanical locking pins on the rear unit. The locking pins are operated with the rear hydraulic control valve. If the safety pins become bent are broken refer to the steps before to replace the damaged pin.

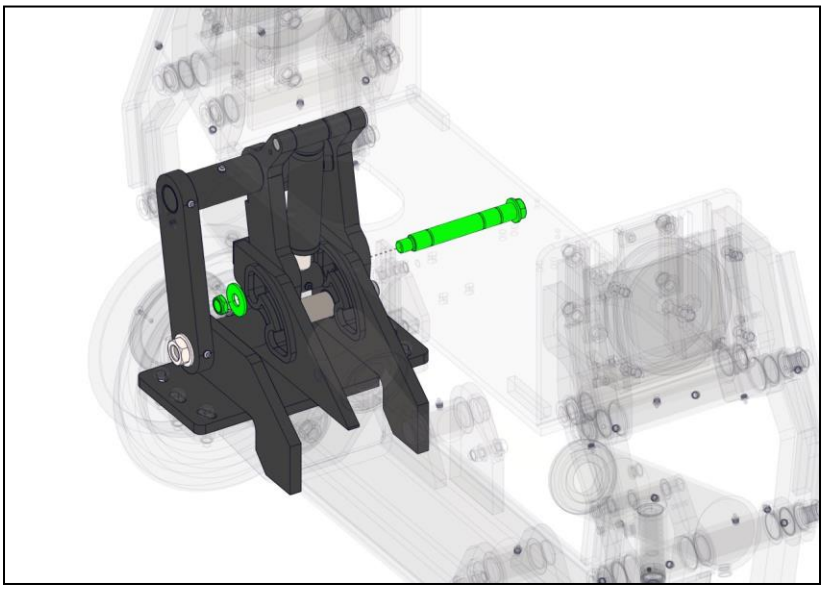
PROCEDURE

1- Place the vehicle on level ground or level track.

2- Deploy the rear hi-rail completely.

3- Remove the 3/4”-10 thin hex nyloc nut and washer from the existing pins.

4- Remove the damaged saftey pins from the hi-rail assembly.
Note: The pin will need to be cut in pieces if bent, using a reciprocating saw.



5- Insert the new Safety pin in the hi-rail assembly.
    a. Use a pry bar to align components if required.
    b. Drive the pin all the way with a hammer if required.

6- Install the supplied 3/4” washer and 3/4"-10 thin nyloc nut.
    a. Tighten all the way with impact or key.
    b. Back off the nut until the washer is allowed to rotate freely.

7- Verify the functionality of the hi-rail and locking system.

CONTACT INFORMATION

To order parts or for technical support, please contact Continental Railworks from Monday to Friday, 8:30 a.m. to 4:30 p.m. ET, by calling **(514) 956-8081** or faxing **(514) 956-0737**. Please have the hi-rail assembly's serial number available for easier tracking.

CANADA + US
Continental Railworks 7380 Vérité St-Laurent, QC, H4S 1C5 (514) 956-8081

LIMITED WARRANTY INFORMATION

The following warranty applies to all products manufactured by Continental Railworks.

Continental Railworks (hereinafter referred to as "Continental") warrants to the original purchaser that all equipment supplied shall be free from defects in material and workmanship for a period of 12 months from the date of purchase. If such a defect appears during the warranty period, Continental will repair or replace the defective part or product (at its option) without charge if applicable claim procedures are followed.

The product must have been properly installed, adjusted, maintained, and serviced in order to be eligible for warranty.

The warranty does not cover defects or damage to products that have been improperly installed, abused, misused, or damaged due to accident. Continental disclaims liability for indirect, incidental, and consequential damages, such as damage incurred during shipping and handling. This disclaimer applies during and after the warranty period.

Warranty claims may be made by contacting our Customer Service Department at the address indicated above, or by calling (514) 956-8081. All claims must be made in writing.

Continental or its authorized representative reserves the right to inspect products claimed to be defective for warranty purposes and dispose of the claim as it sees fit, including repair or replacement. Unauthorized repair or replacement prior to inspection may void the warranty. Use of non-OEM parts will immediately void the warranty.

All products or parts claimed to be defective must be returned to Continental for warranty consideration within 30 days of the claim. All items shipped from Continental for warranty reasons will be sent freight prepaid, and all items returned to Continental must be sent freight prepaid.

Labor performed for warranty reasons must be done by an authorized Continental representative or by a person or company pre-approved by Continental in writing. Labor performed without prior written approval will not be warranted.

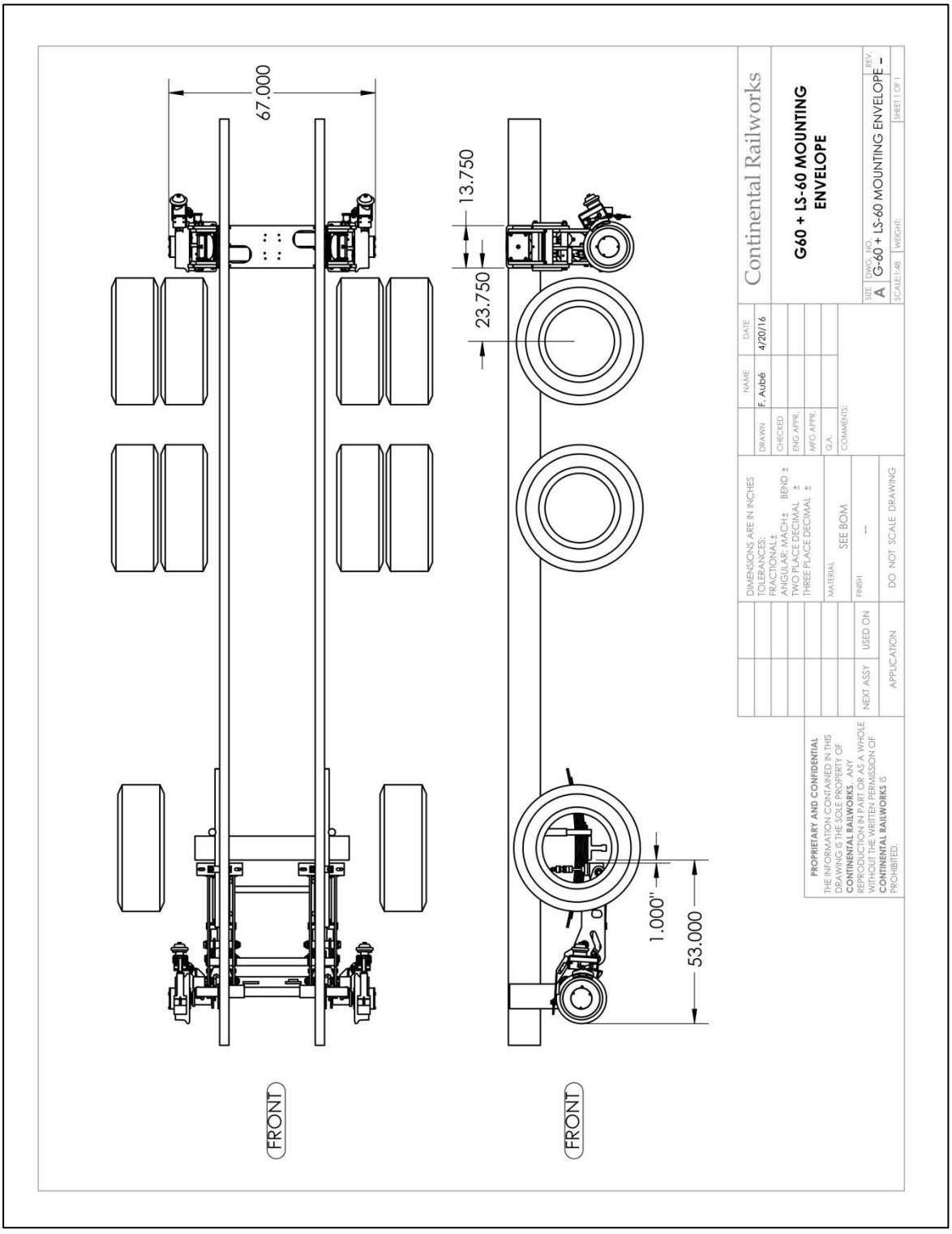
APPENDIX 1

BOLT TORQUE TABLE

Bolt Torque Requirements Grade 8 Fasteners	
Bolt Diameter *(in)*	**Torque (Lub.)** *(ft-lbs)*
3/8"	35
1/2"	80
5/8"	170
3/4"	280
1"	680

APPENDIX 2

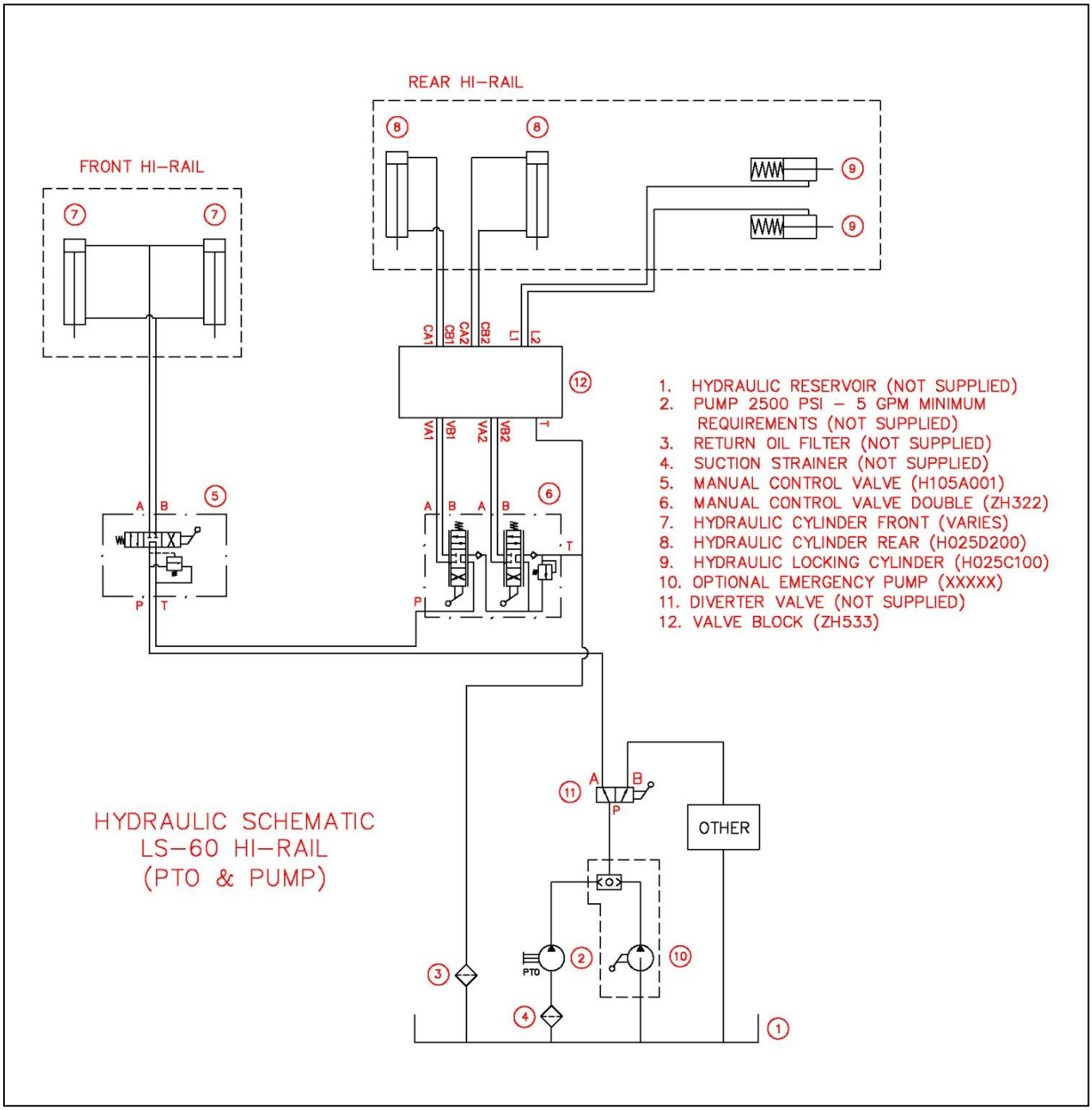
MOUNTING ENVELOPE



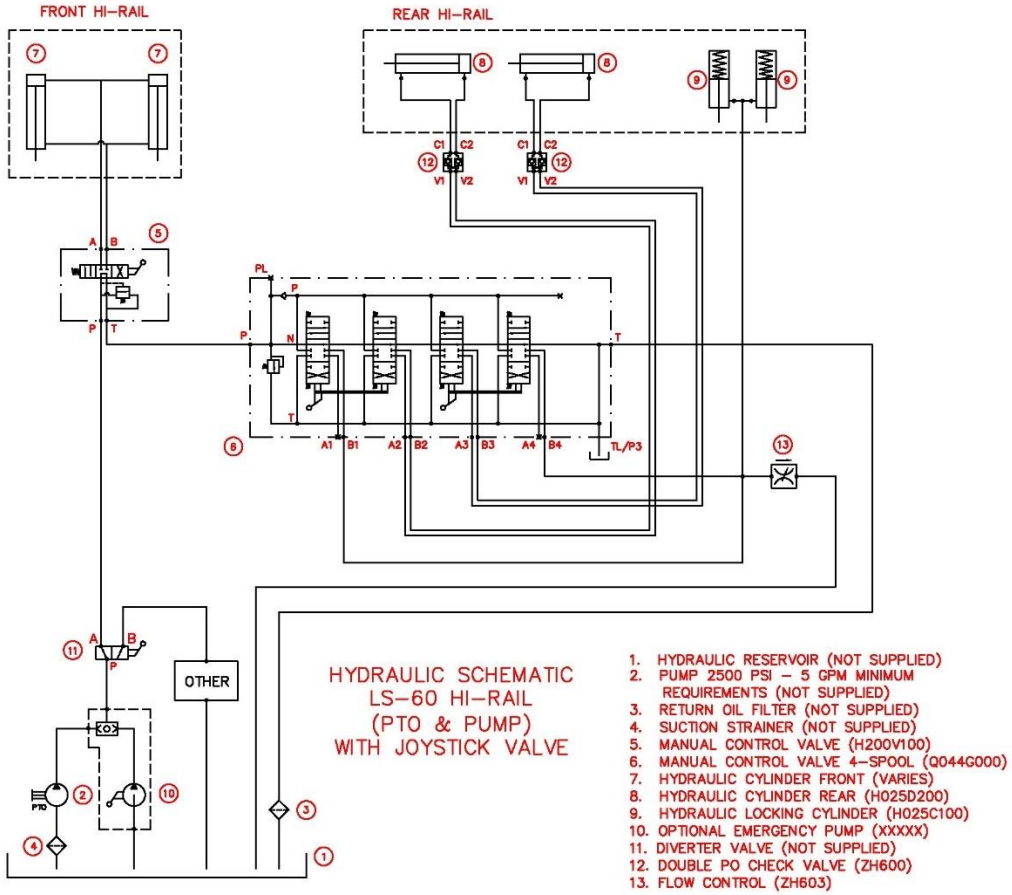
APPENDIX 3

HYDRAULIC SCHEMATICS – BLOCK VALVE SETUP

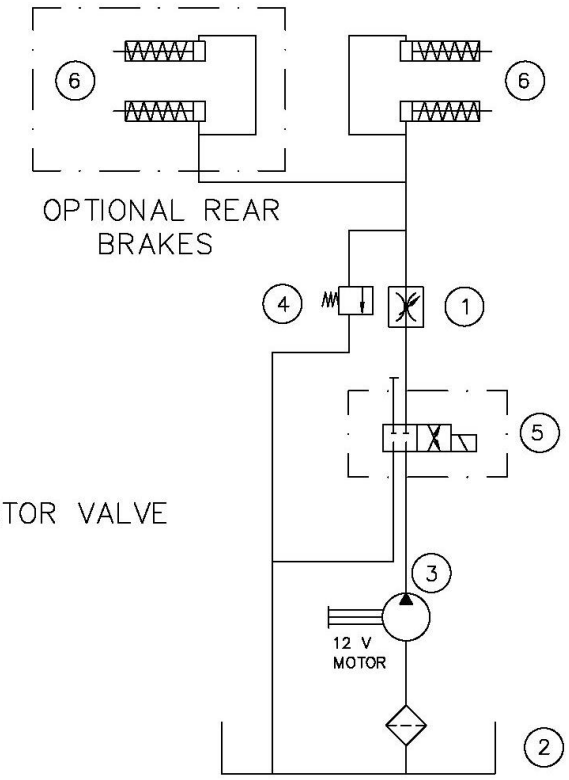
PTO AND PUMP SETUP



HYDRAULIC SCHEMATICS – JOYSTICK VALVE SETUP



OPTIONAL HYDRAULIC BRAKES



1. FLOW CONTROL VALVE
2. HYDRAULIC RESERVOIR
3. PUMP 3000 PSI 2 GPM
4. RELIEF VALVE 2500 PSI
5. PUMP MOUNTED ELECTRIC DIVERTOR VALVE
6. HYDRAULIC BRAKE CYLINDERS

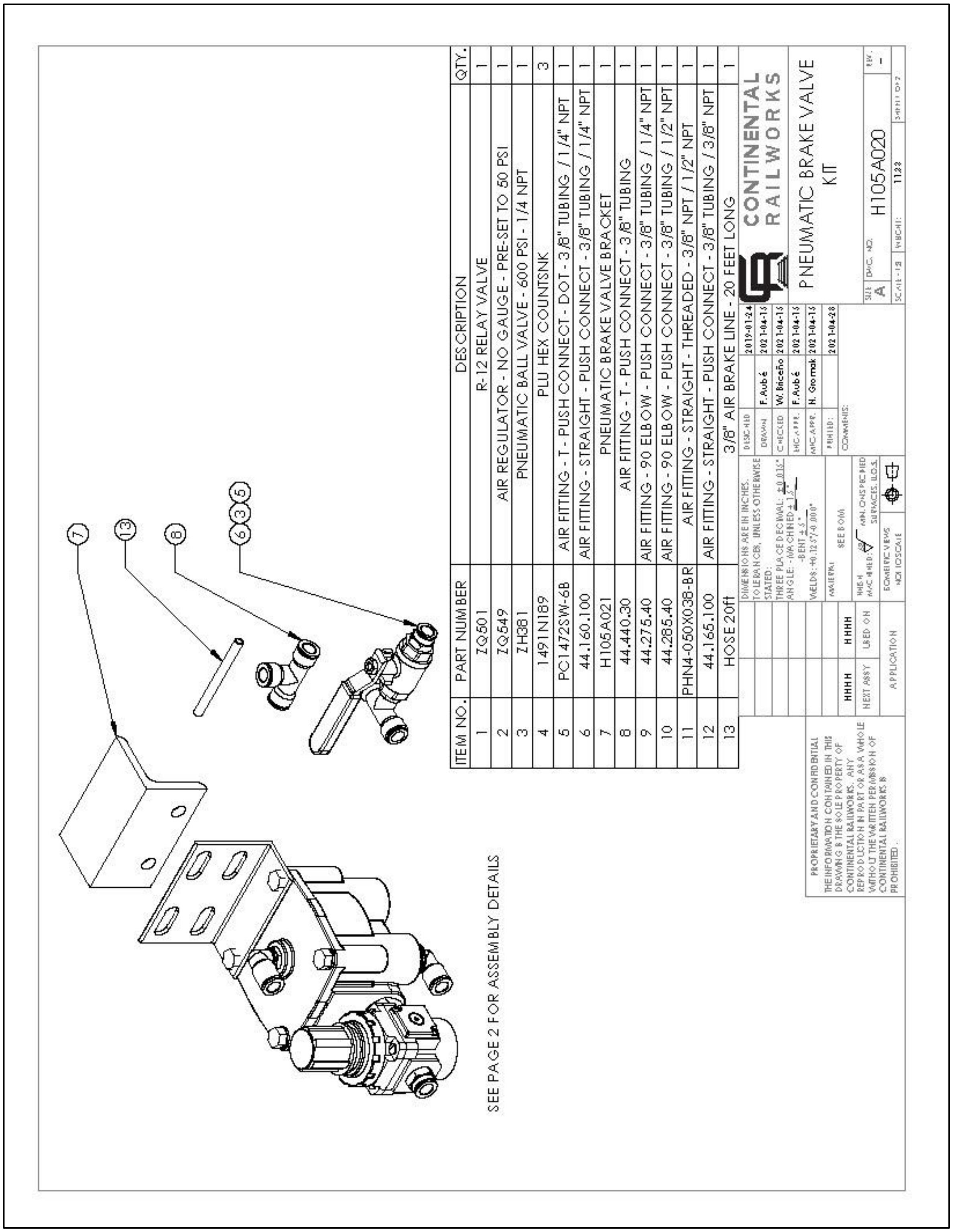
HYDRAULIC SCHEMATIC

G–60 HI–RAIL

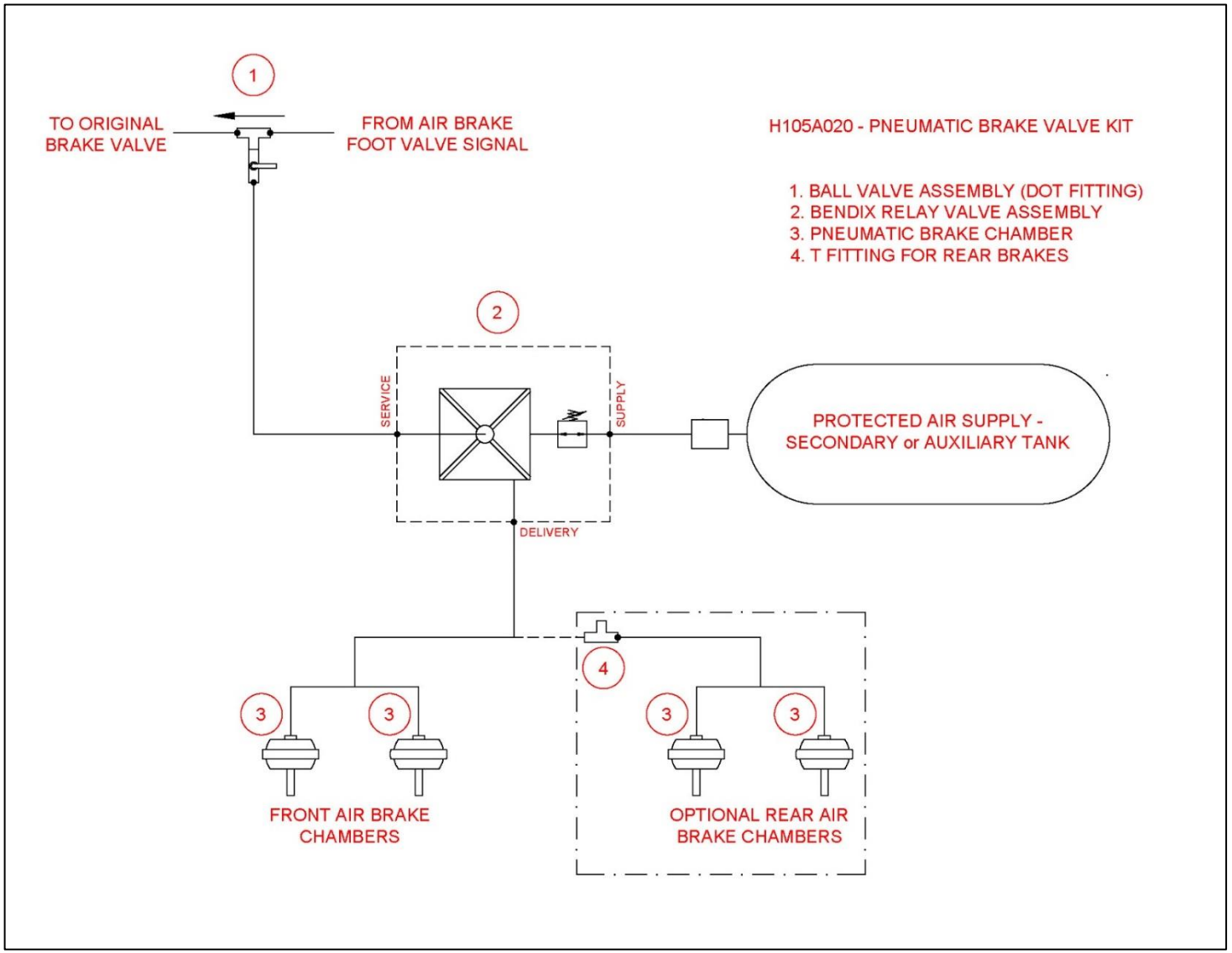
FRONT HYDRAULIC BRAKES

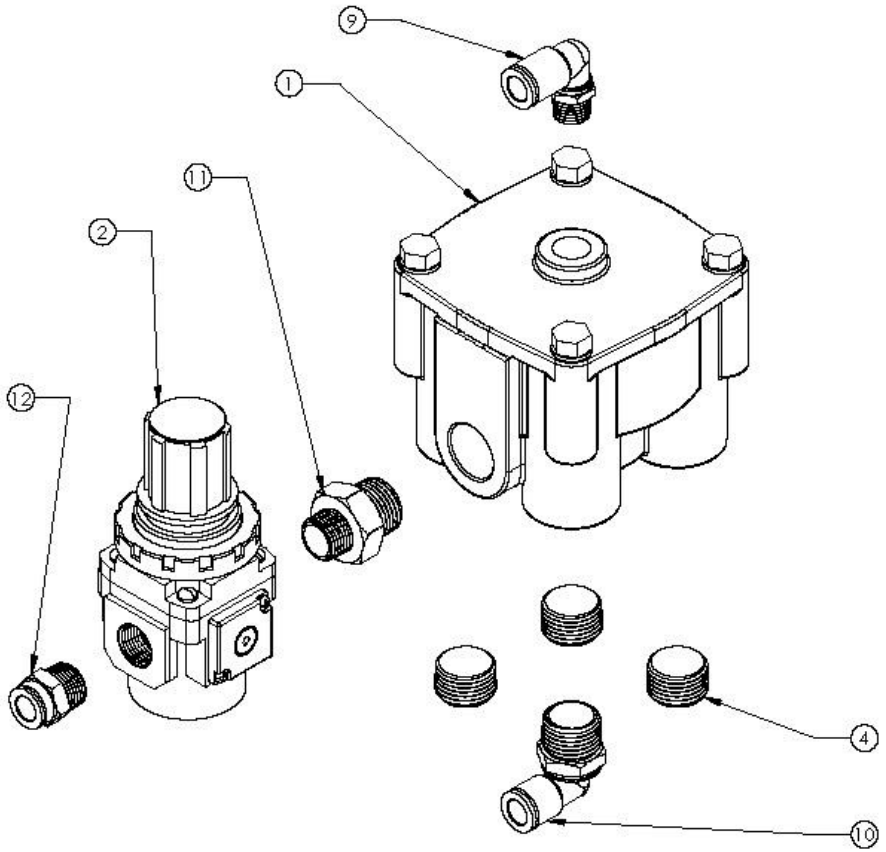
APPENDIX 4

PNEUMATIC BRAKE DIAGRAM



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	ZQ501	R-12 RELAY VALVE	1
2	ZQ549	AIR REGULATOR - NO GAUGE - PRE-SET TO 50 PSI	1
3	ZH381	PNEUMATIC BALL VALVE - 600 PSI - 1/4 NPT	1
4	1491N189	PLU HEX COUNTSNK	3
5	PC1472SW-6B	AIR FITTING - T - PUSH CONNECT - DOT - 3/8" TUBING / 1/4" NPT	1
6	44.160.100	AIR FITTING - STRAIGHT - PUSH CONNECT - 3/8" TUBING / 1/4" NPT	1
7	H105A021	PNEUMATIC BRAKE VALVE BRACKET	1
8	44.440.30	AIR FITTING - T - PUSH CONNECT - 3/8" TUBING	1
9	44.275.40	AIR FITTING - 90 ELBOW - PUSH CONNECT - 3/8" TUBING / 1/4" NPT	1
10	44.285.40	AIR FITTING - 90 ELBOW - PUSH CONNECT - 3/8" TUBING / 1/2" NPT	1
11	PHN4-050X038-BR	AIR FITTING - STRAIGHT - THREADED - 3/8" NPT / 1/2" NPT	1
12	44.165.100	AIR FITTING - STRAIGHT - PUSH CONNECT - 3/8" TUBING / 3/8" NPT	1
13	HOSE 20ft	3/8" AIR BRAKE LINE - 20 FEET LONG	1


1
TO ORIGINAL
BRAKE VALVE
FROM AIR BRAKE
FOOT VALVE SIGNAL
H105A020 - PNEUMATIC BRAKE VALVE KIT
1. BALL VALVE ASSEMBLY (DOT FITTING)
2. BENDIX RELAY VALVE ASSEMBLY
3. PNEUMATIC BRAKE CHAMBER
4. T FITTING FOR REAR BRAKES
2
SERVICE
SUPPLY
PROTECTED AIR SUPPLY -
SECONDARY or AUXILIARY TANK
DELIVERY
4
3
3
3
3
FRONT AIR BRAKE
CHAMBERS
OPTIONAL REAR AIR
BRAKE CHAMBERS



		DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±0.015" ANGLE: -MACHINED ± 1.5° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED		2019-01-24
			DRAWN	F. Aubé	2021-04-15
			CHECKED	W. Briceño	2021-04-15
			ENG APPR.	F. Aubé	2021-04-15
			MFG APPR.	N. Gromak	2021-04-15
		MATERIAL: SEE BOM	PRINTED:		2021-04-28
HHHH	HHHH		COMMENTS:		
NEXT ASSY	USED ON	FINISH: MACHINED: ✓ MIN. ONSPECIFIED SURFACES. U.O.S.			
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE			

CONTINENTAL RAILWORKS

PNEUMATIC BRAKE VALVE KIT

SIZE	DWG. NO.	REV.
A	H105A020	-

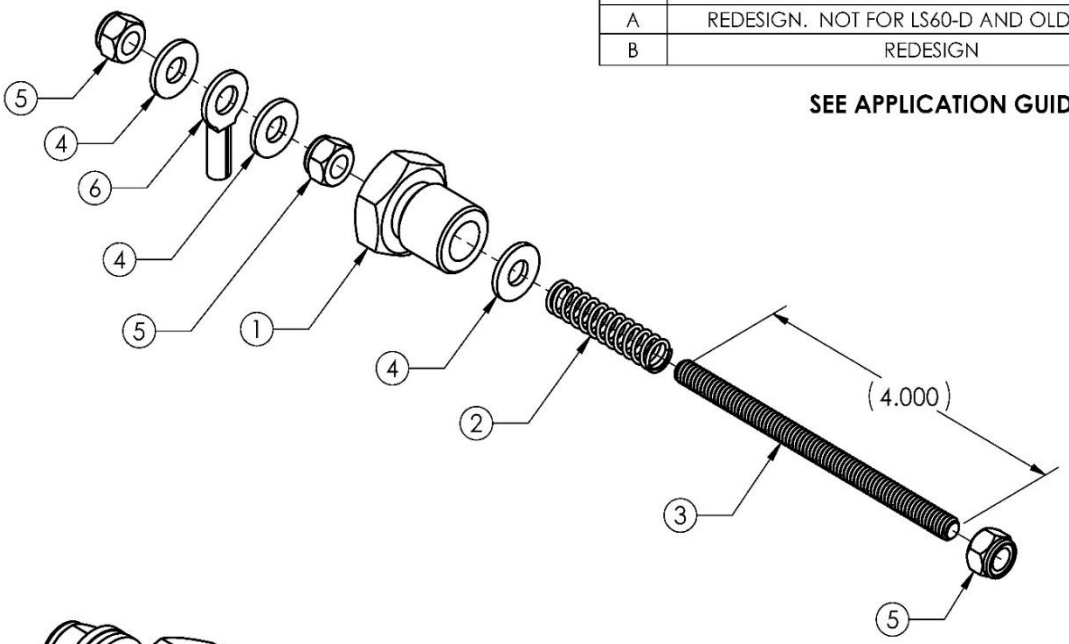
SCALE: 1:3	WEIGHT: 11.23	SHEET 2 OF 2

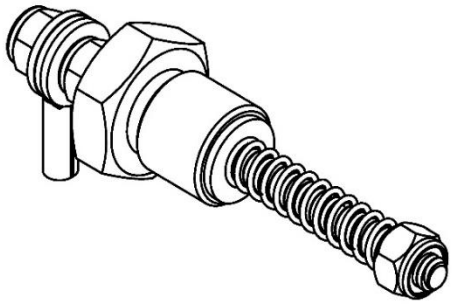
APPENDIX 5

SHUNT KIT

REV.	DESCRIPTION	DATE	BY
A	REDESIGN. NOT FOR LS60-D AND OLDER UNITS!	3/11/2020	N. Gromak
B	REDESIGN	4/16/2020	N. Gromak

SEE APPLICATION GUIDE ON SECOND PAGE





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	E077A004	HEX. NYLON PLASTIC BUSHING	1
2	ZQ564	MCMASTER CARR SPRING 9434K8	1
3	ZQ565	MCMASTER CARR 1/4" UNC THREADED ROD 95475A558	1
4		1/4" REGULAR FLAT WASHER	3
5		1/4" UNC LIGHT NYLON INSERT LOCKNUT	3
6		HD Terminal, 16-14 AWG, 5/16" Stud, Noninsulated	1

NEXT ASSY	USED ON
	SHUNT
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL: SEE BOM

FINISH: 125 MACHINED. MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Willson Briceño	6/13/2016
DRAWN	W. Briceño	6/13/2016
CHECKED	F. Aubé	6/13/2016
ENG APPR.	F. Aubé	6/13/2016
MFG APPR.	N. Gromak	6/13/2016
PRINTED:		4/16/2020

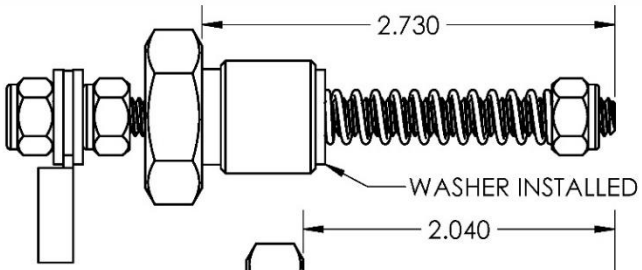
COMMENTS:

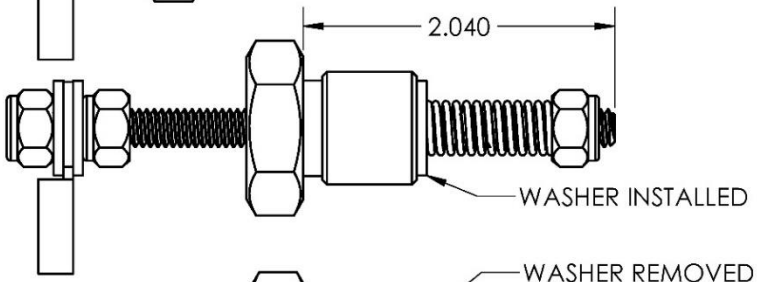
CONTINENTAL RAILWORKS

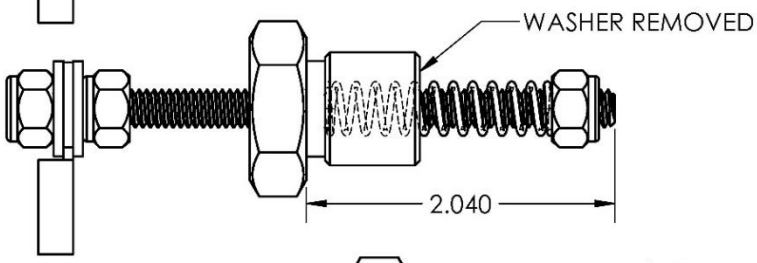
SHUNT KIT

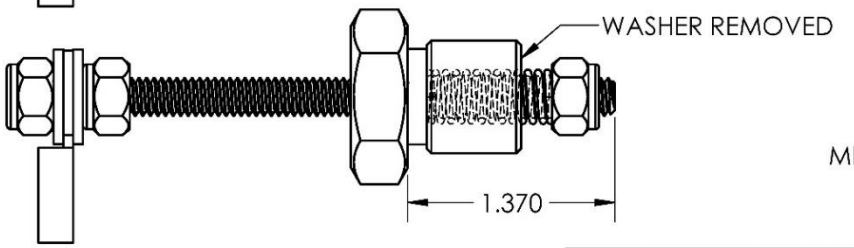
SIZE	DWG. NO.	REV.
A	E077A300	B

SCALE - 1:2 | WEIGHT: 0.11 | SHEET 1 OF 2





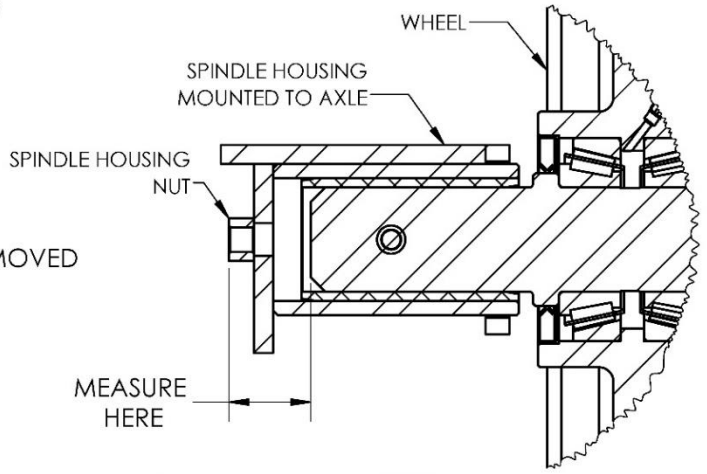


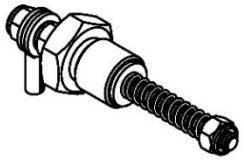


USING A SUITABLE INSTRUMENT, MEASURE THE DISTANCE FROM THE SPINDLE HOUSING NUT TO THE SPINDLE BACK. SEE BELOW.

IF THE MEASUREMENT IS ABOVE 2.040", LEAVE THE 1/4" WASHER INSTALLED.

IF THE MEASUREMENT IS BELOW 2.040", REMOVE THE WASHER AND ALLOW THE SPRING TO FALL INTO THE RECESS IN THE PLASTIC AND RE-ASSEMBLE.





NEXT ASSY	USED ON
	SHUNT
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	William Briceño	6/13/2016
DRAWN	W. Briceño	6/13/2016
CHECKED	F. Aubé	6/13/2016
ENG APPR.	F. Aubé	6/13/2016
MFG APPR.	N. Gromak	6/13/2016
PRINTED:		4/16/2020
COMMENTS:		

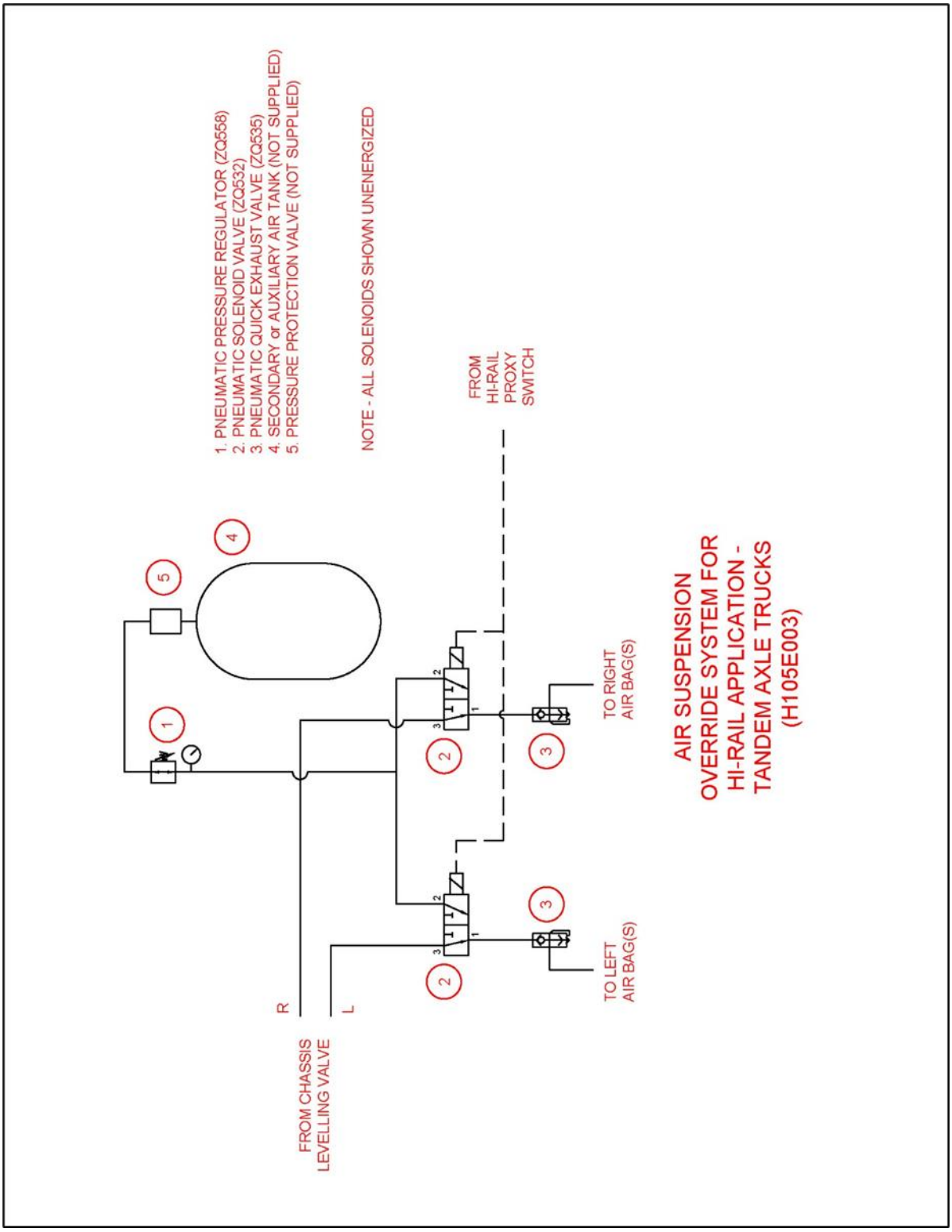
CONTINENTAL RAILWORKS

SHUNT KIT

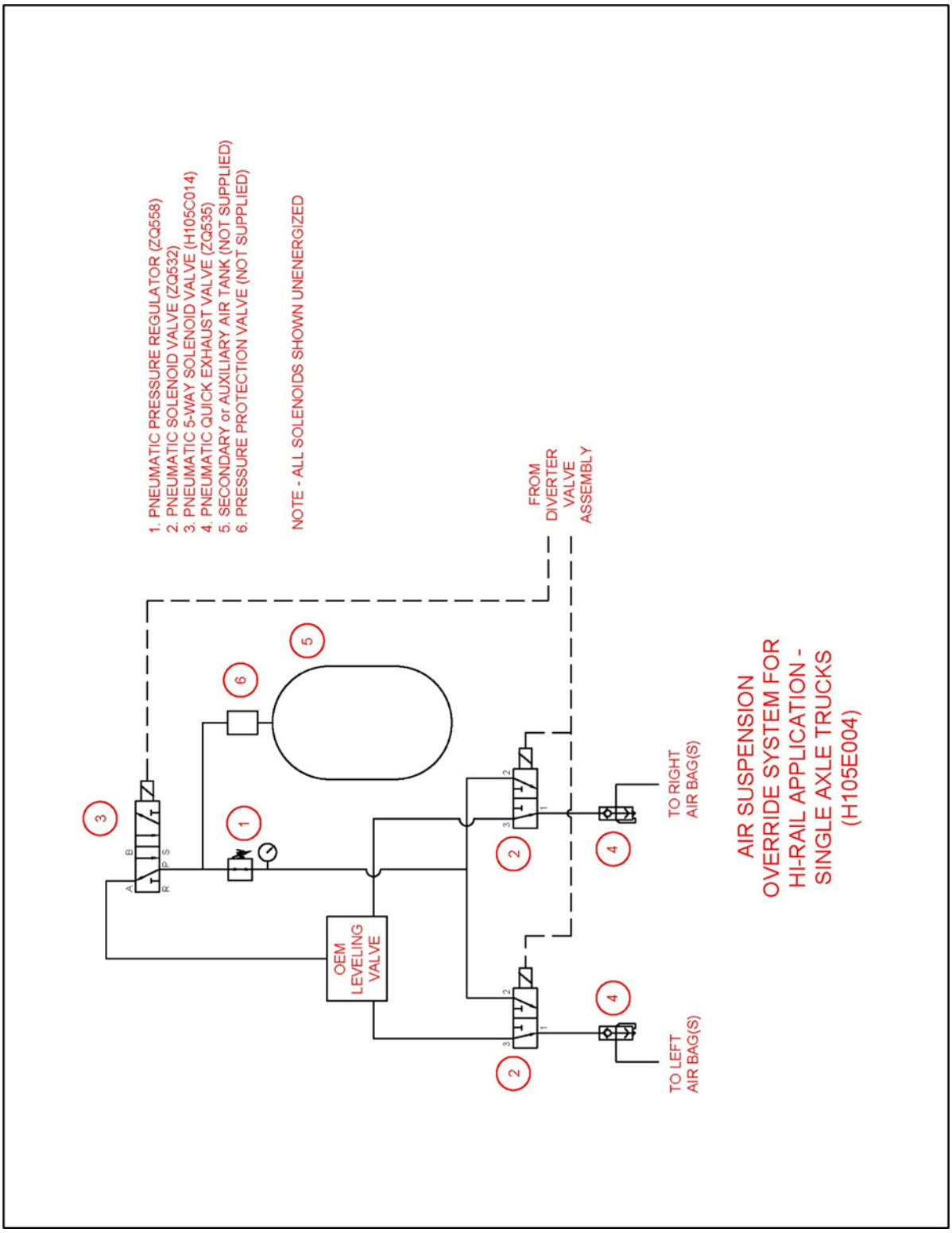
SIZE	DWG. NO.	REV.
A	E077A300	B
SCALE - 1:1	WEIGHT: 0.11	SHEET 2 OF 2

APPENDIX 6

PNEUMATIC SCHEMATICS – H105E003 TANDEM AXLE TRUCKS

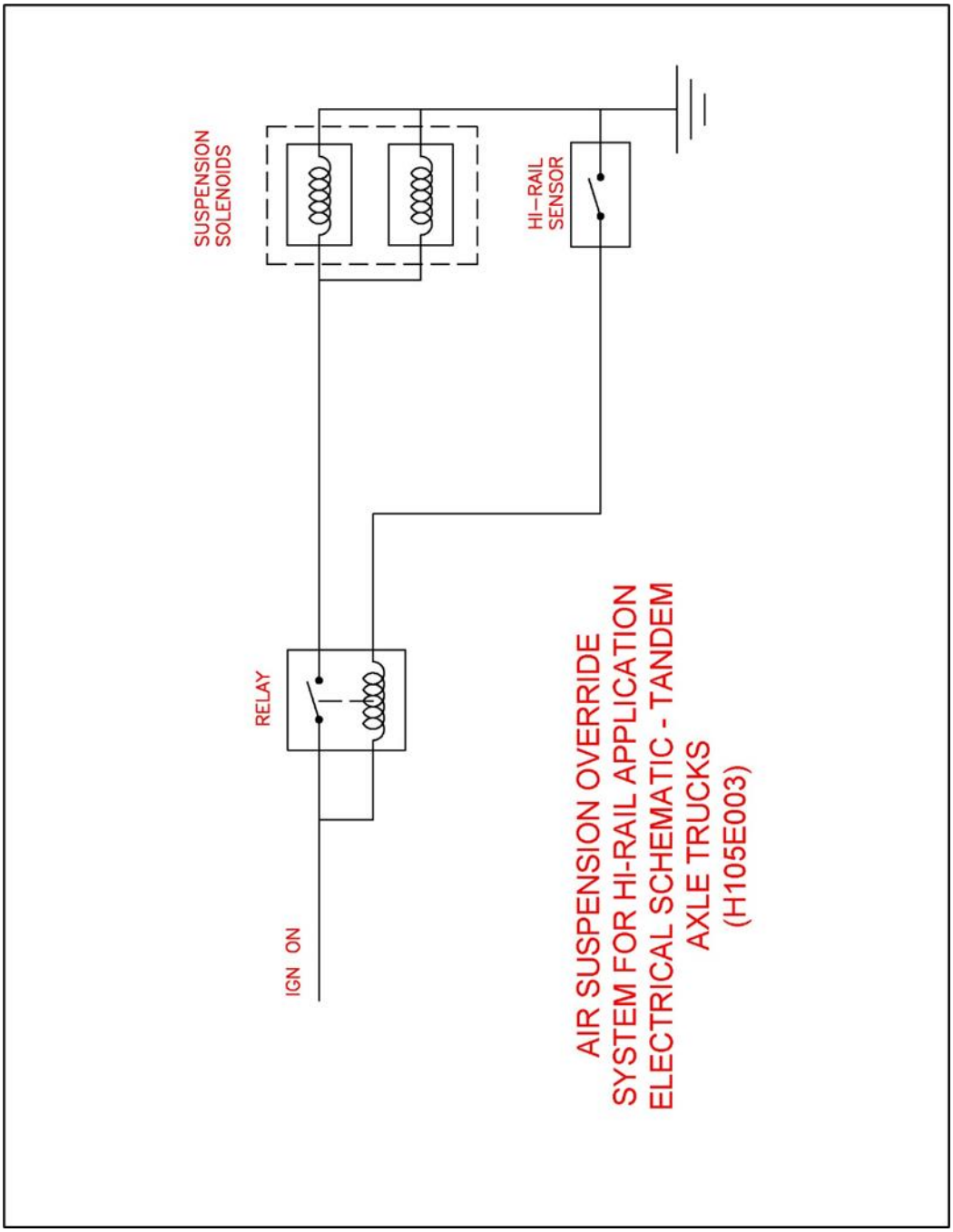


PNEUMATIC SCHEMATICS – H105E004 SINGLE AXLE TRUCKS

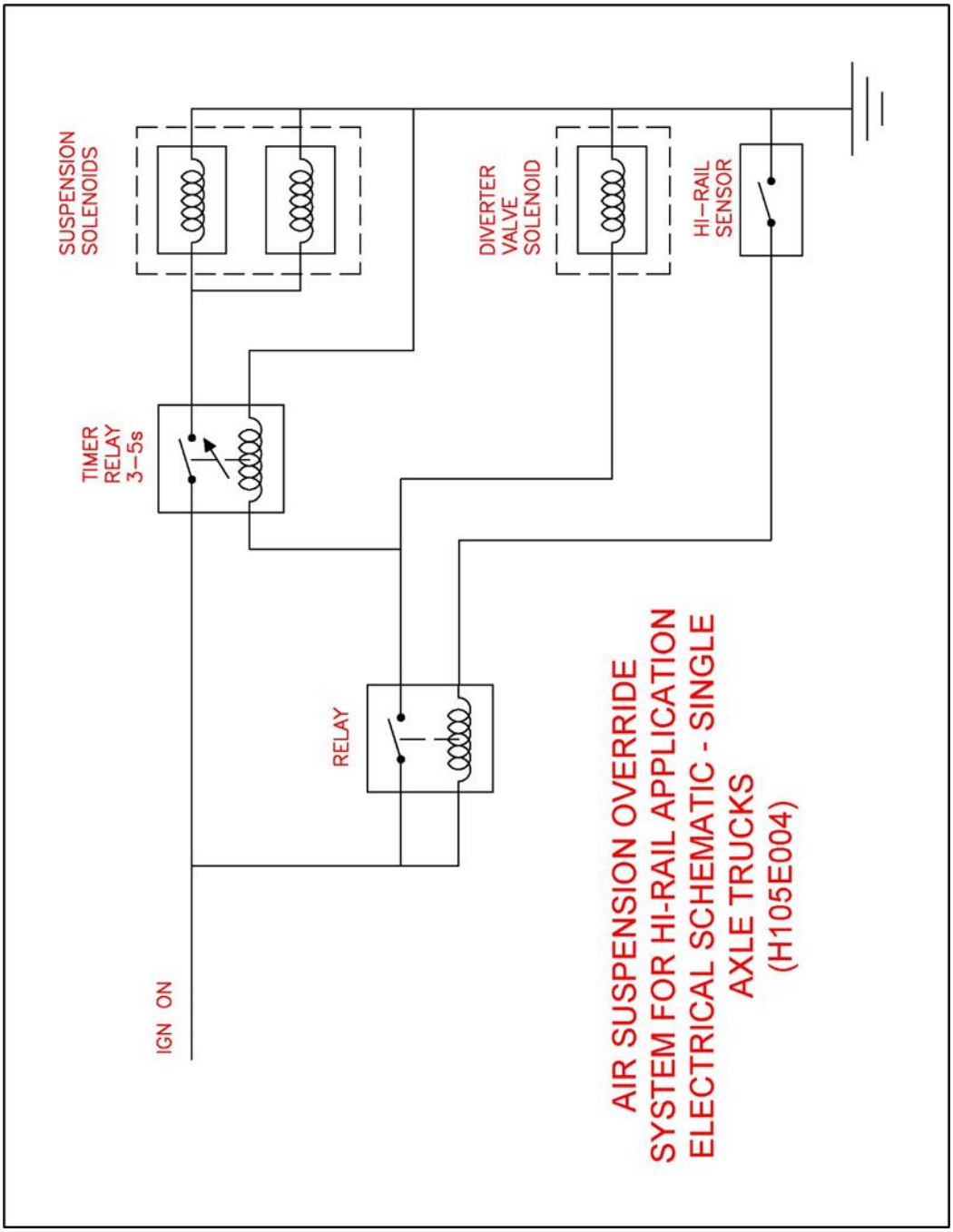


APPENDIX 7

ELECTRICAL SCHEMATICS – H105E003 TANDEM AXLE TRUCKS



ELECTRICAL SCHEMATICS – H105E004 SINGLE AXLE TRUCKS



APPENDIX 8

ALIGNMENT DIAGRAM

CONTINENTAL RAILWORKS

7380 Rue Verite, St- Laurent, QC H4S 1C5 Tel: 514-95-8081

Annual Rail Gear Inspection Form

Customer: _____ License: _____
Vehicle Number: _____ Year: _____ Mileage: _____
VIN: _____ Date: _____

Hi-Rail Model Front: _____ Year: _____ Serial: _____
Hi-Rail Model Rear: _____ Year: _____ Serial: _____

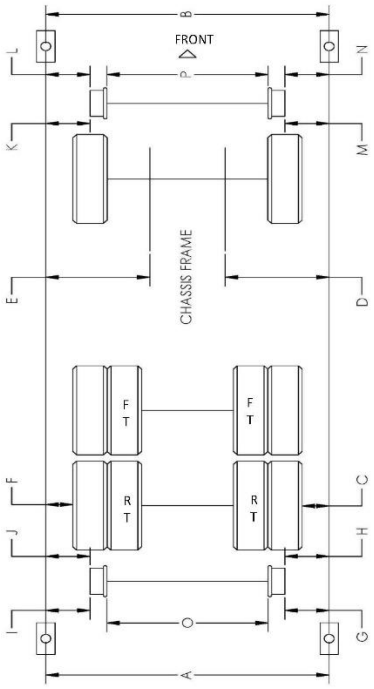
Rail Gear Alignment

P-Guage Front Axle _____ (53.5" +/-1/8")

B (+/- 1/32") _____

L _____ (+/- 1/16")
K _____

N _____ (+/- 1/16")
M _____



E _____ E&D (+/- 1/32")

D _____ E&D (+/- 1/32")

Contact Patch
FT _____
RT _____

Contact Patch
FT _____
RT _____

F _____ C&F (+/- 1/32")

C _____ C&F (+/- 1/32")

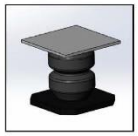
J _____ (+/- 1/16")
I _____

H _____ (+/- 1/16")
G _____

O-Guage Rear Axle _____ (53.5" +/-1/8")

A (+/- 1/32") _____

Height of Rear spring in the stowed position



Drivers Side : _____
Passenger Side : _____

Note: If compressed more than 6-3/4" stoppers will to be adjusted.
See Manual for Instructions

APPENDIX 9

ALIGNMENT AND PRESSURE DATA FORM

CONTINENTAL RAILWORKS
7380 Rue Verite, St- Laurent, QC H4S 1C5 Tel: 514-95-8081

Annual Rail Gear Inspection Form

CHASSIS

_____ 1 CHECK VEHICLE BRAKE FLEX LINES FOR SCUFFING AND ENSURE SUFFICIENT CLEARANCE FROM MOVING PARTS.
_____ 2 CHECK ALL RIMS, STUDS, NUTS FOR ANY OF THESE SHOWING SIGN OF DAMAGE, DEFORMATION, LOOSENESS OR CRACKS.
_____ 3 CHECK ALL TIRES INCL. SPARE FOR WEAR & DAMAGE, ADJ. AIR PRES. AS PER MFG RATING FOR OEM WHEELS/TIRES AND TO SPEC.
_____ 4 CHECK VEHICLE FRAME RAILS, ALL FRAME BRACKETS, CROSS MEMBERS, AXLES, CROSS BRACES, TORQUE AND WHEEL ARMS FOR CRACKS, DAMAGES AND STRAIGHTENESS.
_____ 5 CHECK TO MAKE SURE BACKUP ALARM IS WORKING PROPERLY.
_____ 6 CHECK TO ENSURE STROBE LIGHT IS INSTALLED AND WORKING PROPERLY.

HI-RAIL BRAKES & RAIL SWEEPS

_____ 1 INSPECT BRAKE PADS AND REPLACE IF WORN TO 5/16" OR LESS.
_____ 2 INSPECT BRAKE LINAKAGES FOR WEAR AND ADJUST DO BRAKE PAD HAS 1/8" CLEARANCE TO RAIL WHEEL .
_____ 3 CHECK TO MAKE SURE ALL BRAKES ARE WORKING CORRECTLY WHEN BRAKE PEDAL IS PRESSED.
_____ 4 CHECK RAIL SWEEPS FOR WEAR AND ADJUSTMENT SO THEY CONTACT THE RAIL .

HI-RAIL WHEELS & BEARINGS

_____ 1 CHECK ALL RAIL WHEELS FOR FLANGE AND WHEEL FACE CONDITION FOR WEAR OR SEPARATION.
_____ 2 REMOVE AND INSPECT BEARINGS FOR ROUGHNESS OR LOOSENESS AND REPACK USING Castrol Pyroplex Blue 2 GREASE.
_____ 3 INSTALL NEW GREASE SEAL.
_____ 4 INSTALL NEW COTTER PIN FOR WHEEL BEARING NUT.
_____ 5 CHECK FOR WEAR IN OUTER BEARINGS, TUBE AND SHAFT.
_____ 6 CHECK ELECTRIC ISOLATION OF EACH GUIDE WHEEL TO FRAME .
_____ 7 CHECK SPINDLES FOR WEAR AND CONDITION.

HI-RAIL ASSEMBLIES

_____ 1 CHECK MOUNTING BOLTS TO ENSURE THEY ARE TIGHT AND NOT BROKEN.
_____ 2 GREASE FRONT AND REAR ASSEMBLIES .
_____ 3 CHECK MOUNTING PLATES TO MAKE SURE THEY ARE BENT AND NO CRACKED WELDS.
_____ 4 CHECK LOCKING PINS FOR WEAR AND REPLACE AS NEEDED.
_____ 5 CHECK FOR CRACKED BENT OR MISSING DERAIL SKIDS.
_____ 6 INSPECT TRUCK AXLE LOCK UP SYSTEM FOR PROPER OPERATION, IF EQUIPPED.

HYDRAULICS

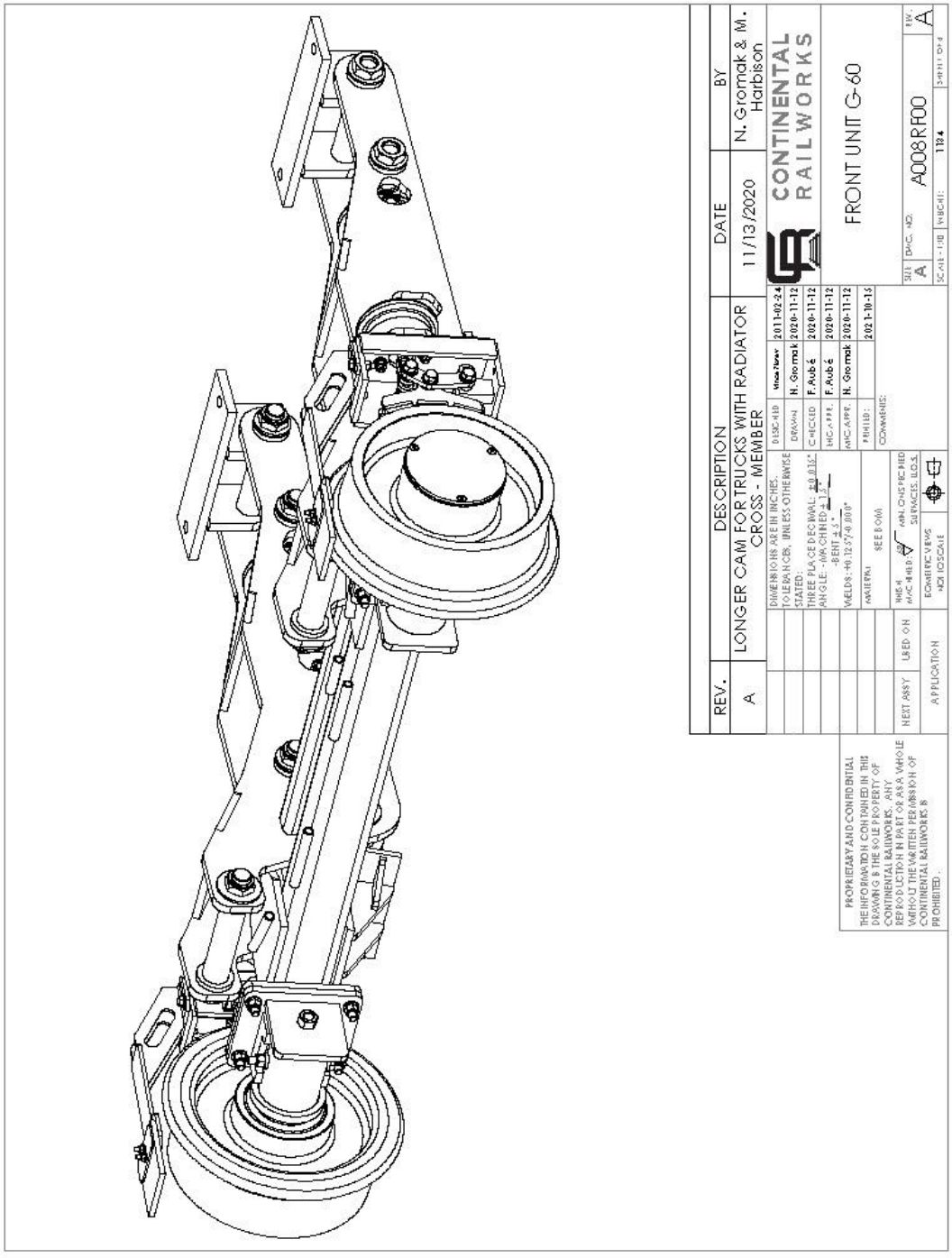
_____ 1 CHECK HYDRAULIC CYLINDERS FOR LEAKS & PROPER OPERATION.
_____ 2 CHECK HYDRAULIC FUILD LEVEL.
_____ 3 CHECK HYDRAULIC OPERATING PRESSURE AND ADJUST ACCOURDINGLY. (SHOULD BE 2500-3000 PSI)
_____ 4 CHECK EMERGANCY HAND PUMP IF EQUIPPED FOR PROPER OPERATION.

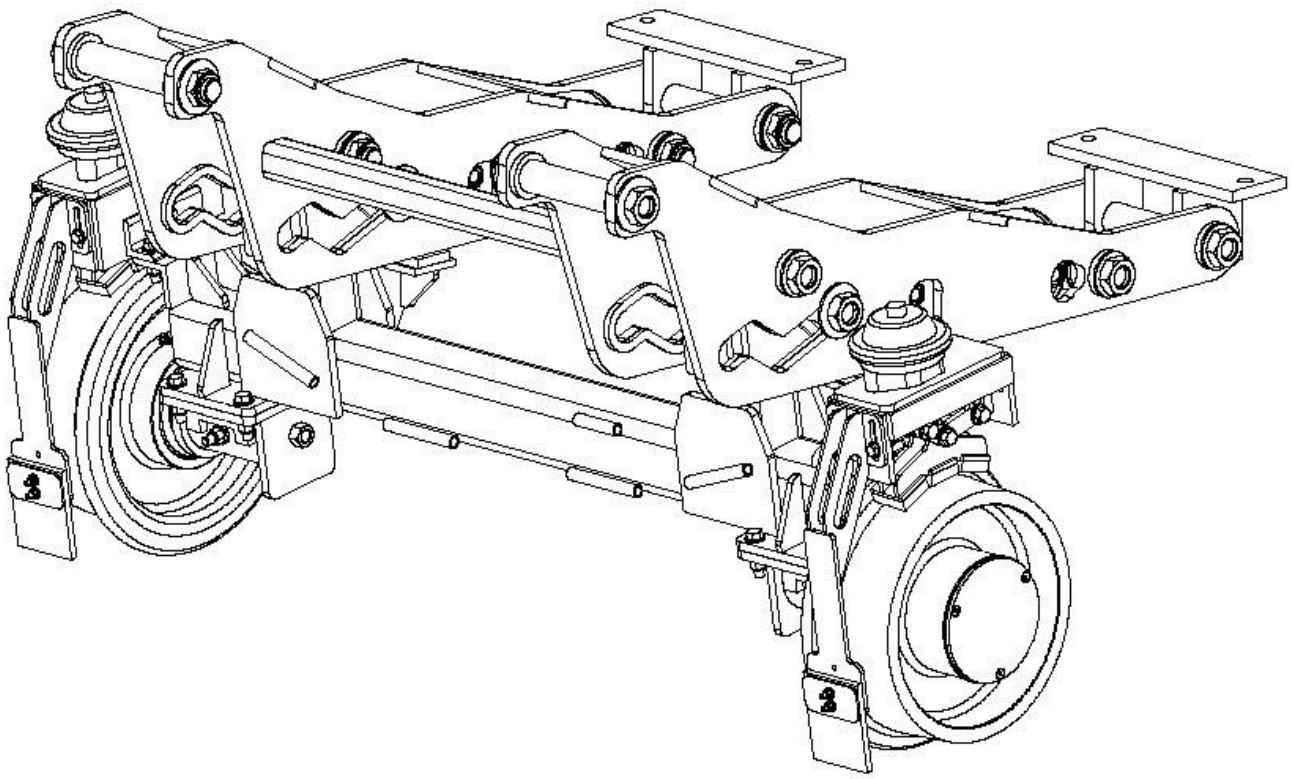
COMMENTS & NOTES

APPENDIX 10

FRONT G-60 DRAWINGS

NOTE – Some components may differ slightly from drawings shown.





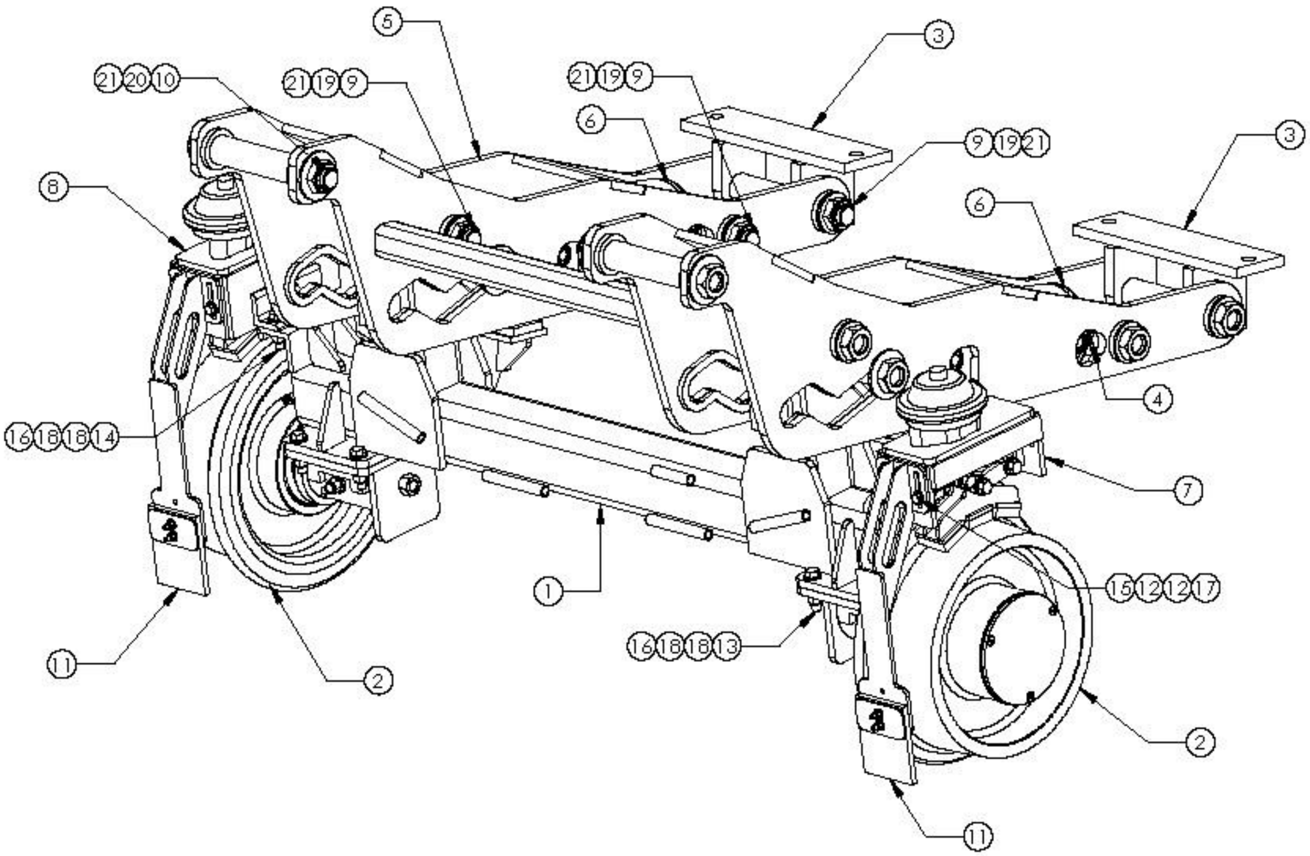
		DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±0.016" ANGLE: - MACHINED ±1.5° -BENT ±5° WELDS: +0.125"/-0.000"	DESIGNED	Vince Morev	2011-02-24
			DRAWN	N. Gromak	2020-11-12
			CHECKED	F. Aubé	2020-11-12
			ENG APPR.	F. Aubé	2020-11-12
			MFG APPR.	N. Gromak	2020-11-12
		MATERIAL: SEE BOM	PRINTED:		2021-10-15
NEXT ASSY	USED ON	FINISH MACHINED: MIN. UNSPECIFIED SURFACES, U.O.S.	COMMENTS:		
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE			

CONTINENTAL RAILWORKS

FRONT UNIT G-60

SIZE	DWG. NO.	REV.
A	A008RF00	A

SCALE: 1:10	WEIGHT: 1184	SHEET 2 OF 4



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CONTINENTAL RAILWORKS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CONTINENTAL RAILWORKS IS PROHIBITED.

NEXT ASSY	USED ON	
APPLICATION		

DIMENSIONS ARE IN INCHES.
TOLERANCES, UNLESS OTHERWISE STATED:
THREE PLACE DECIMAL: ±0.015"
ANGLE: -MACHINED ±1.5°
-BENT ±5°
WELDS: +0.125"/-0.000"

MATERIAL: SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES, U.O.S.

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Vince Florev	2011-02-24
DRAWN	N. Gromak	2020-11-12
CHECKED	F. Aubé	2020-11-12
ENG APPR.	F. Aubé	2020-11-12
MFG APPR.	N. Gromak	2020-11-12
PRINTED:		2021-10-15

COMMENTS:

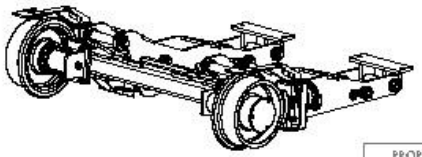
CONTINENTAL RAILWORKS

FRONT UNIT G-60

SIZE	DWG. NO.	REV.
A	A008RF00	A

SCALE: 1:10 | WEIGHT: 1134 | SHEET 3 OF 4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D008RF00	FRONT AXLE ASS'Y	1
2	E008A001	WHEEL 14" ASSEMBLY W/SPINDLE HOUSING	2
3	F078R500	HIRAIL MTG BRACKET	2
4	F088R003	SPACER	4
5	F108RF00	FRONT CAM ASS'Y	1
6	H028K010	5" HYDRAULIC CYLINDER X 8" STROKE	2
7	H077CFD0	AIR BRAKE ASS'Y DRIVER'S SIDE	1
8	H077CFP0	AIR BRAKE ASS'Y PASSENGER'S SIDE	1
9	P008K010	1-3/4" PIN X 9.625" ASS'Y	6
10	P008K020	1-3/4" PIN X 9.000" ASS'Y	4
11	R007GB00	UNIVERSAL RAILSWEEP BRKT 14"	2
12		3/8" REGULAR FLAT WASHER	8
13		1/2" UNC GR.8 BOLT X 2.250" LONG	8
14		1/2" UNC GR.8 BOLT X 2.000" LONG	4
15		3/8" UNC GR.8 BOLT X 1.500" LONG	4
16		1/2" UNC GR.8 NYLON INSERT LOCKNUT	12
17		3/8" UNC GR.8 NYLON INSERT LOCKNUT	4
18		1/2" REGULAR FLAT WASHER	24
19		1-1/4" REGULAR FLAT WASHER	6
20		1-1/4" WIDE FLAT WASHER	4
21		1-1/4" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	10



NEXT ASS'Y	USED ON
APPLICATION	

DIMENSIONS ARE IN INCHES.
TOLERANCES, UNLESS OTHERWISE STATED:
THREE PLACE DECIMAL: ±0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH: MACHINED: 63 MIN. UNSPECIFIED SURFACES. U.O.S.
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Vince Morey	2011-02-24
DRAWN	N. Gromak	2020-11-12
CHECKED	F. Aubé	2020-11-12
ENG APPR.	F. Aubé	2020-11-12
MFG APPR.	N. Gromak	2020-11-12
PRINTED:		2021-10-15
COMMENTS:		

CONTINENTAL RAILWORKS

FRONT UNIT G-60

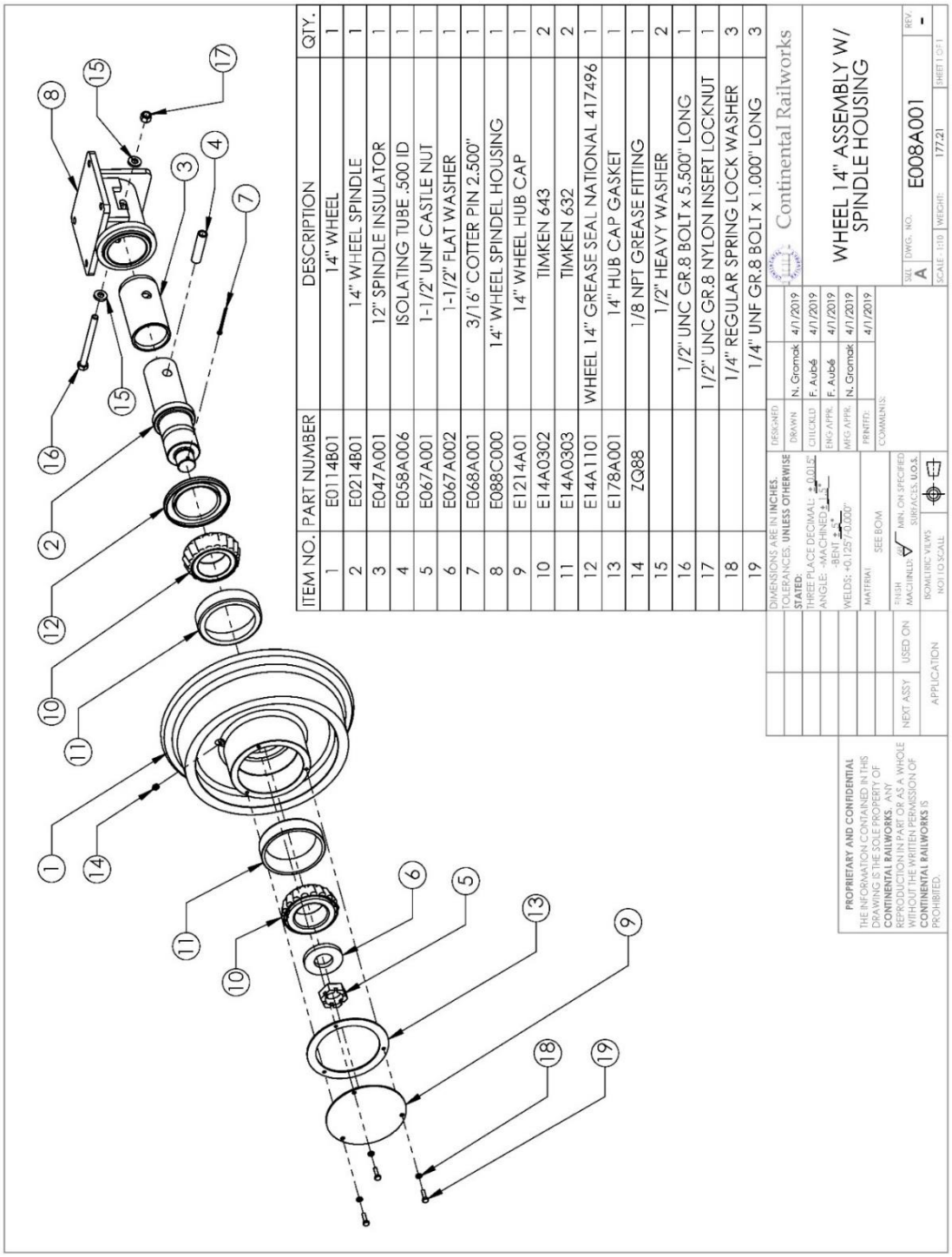
SIZE	DWG. NO.	REV.
A	A008RF00	A

SCALE: 1:30 | WEIGHT: 1134 | SHEET 1 OF 1

APPENDIX 11

G-60 SPINDLE ASSEMBLY DRAWINGS

NOTE – Some components may differ slightly from drawings shown.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	E0114B01	14" WHEEL	1
2	E0214B01	14" WHEEL SPINDLE	1
3	E047A001	12" SPINDLE INSULATOR	1
4	E058A006	ISOLATING TUBE .500 ID	1
5	E067A001	1-1/2" UNF CASTLE NUT	1
6	E067A002	1-1/2" FLAT WASHER	1
7	E068A001	3/16" COTTER PIN 2.500"	1
8	E088C000	14" WHEEL SPINDEL HOUSING	1
9	E1214A01	14" WHEEL HUB CAP	1
10	E14A0302	TIMKEN 643	2
11	E14A0303	TIMKEN 632	2
12	E14A1101	WHEEL 14" GREASE SEAL NATIONAL 417496	1
13	E178A001	14" HUB CAP GASKET	1
14	ZQ88	1/8 NPT GREASE FITTING	1
15		1/2" HEAVY WASHER	2
16		1/2" UNC GR.8 BOLT x 5.500" LONG	1
17		1/2" UNC GR.8 NYLON INSERT LOCKNUT	1
18		1/4" REGULAR SPRING LOCK WASHER	3
19		1/4" UNF GR.8 BOLT x 1.000" LONG	3

DIMENSIONS ARE IN **INCHES**. TOLERANCES: **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ±.005" ANGLE: -MACHINED ± 1° -BENT ±3° WELDS: +0.125"/-0.000" MATERIAL: SEE BOM FINISH: MACHINED: 125 MIN. ON SPECIFIED SURFACES, U.O.S. ISOMETRIC VIEWS NOT TO SCALE

DESIGNED: N. Gromak 4/1/2019
DRAWN: F. Aubé 4/1/2019
CHECKED: F. Aubé 4/1/2019
ENG APPR.: N. Gromak 4/1/2019
MFG APPR.: 4/1/2019
PRINTED: 4/1/2019
COMMENTS:

Continental Railworks

WHEEL 14" ASSEMBLY W/ SPINDLE HOUSING

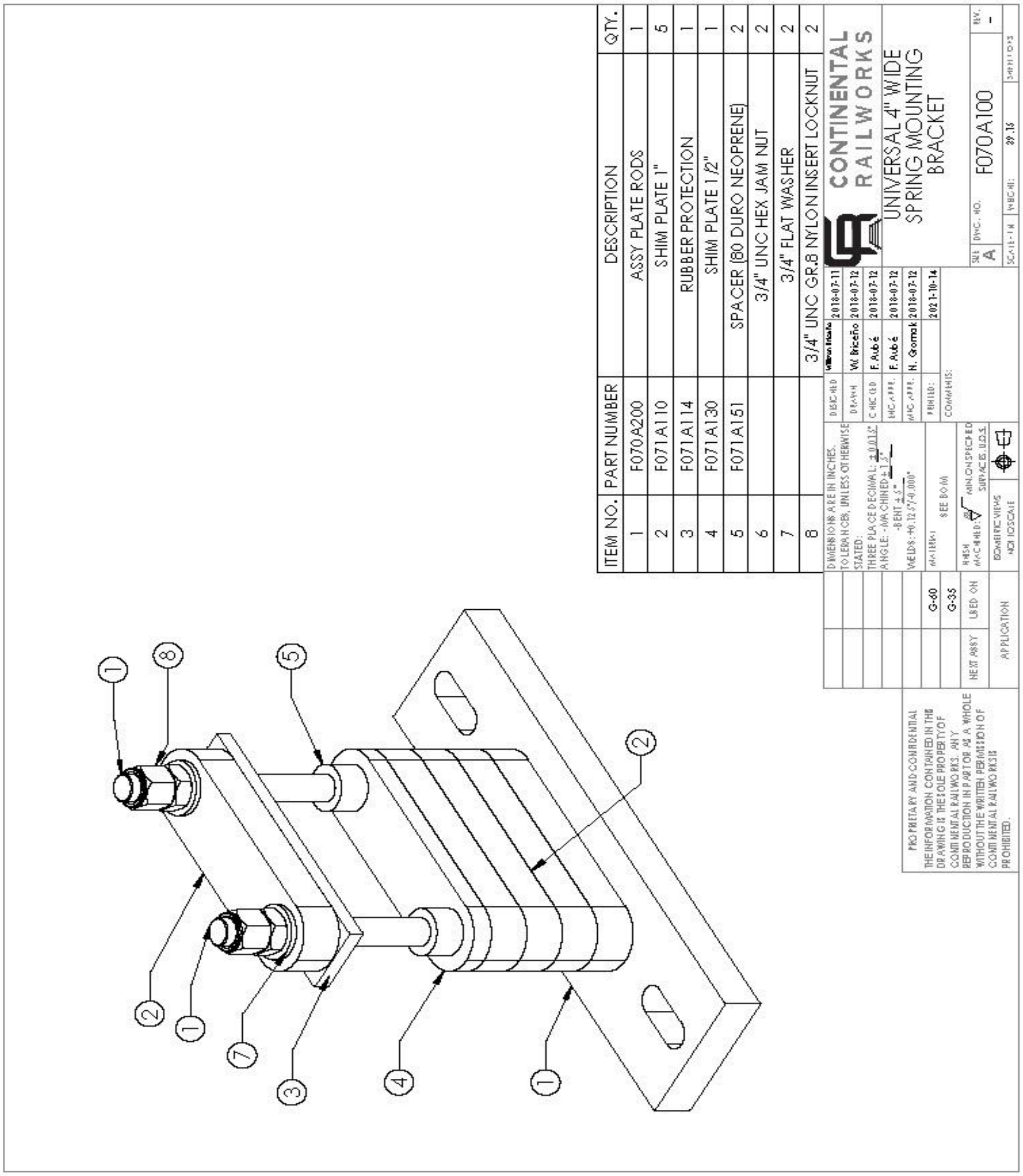
SIZE: A | DWG. NO.: E008A001 | REV: -
SCALE: 3/10 | WEIGHT: 177.21 | SHEET 1 OF 1

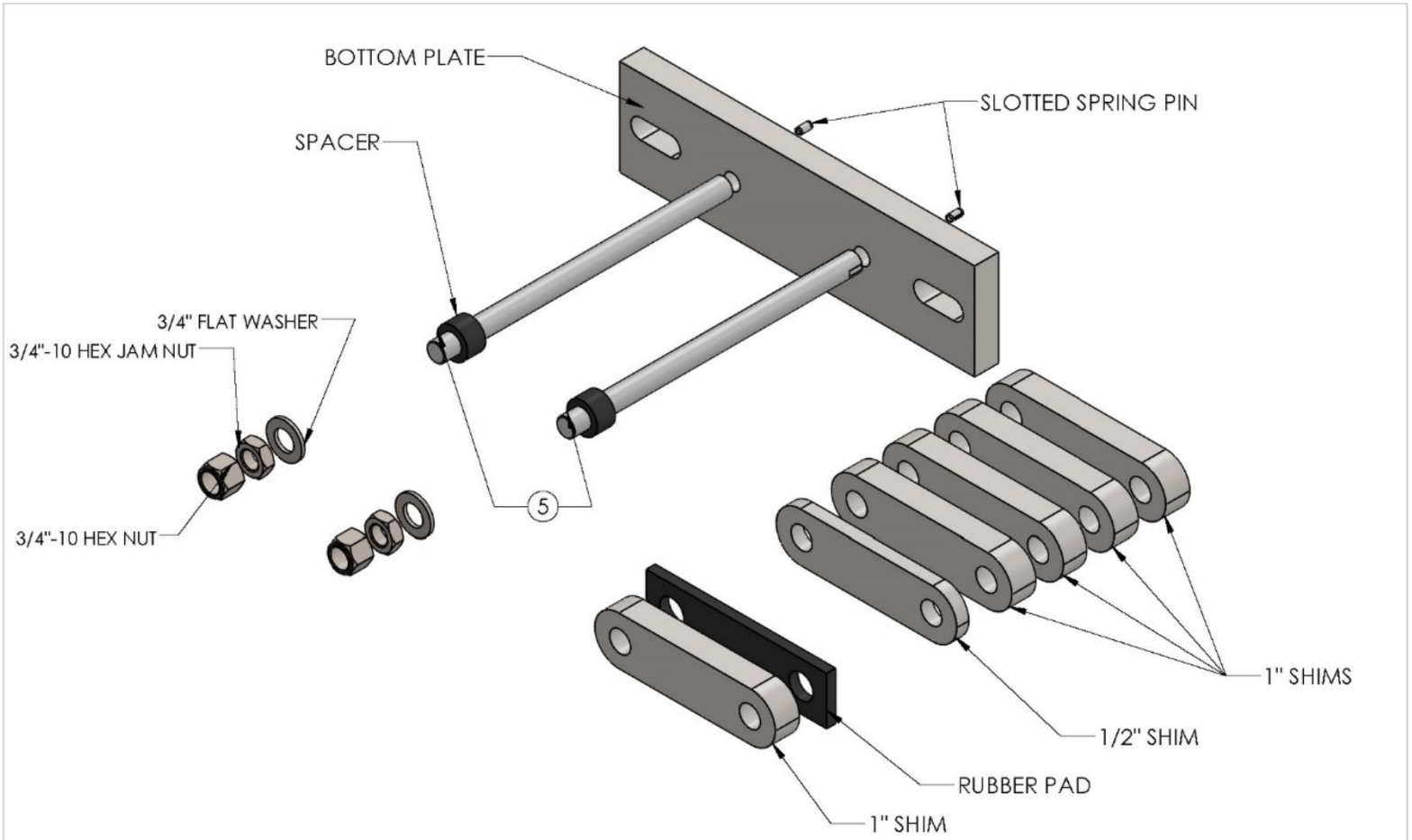
NEXT ASSY: USED ON
APPLICATION

APPENDIX 12

UNIVERSAL MOUNTING BRACKET SYSTEM DRAWINGS

NOTE – Some components may differ slightly from drawings shown.





NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES.**
TOLERANCES. **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ±0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL: G-60, G-35 — SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Wilston Briceño	2018-07-11
DRAWN	W. Briceño	2018-07-12
CHECKED	F. Aubé	2018-07-12
ENG APPR.	F. Aubé	2018-07-12
MFG APPR.	N. Gromak	2018-07-12
PRINTED:		2021-10-14

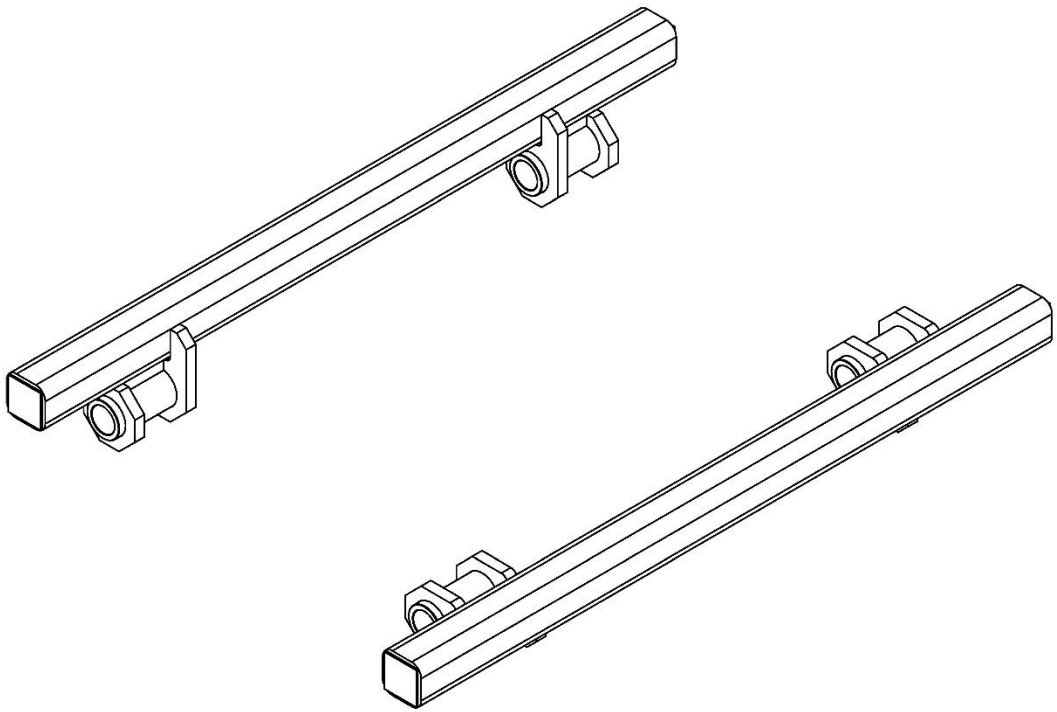
COMMENTS:

CONTINENTAL RAILWORKS

UNIVERSAL 4" WIDE SPRING MOUNTING BRACKET

SIZE	DWG. NO.	REV.
A	F070A100	-

SCALE - 1:4 | WEIGHT: 39.15 | SHEET 2 OF 3



		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ± 0.015" ANGLE: -MACHINED ± 1.5° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED	W. Briceño	2018-08-20
			DRAWN	W. Briceño	2018-08-21
			CHECKED	F. Aubé	2018-08-21
			ENG APPR.	F. Aubé	2018-08-21
			MFG APPR.	N. Gromak	2018-08-21
			PRINTED:		2022-01-28
		MATERIAL: SEE BOM	COMMENTS:		
G001A000	G-60	FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES, **U.O.S.**			
NEXT ASSY	USED ON	ISOMETRIC VIEWS NOT TO SCALE			
APPLICATION					

Continental Railworks

CROSS BEAM (HSS) G-60

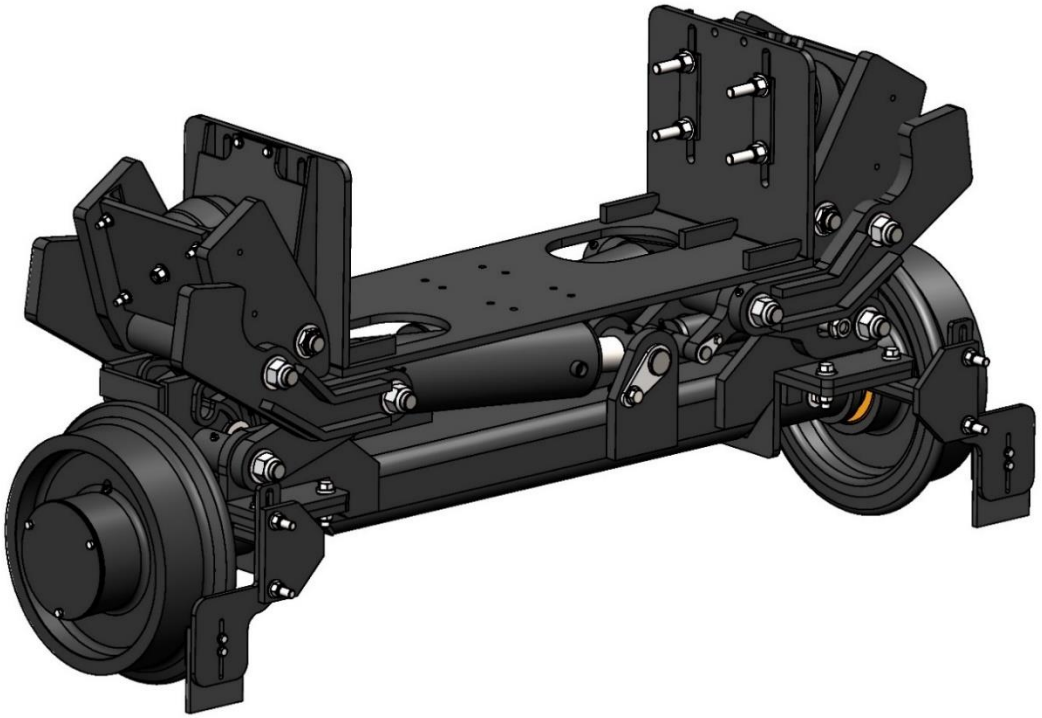
SIZE	DWG. NO.	REV.
A	G031A000	-

SCALE: 1:16 | WEIGHT: | SHEET 4 OF 4

APPENDIX 13

REAR LS-60 (WITHOUT BRAKES) DRAWINGS

NOTE – Some components may differ slightly from drawings shown



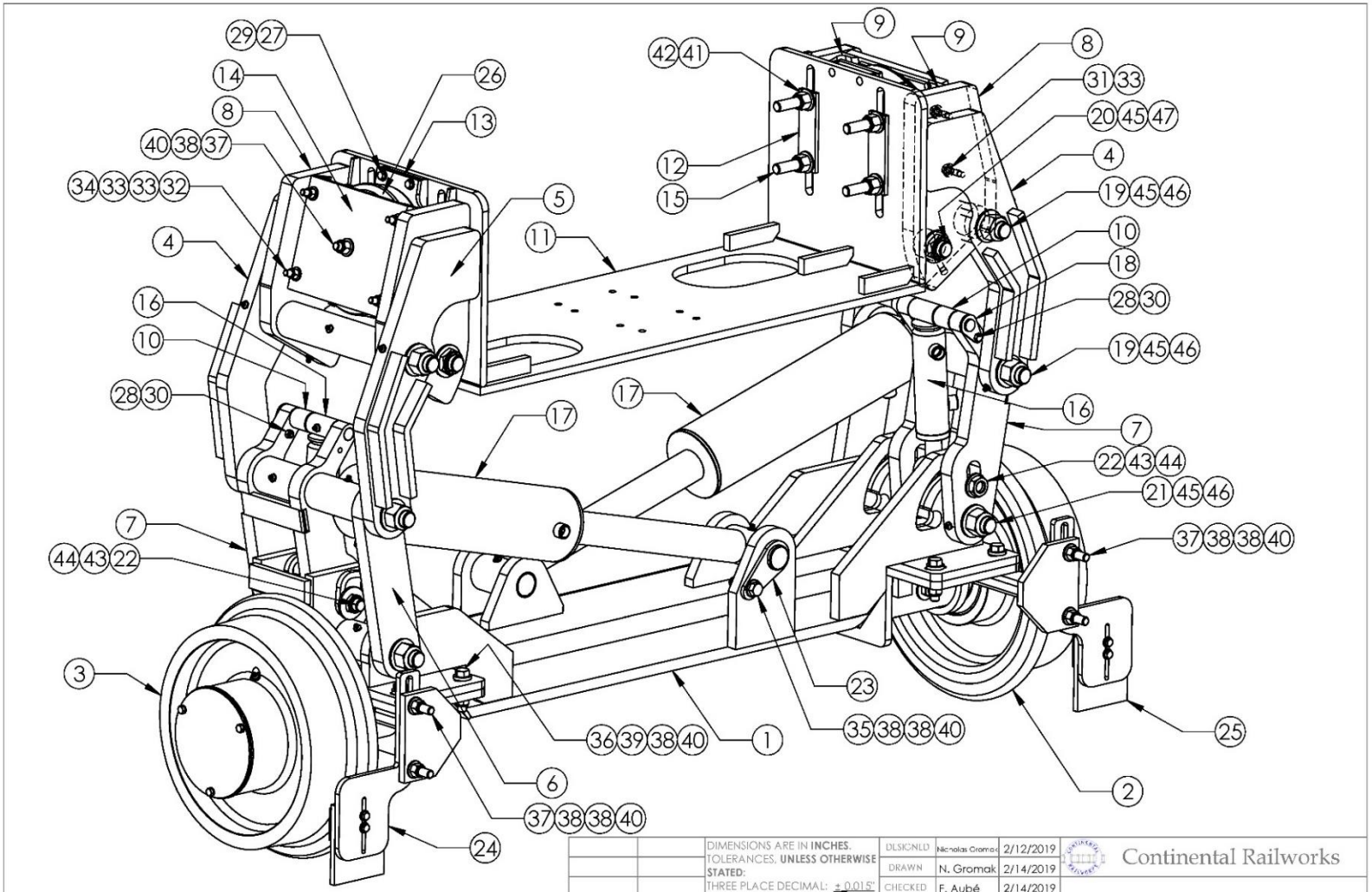
		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:**	DESIGNED	Nicholas Gromak	2/12/2019
		THREE PLACE DECIMAL: ± 0.015"	DRAWN	N. Gromak	2/14/2019
		ANGLE: -MACHINED ± 1.5°	CHECKED	F. Aubé	2/14/2019
		-BENT ± 5°	ENG APPR.	F. Aubé	2/14/2019
		WELDS: +0.125"/-0.000"	MFG APPR.	N. Gromak	2/14/2019
		MATERIAL: SEE BOM	PRINTED:		5/13/2019
			COMMENTS:		
NEXT ASSY	USED ON	FINISH: 63 MACHINED MIN. ON SPECIFIED SURFACES. **U.O.S.**			
APPLICATION		ISOMETRIC VIEWS: NOT TO SCALE			

Continental Railworks

LS-60-D

SIZE	DWG. NO.	REV.
A	A009VD00	-

SCALE: 1:8 | WEIGHT: 1193.51 | SHEET 1 OF 9



PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF **CONTINENTAL RAILWORKS**. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF **CONTINENTAL RAILWORKS** IS PROHIBITED.

NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED**:
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL
SEE BOM

FINISH
MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS
NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

COMMENTS:

Continental Railworks

LS-60-D

SIZE	DWG. NO.	REV.
A	A009VD00	-

SCALE: 1:8 | WEIGHT: 1193.51 | SHEET 3 OF 9

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D009VD00	"D" MODEL AXLE	1
2	E009EC30	"C" MODEL PASSENGER SIDE SPINDLE ASSEMBLY	1
3	E009EC40	"C" MODEL DRIVER SIDE SPINDLE ASSEMBLY	1
4	F009VD10	"D" ASSEMBLED UPPER LINK	2
5	F009VD20	"D" ASSEMBLED UPPER LINK	2
6	F009VD30	"D" ASSEMBLED LOWER LINK	2
7	F009VD40	"D" ASSEMBLED LOCKING LINK	2
8	F009VD50	"D" ASSEMBLED STOPPER	2
9	F029V001	SPRING PLATE ANGLES	4
10	F089V006	SPACER	2
11	G009VC10	LS MOUNTING PLATE ASSEMBLY FOR MODEL "C"	1
12	G019V001	ADJUSTMENT PLATE	4
13	G019V017	PLATE	2
14	G019VC02	C MODEL SPRING PLATE ASSEMBLY	2
15	G019VC03	CAPTIVE BOLT ASSEMBLY	4
16	H025C100	SINGLE ACTION CYLNDER 1-1/2" x 1"	2
17	H025D200	4" HYDRAULIC CYLINDER x 12" STROKE	2
18	P009V070	PIN ASSY 5.750" LONG	2
19	P009VC10	"C" MODEL LS PIN ASSY 13.438" LONG	4
20	P009VC20	"C" MODEL LS PIN ASSY 11.531" LONG	2
21	P009VC30	"C" MODEL LS PIN ASSY 11.438" LONG	2
22	P009VC40	"C" MODEL LOCKING CYLINDER PIN ASSY 6.938" LONG	2
23	P009VD10	"D" AXLE PIN	2
24	R009VC00	LS RAILSWEEP FOR MODEL "C" (DRIVER)	1
25	R009VC00	LS RAILSWEEP FOR MODEL "C" (PASSENGER)	1
26	V006A002	RUBBER SPRING 1525-55	2

NEXT ASSY | USED ON

APPLICATION

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH: MACHINED: 63 MIN. ON SPECIFIED SURFACES, **U.O.S.**
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Cromack	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

COMMENTS:

Continental Railworks

LS-60-D

SIZE: A | DWG. NO. A009VD00 | REV. –

SCALE: 1:8 | WEIGHT: 1193.51 | SHEET 4 OF 9

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
27		1/4" UNC GR.8 BOLT x 1.000" LONG	8
28		1/4" UNC GR.8 BOLT x 1.500" LONG	2
29		1/4" FLAT WASHER	8
30		1/4" UNC LIGHT NYLON INSERT LOCKNUT	2
31		3/8" UNC GR.8 BOLT x 1.000" LONG	8
32		3/8" UNC GR.8 BOLT x 1.750" LONG	8
33		3/8" FLAT WASHER	24
34		3/8" UNC GR.8 NYLON INSERT LOCKNUT	8
35		1/2" UNC GR.8 BOLT x 2.000" LONG	2
36		1/2" UNC GR. 8 BOLT x 2.250" LONG	8
37		1/2" UNC GR.8 BOLT x 2.500" LONG	6
38		1/2" FLAT WASHER	22
39		1/2" HEAVY WASHER	8
40		1/2" UNC GR.8 NYLON INSERT LOCKNUT	16
41		5/8" FLAT WASHER	8
42		5/8" UNC GR.8 NYLON INSERT LOCKNUT	8
43		3/4" FLAT WIDE WASHER	2
44		3/4" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
45		1" FLAT WASHER	8
46		1" UNC GR.8 NYLON INSERT LOCKNUT	6
47		1" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
48	G009V002	1/4" MOUNTING PLATE SHIM	2
49	G009V003	1/8" MOUNTING PLATE SHIM	4
50	HLS60KIT	HOSE-FITTING LS-60	1

NEXT ASSY | USED ON

APPLICATION

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL: SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
LNG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

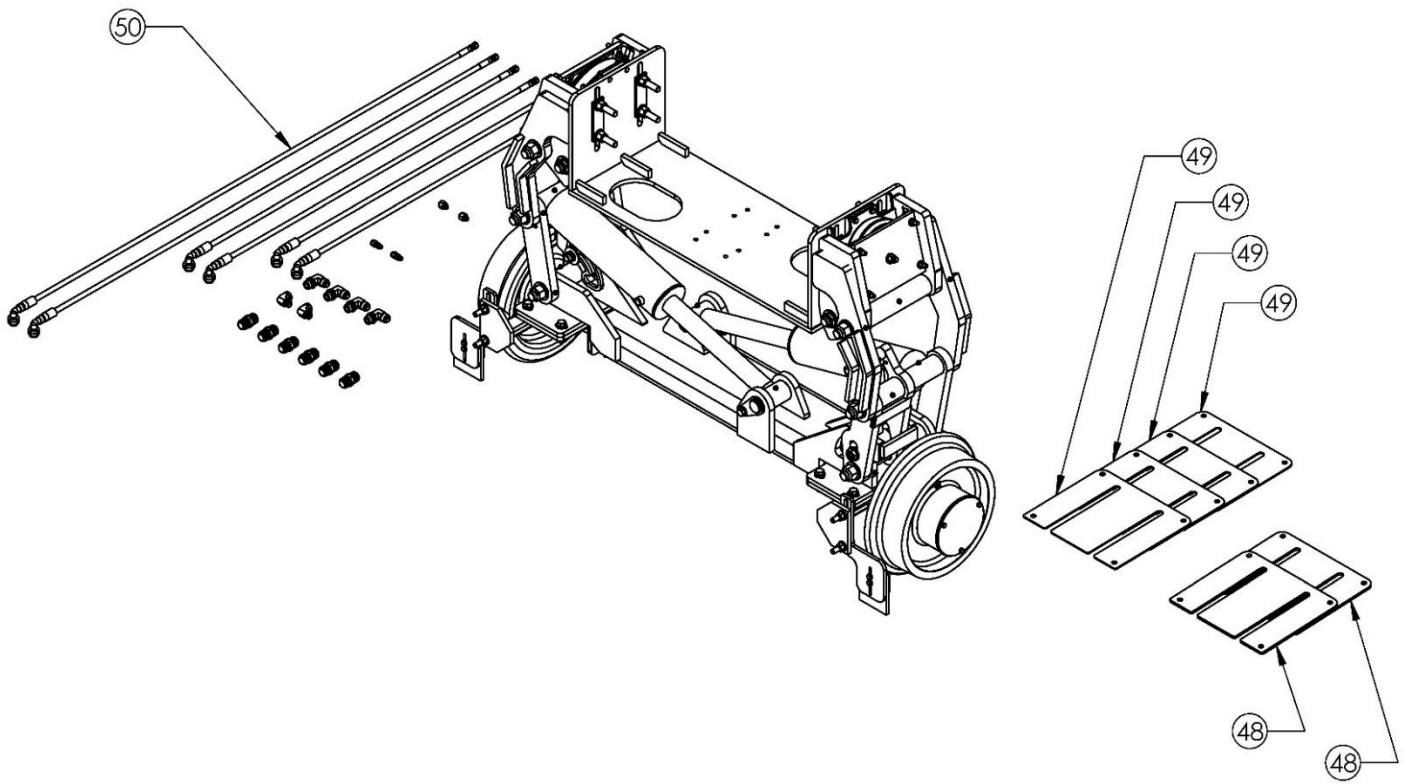
COMMENTS:

Continental Railworks

LS-60-D

SIZE A | DWG. NO. A009VD00 | REV. -

SCALE 1:8 | WEIGHT: 1193.51 | SHEET 5 OF 9



		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ± 0.015" ANGLE: -MACHINED ± 1.0° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED	Nicholas Gromak	2/12/2019
			DRAWN	N. Gromak	2/14/2019
			CHECKED	F. Aubé	2/14/2019
			ENG APPR.	F. Aubé	2/14/2019
			MFG APPR.	N. Gromak	2/14/2019
			PRINTED:		5/13/2019
		MATERIAL SEE BOM	COMMENTS:		
NEXT ASSY	USED ON	FINISH MACHINED: MIN. ON SPECIFIED SURFACES. **U.O.S.**			
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE			

PROPRIETARY AND CONFIDENTIAL

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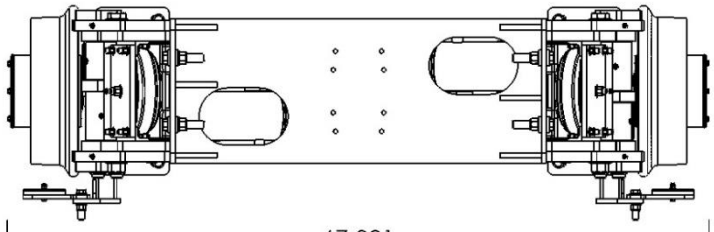
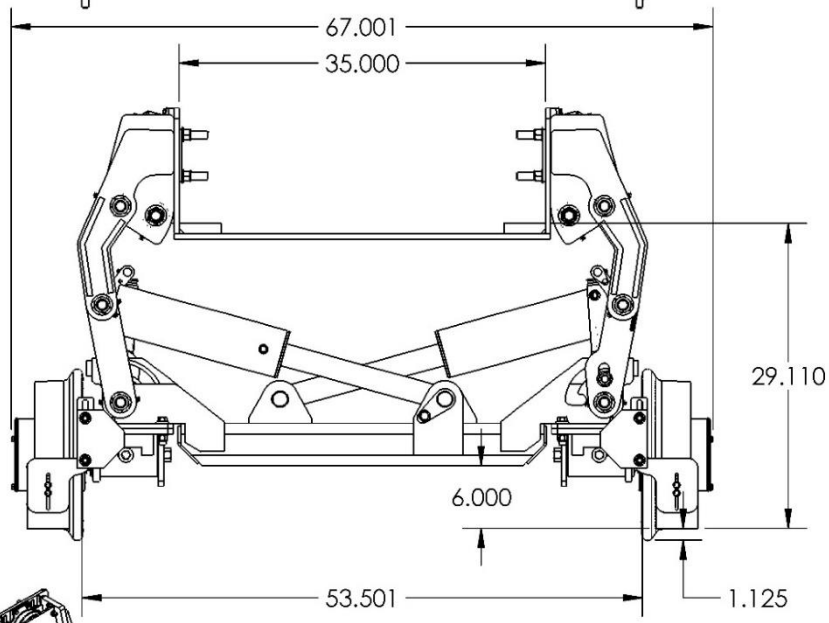
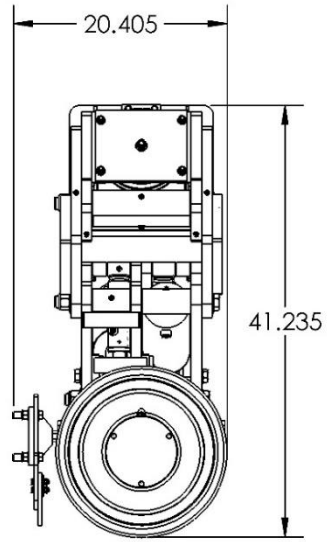
LS-60-D

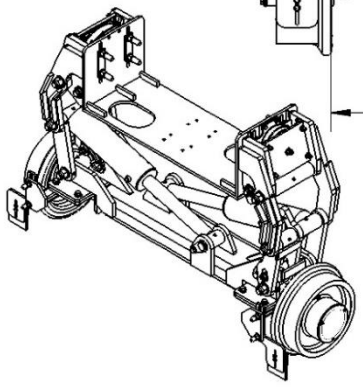
SIZE	DWG. NO.	REV.
A	A009VD00	-

SCALE: 1:16	WEIGHT: 1193.51	SHEET 6 OF 9









NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

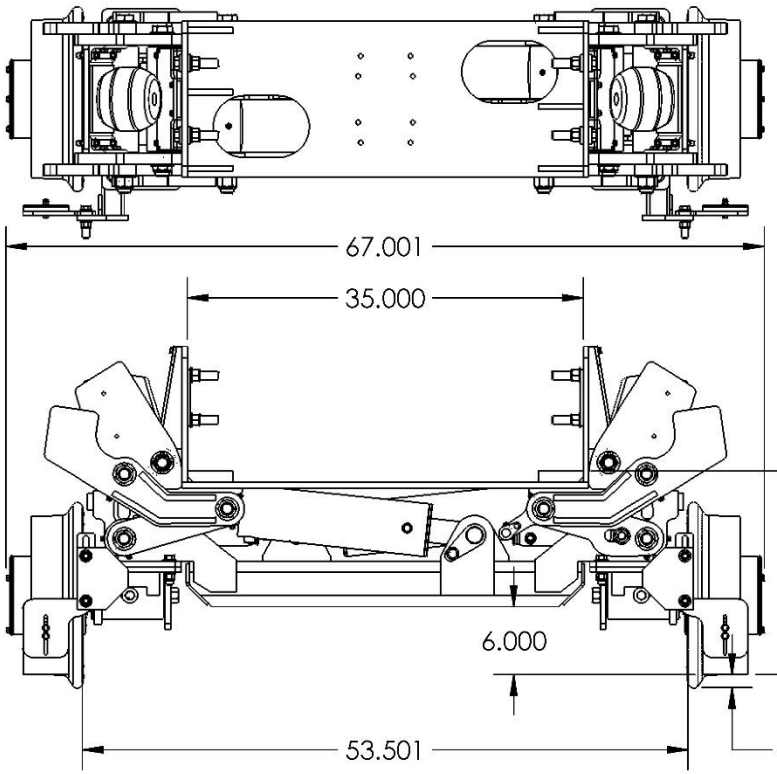
COMMENTS:

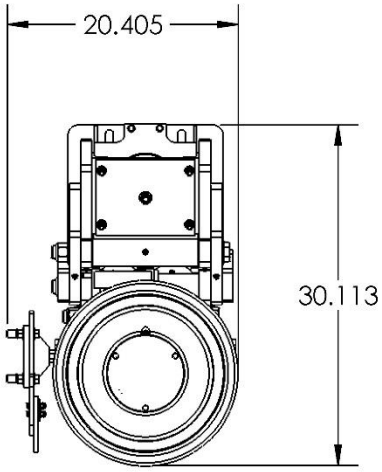
Continental Railworks

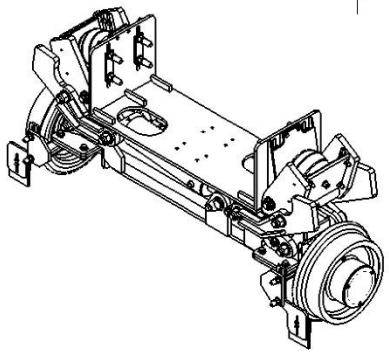
LS-60-D

SIZE	DWG. NO.	REV.
A	A009VD00	-

SCALE: 1:14 | WEIGHT: 1193.51 | SHEET 7 OF 9







NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL
SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

COMMENTS:

Continental Railworks

LS-60-D

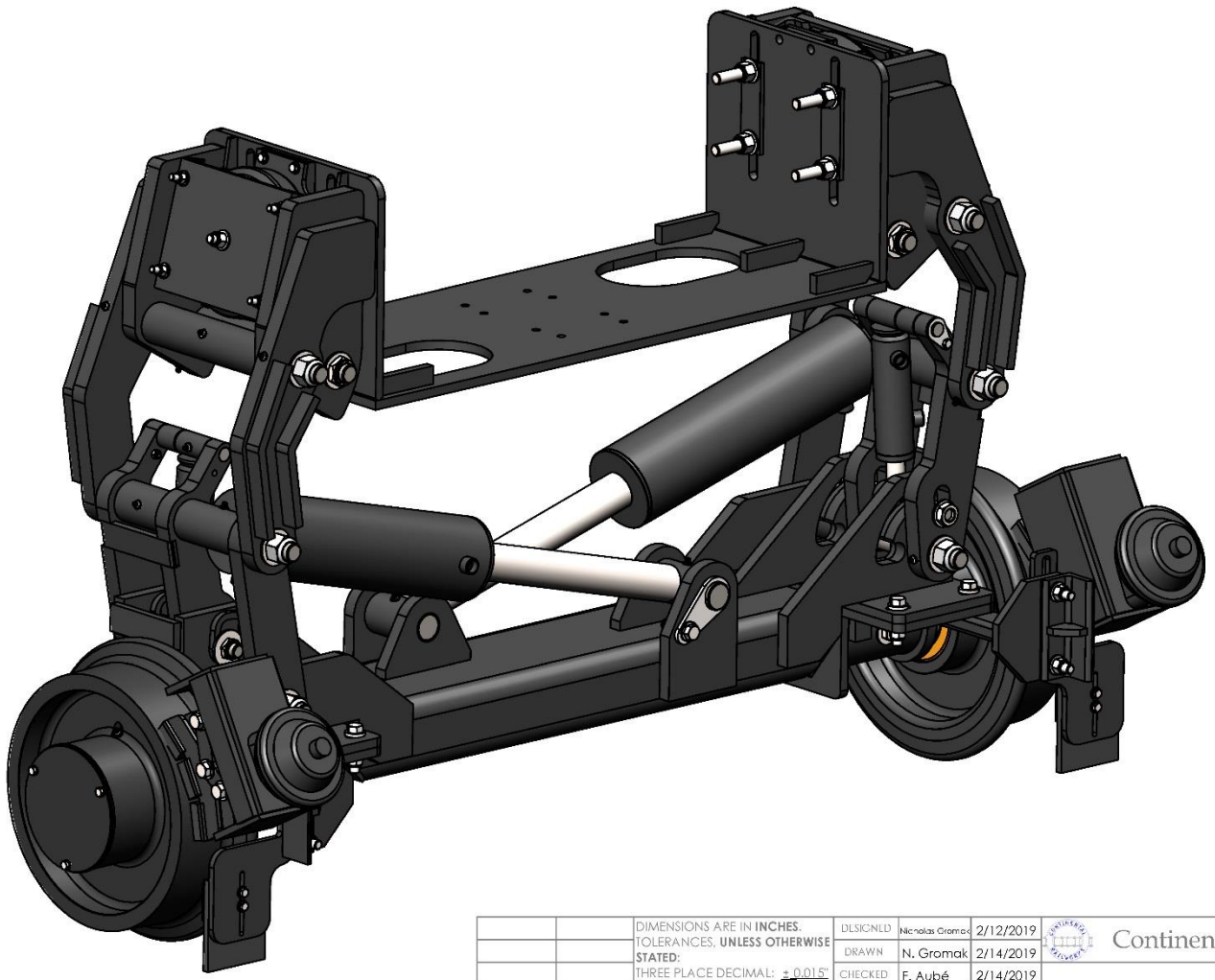
SIZE	DWG. NO.	REV.
A	A009VD00	-

SCALE: 1:14 | WEIGHT: 1193.51 | SHEET 8 OF 9

APPENDIX 14

REAR LS-60 (WITH BRAKES) DRAWINGS

NOTE – Some components may differ slightly from drawings shown.



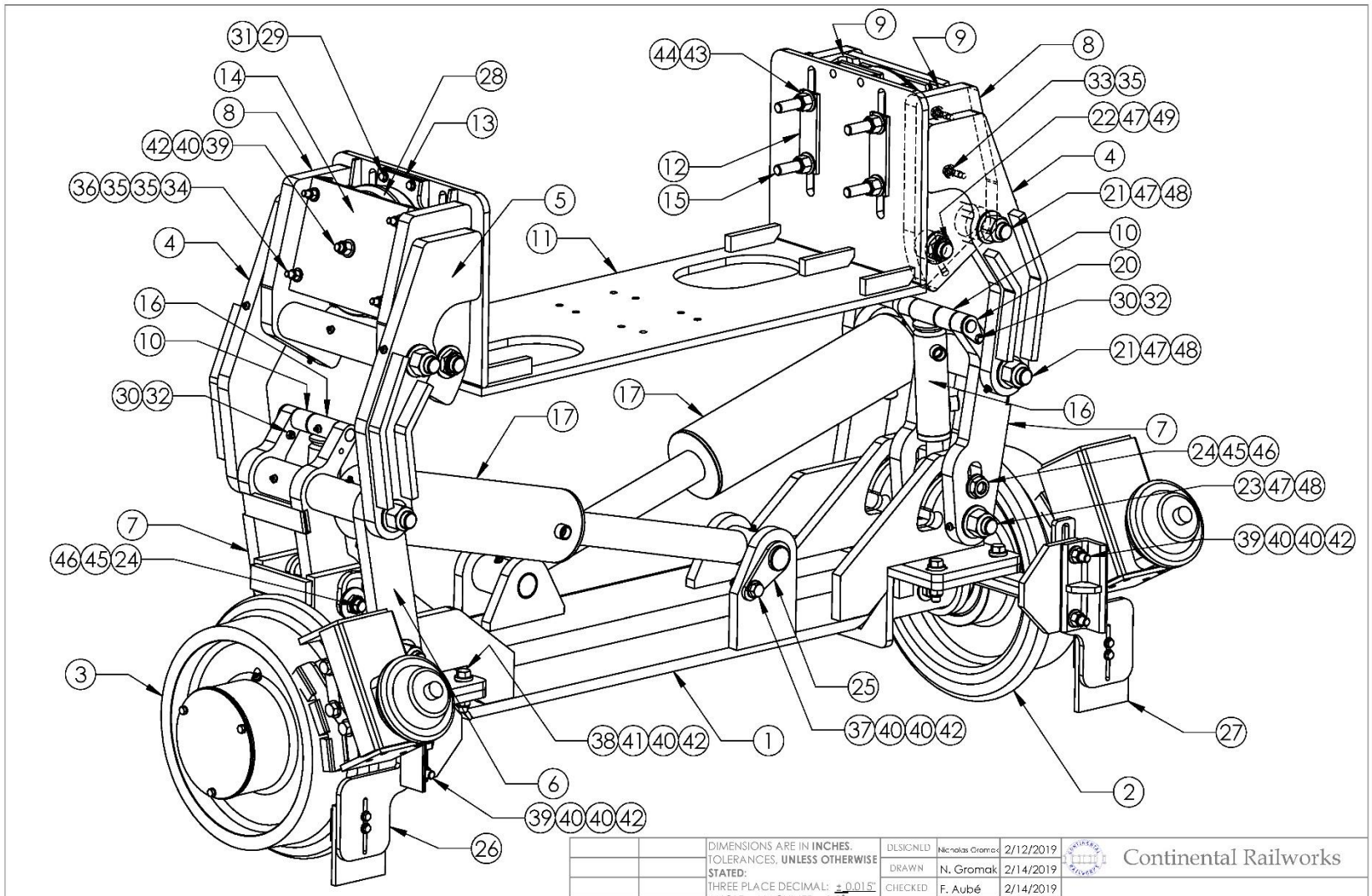
		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ± 0.015" ANGLE: -MACHINED ± 1.5° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED	Nicholas Gromak	2/12/2019
			DRAWN	N. Gromak	2/14/2019
			CHECKED	F. Aubé	2/14/2019
			ENG APPR.	F. Aubé	2/14/2019
			MFG APPR.	N. Gromak	2/14/2019
		MATERIAL: SEE BOM	PRINTED:		5/13/2019
			COMMENTS:		
NEXT ASSY	USED ON	FINISH MACHINED: MIN. ON SPECIFIED SURFACES. **U.O.S.**			
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE			

Continental Railworks

LS-60-D (WITH BRAKES)

SIZE	DWG. NO.	REV.
A	A009VDB0	-

SCALE: 1:8	WEIGHT: 1243.30	SHEET 2 OF 9



		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ± 0.015" ANGLE: -MACHINED ± 1.5° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED	Nicholas Gromak	2/12/2019
			DRAWN	N. Gromak	2/14/2019
			CHECKED	F. Aubé	2/14/2019
			ENG APPR.	F. Aubé	2/14/2019
			MFG APPR.	N. Gromak	2/14/2019
			PRINTED:		5/13/2019
		MATERIAL SEE BOM	COMMENTS:		
NEXT ASSY	USED ON	FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. U.O.S.			
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE			

Continental Railworks

LS-60-D (WITH BRAKES)

SIZE	DWG. NO.	REV.
A	A009VDB0	-

SCALE: 1:8	WEIGHT: 1243.30	SHEET 3 OF 9

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
29		1/4" UNC GR.8 BOLT x 1.000" LONG	8
30		1/4" UNC GR.8 BOLT x 1.500" LONG	2
31		1/4" FLAT WASHER	8
32		1/4" UNC LIGHT NYLON INSERT LOCKNUT	2
33		3/8" UNC GR.8 BOLT x 1.000" LONG	8
34		3/8" UNC GR.8 BOLT x 1.750" LONG	8
35		3/8" FLAT WASHER	24
36		3/8" UNC GR.8 NYLON INSERT LOCKNUT	8
37		1/2" UNC GR.8 BOLT x 2.000" LONG	2
38		1/2" UNC GR. 8 BOLT x 2.250" LONG	8
39		1/2" UNC GR.8 BOLT x 2.500" LONG	6
40		1/2" FLAT WASHER	22
41		1/2" HEAVY WASHER	8
42		1/2" UNC GR.8 NYLON INSERT LOCKNUT	16
43		5/8" FLAT WASHER	8
44		5/8" UNC GR.8 NYLON INSERT LOCKNUT	8
45		3/4" FLAT WIDE WASHER	2
46		3/4" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
47		1" FLAT WASHER	8
48		1" UNC GR.8 NYLON INSERT LOCKNUT	6
49		1" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
50	G009V002	1/4" MOUNTING PLATE SHIM	2
51	G009V003	1/8" MOUNTING PLATE SHIM	4
52	HLS60KIT	HOSE-FITTING LS-60	1

NEXT ASSY | USED ON

APPLICATION

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED**:
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL
SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

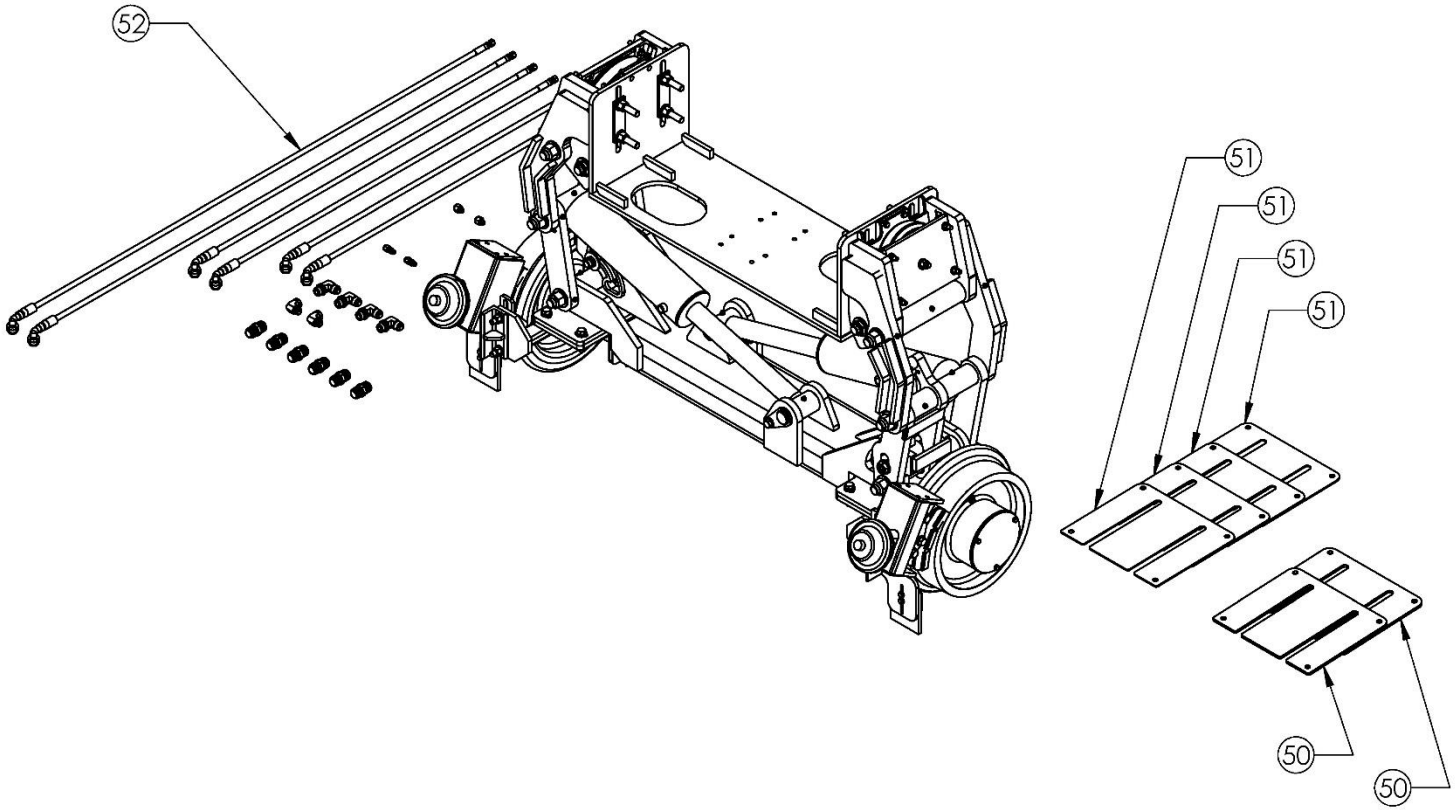
COMMENTS:

Continental Railworks

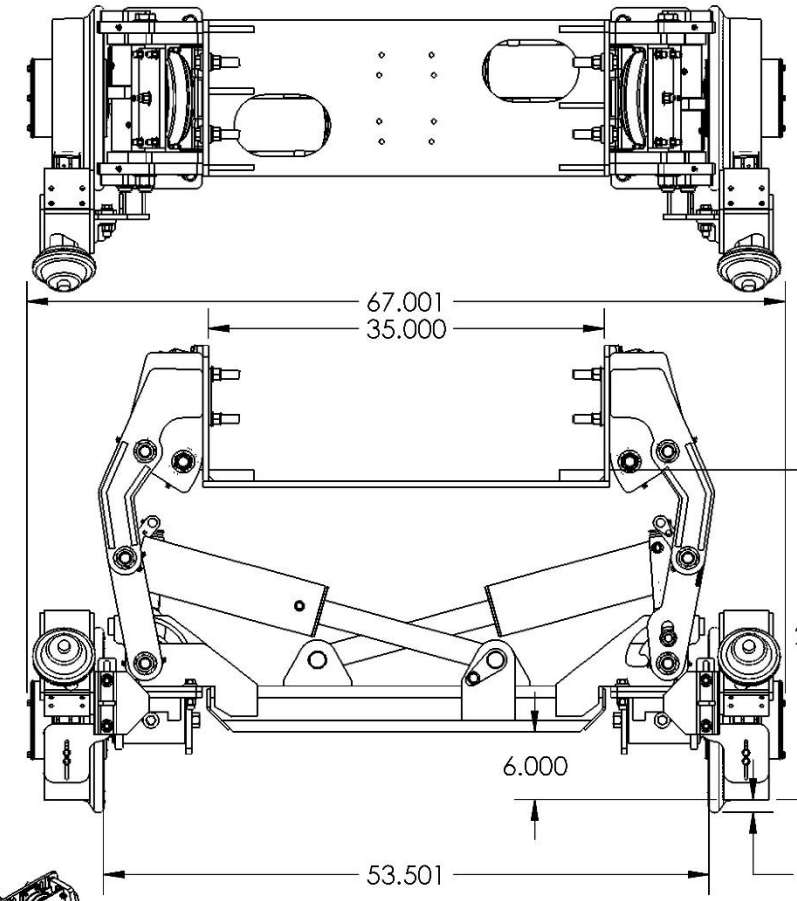
LS-60-D (WITH BRAKES)

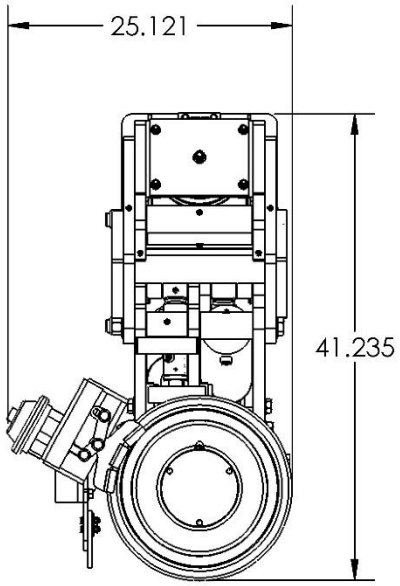
SIZE A | DWG. NO. A009VDB0 | REV. -

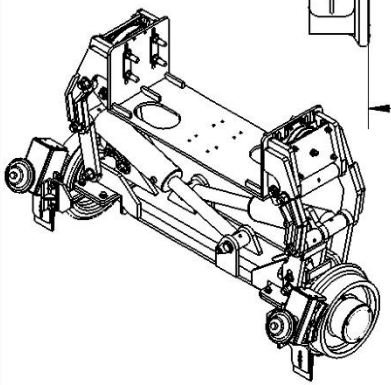
SCALE: 1:8 | WEIGHT: 1243.30 | SHEET 5 OF 9



		DIMENSIONS ARE IN **INCHES**. TOLERANCES, **UNLESS OTHERWISE STATED:** THREE PLACE DECIMAL: ± 0.015" ANGLE: -MACHINED ± 1.0° -BENT ± 5° WELDS: +0.125"/-0.000"	DESIGNED	Nicholas Gromak	2/12/2019	Continental Railworks
			DRAWN	N. Gromak	2/14/2019	
			CHECKED	F. Aubé	2/14/2019	
			ENG APPR.	F. Aubé	2/14/2019	LS-60-D (WITH BRAKES)
			MFG APPR.	N. Gromak	2/14/2019	
		MATERIAL SEE BOM	PRINTED:		5/13/2019	
			COMMENTS:			
NEXT ASSY	USED ON	FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. U.O.S.				SIZE A · DWG. NO. A009VDB0 · REV. -
APPLICATION		ISOMETRIC VIEWS NOT TO SCALE				SCALE: 1:16 · WEIGHT: 1243.30 · SHEET 6 OF 9







NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED**:
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. **U.O.S.**
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
ENG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

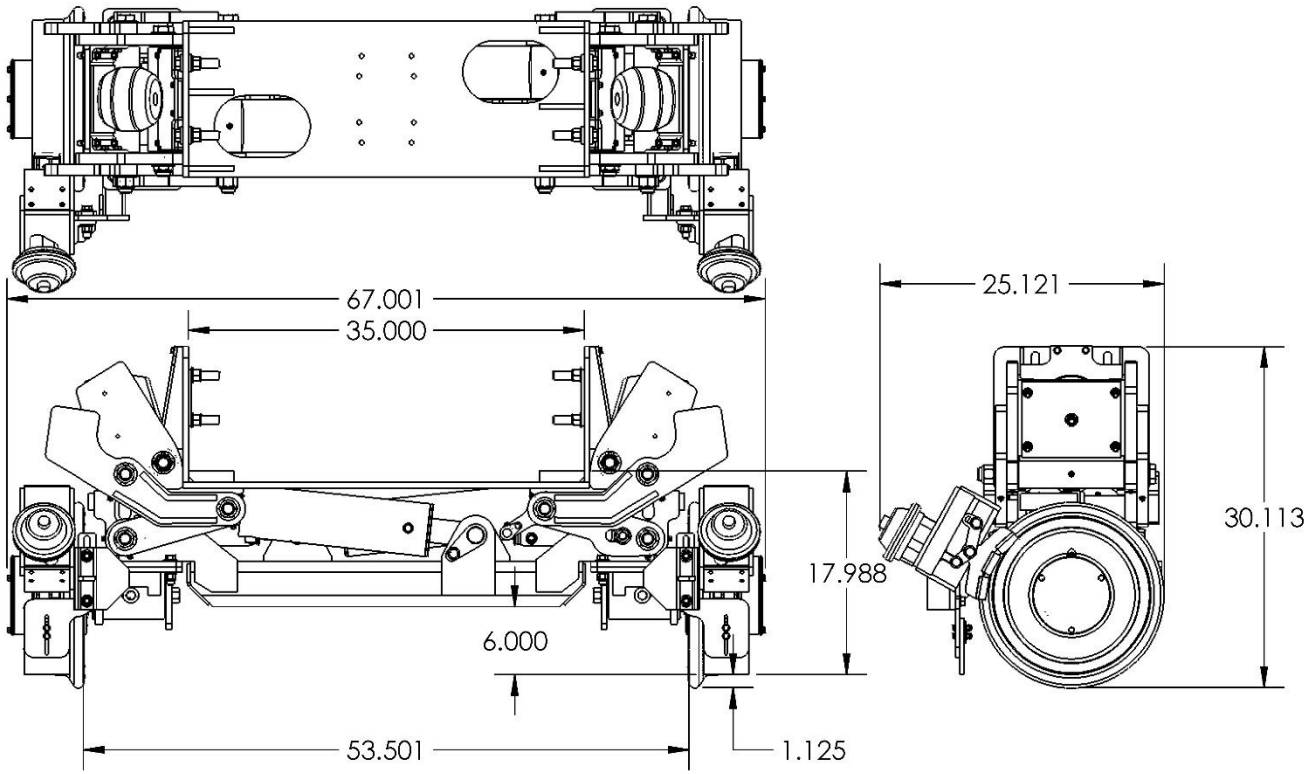
COMMENTS:

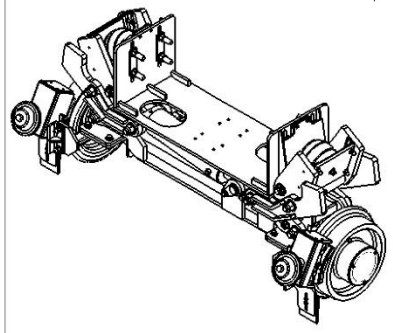
Continental Railworks

LS-60-D (WITH BRAKES)

SIZE	DWG. NO.	REV.
A	A009VDB0	-

SCALE: 1:14 | WEIGHT: 1243.30 | SHEET 7 OF 9





NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED:**
THREE PLACE DECIMAL: ± 0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"
MATERIAL: SEE BOM
FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES, **U.O.S.**
ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gremo	2/12/2019
DRAWN	N. Gromak	2/14/2019
CHECKED	F. Aubé	2/14/2019
LNG APPR.	F. Aubé	2/14/2019
MFG APPR.	N. Gromak	2/14/2019
PRINTED:		5/13/2019

COMMENTS:

Continental Railworks

LS-60-D (WITH BRAKES)

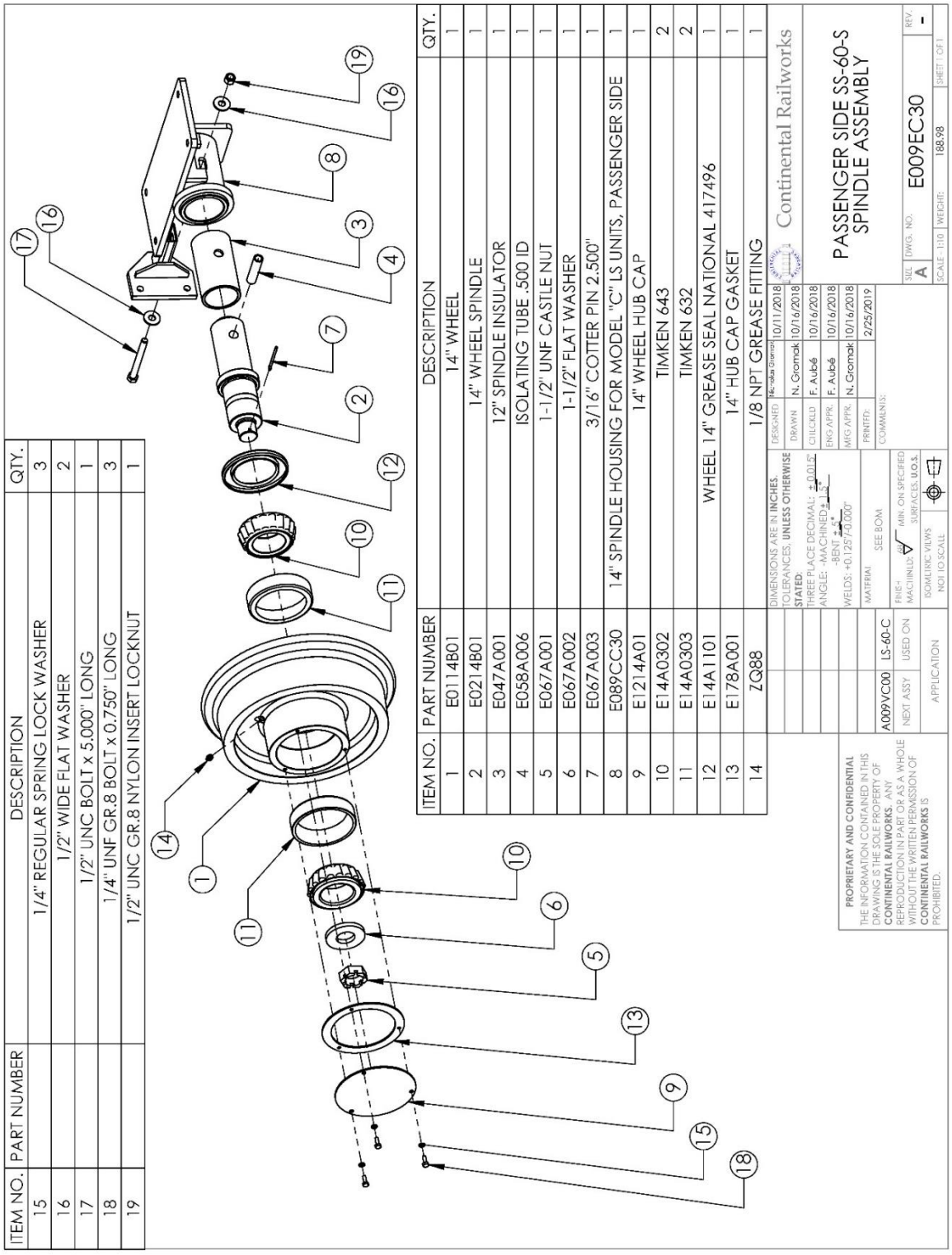
SIZE	DWG. NO.	REV.
A	A009VDB0	-

SCALE: 1:14 | WEIGHT: 1243.30 | SHEET 8 OF 9

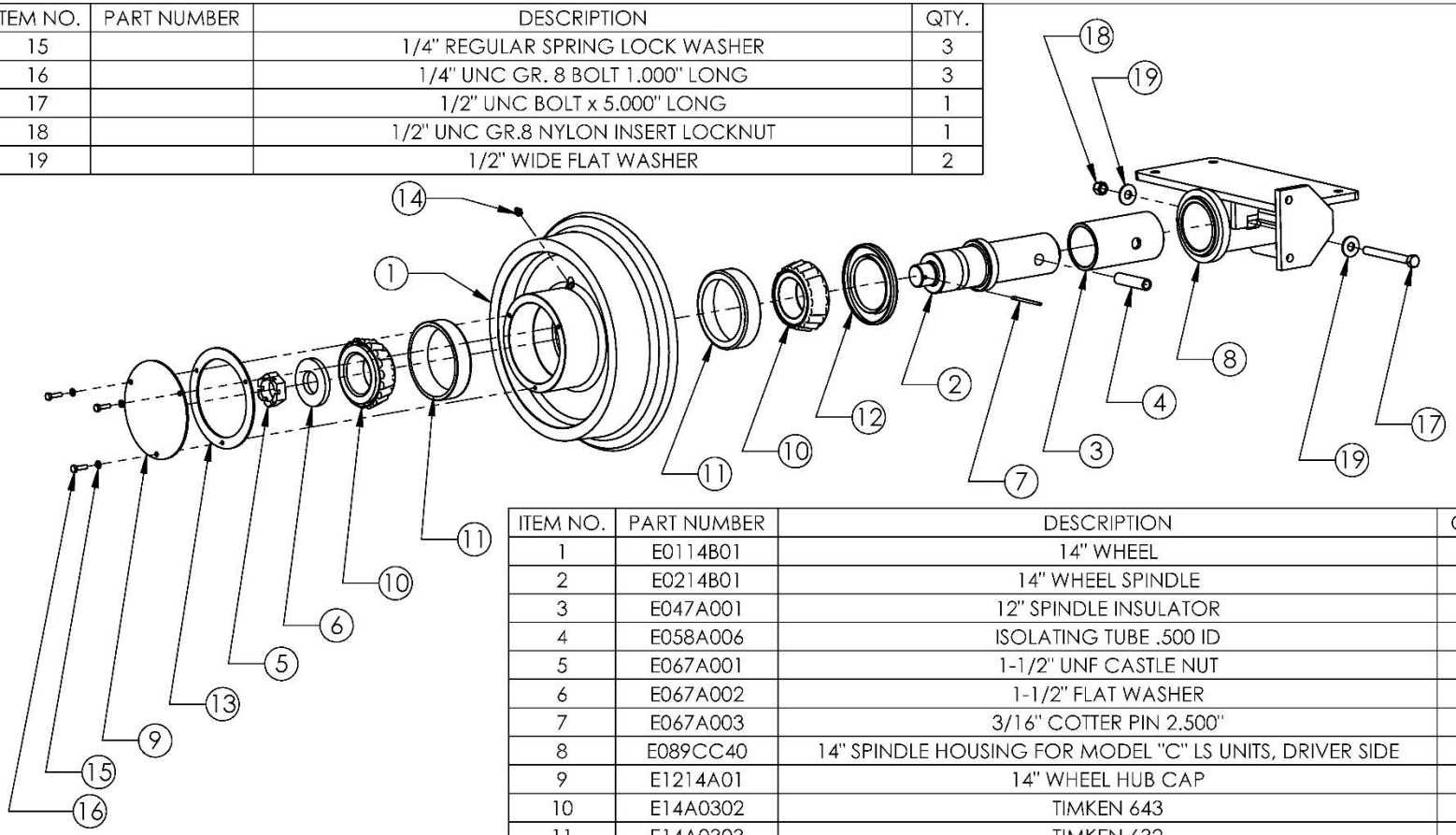
APPENDIX 15

LS-60 SPINDLE ASSEMBLY DRAWINGS

NOTE – Some components may differ slightly from drawings shown.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
15		1/4" REGULAR SPRING LOCK WASHER	3
16		1/4" UNC GR. 8 BOLT 1.000" LONG	3
17		1/2" UNC BOLT x 5.000" LONG	1
18		1/2" UNC GR.8 NYLON INSERT LOCKNUT	1
19		1/2" WIDE FLAT WASHER	2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	E0114B01	14" WHEEL	1
2	E0214B01	14" WHEEL SPINDLE	1
3	E047A001	12" SPINDLE INSULATOR	1
4	E058A006	ISOLATING TUBE .500 ID	1
5	E067A001	1-1/2" UNF CASTLE NUT	1
6	E067A002	1-1/2" FLAT WASHER	1
7	E067A003	3/16" COTTER PIN 2.500"	1
8	E089CC40	14" SPINDLE HOUSING FOR MODEL "C" LS UNITS, DRIVER SIDE	1
9	E1214A01	14" WHEEL HUB CAP	1
10	E14A0302	TIMKEN 643	2
11	E14A0303	TIMKEN 632	2
12	E14A1101	WHEEL 14" GREASE SEAL NATIONAL 417496	1
13	E178A001	14" HUB CAP GASKET	1
14	ZQ88	1/8 NPT GREASE FITTING	1

A009VC00	LS-60-C
NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN **INCHES**.
TOLERANCES, **UNLESS OTHERWISE STATED**:
THREE PLACE DECIMAL: ±0.015"
ANGLE: -MACHINED ± 1.5°
-BENT ± 5°
WELDS: +0.125"/-0.000"

MATERIAL
SEE BOM

FINISH MACHINED: 63 MIN. ON SPECIFIED SURFACES. U.O.S.

ISOMETRIC VIEWS NOT TO SCALE

DESIGNED	Nicholas Gromak	10/11/2018
DRAWN	N. Gromak	10/16/2018
CHECKED	F. Aubé	10/16/2018
ENG APPR.	F. Aubé	10/16/2018
MFG APPR.	N. Gromak	10/16/2018
PRINTED:		2/25/2019

COMMENTS:

Continental Railworks

DRIVER SIDE LS SPINDLE ASSEMBLY FOR "C" MODELS

SIZE	DWG. NO.	REV.
A	E009EC40	-

SCALE - 1:10 | WEIGHT: 188.98 | SHEET 1 OF 2