



## MANUAL

INSTALLATION – OPERATION – PARTS – SERVICE

**MODEL LS-60 REAR HI-RAIL UNIT**

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

October 2020  
Revision D2

**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 model **LS-60** 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 adjustments 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**, or emailing **admin@continentalrailworks.com**. Support personnel are frequently available during off-peak hours as well, so please do not hesitate to call or email 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 Model LS-60 is designed for tandem/tridem axle heavy trucks with a GVWR between 56,000 and 89,000 lbs. For this application, the LS-60 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 mechanically, 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 suspension in the unit contributes to maintaining proper rail contact over crossings or irregular rail sections. Rear air brakes are optional although all front hi-rail units come standard with air brakes. Traction is adjustable by simply shimming the rear unit higher or lower on the frame.

The combined weight of the LS-60 hi-rail and all necessary valves is approximately 1250 lbs.

## **OPTIONS**

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

### **REAR AIR BRAKES**

Front air brakes are standard on all heavy hi-rail units, but rear brakes are available for the LS-60 if required. Plumbing the air lines to the rear brakes is detailed in the Pneumatic Brake Valve Kit section of the manual.

### **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**

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. The truck axles should be aligned as well.

### 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

In case of unforeseen interferences with some vehicle components (frame mounted equipment, radiators, hood hinges, bumper mounts, etc) small modifications to the mounting components may be required. 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

Please refer to the manual supplied with the accompanying front hi-rail unit for complete instructions.

## REAR UNIT INSTALLATION

### CHASSIS PREPARATION

- 1- Inflate tires to recommended pressure.
- 2- Prior to measuring the frame height, ensure the air bags are properly inflated, if equipped.
- 3- Disconnect the truck batteries.
- 4- 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.
- 5- 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 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.

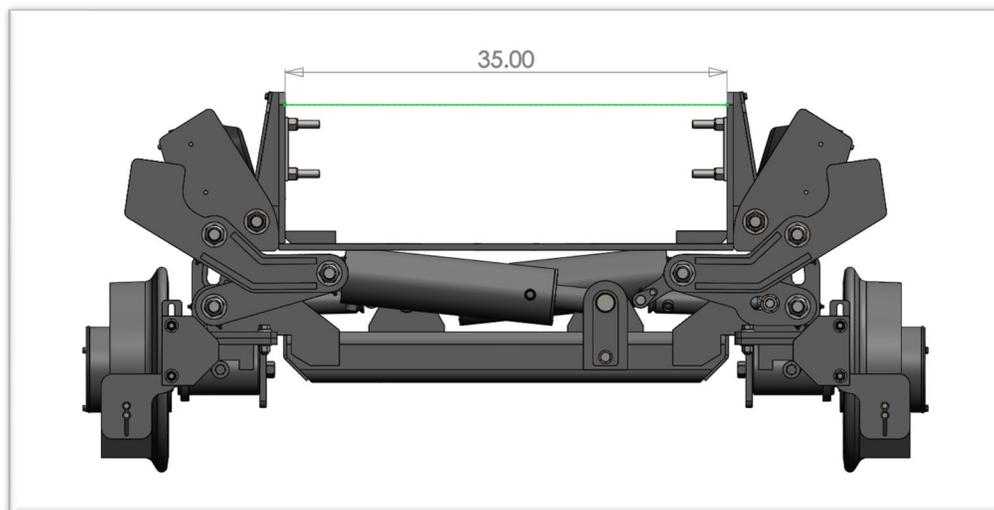


Figure 1: Mounting plate dimension

- 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.

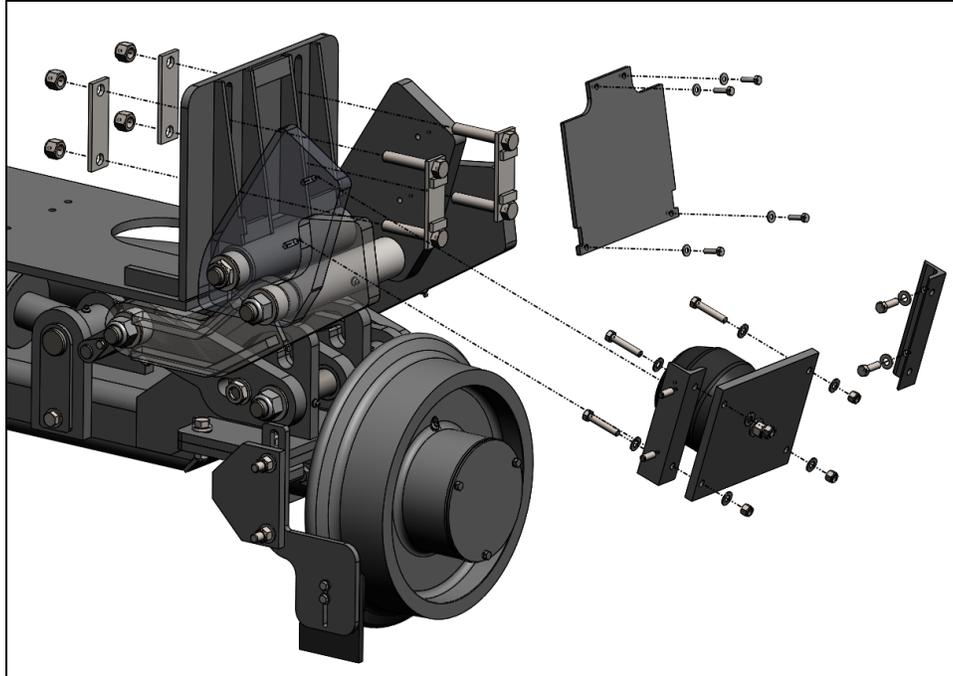


Figure 2: Disassembly for installation

- 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"

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

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Figure 3: Frame Height vs Shim Thickness

- 4- Fabricate the required height shims following one of these methods:
- Solid flat bar of proper thickness, painted
  - Flat bar stack, painted individually and welded at the ends
  - Capped HSS tube with a wall thickness of 3/8" minimum, painted
- 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.

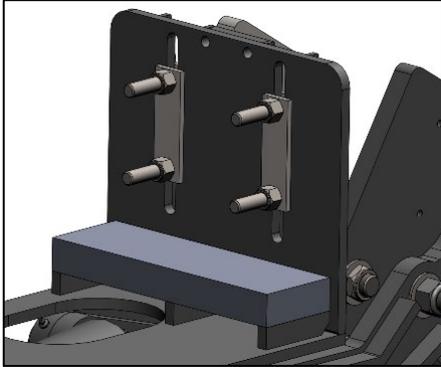


Figure 4: Solid Shim

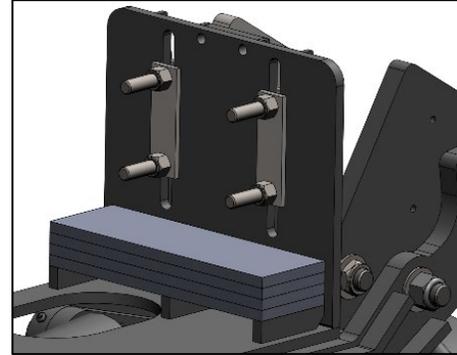


Figure 5: Stacked Solid Shim

- 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".

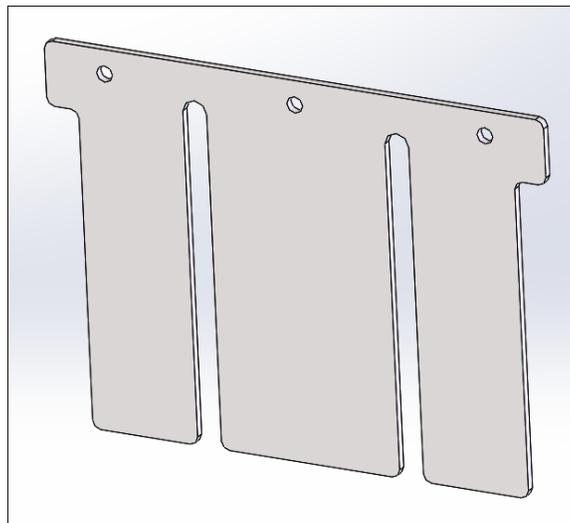


Figure 6: Width shims

- 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.

## INSTALLATION

- 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 tandem axles and 3" from the Spring hanger on 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.

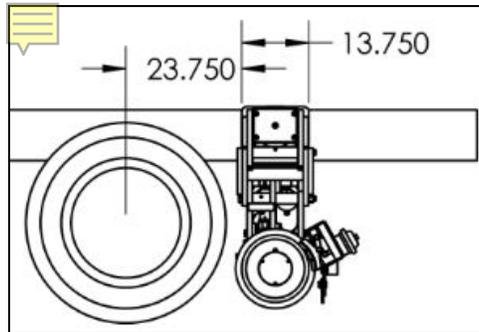


Figure 4: Location of Rear Mounting Plates

- 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.

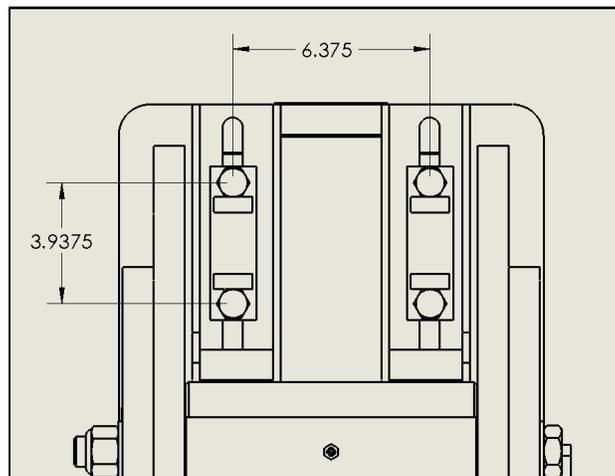


Figure 5: Mounting plate bolt pattern

- 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.

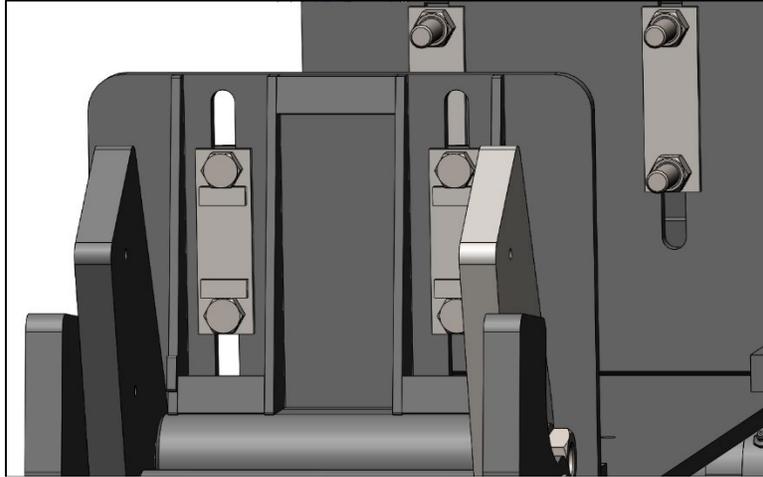


Figure 6: Captive bolt assemblies and hardware

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.

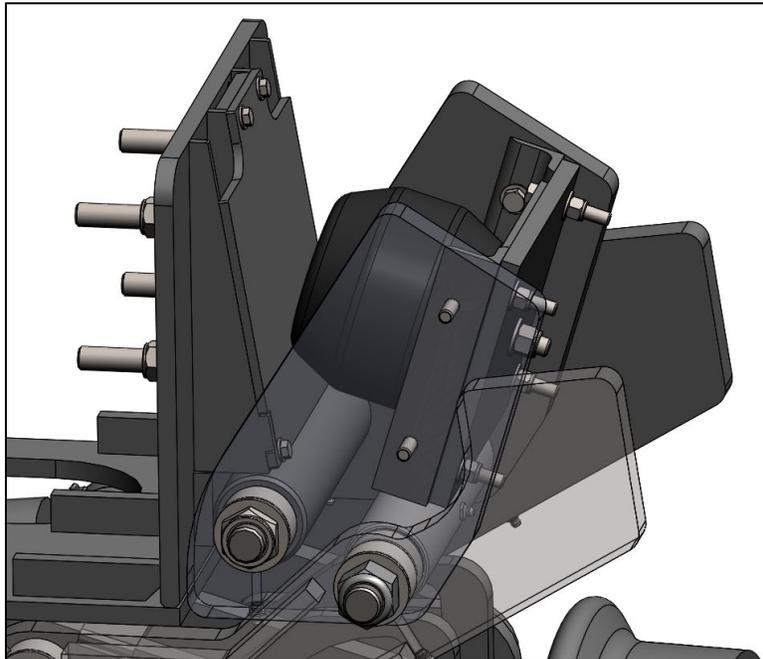


Figure 7: Spring components reassembled

# HYDRAULICS

## PTO / PUMP SETUP

The hi-rail system requires a working pressure of 2500 psi and a flow rate of 5 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 models hi-rail feature 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:

- 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 1/2" 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 1/2" hydraulic hose from the discharge port (T) of the front control valve to the pressure port (P) of the rear control valve.
- 4- Run a 1/2" hydraulic hose from the discharge port (T) of the rear control valve to the return line to the tank.
- 5- 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).
- 6- 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.
- 7- Connect the T port on the valve block to the return line to the tank.
- 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.

## TROUBLESHOOTING

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

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.

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.

LS-60 VALVE BLOC

(PICTURE OF VALVE BLOC  
WITH COMPONENTS INDICATED)

INSTALLATION

## 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"

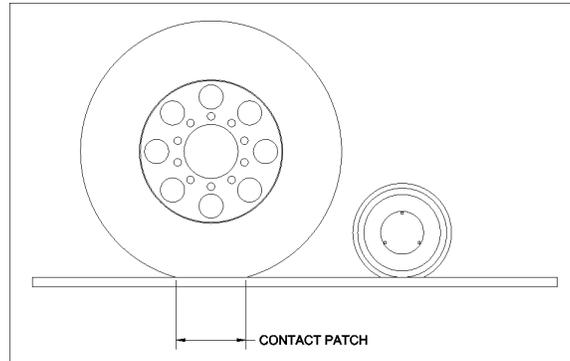


Figure 8: Tire contact patch

- 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.

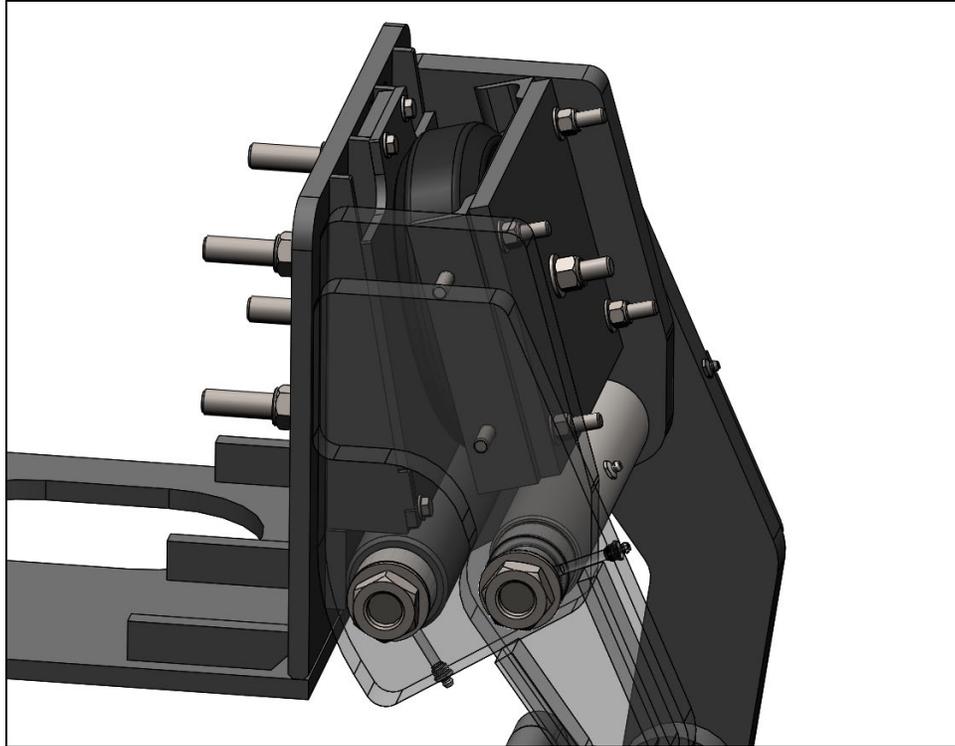


Figure 9: Rubber spring compressed

- 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.

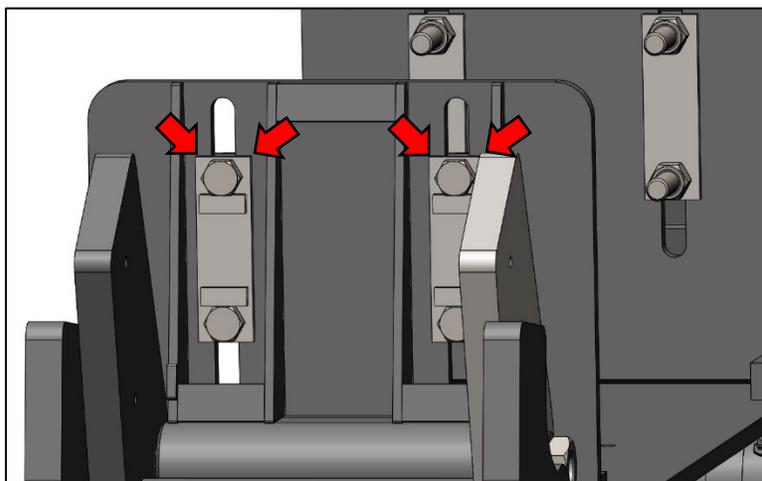


Figure 10: Welded captive bolt assemblies

## 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. (Refer to Adjustment section for contact patch values in relation to truck assembly state).
- 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

As explained in the sections above, ensure that the following steps are performed to finalize the alignment and adjustment:

- Weld spindle housing cross bolts – Weld the thick washer installed on the  $\frac{1}{2}$ " 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 11: Welded spindle housing (toe and gauge adjustment)

- 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.

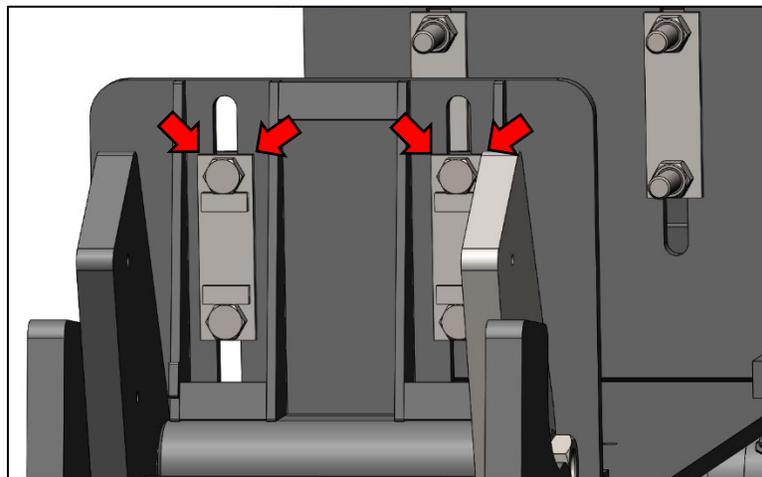


Figure 12: Welded captive bolt assemblies

# PARTS

## LS-60D ASSEMBLY PARTS

ASSEMBLY COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
A009VD00	LS-60D REAR HI-RAIL UNIT ASSEMBLY	1*
A009VDB0	LS-60D REAR HI-RAIL UNIT ASSEMBLY WITH BRAKES	1*
ZH322	CONTROL VALVE DOUBLE	1
ZH533	LS-60 VALVE BLOCK	
H105A014	PNEUMATIC BRAKE VALVE KIT	1
ZQ96	VELCRO STEERING LOCK	1
	BOLT KIT – FRONT MTG PLATE TO FRAME	1
	BOLT KIT – REAR HI-RAIL TO MTG PLATE (ON HI-RAIL)	1
LS-60D	INSTALLATION / OPERATION MANUAL	1

**NOTE** – See packing list at the end of the manual for details and part numbers of the mounting components or any other option shipped with the hi-rail unit.

\* Hi-rail unit will include one or the other

## LS-60D SPINDLE ASSEMBLY PARTS

LS-60D SPINDLE ASSEMBLY COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
E0114B01	14" WHEEL	2
E0214B01	14" WHEEL SPINDLE	2
E047A001	12" SPINDLE INSULATOR	2
E058A006	ISOLATING TUBE .500 ID	2
E067A001	1-1/2" UNF CASTLE NUT	2
E067A002	1-1/2" FLAT WASHER	2
E067A003	3/16" COTTER PIN 2.500"	2
E089CC40	14" SPINDLE HOUSING FOR MODEL "C" LS UNITS, DRIVER SIDE	1
E089CC30	14" SPINDLE HOUSING FOR MODEL "C" LS UNITS, PASSENGER SIDE	1
E1214A01	14" WHEEL HUB CAP	2
E14A0302	TIMKEN 643	4
E14A0303	TIMKEN 632	4
E14A1101	WHEEL 14" GREASE SEAL NATIONAL 417496	2
E178A001	14" HUB CAP GASKET	2
ZQ88	1/8 NPT GREASE FITTING	2
	1/4" REGULAR SPRING LOCK WASHER	6
	1/4" UNC GR. 8 BOLT 1.000" LONG	6
	1/2" UNC BOLT x 5.000" LONG	2
	1/2" UNC GR.8 NYLON INSERT LOCKNUT	2
	1/2" WIDE FLAT WASHER	4

## LS-60D UNIT (WITH BRAKES)

LS-60D COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
D009VD00	"D" MODEL AXLE	1
E009EC30	"C" MODEL PASSENGER SIDE SPINDLE	1
E009EC40	"C" MODEL DRIVER SIDE SPINDLE ASSEMBLY	1
F009VD10	"D" ASSEMBLED UPPER LINK	2
F009VD20	"D" ASSEMBLED UPPER LINK	2
F009VD30	"D" ASSEMBLED LOWER LINK	2
F009VD40	"D" ASSEMBLED LOCKING LINK	2
F009VD50	"D" ASSEMBLED STOPPER	2
F029V001	SPRING PLATE ANGLES	4
F089V006	SPACER	2
G009VC10	LS MOUNTING PLATE ASSEMBLY FOR MODEL	1
G019V001	ADJUSTMENT PLATE	4
G019V017	PLATE	2
G019VC02	C MODEL SPRING PLATE ASSEMBLY	2
G019VC03	CAPTIVE BOLT ASSEMBLY	4
H025C100	SINGLE ACTION CYLINDER 1-1/2" x 1"	2
H025D200	4" HYDRAULIC CYLINDER x 12" STROKE	2
H079CL00	LS DRIVER SIDE BRAKE BOX ASSEMBLY	1
H079CR00	LS PASSENGER SIDE BRAKE BOX ASSEMBLY	1
P009V070	PIN ASSY 5.750" LONG	2
P009VC10	"C" MODEL LS PIN ASSY 13.438" LONG	4
P009VC20	"C" MODEL LS PIN ASSY 11.531" LONG	2
P009VC30	"C" MODEL LS PIN ASSY 11.438" LONG	2
P009VC40	"C" MODEL LOCKING CYLINDER PIN ASSY	2
P009VD10	"D" AXLE PIN	2
R009VC00	LS RAILSWEEP FOR MODEL "C" (DRIVER)	1
R009VC00	LS RAILSWEEP FOR MODEL "C" (PASSENGER)	1
V006A002	RUBBER SPRING 1525-55	2
	1/4" UNC GR.8 BOLT x 1.000" LONG	8
	1/4" UNC GR.8 BOLT x 1.500" LONG	2
	1/4" FLAT WASHER	8
	1/4" UNC LIGHT NYLON INSERT LOCKNUT	2
	3/8" UNC GR.8 BOLT x 1.000" LONG	8
	3/8" UNC GR.8 BOLT x 1.750" LONG	8
	3/8" FLAT WASHER	24
	3/8" UNC GR.8 NYLON INSERT LOCKNUT	8
	1/2" UNC GR.8 BOLT x 2.000" LONG	2
	1/2" UNC GR. 8 BOLT x 2.250" LONG	8
	1/2" UNC GR.8 BOLT x 2.500" LONG	6
	1/2" FLAT WASHER	22
	1/2" HEAVY WASHER	8
	1/2" UNC GR.8 NYLON INSERT LOCKNUT	16

	5/8" FLAT WASHER	8
	5/8" UNC GR.8 NYLON INSERT LOCKNUT	8
	3/4" FLAT WIDE WASHER	2
	3/4" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
	1" FLAT WASHER	8
	1" UNC GR.8 NYLON INSERT LOCKNUT	6
	1" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
G009V002	1/4" MOUNTING PLATE SHIM	2
G009V003	1/8" MOUNTING PLATE SHIM	4
HLS60KIT	HOSE-FITTING LS-60	1

## LS-60D UNIT (NO BRAKES)

LS-60D COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
D009VD00	"D" MODEL AXLE	1
E009EC30	"C" MODEL PASSENGER SIDE SPINDLE	1
E009EC40	"C" MODEL DRIVER SIDE SPINDLE ASSEMBLY	1
F009VD10	"D" ASSEMBLED UPPER LINK	2
F009VD20	"D" ASSEMBLED UPPER LINK	2
F009VD30	"D" ASSEMBLED LOWER LINK	2
F009VD40	"D" ASSEMBLED LOCKING LINK	2
F009VD50	"D" ASSEMBLED STOPPER	2
F029V001	SPRING PLATE ANGLES	4
F089V006	SPACER	2
G009VC10	LS MOUNTING PLATE ASSEMBLY FOR MODEL	1
G019V001	ADJUSTMENT PLATE	4
G019V017	PLATE	2
G019VC02	C MODEL SPRING PLATE ASSEMBLY	2
G019VC03	CAPTIVE BOLT ASSEMBLY	4
H025C100	SINGLE ACTION CYLINDER 1-1/2" x 1"	2
H025D200	4" HYDRAULIC CYLINDER x 12" STROKE	2
P009V070	PIN ASSY 5.750" LONG	2
P009VC10	"C" MODEL LS PIN ASSY 13.438" LONG	4
P009VC20	"C" MODEL LS PIN ASSY 11.531" LONG	2
P009VC30	"C" MODEL LS PIN ASSY 11.438" LONG	2
P009VC40	"C" MODEL LOCKING CYLINDER PIN ASSY	2
P009VD10	"D" AXLE PIN	2
R009VC00	LS RAILSWEPT FOR MODEL "C" (DRIVER)	1
R009VC00	LS RAILSWEPT FOR MODEL "C" (PASSENGER)	1
V006A002	RUBBER SPRING 1525-55	2
	1/4" UNC GR.8 BOLT x 1.000" LONG	8
	1/4" UNC GR.8 BOLT x 1.500" LONG	2
	1/4" FLAT WASHER	8
	1/4" UNC LIGHT NYLON INSERT LOCKNUT	2
	3/8" UNC GR.8 BOLT x 1.000" LONG	8
	3/8" UNC GR.8 BOLT x 1.750" LONG	8
	3/8" FLAT WASHER	24
	3/8" UNC GR.8 NYLON INSERT LOCKNUT	8
	1/2" UNC GR.8 BOLT x 2.000" LONG	2
	1/2" UNC GR. 8 BOLT x 2.250" LONG	8
	1/2" UNC GR.8 BOLT x 2.500" LONG	6
	1/2" FLAT WASHER	22
	1/2" HEAVY WASHER	8
	1/2" UNC GR.8 NYLON INSERT LOCKNUT	16

	5/8" FLAT WASHER	8
	5/8" UNC GR.8 NYLON INSERT LOCKNUT	8
	3/4" FLAT WIDE WASHER	2
	3/4" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
	1" FLAT WASHER	8
	1" UNC GR.8 NYLON INSERT LOCKNUT	6
	1" UNC GR.8 LIGHT NYLON INSERT LOCKNUT	2
G009V002	1/4" MOUNTING PLATE SHIM	2
G009V003	1/8" MOUNTING PLATE SHIM	4
HLS60KIT	HOSE-FITTING LS-60	1

## 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 always 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.

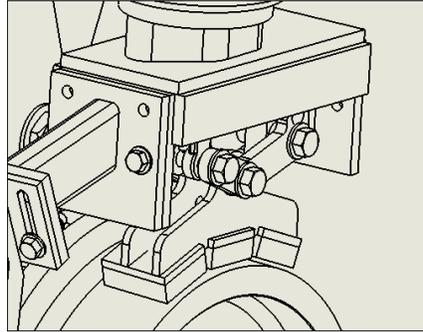


Figure 13: Brake shoe installation

## GREASE POINTS

All bushings and pivoting pins feature grease fittings. Pins travelling through slots must have grease applied to them manually.

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.

## 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.

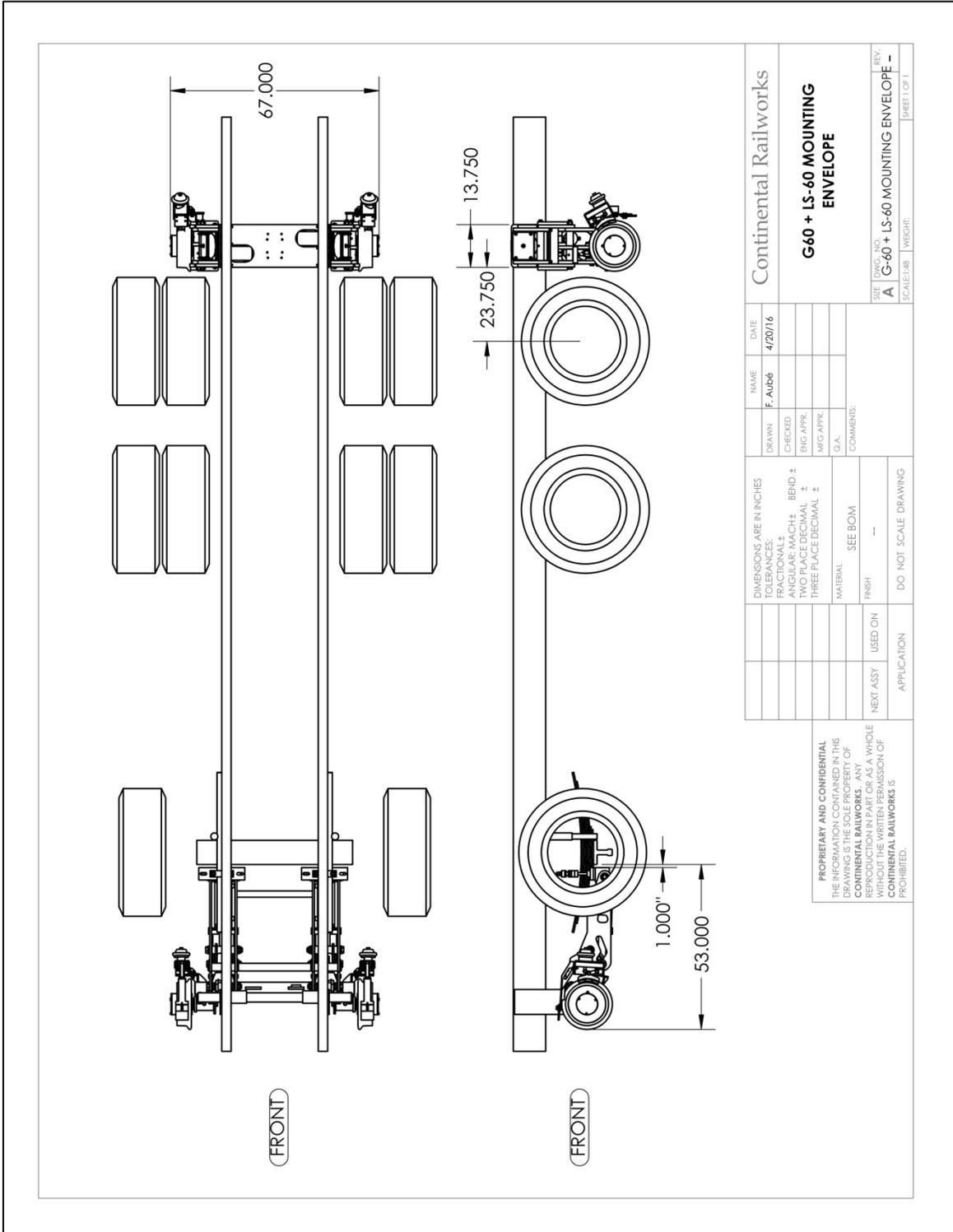
# APPENDIX 1

## BOLT TORQUE TABLE

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

# APPENDIX 2

## MOUNTING ENVELOPE

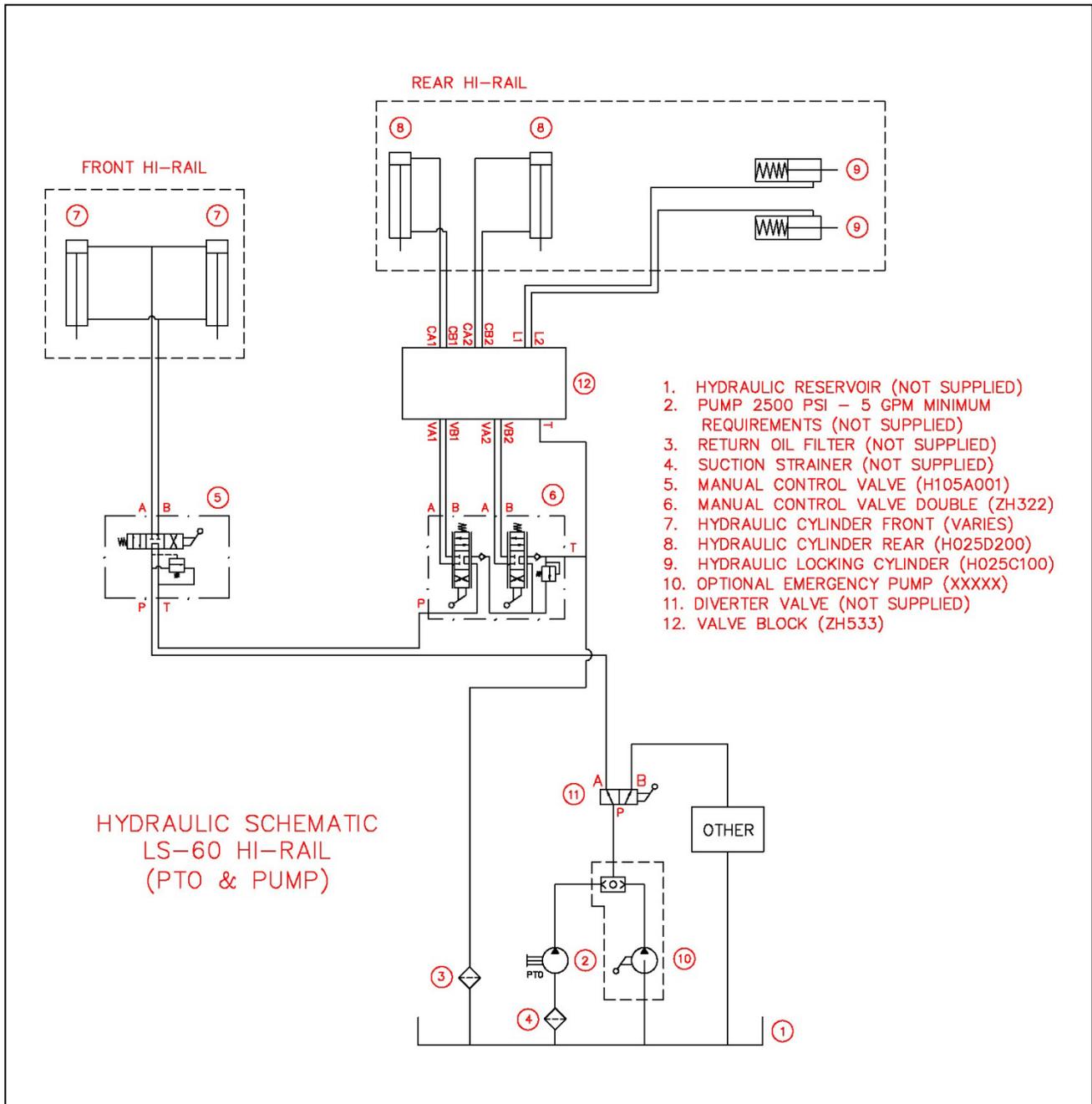


CONTINENTAL RAILWORKS		DATE	4/20/16
NAME	F. Aud6	NAME	
DRAWN		CHECKED	
ENG APPR.		MFG APPR.	
Q.A.		COMMENTS:	
DIMENSIONS ARE IN INCHES		CONTINENTAL RAILWORKS	
TOLERANCES:		G60 + LS-60 MOUNTING ENVELOPE	
FRACTIONAL ±		ENVELOPE	
ANGULAR: MACH ±	BEND ±	REV. --	
TWO PLACE DECIMAL ±		SCALE: 1/4" = 1"	
THREE PLACE DECIMAL ±		SHEET 1 OF 1	
MATERIAL	SEE BOM	WEIGHT:	
FINISH	---	REV. --	
APPLICATION	DO NOT SCALE DRAWING	SCALE: 1/4" = 1"	
NEXT ASSY	USED ON	REV. --	
<p>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.</p>			

# APPENDIX 3

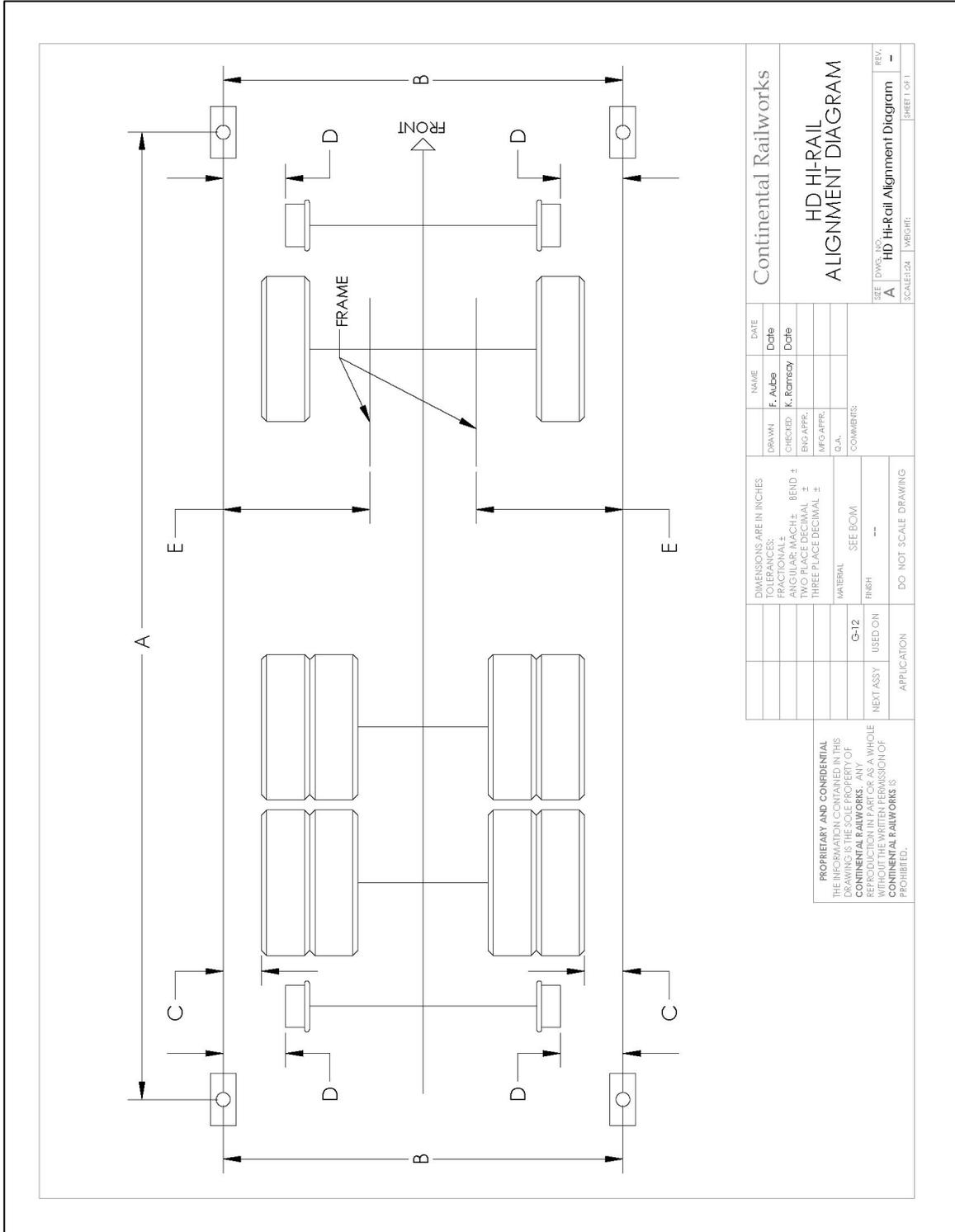
## HYDRAULIC SCHEMATICS

### PTO AND PUMP SETUP



# APPENDIX 4

## ALIGNMENT DIAGRAM



DRAWN		NAME		DATE	
CHECKED		F. Aube		Date	
ENG. APPR.		K. Ramey		Date	
MFG. APPR.					
Q.A.					
DIMENSIONS ARE IN INCHES					
TOLERANCES:					
FRACTIONAL ±					
ANGULAR: MACH ± BEND ±					
TWO PLACE DECIMAL ±					
THREE PLACE DECIMAL ±					
MATERIAL SEE BOMI					
FINISH ---					
DO NOT SCALE DRAWING					
NEXT ASSY		APPLICATION		USED ON	
				G-12	

Continental Railworks  
 HD HI-RAIL  
 ALIGNMENT DIAGRAM

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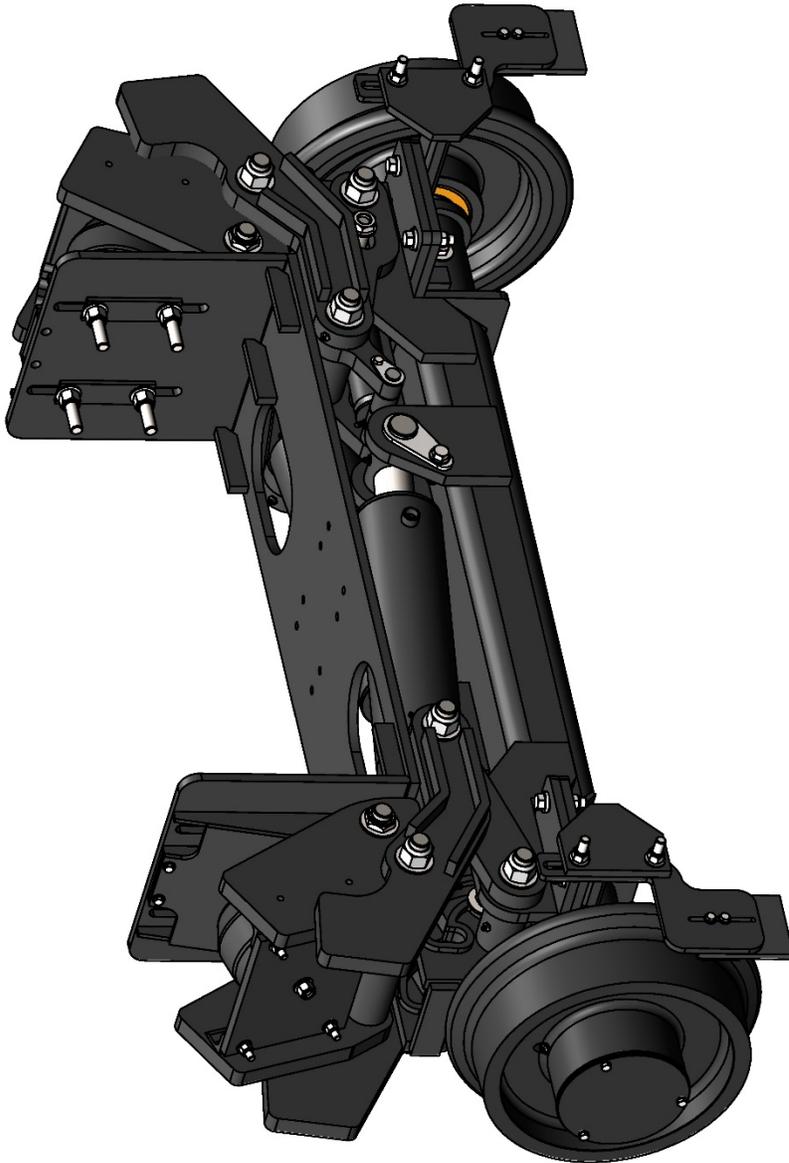
SEE DWG. NO. HD Hi-Rail Alignment Diagram  
 SCALE: 1/2" = 1'-0" WEIGHT: SHEET 1 OF 1



# APPENDIX 8

## REAR LS-60D (WITHOUT BRAKES) DRAWINGS

NOTE - Some components may differ slightly from drawings shown.

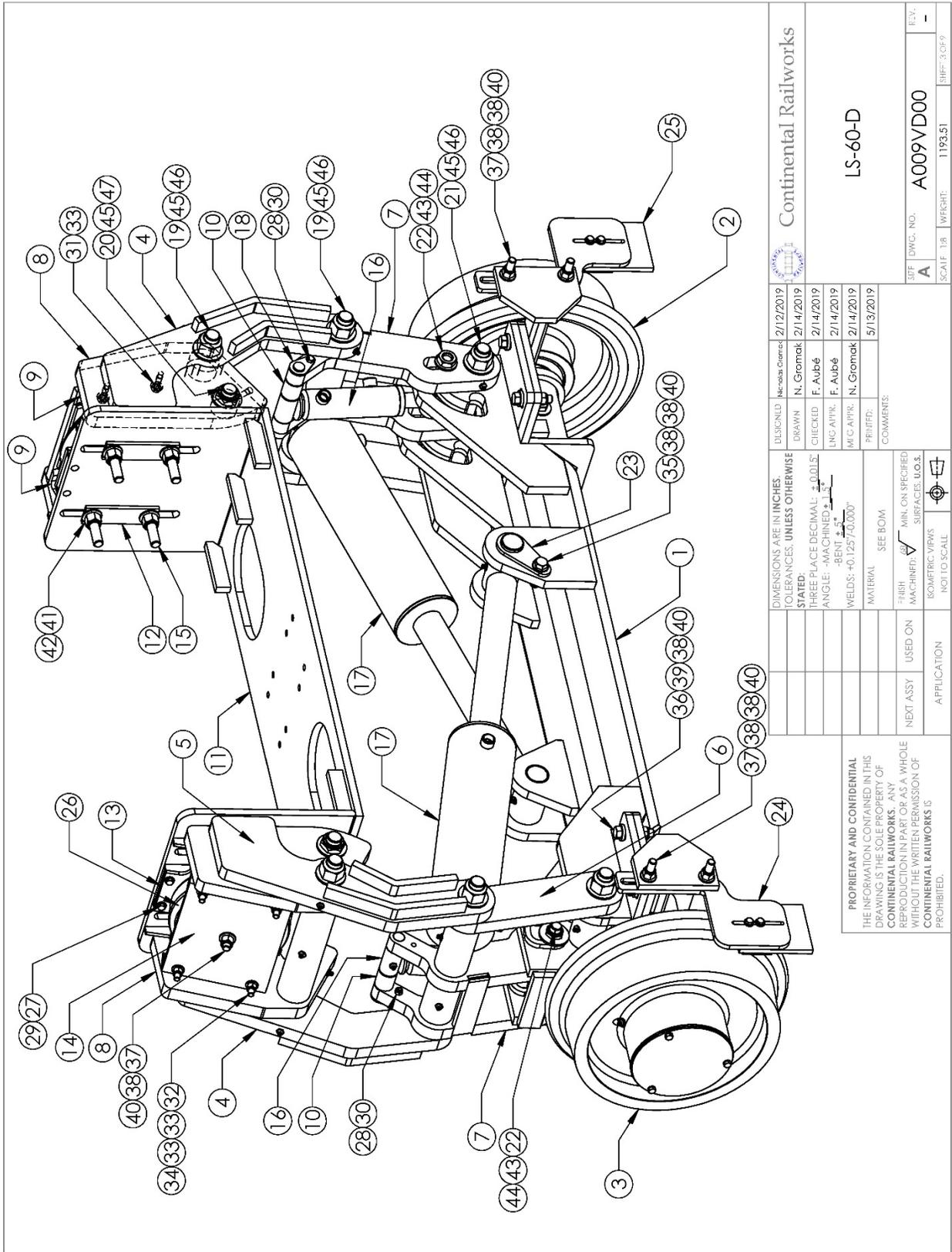


		Continental Railworks	
		LS-60-D	
DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: $\pm 0.015"$ ANGLE: MACHINED $\pm 1.5"$ BERT $\pm 1.5"$ WELDS: $\pm 0.125 / \pm 0.000"$		DESIGNED: 2/12/2019	INCHES: 2/12/2019
MATERIAL: SEE BOM		DRAWN: N. Gromak	2/14/2019
*FIBER MACHINED: MIN. ON SPECIFIED SURFACES: U.O.S.		CHECKED: F. Aubé	2/14/2019
ISOMETRIC VIEWS NOT TO SCALE		ENG. APPR.: F. Aubé	2/14/2019
APPLICATION: NEXT ASSY		MFG. APPR.: N. Gromak	2/14/2019
USED ON:		PERITFD: 5/13/2019	COMMENTS:
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 Continental Railworks		DATE	2/12/2019	DESIGNED	Nicolas Gromak
		DWG. NO.	A009VD00	DRAWN	N. Gromak
LS-60-D		REV.	-	CHECKED	F. Aubé
		SCALE	1:8	ENG APPR.	F. Aubé
A009VD00		WEIGHT	1193.51	MIC APPR.	N. Gromak
		SHEET	2 OF 9	PRINTED	5/13/2019
COMMENTS:					
DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED:					
THREE PLACE DECIMAL: ±.0015"					
ANGLE: MACHINED ±.1°					
BEAT ±.2°					
WELDS: ±0.125/±0.000"					
MATERIAL: SEE BOM					
FINISH: MIN. ON SPECIFIED SURFACES, U.O.S.					
BOMETRIC VIEWS: NOT TO SCALE					
NEXT ASSY	USED ON				
APPLICATION					
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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 CYLINDER 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

Continental Railworks

LS-60-D

REV: -  
 DWG. NO. A009VD00  
 SHEET 1 OF 2

DATE	2/12/2019	DESIGNED	N. Gromok
DRAWN	2/14/2019	CHECKED	F. Aubé
LANG. ATTK.	2/14/2019	LANG. ATTK.	F. Aubé
DATE	2/14/2019	DATE	2/14/2019
DATE	2/14/2019	DATE	2/14/2019

DIMENSIONS ARE IN INCHES TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±.0015" ANGLE: MACHINED ±.1° BEAT ±.5° WELDS: ±0.125/±0.000" MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED SURFACES, U.O.S. BOMETRIC VIEWS NOT TO SCALE	DIMENSIONS ARE IN INCHES TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±.0015" ANGLE: MACHINED ±.1° BEAT ±.5° WELDS: ±0.125/±0.000" MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED SURFACES, U.O.S. BOMETRIC VIEWS NOT TO SCALE
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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



**Continental Railworks**

**LS-60-D**

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

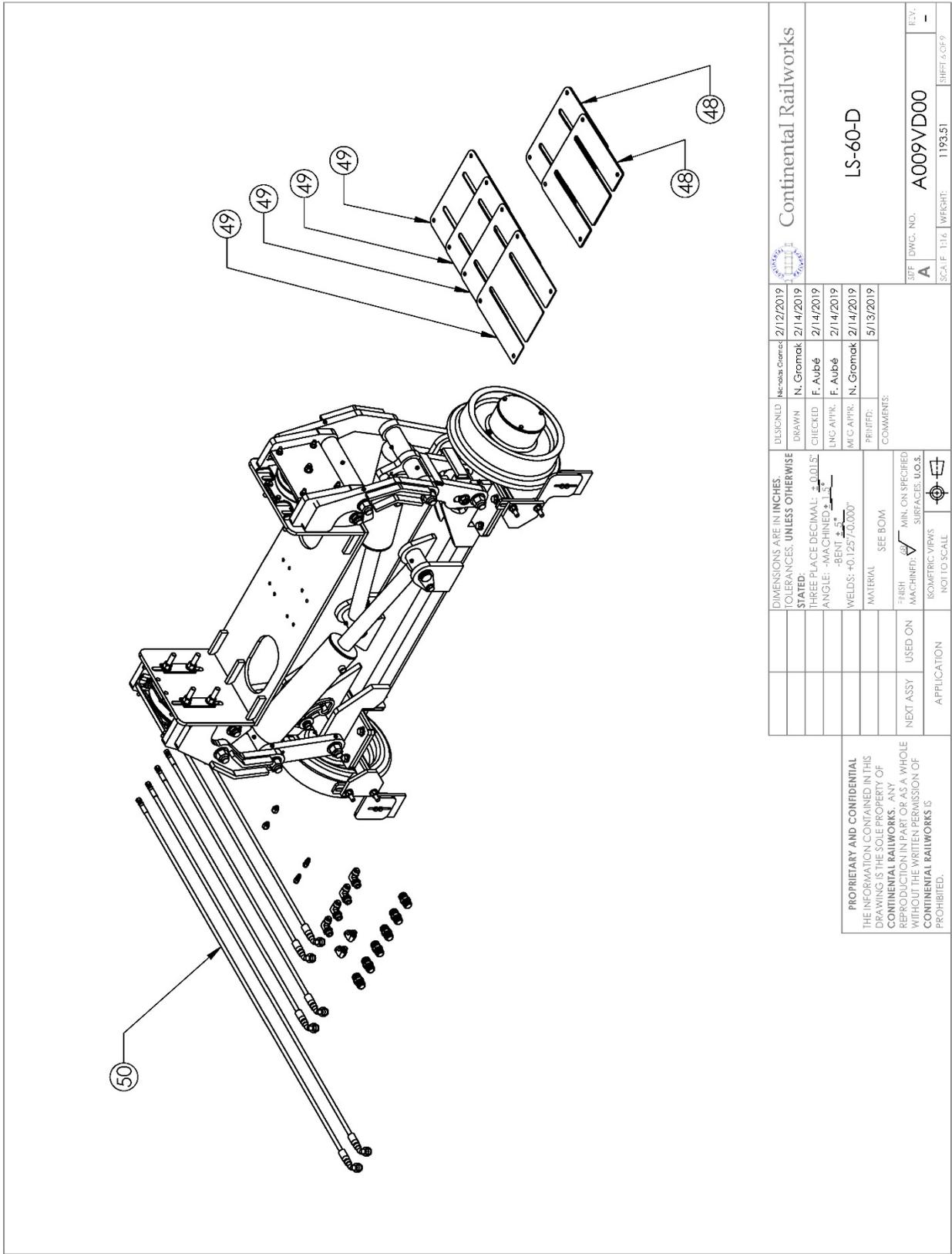
REVISIONS:  
 REV. -  
 A009VD00  
 WEIGHT: 1193.51  
 SHEET 5 OF 9

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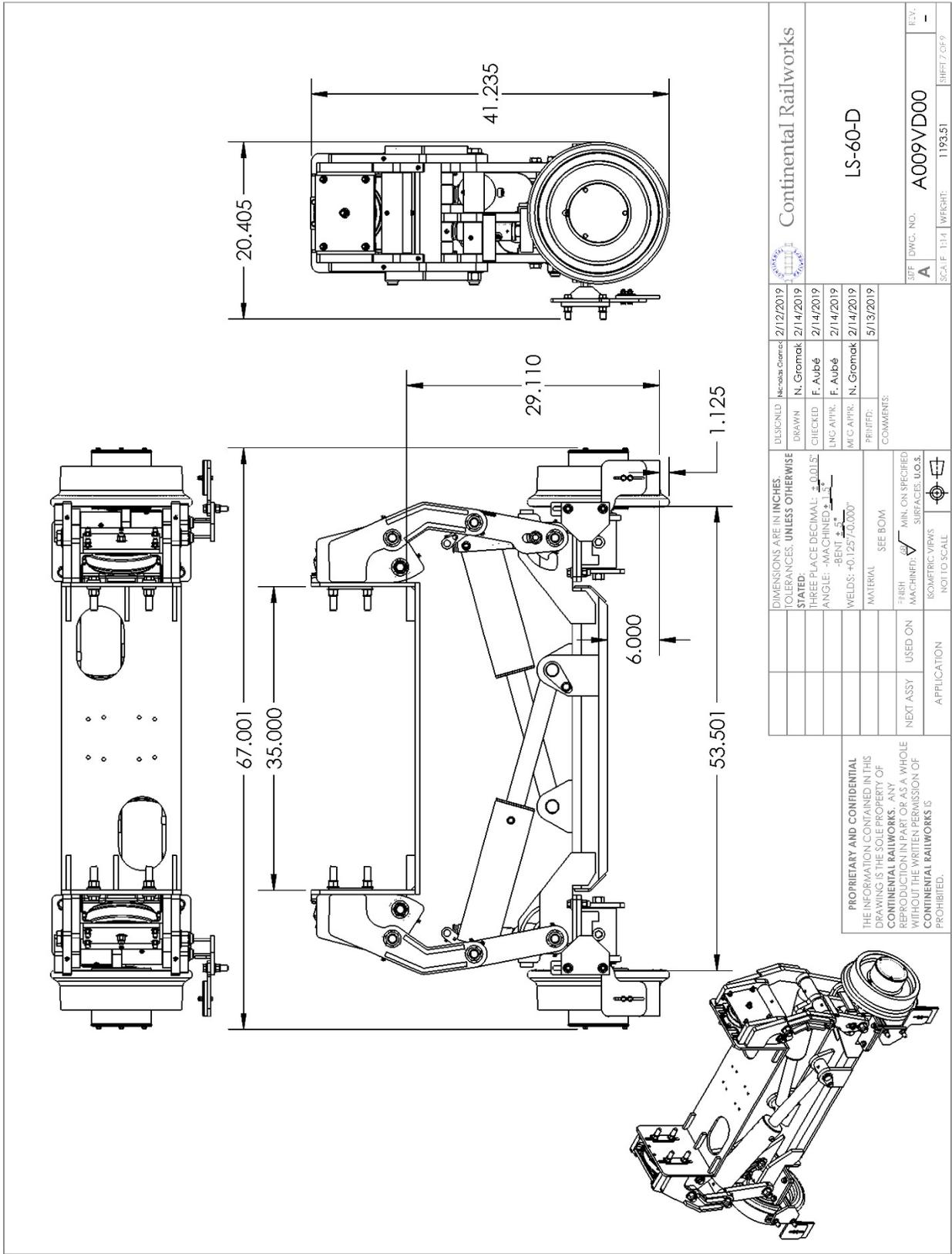
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 ANGLE: MACHINED ±.1°  
 BEAT ±.5°  
 WELDS: ±0.125/±0.000"  
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 FINISH: MIN. ON SPECIFIED SURFACES, U.O.S.  
 BOM: METRIC VIEWS NOT TO SCALE

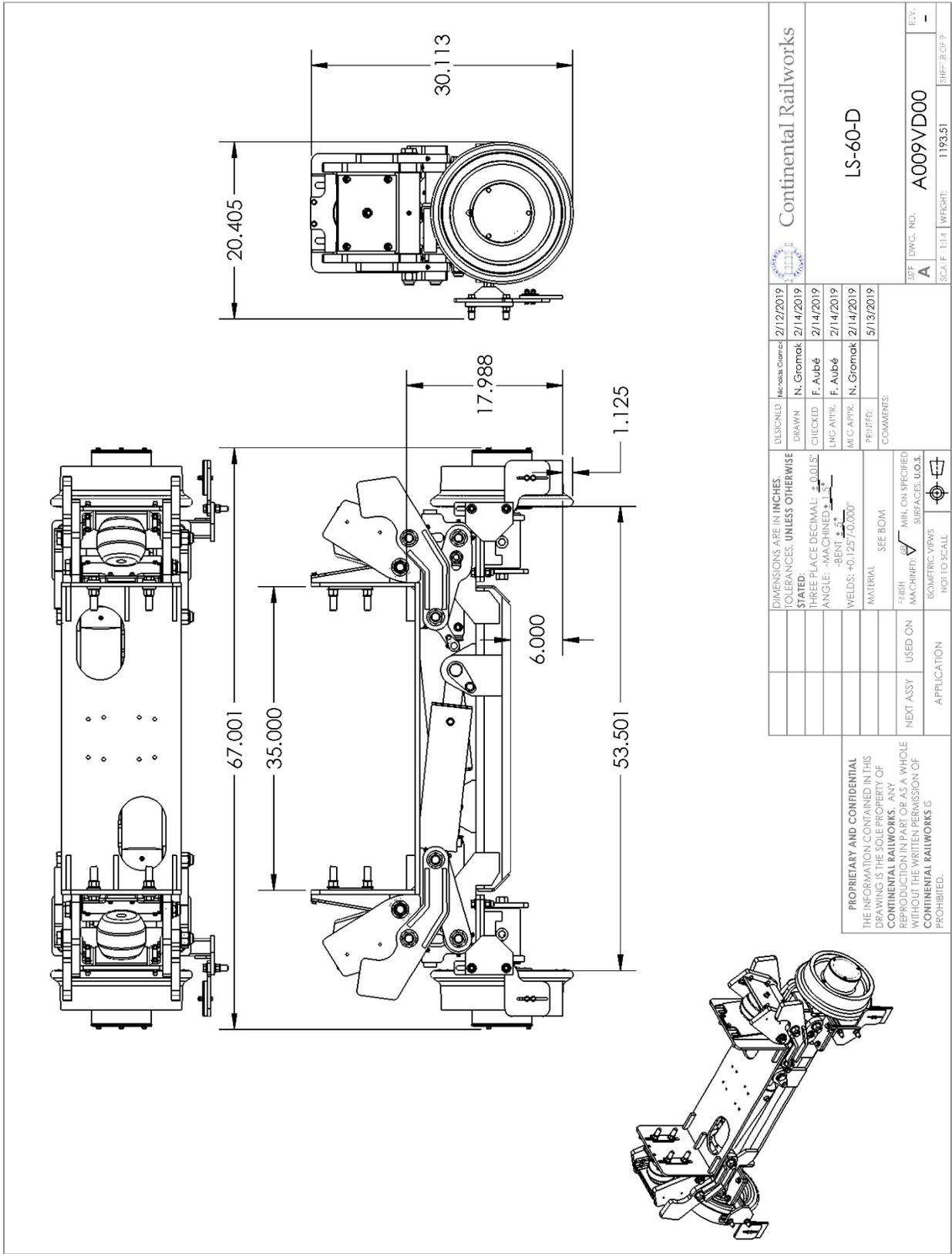
APPLICATION

NEXT ASSY USED ON



		<b>Continental Railworks</b>	
		<b>LS-60-D</b>	
DATE: <b>A</b> DWG. NO.: <b>A009VD00</b> SCA. F. 1:16   WEIGHT: 1193.51   SHEET A OF 9	DESIGNED: <b>N. Gromak</b> DRAWN: <b>N. Gromak</b> CHECKED: <b>F. Aubé</b> ENG. APPROV.: <b>N. Gromak</b> PRINTED: <b>5/13/2019</b>	DATE: <b>2/12/2019</b> DRAWN: <b>2/14/2019</b> CHECKED: <b>2/14/2019</b> ENG. APPROV.: <b>2/14/2019</b> PRINTED: <b>5/13/2019</b>	REVISIONS: REV. <b>-</b>
DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: $\pm 0.015$ ANGLE: MACHINED $\pm 1^\circ$ BENT $\pm 0.5^\circ$ WELDS: $\pm 0.125/40000$ MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED SURFACES. U.O.S. ISOMETRIC VIEWS: NOT TO SCALE	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:	COMMENTS:

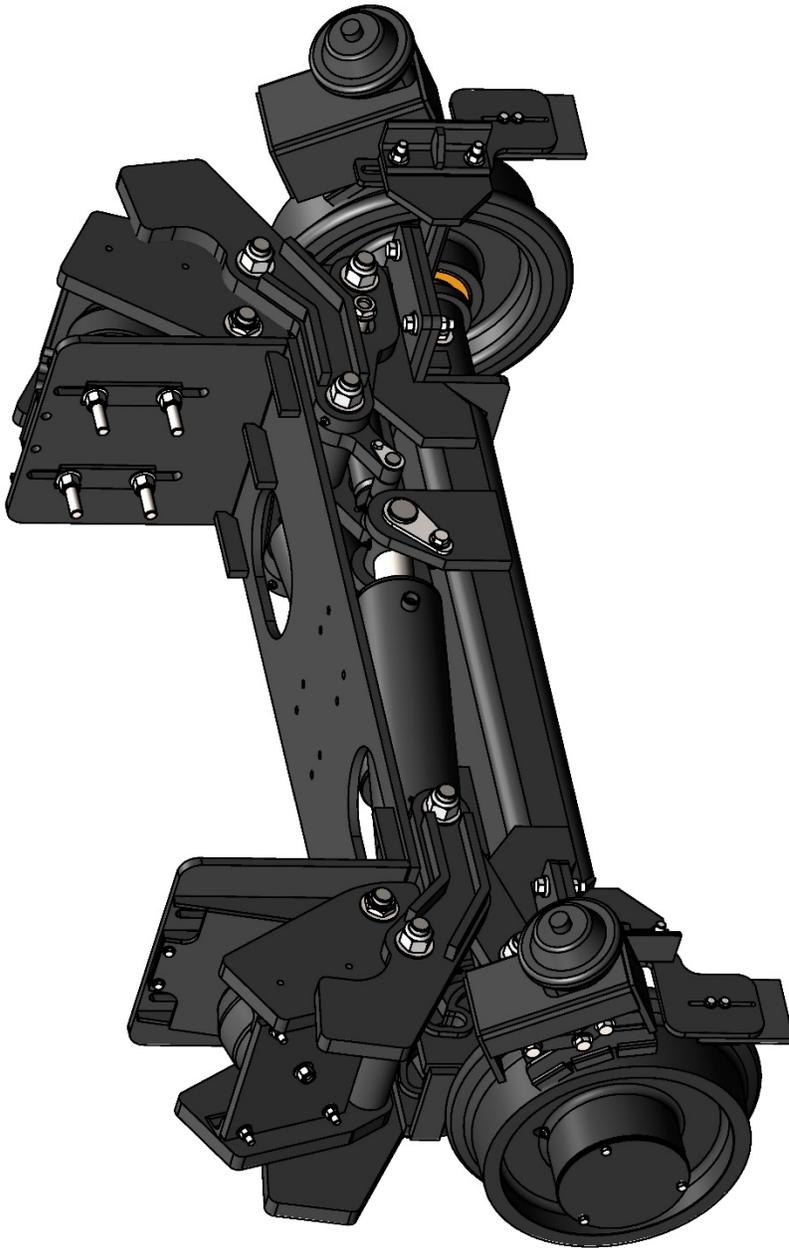




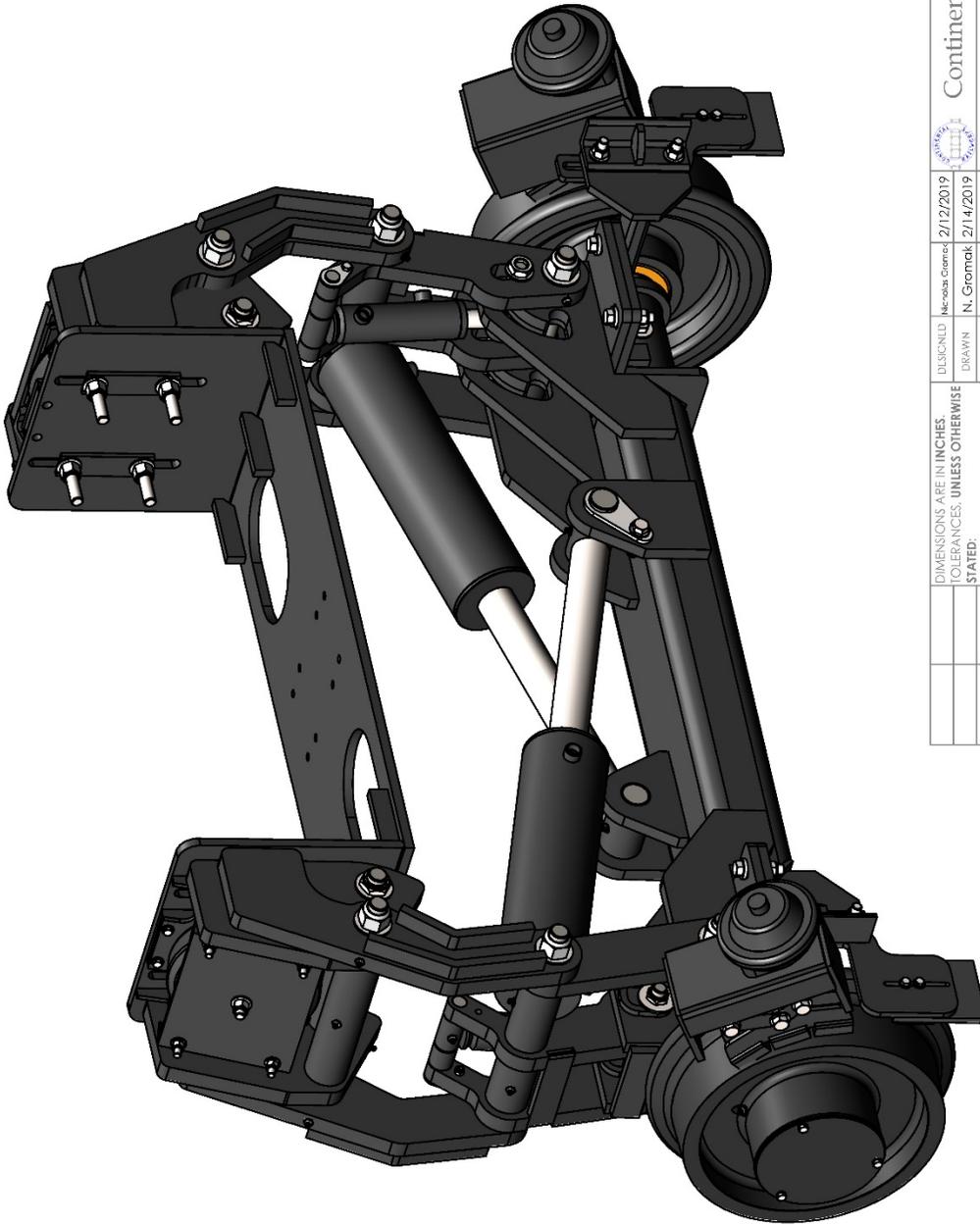
## APPENDIX 9

### **REAR LS-60D (WITH BRAKES) DRAWINGS**

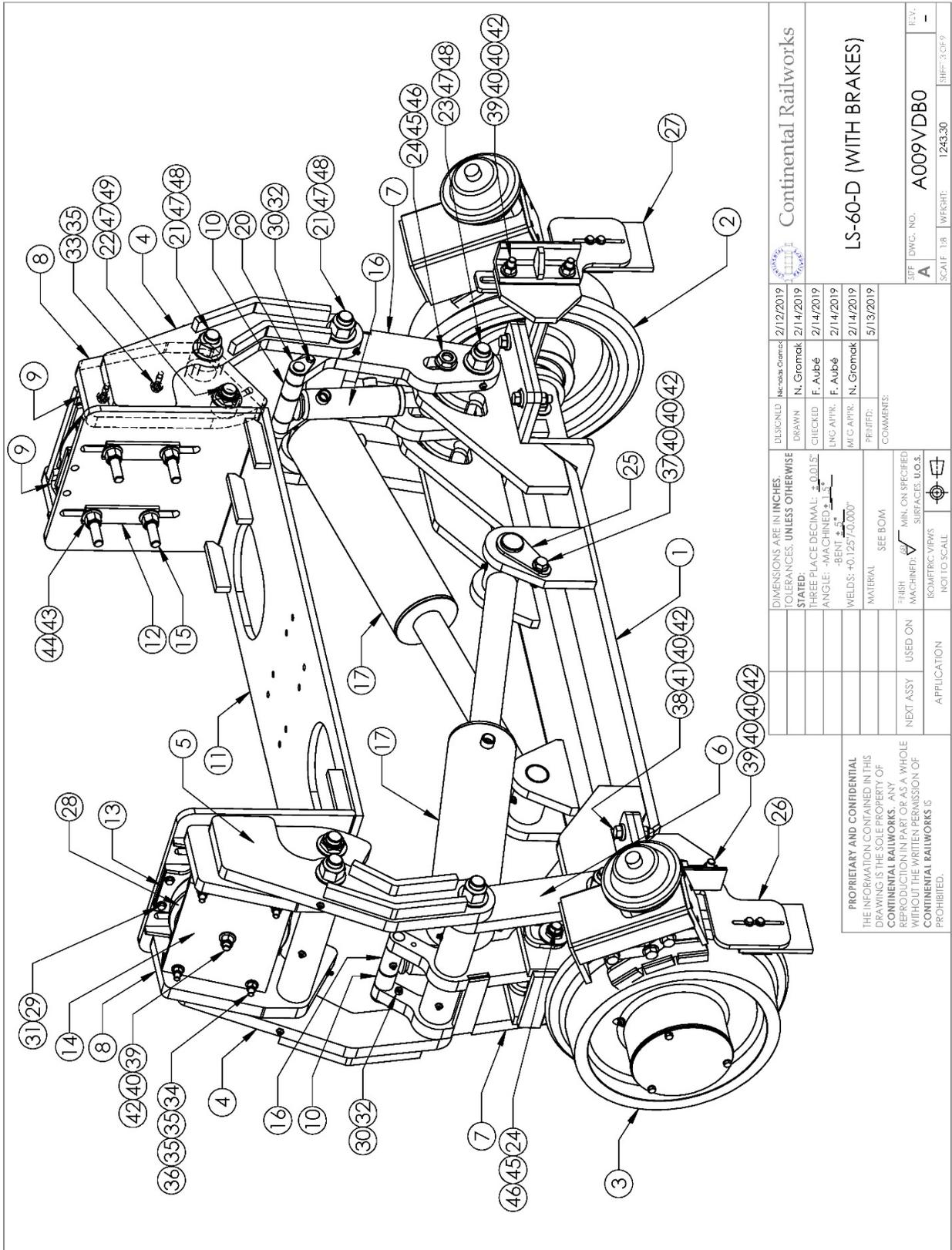
**NOTE** – Some components may differ slightly from drawings shown.



<p><b>PROPRIETARY AND CONFIDENTIAL</b>          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.</p>		<p>DESIGNED: 2/12/2019          DRAWN: N. Gromak 2/14/2019</p>		<p>DATE: 2/12/2019          CONTINENTAL RAILWORKS</p>	
		<p>CHECKED: F. Aubé 2/14/2019          ENG APPR: F. Aubé 2/14/2019          MFG APPR: N. Gromak 2/14/2019          PRINTED: 5/13/2019</p>		<p>LS-60-D (WITH BRAKES)</p>	
<p>DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED:</p>		<p>THREE PLACE DECIMAL: ±.0015"          ANGLE: MACHINED ±.1°          BENT ±.3°</p>		<p>SCALE: 1:8</p>	
<p>WELDS: +0.125/-0.000"</p>		<p>MATERIAL: SEE BOM</p>		<p>WEIGHT: 1243.30</p>	
<p>FINISH: MIN. ON SPECIFIED MACHINERY SURFACES. U.O.S.</p>		<p>USED ON NEXT ASSY</p>		<p>REV: A</p>	
<p>APPLICATION</p>		<p>NOT TO SCALE</p>		<p>SCALE: 1:8</p>	
<p>APPLICATION</p>		<p>NOT TO SCALE</p>		<p>REV: -</p>	



<p><b>PROPRIETARY AND CONFIDENTIAL</b>          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.</p>		<p>DESIGNED: 2/12/2019          DRAWN: N. Gromak 2/14/2019</p>		<p>Continental Railworks</p>	
		<p>CHECKED: F. Aubé 2/14/2019          ENG APPR: F. Aubé 2/14/2019          MFG APPR: N. Gromak 2/14/2019          PRINTED: 5/13/2019</p>		<p>LS-60-D (WITH BRAKES)</p>	
<p>DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED:</p>		<p>THREE PLACE DECIMAL: ±.0015"          ANGLE: MACHINED ±.1°          BENT ±.3°</p>		<p>REV: A</p>	
<p>WELDS: +0.125/-0.000"</p>		<p>MATERIAL: SEE BOM</p>		<p>SCALE: 1:8 WEIGHT: 1243.30</p>	
<p>FINISH: MIN. ON SPECIFIED MACHINERY SURFACES. U.O.S.</p>		<p>NOT TO SCALE</p>		<p>DRG. NO. A009VDB0</p>	
<p>USED ON</p>		<p>APPLICATION</p>		<p>SHEET 2 OF 9</p>	



		<b>Continental Railworks</b>	
<b>LS-60-D (WITH BRAKES)</b>			
DATE: 2/12/2019 DRAWN: N. Gromak CHECKED: F. Aubé ENG APPR: N. Gromak PRINTED: 5/13/2019	REVISIONS: 2/12/2019 2/14/2019 2/14/2019 2/14/2019 5/13/2019	DIMENSIONS ARE IN INCHES TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±.0015" ANGLES: MACHINED ±.1° BENT ±.2° WELDS: +0.125/±0.000" MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED MACHINERY SURFACES, U.O.S. USED ON: <input type="checkbox"/> NEXT ASSY APPLICATION: <input type="checkbox"/>	DWG. NO.: <b>A009VDB0</b> WEIGHT: 1243.30 SHEET: 3 OF 9
<p> <b>PROPRIETARY AND CONFIDENTIAL</b>          THE INFORMATION CONTAINED IN THIS          DRAWING IS THE SOLE PROPERTY OF  <b>CONTINENTAL RAILWORKS</b>. ANY          REPRODUCTION IN PART OR AS A WHOLE          WITHOUT THE WRITTEN PERMISSION OF  <b>CONTINENTAL RAILWORKS</b> IS          PROHIBITED.       </p>			



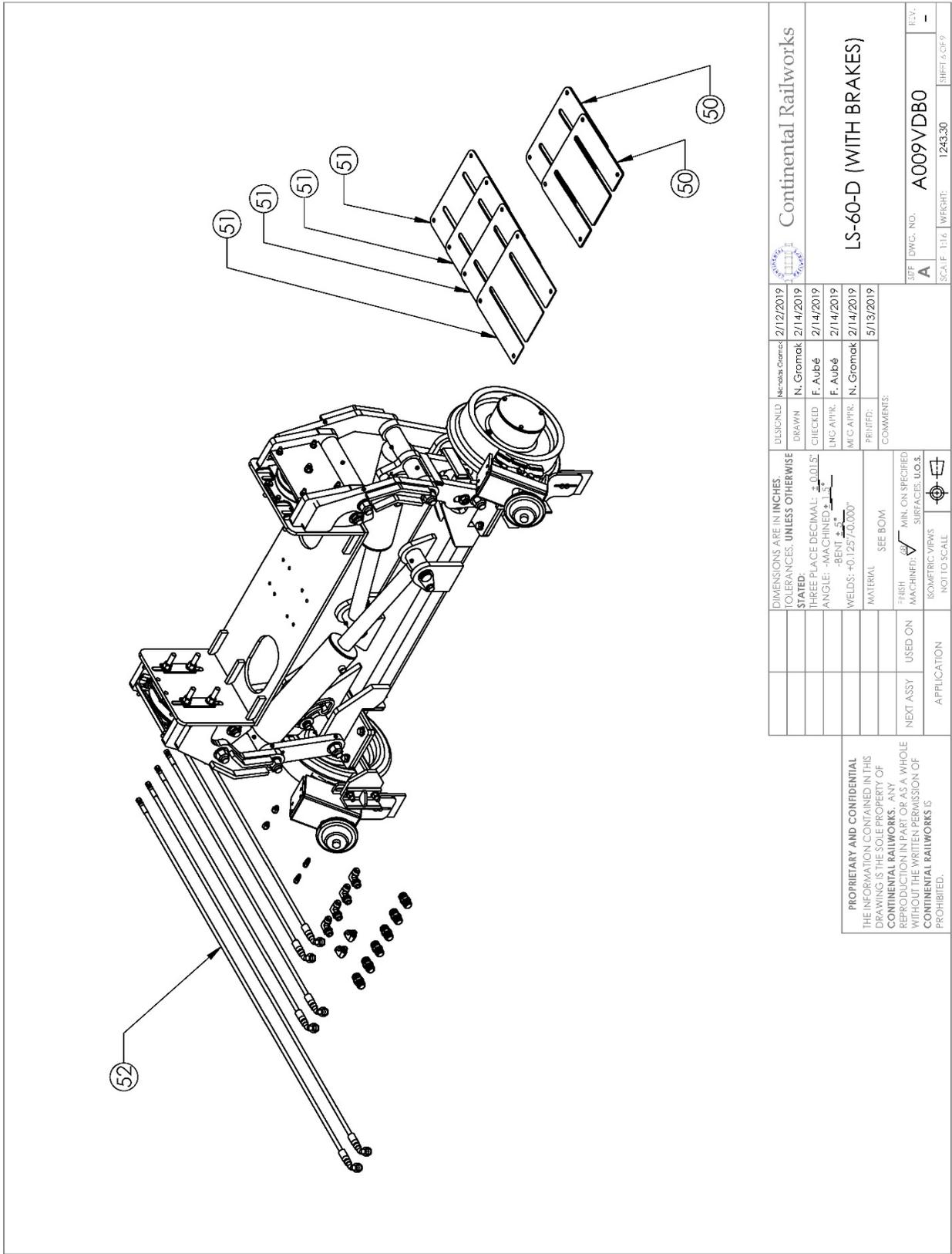
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
29		1/4" UNC GR.8 BOLT x 1.000" LONG	8
30		1/4" UNC GR.8 BOLT x 1.500" LONG	2
31		1/4" FLAT WASHER	8
32		1/4" UNC LIGHT NYLON INSERT LOCKNUT	2
33		3/8" UNC GR.8 BOLT x 1.000" LONG	8
34		3/8" UNC GR.8 BOLT x 1.750" LONG	8
35		3/8" FLAT WASHER	24
36		3/8" UNC GR.8 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


**Continental Railworks**  
**LS-60-D (WITH BRAKES)**

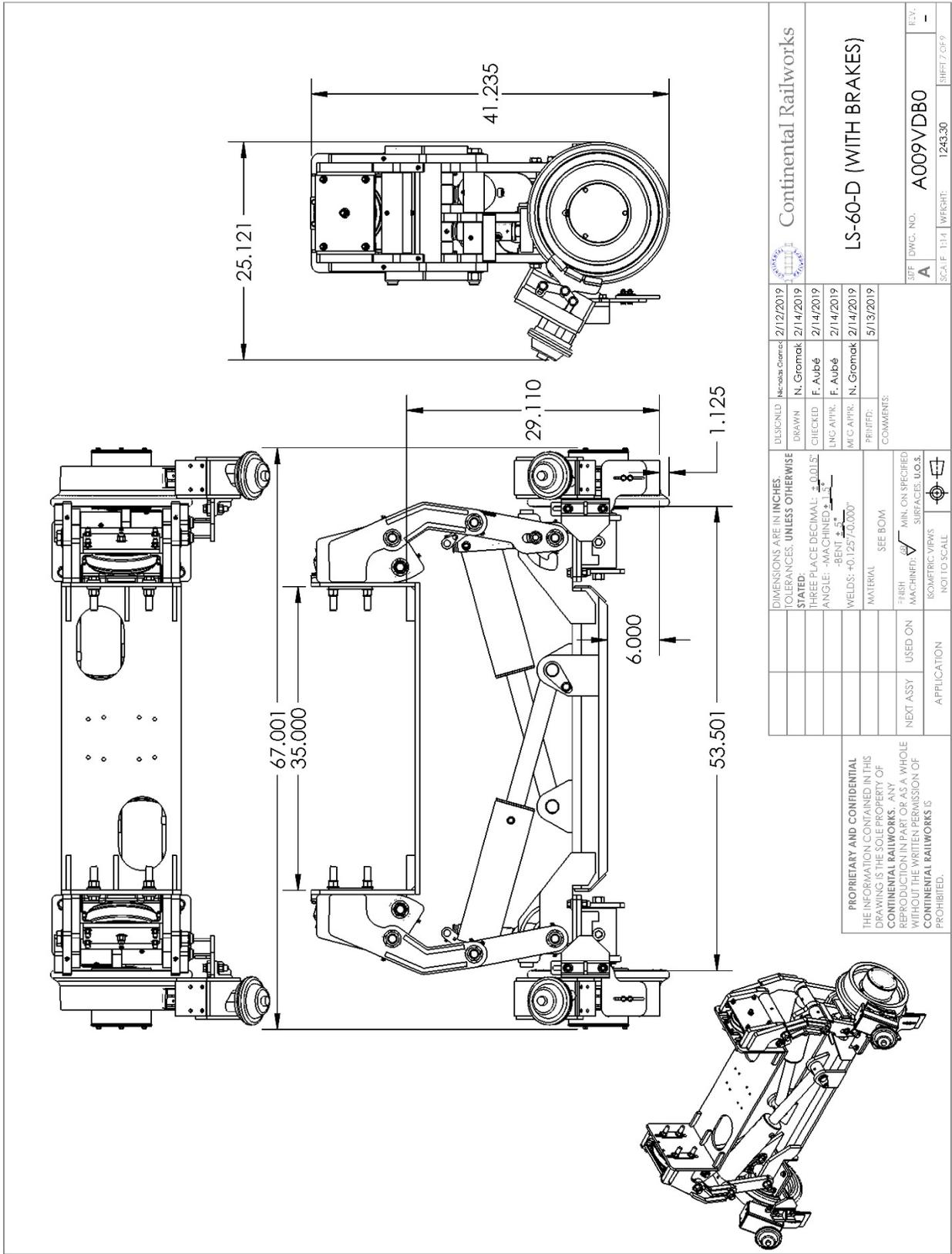
DIMENSIONS ARE IN INCHES TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±.0015" ANGLE: MACHINED ±.1° BEAT ±.1° WELDS: ±0.125/±0.000" MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED MACHINERY SURFACES. U.O.S. USED ON: <input type="checkbox"/> NEXT ASSY <input type="checkbox"/> APPLICATION	DISCLOSED DRAWN: N. Gromak CHECKED: F. Aubé ENG APPR: F. Aubé MFG APPR: N. Gromak PRINTED: 5/13/2019 COMMENTS:	RELEASED DATE: 2/12/2019 DRAWN: N. Gromak CHECKED: F. Aubé ENG APPR: F. Aubé MFG APPR: N. Gromak PRINTED: 5/13/2019 COMMENTS:
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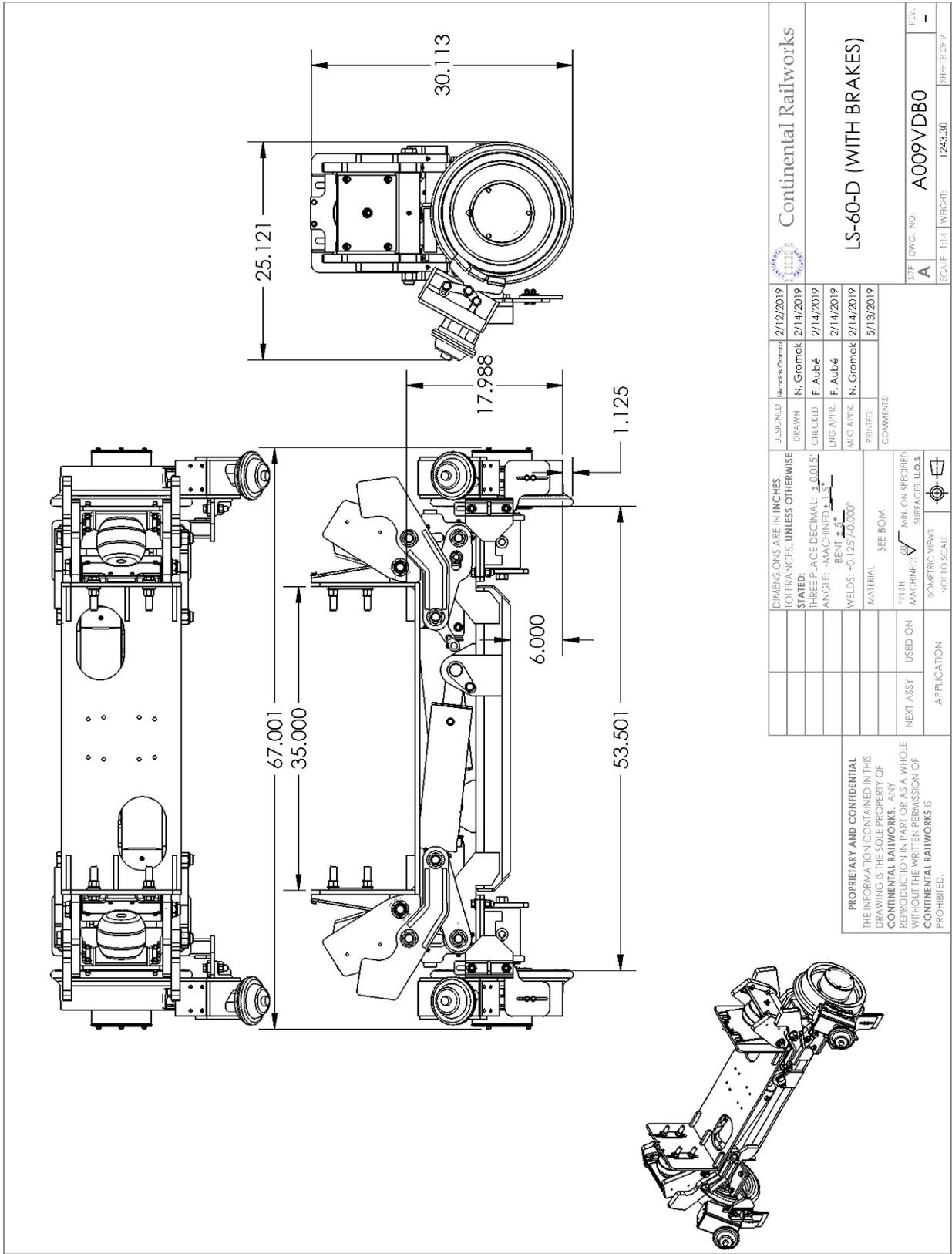
PROPRIETARY AND CONFIDENTIAL  
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 CONTINENTAL RAILWORKS. ANY  
 REPRODUCTION IN PART OR AS A WHOLE  
 WITHOUT THE WRITTEN PERMISSION OF  
 CONTINENTAL RAILWORKS IS  
 PROHIBITED.

DWG. NO.: <b>A009VDB0</b> SCALE: 1:8 WEIGHT: 1243.30 SHEET 5 OF 9	REV: -
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		2/12/2019		DESIGNED DRAWN CHECKED ENG APPR. MFG APPR. PRINTED:	2/12/2019		N. Gromak F. Aubé F. Aubé N. Gromak	2/14/2019		COMMENTS:	SHEET NO. <b>A</b> DWG. NO. <b>A009VDB0</b> SCA. F. 1:16 WEIGHT: 1243.30 SHEET A OF 9
		2/14/2019			2/14/2019			2/14/2019			
DIMENSIONS ARE IN INCHES. TOLERANCES, UNLESS OTHERWISE STATED: THREE PLACE DECIMAL: ±.0015" ANGLE: MACHINED ±.1° BENT ±.2° WELDS: +0.125/-0.000" MATERIAL: SEE BOM FINISH: MIN. ON SPECIFIED MACHINERY SURFACES. U.O.S. BOMETRIC VIEWS: NOT TO SCALE											
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											





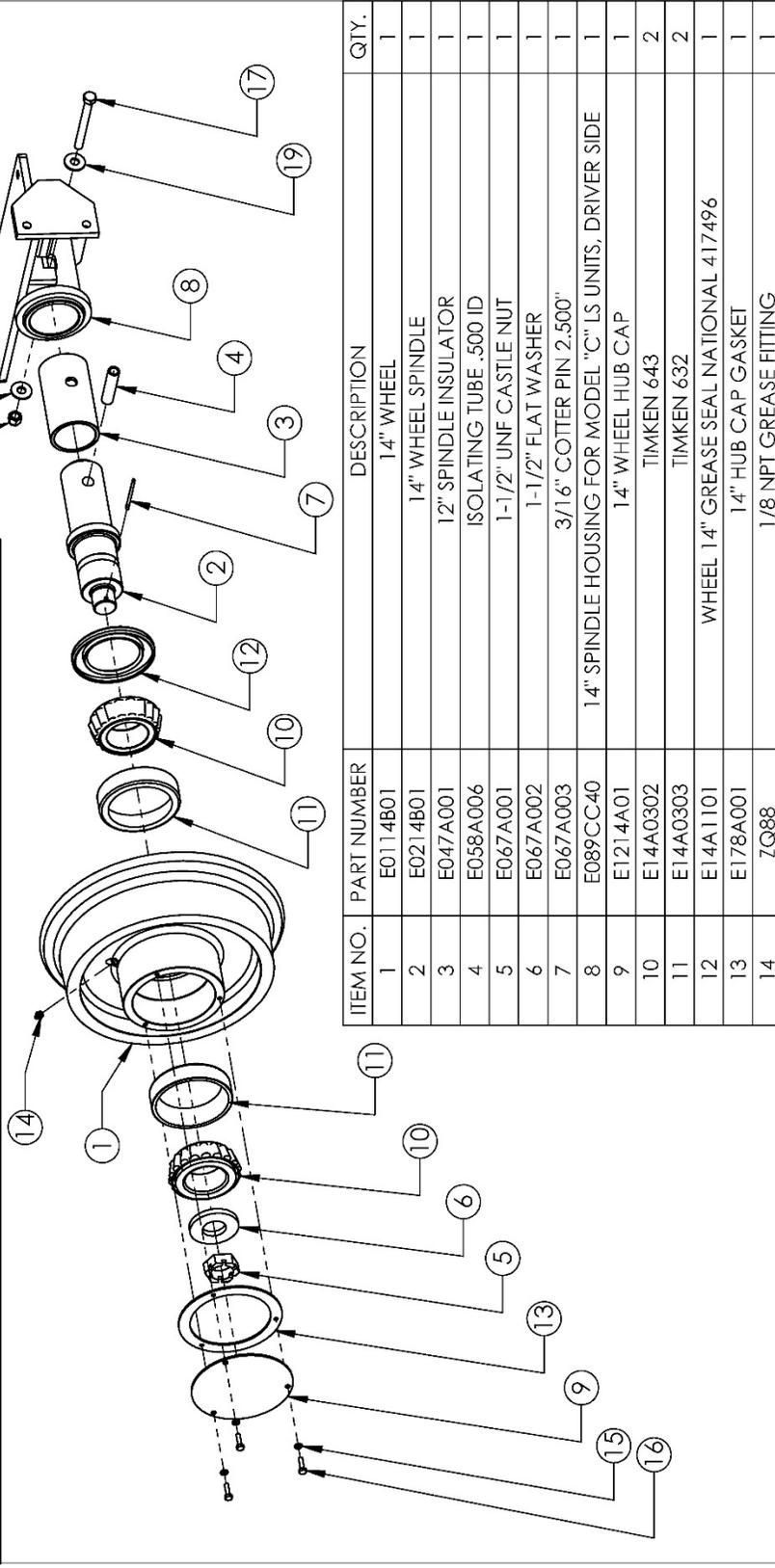
## APPENDIX 10

### **LS-60D 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

DIMENSIONS ARE IN INCHES.  
 TOLERANCES, UNLESS OTHERWISE STATED:  
 HOLE:  $\pm 0.015"$   
 SHAFT:  $\pm 0.015"$   
 ANGLE: MAX CHAMFER  $1:2$   
 BEND:  $R = 0.125$   
 WELDS:  $\pm 0.125$  (70,000)  
 MATERIAL: SEE BOM  
 FINISH: MIN. ON SPECIFIED MACHINED SURFACES, U.O.S.  
 BOWLING: MILWS  
 NOT TO SCALE

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

Continental Railworks  
 DRIVER SIDE LS SPINDLE ASSEMBLY FOR "C" MODELS

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APPLICATION: NEXT ASSY USED ON

SHEET NO. **A** | DWG. NO. **E009EC40** | REV. **-**  
 SCALE: 1:10 | WEIGHT: 188.98 | SHEET 1 OF 2

APPENDIX 11

**PACKING LIST**