

CONTINENTAL RAILWORKS



MANUAL

INSTALLATION – OPERATION – PARTS – SERVICE

MODEL G-35 HI-RAIL UNIT

(26,000 to 39,000 lbs GVWR TRUCKS)

September 2018
Revision 5

CONTINENTAL RAILWORKS
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INTRODUCTION

The following installation, operation, parts, and service manual has been prepared to be used with the Continental Railworks model **G-35** hi-rail unit on a 26,000 to 39,000 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**, faxing **(514) 956-0737** or emailing **admin@continentalrailworks.com**. Support personnel are frequently available during off-peak hours as well, so please do not hesitate to call or fax 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 G-35 is designed for single axle heavy trucks with a GVWR between 26,000 and 39,000 lbs. For this application, the G-35 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 12" 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 rear unit improves ride quality on rail and contributes 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). Traction is adjustable by preloading the rear rubber suspension.

The combined weight of the G-35 hi-rail, mounting plates and all necessary valves is approximately 1855 lbs.

OPTIONS

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

REAR AIR BRAKES

Front air brakes are standard on all G-35 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 4300-4400
 Freightliner M2-108SD
 Ford F750
 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 custom front hi-rail mounting components for each chassis, in order to achieve proper ground clearance and penetration (lift-off). The installer is responsible for measuring the chassis and filling up a Chassis Dimension Sheet so the components can be designed and manufactured.

Note that because of the different chassis types onto which the G-35 mounts, that components shown in this manual may not exactly reflect what is delivered, but the installation is the same.

CHASSIS PREPARATION

- 1- 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.
- 2- Remove the frame mounted tow hooks. Tow hooks may be reinstalled at the end of the front hi-rail installation.
- 3- Remove the frame mounted bumper brackets. Reinstall at the end of the front hi-rail installation if required.
- 4- Disconnect the truck batteries.
- 5- 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 SPRING BRACKETS

Spring brackets are selected and manufactured after receiving the chassis dimensions, so that the proper height is achieved for ground clearance and penetration.

- 1- Remove the pin and bushing assembly from the spring bracket assembly mounted to the rear of the hi-rail.
- 2- Raise the hi-rail in position to install the spring bracket assembly onto the chassis leaf spring and reinstall the bushing assembly and pin above the leaf springs.

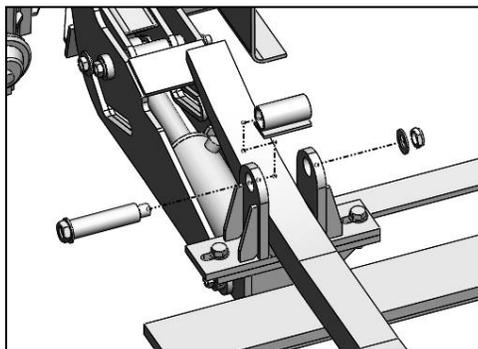


Figure 1: Installation of Spring Bracket Assembly

- 3- The spring bracket may need to be shimmed between the bottom of the bracket and the underside of the leaf spring. Ensure a tight fit around the thickness of the leaf springs. It is recommended to shim with a capped section of 4"x4" HSS tubing cut to the right height, or with solid flat bars stacked and welded together.

Note – Welding on the leaf springs is not recommended or allowed by the chassis manufacturer. The added shims can be welded to the spring brackets.

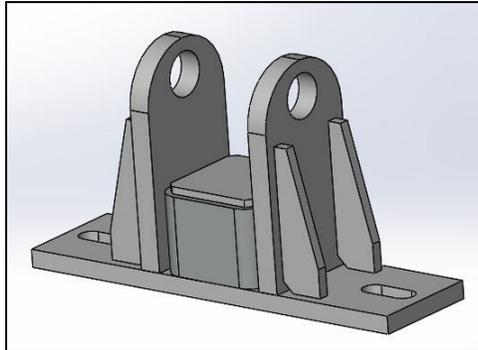


Figure 2: HSS Tube Shim Under Leaf Springs

- 4- The spring bracket needs to be installed 1" ahead of the axle (if the shock absorber is behind the axle) or 1" ahead of the shock absorber (if shock absorber is ahead of the axle).

Note – Special applications or chassis models may require a distance greater than 1" between the spring bracket and the axle or shock absorber. Special instructions will be supplied if it applies.

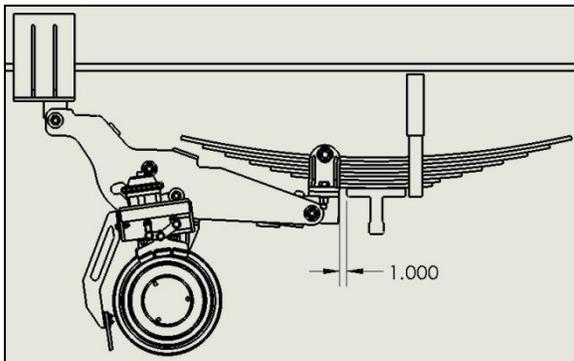


Figure 3: Shock Absorber Behind Axle

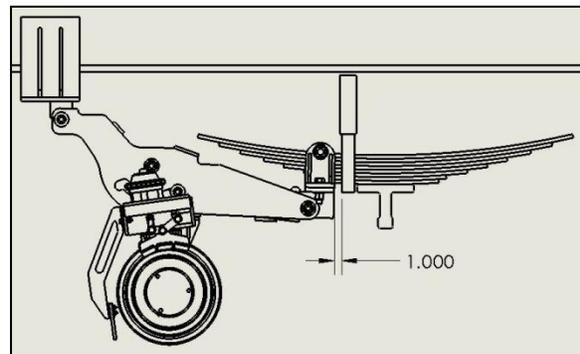


Figure 4: Shock Absorber Ahead of Axle

FRONT MOUNTING BRACKETS

Front mounting plates are selected and manufactured after receiving the chassis dimensions, so that the proper height is achieved for ground clearance and penetration.

Front mounting brackets can take many forms, but are all designed to transfer the load (while the truck is on rail) to the underside of the frame extensions. Shown below are two of the most common types of front mounting brackets:

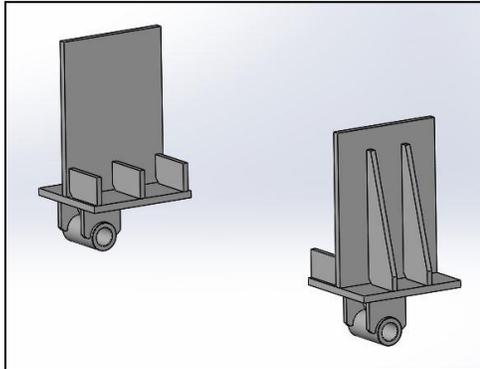


Figure 5: Narrow Frame Mounting Brackets

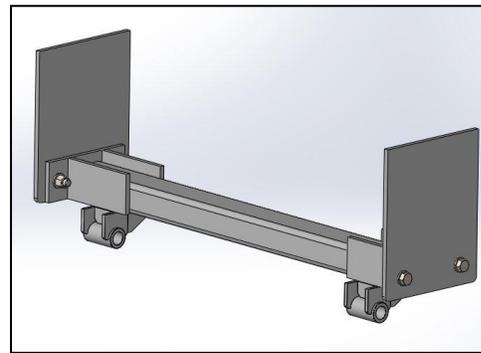


Figure 6: Wide Frame Mounting Brackets

- 1- With the spring brackets secured to the leaf springs in the proper location, raise the front of the hi-rail unit so the front mounting brackets make contact with the underside of the frame extensions.
- 2- Ensure the mounting brackets make contact with the bottom of the frame extensions, then clamp in place and mark holes for securing, using the provided 5/8" Grade 8 bolts, washers and stover nuts. Use 4 bolts per side.



Figure 7: Front Mounting Bracket Secured to Frame Extension

- 3- Torque bolts adequately. Refer to the Bolt Torque Table in the Appendices.
- 4- If required, trim or cut the unused portion of front frame extensions.
- 5- If required, reinstall the front bumper mounts, front bumper and tow hooks.

REAR UNIT INSTALLATION

REAR MOUNTING PLATES

The rear mounting plates are manufactured to adapt to different chassis heights through added shims. Measuring the chassis height and following the tables below will provide proper deployment height for adequate traction and adjustability.

The rear mounting plates are specific to driver and passenger sides, with the spring support plate always pointing towards the front of the vehicle.

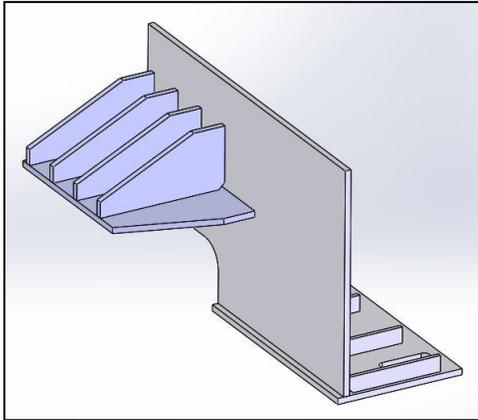


Figure 8: Driver Side Rear Mounting Plate

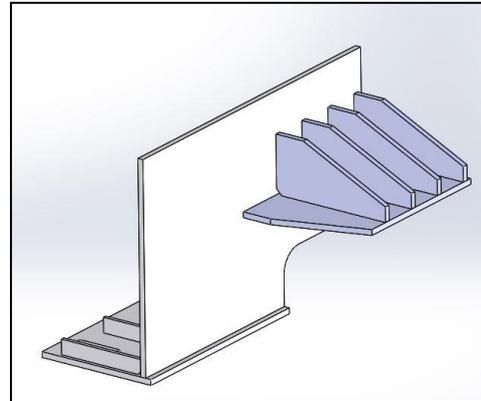


Figure 9: Passenger Side Rear Mounting Plate

- 1- If installed, remove the rear mounting plates from the hi-rail assembly and conserve hardware.
- 2- Measure the distance from the ground to the underside of the vehicle frame where the rear mounting plates will be installed (front edge at 34" from center of the rear axle as explained below).
- 3- The mounting plates supplied are designed for an empty vehicle (no body or crane) with a 30" frame height. Any frame height higher than 30" will require shims to be installed between the mounting plates and the underside of the frame rails. Solid flat bar are to be used for shims. Refer to the tables below for shim thicknesses:

BARE AND UNLADEN CHASSIS (NO BODY OR CRANE INSTALLED)		LOADED CHASSIS (BODY OR CRANE INSTALLED)	
DIMENSION UNDERSIDE OF FRAME TO GROUND	SHIM THICKNESS	DIMENSION UNDERSIDE OF FRAME TO GROUND	SHIM THICKNESS
30"	0"	28"	0"
31"	1"	29"	1"
32"	2"	30"	2"
33"	3"	31"	3"

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

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

Figure 10: Frame Height vs Shim Thickness

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.

- 4- Place the mounting plates on the chassis frame with the spring support plate pointing towards the front of the vehicle.

- 5- Position the front edge of the mounting plates at 34" from the center of the rear axle.

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.

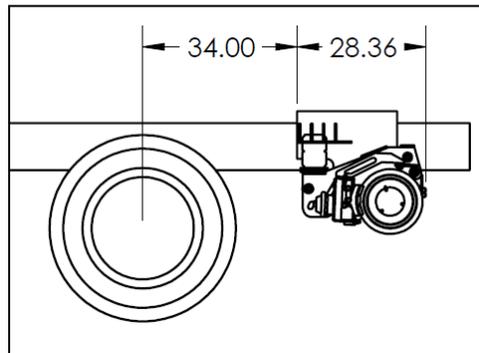


Figure 11: Location of Rear Mounting Plates

- 6- Ensure the mounting plates make contact with the bottom of the chassis frame, then clamp in place and mark holes for securing, using the provided 5/8" Grade 8 bolts, washers and stover nuts. Use a minimum of 6 bolts per side, with 3 bolts in the spring support plate area and 3 bolts towards the rear of the mounting plates.



Figure 12: Rear Mounting Plate Driver Side



Figure 13: Rear Mounting Plate Bolt Pattern

- 7- Torque bolts adequately. Refer to the Bolt Torque Table in the Appendices.

REAR HI-RAIL UNIT

- 1- Position the rear hi-rail unit under the rear mounting plates with the wheels pointing towards the rear of the vehicle (axle rotates towards the truck tires).
- 2- Install the rear rubber springs if not already installed.
 - a. Place one ½" thick plastic shim under the spring and bolt in place using a 3/8" bolt of adequate length, washer and nylon insert locknut (hardware not provided).
 - b. Place one spring center plate on top of each rear rubber spring.
 - c. The spring center plates will be centered and tacked after alignment.

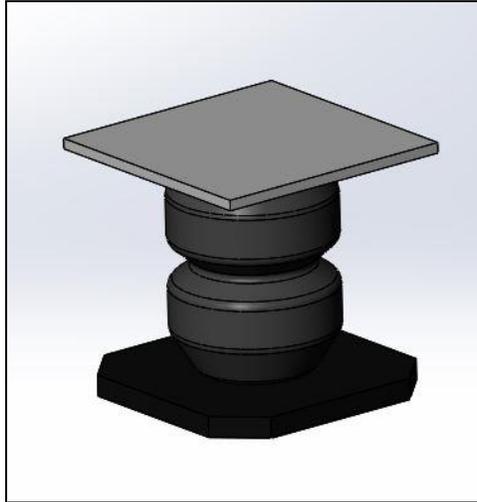


Figure 14: Plastic Shim, Rubber Spring and Spring Center Plate

- 3- Raise the hi-rail unit so the hi-rail frame comes in contact with the underside of the mounting plates.
- 4- Align the holes in the hi-rail frame with the side to side slots in the mounting plates.
- 5- Bolt in position using the provided 5/8" Grade 8 bolts, washers and nylon insert locknuts.
- 6- Do not fully tighten the bolts at this point (after alignment).

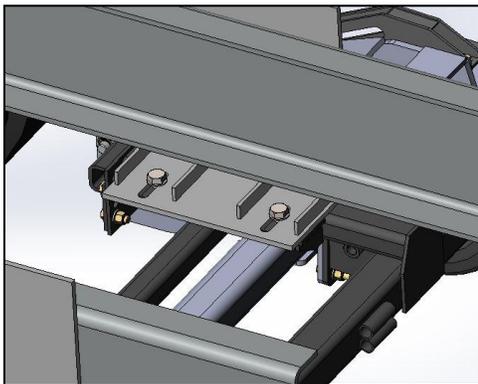


Figure 15: Rear Hi-Rail Unit Mounted (Top)

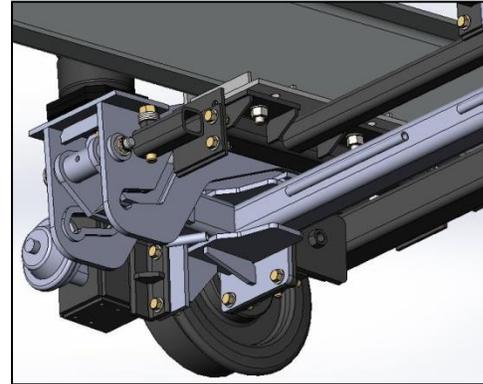


Figure 16: Rear Hi-Rail Unit Mounted (Bottom)

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 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.

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

- 1- Install the front and rear operating valves in a suitable location, preferably on the driver's side of the vehicle.
- 2- Run a 1/2" hydraulic hose from the pressure source (either PTO / Pump or a diverter valve) to the front hydraulic valve and connect it to the pressure port of the valve to allow flow through the valve.
- 3- Run a 1/2" hydraulic hose from the discharge port of the front valve to the pressure port of the rear valve.
- 4- Run a 1/2" hydraulic hose from the discharge port of the rear valve to the return line to the tank.
- 5- Connect the two ports on the front hydraulic valve to the front hydraulic cylinders, through T fittings to split the flow to both cylinders.
- 6- Connect the two ports on the rear hydraulic valve to the rear hydraulic cylinders, through T fittings to split the flow to both cylinders.
- 7- 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.
- 8- Verify the entire system for leaks.

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 1.5 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 flow and pressure adjustability to fine tune the braking performance on rail.

The valve kit is designed to be installed inside the cab of the vehicle, away from the elements. Installation outside the vehicle or in a compartment of the service body will void the limited warranty.

Part number for replacement of the Pneumatic Brake Valve Kit is H105A014.

! 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

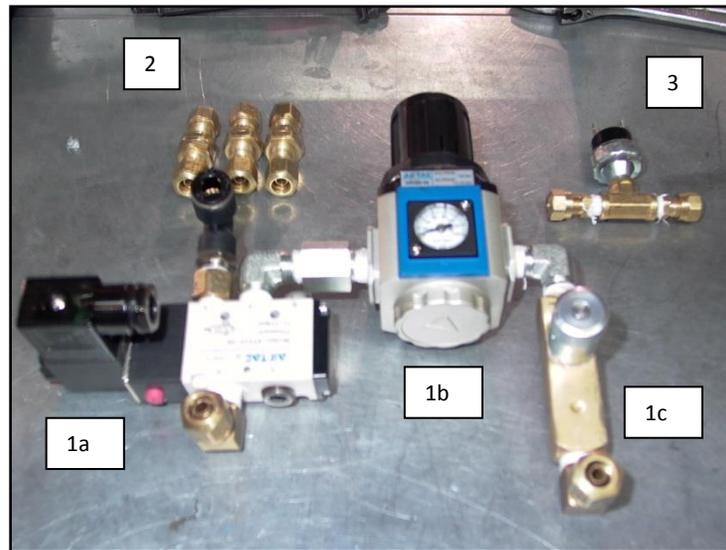
Contents of Kit

Figure 17: Pneumatic Brake Valve Kit

INCLUDED

- Item 1 – 1 x Pneumatic Brake Valve Assembly
 - 1a – Pneumatic Valve
 - 1b – Pressure Regulator Unit
 - 1c – Flow Control Unit
- Item 2 – 3 x Bulkhead Fittings
- Item 3 – 1 x Inline Pressure Switch

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
- Various fittings for connection of the hi-rail brakes
- Electrical wire and connectors
- Mounting hardware

Location and Mounting

- 1- Find a suitable location in the cab of the vehicle to mount the valve kit. The valve kit needs to be out of the way of occupants or luggage.
The valve kit does not need to be mounted in any particular orientation; it can be mounted vertically, horizontally or flat on the cab floor, for example.
- 2- Secure the valve assembly to the mounting surface using the mounting bracket located on the pressure reducer unit.
- 3- When mounting the assembly, ensure the A port stays capped and the R port retains its breather vent (as shipped).

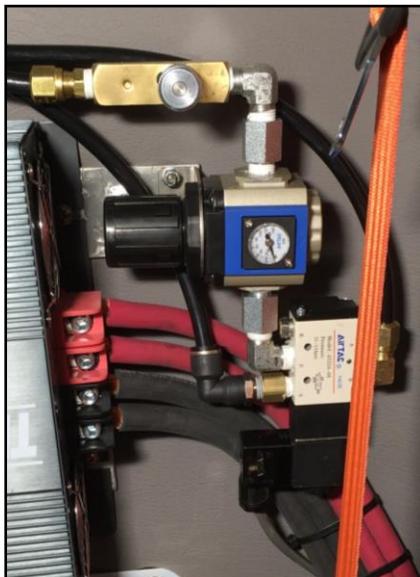


Figure 18: Suitable Mounting Example

Plumbing

- 1- Install the three (3) bulkhead fittings through the floor of the vehicle cab, out of the way of potential pinch points or any other source of damage.



Figure 19: Bulkhead Fittings in Cab Figure 20: Bulkhead Fittings under Cab

- 2- Connect each port on the Pneumatic Brake Valve Assembly to the bulkhead fittings in the floor.



Figure 21: Air Line Routing in Cab

- 3- Connect fittings and ports as follows:
- a. Port A – Port A needs to be capped (as shipped)
 - b. Port B – Port B feeds the hi-rail brakes through a bulkhead fitting.
 - i. Connect to the front brakes directly if hi-rail kit is supplied only with front brakes. Use a T fitting to split off left and right brake lines, with left and right air lines of approximately the same length.
 - ii. Connect to front and rear brakes if hi-rail is supplied with front and rear brakes. Use a T fitting to split off front and rear brake lines, with front and rear air lines of approximately the same length. Use T fittings in front and rear air lines to split off respective left and right brake lines, with left and right air lines of approximately the same length.
 - c. Port R – Port R needs to retain its breather vent (as shipped).
 - d. Port P – Port P stays connected to the Pressure Regulator Unit (as shipped).
 - e. Port S – Port S feeds the exhaust air through a bulkhead fitting.
 - i. Connect a hose to bleed off exhaust air.
 - ii. Ensure the end of the hose is in a location where it can stay clean and free of obstructions.
 - f. Flow Control Unit – Flow Control Unit is connected to air source through a bulkhead fitting.
 - i. To properly isolate the chassis main air brake system, the hi-rail brakes **MUST BE CONNECTED TO THE SECONDARY OR AUXILIARY AIR TANK** of the vehicle.
 - ii. Connect the Flow Control Unit to the air source through a bulkhead fitting by finding an adequate air source (ie spare fitting on secondary or auxiliary air tank).

4- Refer to the Appendices for more details on air line routing.



Figure 22: Pneumatic Valve Ports

Electrical

- 1- Connect Inline Pressure Switch to the chassis air brake system.
 - a. Install the switch on the front air brake line wherever access is adequate. Ensure that the pressure switch is properly secured to the vehicle to prevent damage or connection failures.
 - b. Connect one lead of the pressure switch to a brake actuated power source (such as the brake light signal) through a 5A fuse.
 - c. Route the other lead to the Pneumatic Brake Valve Assembly in the cab.
- 2- Connect the Inline Pressure Switch to the Pneumatic Valve
 - a. Connect the signal lead from the Inline Pressure Switch to the positive lead of the DIN solenoid valve connector on the Pneumatic Valve.
 - b. Ground the DIN solenoid valve connector.

ADJUSTMENT

- 1- With all air and electrical connections complete, perform initial adjustment to Pneumatic Brake Valve assembly as follows:
 - a. Release the set screw on the Flow Control Unit's knob.
 - b. Close the Flow Control Unit's knob completely, and then open to 3/4 of a complete turn.
 - c. Set the Pressure Regulator Unit's dial to 50 psi.
- 2- Perform a track test with the vehicle and assess the hi-rail brakes' performance.
- 3- Adjust flow and pressure values as required to provide enough braking force (pressure), proper application and release speeds (flow).

AUXILIARY HYDRAULIC BRAKE KIT

(STANDARD WITH HYDRAULIC BRAKE CHASSIS)

GENERAL DESCRIPTION

The Continental Railworks Auxiliary Hydraulic Brake Kit has been designed to provide on rail braking power to chassis equipped with a hydraulic brake system. It features pressure adjustability to fine tune the braking performance on rail.

The power pack is designed to be installed inside the service body of the vehicle, away from the elements. Installation outside the vehicle will void the limited warranty.

Part number for replacement of the Hydraulic Brake Power Pack is ZH339.

Part number for replacement of the flow control is ZQ2.

INSTALLATION

Contents of Kit

INCLUDED

- Hydraulic power pack for brakes
- Hydraulic flow control
- Hydraulic brake cylinders (assembled on hi-rail)

NOT INCLUDED

- ¼" steel braided hydraulic hose
- Various fittings for connection of the hi-rail brakes
- Electric switch
- 150 A circuit breaker
- Electrical wire and connectors
- Mounting hardware

Location and Mounting

- 1- Install the brake power pack in a suitable location (under the hood or in the vehicle's service body).
- 2- Secure the power pack adequately, with access to the fluid filler cap.
- 3- Install the flow control valve on the pressure side of the pump.

Plumbing and Electrical

- 1- Connect the flow control valve to the hi-rail brake cylinders using ¼" steel braided hydraulic hose, through a T fitting to split the flow to both cylinders.
- 2- If the hi-rail is equipped with optional rear hydraulic brakes, route the hoses to the rear as well, through T fittings to split the flow four ways.
- 3- The brake cylinders are spring return single acting cylinders; there is no need for return lines.
- 4- Ensure the hydraulic hoses are of sufficient length to go through the entire range of motion of the hi-rail unit(s).
- 5- Secure hydraulic hoses adequately.
- 6- Install an electric switch on the vehicle's dash.
- 7- Locate the vehicle's brake light switch and connect a feed to the previously installed dash switch.
- 8- Connect a feed from the dash switch to the activation solenoid on the brake power pack.
- 9- Install a 150 A circuit breaker near the battery.
- 10- Connect the battery to the brake pump solenoid's power feed through the 150 A circuit breaker.
- 11- Test the system
 - a. With the dash switch on, the brake pump should activate and the hi-rail brakes should apply when the vehicle brakes are applied.
 - b. When the vehicle brakes are released, the brake pump should de-activate and the pressure in the brake lines should dissipate.
 - c. With the dash switch off, the brake pump should not activate when the vehicle brakes are applied.
- 12- Set the pump pressure to approximately 800 psi
- 13- Test track the vehicle.
 - a. Adjust the pump pressure for the particular vehicle application until the front brakes are able to lock the hi-rail wheels.
 - b. Reduce the pressure by 100 psi.
- 14- Verify the entire system for leaks.

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 E077A200K.

! SAFETY WARNING !

ENSURE WIRES ARE SECURED PROPERLY TO PREVENT PINCHING OR RUBBING WHICH MAY LEAD TO FAILURE.

ENSURE SHUNT KIT IS INCORPORATED IN THE HI-RAIL ANNUAL INSPECTIONS TO VERIFY ITS FUNCTIONALITY

INSTALLATION

Contents of Kit

INCLUDED

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

Note: Components may be slightly different in appearance.

NOT INCLUDED

- 10 gauge electrical wire
- Momentary or Maintained switch (if required)

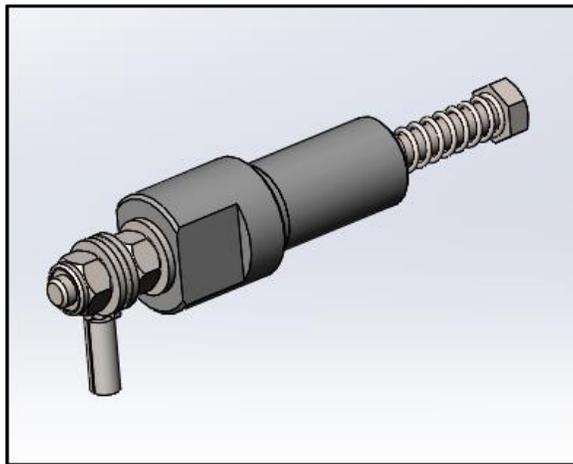


Figure 23: Individual Plastic Bushing and Hardware

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 $\frac{3}{4}$ " 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.



Figure 24: Installed Plastic Bushing and Hardware

Electrical

- 1- Using 10 gauge 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 rail wheel and any part of the axle, but through the paint layer.
- 2- With a megohmmeter, ensure values are as follows:
 - a. Shunt position (switch ON or hard wired): Lower than 22 k Ω
 - b. Insulated position (switch OFF): Higher than 22 k Ω
- 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.

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.

The valve kit is designed to be installed inside the cab of the vehicle or in a heated compartment on the service body, away from the elements. Installation outside the vehicle will void the limited warranty.

Part number for replacement of the Pneumatic Brake Valve Kit is H105E002.

! 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

Contents of Kit

Figure 25: Pneumatic Suspension Kit

INCLUDED

- Item 1 – Pressure Regulator Unit (ZQ408)
 - o Quantity = 1
- Item 2 – 12V Air Solenoid (ZH340)
 - o Quantity = 2
- Not shown – Bracket (G035F004)
 - o Quantity = 1
- Not shown – Fittings and hoses

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 switch for hi-rail
- Electrical relays, wire and connectors
- Mounting hardware

Note: The electrical 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 kit.
The valve kit does not need to be mounted in any particular orientation; it can be mounted vertically, horizontally or flat on the cab floor, for example.
- 2- Secure the mounting bracket to the vehicle in a way that allows access to the pressure regulator unit.

Plumbing

Figure 26: Typical air line routing

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

- 1- Find an adequate air source to power the system (ie spare fitting on secondary or auxiliary air tanks). **DO NOT CONNECT DIRECTLY TO MAIN CHASSIS AIR BRAKE SYSTEM.**
- 2- Route the main pressure air line from the air source to the Pressure Regulator Unit.
- 3- Connect the left and right air bag feeds (from levelling valve) to the #2 ports on the air solenoids.
- 4- Connect the #3 ports on the air solenoids to the left and right air bags.

Electrical

- 1- Install hi-rail switch on hi-rail assembly (proximity switch) or in vehicle cab (toggle switch).
- 2- Install a 12V relay close to the Pneumatic Valves.
 - a. Feed the relay from the chassis' positive power circuit through a 5 A fuse.
 - b. Connect relay to the chassis' IGNITION ON circuit
- 3- Connect the switch to the Pneumatic Valves
 - a. Connect one lead of the switch to the relay
 - b. Ground the switch's other lead.
 - c. Connect the relay output to the positive lead of the solenoid valves.
 - d. Ground the other solenoid valve's lead.

ADJUSTMENT

- 1- With the vehicle on rail (hi-rail deployed) and all air and electrical connections complete, perform initial adjustment to the Pneumatic Suspension system 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 Alignment and Adjustment section in the following pages).
 - i. Raise pressure to increase contact patch.
 - ii. Lower pressure to reduce contact patch.
- 2- Perform a track test with the vehicle and ensure proper suspension functionality.

ALIGNMENT AND ADJUSTMENT

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" 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. This can be performed by adjusting the swiveling spindle housings. 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.
- 8- Adjust the rear hi-rail so that the distance from the rear hi-rail wheel to the string is equal on both sides of the vehicle (dimension D). This can be performed by shifting the whole hi-rail unit from side to side (there are slots between the mounting plates and hi-rail frame). 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). An inside distance of 53-1/2" between the flanges of the hi-rail wheels must be maintained while performing this adjustment. Once the gauge is adjusted, a 1/2" washer can be welded to the spindle housing to transform the adjustment slot into a hole and lock in the adjustment.
- 9- Adjust the front hi-rail toe-in and toe-out so that the wheel faces are parallel to the strings on both sides. This can be performed by adjusting the swiveling spindle housings. 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.

- 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). 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). 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). An inside distance of 53-1/2" between the flanges of the hi-rail wheels must be maintained while performing this adjustment. Once the gauge is adjusted, a 1/2" washer can be welded to the spindle housing to transform the adjustment slot into a hole and lock in the adjustment.
- 11- Ensure all mounting plate adjustment bolts are properly tightened and torqued after adjusting the unit. Please see the bolt torque chart in the Appendices.
- 12- Install shims (various thicknesses supplied) on the front main support pins to lock the Alignment Adjustment in place. The shims should be installed on the inside surface, towards the centerline 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- With the rear hi-rail unit lowered and the rubber springs fully compressed, determine the location where the spring centers should be located to ensure the rubber springs are vertical when in operation. Tack weld the spring centers on top of the rear rubber springs to the mounting plates, ensuring the rubber spring will remain centered when the rear hi-rail suspension is active.
- 15- 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. As the vehicle is loaded, the additional weight will be distributed between the truck springs and the hi-rail suspension. It will be normal for the contact patch of the tires in that condition to increase beyond the maximum indicated below.

- 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 8" and 10".
- 2- If less than 8", the traction of the vehicle must be increased. This is achieved by removing the ½" shims installed under the rear rubber springs, which will in effect raise the hi-rail unit and increase the vehicle traction. To remove the shim, do the following:
 - a. Remove the vehicle from the track
 - b. Lower the hi-rail unit completely
 - c. Remove the 2 stopper assemblies restricting the downward motion of the rear cam assembly (see next section)
 - d. Raise the hi-rail unit, which will in effect lower the rear cam assemblies and make the rubber springs completely accessible
 - e. Remove the shim (or shims), and reverse the order to re-install.
- 3- If more than 10", the traction of the vehicle must be decreased. This is achieved by adding shims under the rubber spring for small adjustments, or adding shims between the rear hi-rail unit and the mounting plates for larger adjustments. Please contact the factory for assistance.
- 4- If the vehicle is loaded, the tire contact patch measurement should be typically between 10" and 12". A fully loaded vehicle may have a tire contact patch as high as 14".

STOPPER ASSEMBLIES

The rear hi-rail features two removable and adjustable Stopper Assemblies to restrict the motion of the cam assemblies. It is important to understand the purpose and means of adjustment to ensure the hi-rail functions as it should.

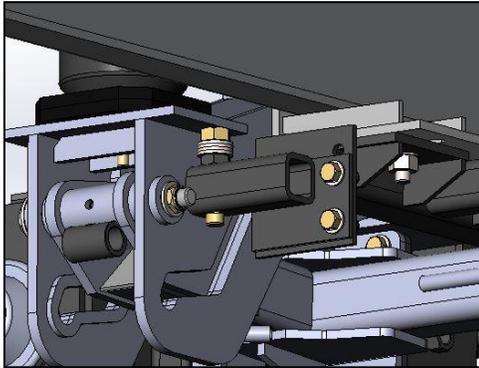


Figure 27: Stopper Assembly Installed

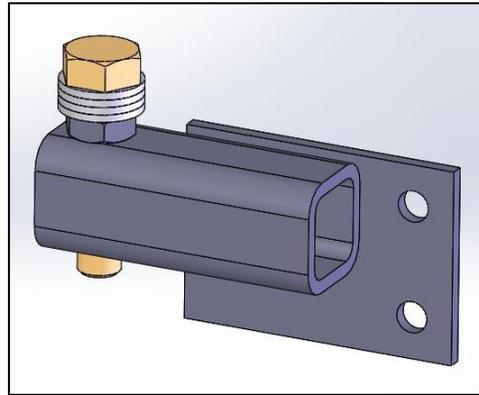


Figure 28: Stopper Assembly

PURPOSE

The Stopper Assemblies are attached to the rear hi-rail frame and restrict the downward motion of the cam assemblies when the hi-rail is retracted.

They are made to be removable in order to adjust the hi-rail spring pressure as seen in the Pressure Adjustment section.

ADJUSTMENT

The idea is to have the downward motion of the cam (rotating about the lower rear pin) restricted so that the rubber spring is only barely compressed when the hi-rail is retracted (after spring shims have been installed and the pressure has been adjusted).

The Stopper Assemblies should be adjusted so that the rubber spring has a compressed height of 7" when the hi-rail in is road position (free height of the spring is 7-1/4", meaning a 1/4" pre-compression).

The Stopper Assemblies can be adjusted in many ways to achieve the right height:

- Adjust the number of washers
- Remove the bolt
- Use the different sets of holes on the hi-rail frame
- Swap out the driver and passenger side stopper assemblies

WARNING

Not adjusting the stoppers to a proper height can cause the hi-rail to malfunction. Having the stoppers too low can damage the rubber springs by allowing it to come out of the spring center plate. Having the stoppers too high can restrict the spring from expanding to its full height, potentially restricting the hi-rail wheels from keeping contact with the rail over a high crossing or similar obstacle.

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

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.
- Stopper position – The stoppers should be adjusted so that the rubber springs are compressed by about $\frac{1}{4}$ " from their free length, when the hi-rail is retracted.
- Position and weld spring center plate – The top spring center plate should be positioned so that the spring is vertical when compressed. The spring should not be allowed to "shear" under compression.



Figure 29: Welded spindle housing (toe and gauge adjustment)



Figure 30: Welded spring center plate

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

- 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- Actuate the rear hydraulic valve or push button remote to lower the rear hi-rail unit.
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-35 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-35 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 !

PARTS

G-35 ASSEMBLY PARTS

ASSEMBLY COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
A007KFM0	FRONT HI-RAIL UNIT ASSEMBLY	1
A007HB00	REAR HI-RAIL UNIT ASSEMBLY	1
G007RD00	REAR MTG PLATE – DRIVER SIDE (ON HI-RAIL)	1
G007RP00	REAR MTG PLATE – PASSENGER SIDE (ON HI-RAIL)	1
See packing list	FRONT MTG BRACKET – DRIVER SIDE (ON HI-RAIL)	1
See packing list	FRONT MTG BRACKET – PASSENGER SIDE (ON HI-RAIL)	1
See packing list	SPRING MTG BRACKET (ON HI-RAIL)	2
See packing list	REAR MTG BRACKET – DRIVER SIDE (ON HI-RAIL)	1
See packing list	REAR MTG BRACKET – PASSENGER SIDE (ON HI-RAIL)	1
F088R100	BUSHING ASSEMBLY (ON HI-RAIL)	2
P008R010	PIN 1-1/2" x 5.750" LONG (ON HI-RAIL)	2
V007A003	REAR RUBBER SPRING	2
F067B100	SPRING GUIDE PLATE	2
F067C025	SPRING SPACER	4
F117BD00	STOPPER – DRIVER SIDE (ON HI-RAIL)	1
F117BP00	STOPPER – PASSENGER SIDE (ON HI-RAIL)	1
F087K001	SPACER 1/4"	2
F087K002	SPACER 3/16"	2
F087K003	SPACER 1/8"	4
F087K004	SPACER 1/2"	2
H105A001	HYDRAULIC OPERATING VALVE	2
H105A014	PNEUMATIC BRAKE VALVE KIT	1
ZQ96	VELCRO STEERING LOCK	1
	BOLT KIT – REAR MTG PLATE TO FRAME	1
	BOLT KIT – FRONT MTG PLATE TO FRAME	1
	BOLT KIT – REAR HI-RAIL TO MTG PLATE (ON HI-RAIL)	1
G-35	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.

G-35 COMMON PARTS

(Not shown on drawings)

COMMON G-35 COMPONENTS (NOT SHOWN)		
PART NUMBER	DESCRIPTION	QTY
E037A001	WHEEL 12" BEARING CONE (Timken 3984)	4
E037A002	WHEEL 12" BEARING CUP (Timken 3925)	4
E117A001	WHEEL 12" GREASE SEAL (National 415991)	2
E067A001	WHEEL 12" / 14" CASTLE NUT	2
E067A002	WHEEL 12" / 14" WASHER	2
	5/32" COTTER PIN x 2.000" LONG	2

FRONT G-35 UNIT

G-35 FRONT COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
D007KF00	FRONT AXLE ASS'Y	1
E0112A01	12" WHEEL	2
E027A001	SPINDLE - 12" WHEEL	2
E047A001	12" SPINDLE INSULATOR	2
E058A006	ISOLATING TUBE .500 ID	2
E087D000	SPINDLE HOUSING ASS'Y	2
E127A001	HUB CAP	2
E177A001	12" HUB CAP GASKET	2
F088R100	BUSHING ASS'Y	2
F107KB00	FRONT CAM ASS'Y	1
H027AD00	HYDRAULIC CYLINDER	1
H027AP00	HYDRAULIC CYLINDER	1
H077CFD0	AIR BRAKE ASS'Y DRIVER'S SIDE	1
H077CFP0	AIR BRAKE ASS'Y PASSENGER'S SIDE	1
P007B010	1-1/4" PIN x 6.875" ASS'Y	4
P007D010	1-1/4" PIN x 8.125" ASS'Y	4
P008R010	1-1/2" PIN x 5.750" ASS'Y	2
R007A000	RAILSWEEP ASS'Y 12"	2
	1" FLAT WASHER	24
	1" UNC LIGHT NYLON INSERT LOCKNUT	6
	1/2" UNC GR. 8 NYLON INSERT LOCKNUT	14
	1/2" FLAT WASHER	4
	1/2" UNC GR. 8 BOLT x 2.000" LONG	12
	1/2" UNC GR. 8 BOLT x 5.000" LONG	2
	1/4" SPRING LOCKWASHER	4
	1/4" UNF BOLT x 0.750" LONG	6
	3/4" FLAT WASHER	2
	3/4" UNC GR. 8 BOLT x 3.000" LONG	4
	3/4" UNC GR. 8 NYLON INSERT LOCKNUT	8
	3/4" UNC LIGHT NYLON INSERT LOCKNUT	14
	3/4" WIDE FLAT WASHER	2
	3/8" FLAT WASHER	8
	3/8" UNC BOLT x 1.500" LONG	4
	3/8" UNC NYLON INSERT LOCKNUT	2
	SPRING MOUNTING BRACKET	2

REAR G-35 UNIT

G-35 REAR COMPONENTS		
PART NUMBER	DESCRIPTION	QTY
D007GB00	REAR AXLE ASS'Y	1
E0112A01	12" WHEEL	2
E027A001	SPINDLE - 12" WHEEL	2
E047A001	12" SPINDLE INSULATOR	2
E058A006	ISOLATING TUBE .500 ID	2
E087D000	SPINDLE HOUSING ASS'Y	2
E127A001	HUB CAP	2
E177A001	12" HUB CAP GASKET	2
F007HB00	REAR FRAME ASS'Y	1
F067C025	RUBBER SPRING SPACER	4
F107BB00	REAR CAM ASS'Y	2
F117BD00	STOPPER, DRIVER'S SIDE	1
F117BP00	STOPPER, PASSENGER'S SIDE	1
H026A020	HYDRAULIC CYLINDER	2
H077BBD0	AIR BRAKE ASS'Y DRIVER'S SIDE	1
H077BBP0	AIR BRAKE ASS'Y PASSENGER'S SIDE	1
P007B010	1-1/4" PIN x 6.875" ASS'Y	4
P007B020	1" PIN x 6.125" ASS'Y	4
R007A000	RAILSWEEP ASS'Y 12"	2
V007A003	RUBBER SPRING 560-65	2
	1/2" FLAT WASHER	36
	1/2" UNC GR. 8 BOLT x 1.500" LONG	4
	1/2" UNC GR. 8 BOLT x 2.000" LONG	12
	1/2" UNC GR. 8 BOLT x 3.500" LONG	2
	1/2" UNC GR. 8 BOLT x 5.000" LONG	2
	1/2" UNC GR. 8 NYLON INSERT LOCKNUT	20
	1/4" SPRING LOCK WASHER	6
	1/4" UNF BOLT x 0.750" LONG	6
	3/4" FLAT WASHER	14
	3/4" LIGHT UNC GR. 8 NYLON INSERT LOCKNUT	8
	3/4" UNC GR. 8 BOLT x 3.500" LONG	2
	3/4" WIDE FLAT WASHER	2
	3/8" FLAT WASHER	8
	3/8" UNC BOLT x 1.500" LONG	4
	3/8" UNC GR. 8 NYLON INSERT LOCKNUT	4

REAR G-35 UNIT (NO REAR BRAKES)

G-35 REAR NO BRAKES COMPONENTS		
PART NUMBER	DESCRIPTION	QTY.
D007GB00	REAR AXLE ASS'Y	1
E0112A01	12" WHEEL	2
E027A001	SPINDLE - 12" WHEEL	2
E047A001	12" SPINDLE INSULATOR	2
E058A006	ISOLATING TUBE .500 ID	2
E087D000	SPINDLE HOUSING ASS'Y	2
E127A001	HUB CAP	2
E177A001	12" HUB CAP GASKET	2
F007HB00	REAR FRAME ASS'Y	1
F067C025	RUBBER SPRING SPACER	4
F107BB00	REAR CAM ASS'Y	2
F117BD00	STOPPER, DRIV SIDE	1
F117BP00	STOPPER, PASS SIDE	1
H026A020	HYDRAULIC CYLINDER	2
P007B010	1-1/4" PIN x 6.875" ASS'Y	4
P007B020	1" PIN x 6.125" ASS'Y	4
R007FD00	RAIL SWEEP ASS'Y 12" WHEEL DRIVER'S SIDE	1
R007FP00	RAIL SWEEP ASS'Y 12" WHEEL PASSENGER'S SIDE	1
V007A003	RUBBER SPRING 560-65	2
	1/2" FLAT WASHER	36
	1/2" UNC GR. 8 BOLT x 1.500" LONG	4
	1/2" UNC GR. 8 BOLT x 2.000" LONG	12
	1/2" UNC GR. 8 BOLT x 3.500" LONG	2
	1/2" UNC GR. 8 BOLT x 5.000" LONG	2
	1/2" UNC GR. 8 NYLON INSERT LOCKNUT	20
	1/4" SPRING LOCK WASHER	6
	1/4" UNF BOLT x 0.750" LONG	6
	3/4" FLAT WASHER	14
	3/4" LIGHT UNC GR. 8 NYLON INSERT LOCKNUT	8
	3/4" UNC GR. 8 BOLT x 3.500" LONG	2
	3/4" WIDE FLAT WASHER	2

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.

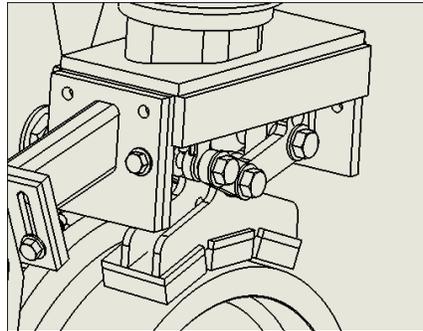


Figure 31: Brake shoe installation

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.

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.

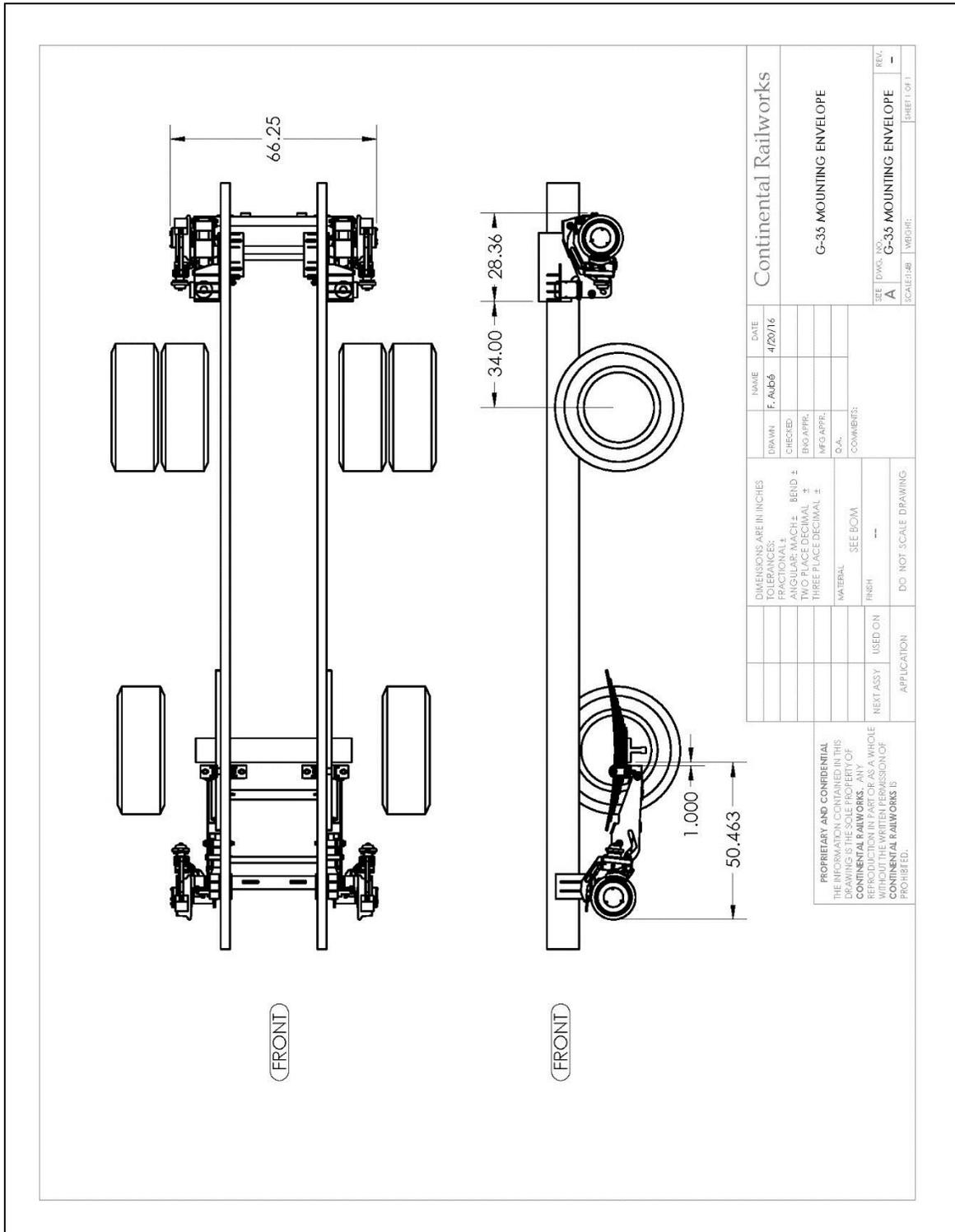
APPENDIX 1

BOLT TORQUE TABLE

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

APPENDIX 2

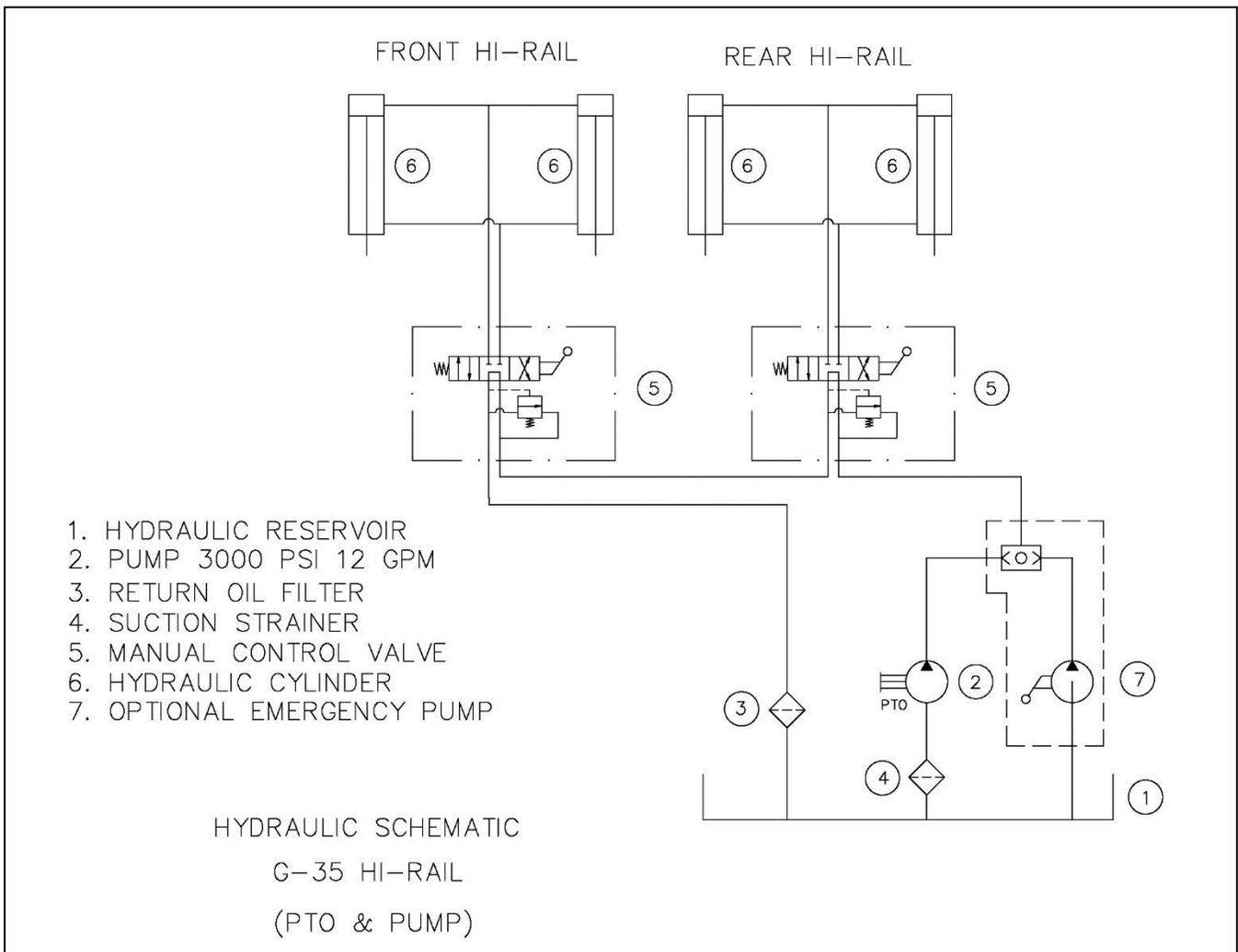
MOUNTING ENVELOPE



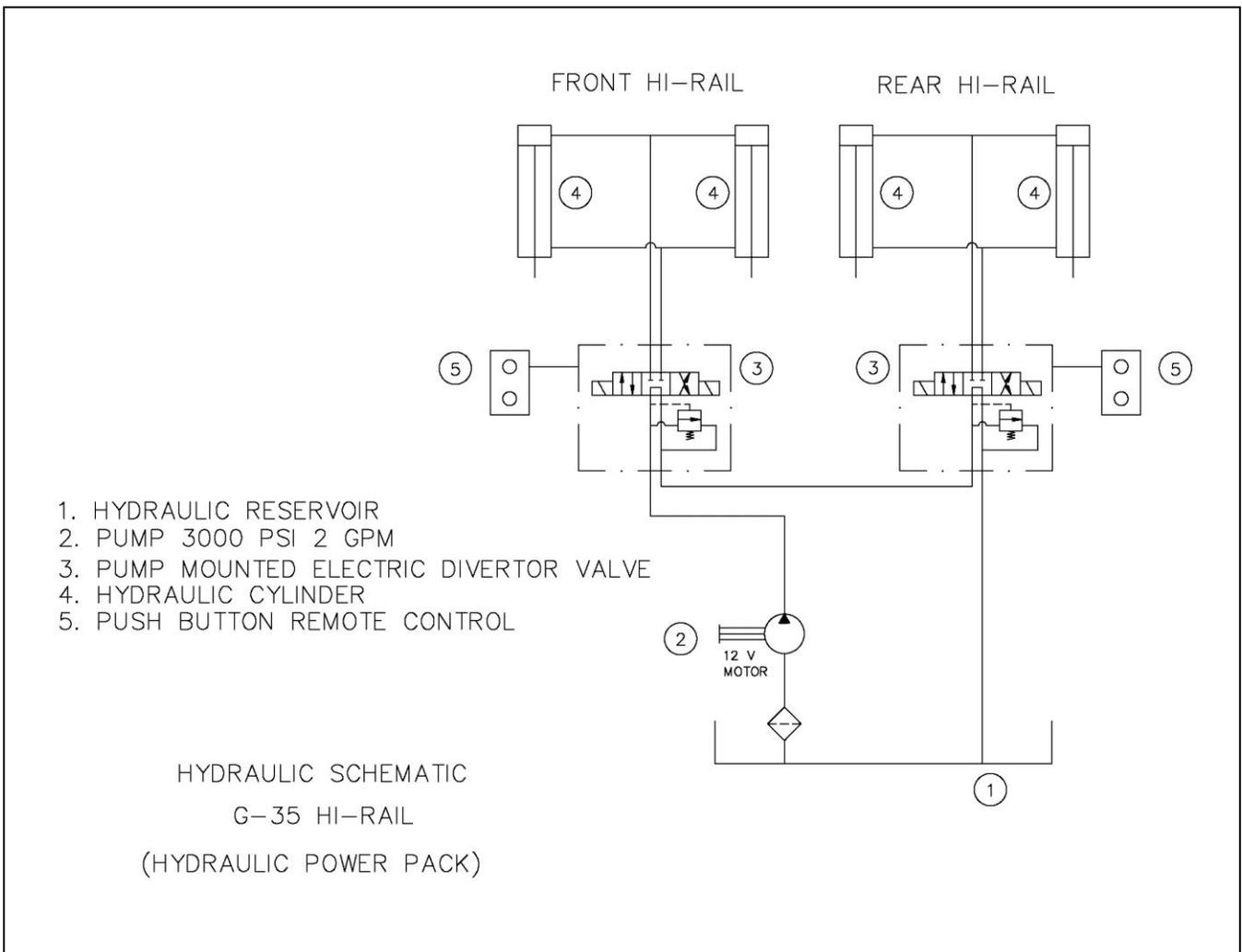
APPENDIX 3

HYDRAULIC SCHEMATICS

PTO AND PUMP SETUP



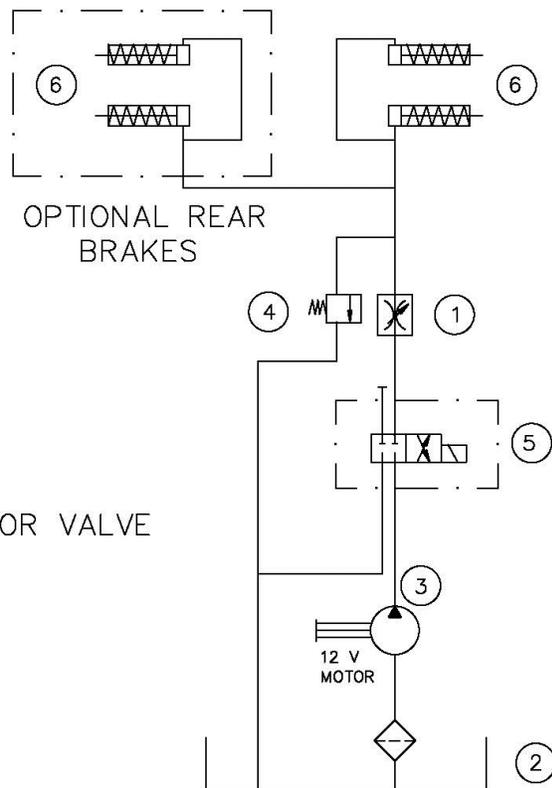
12V POWER PACK SETUP



OPTIONAL HYDRAULIC BRAKES

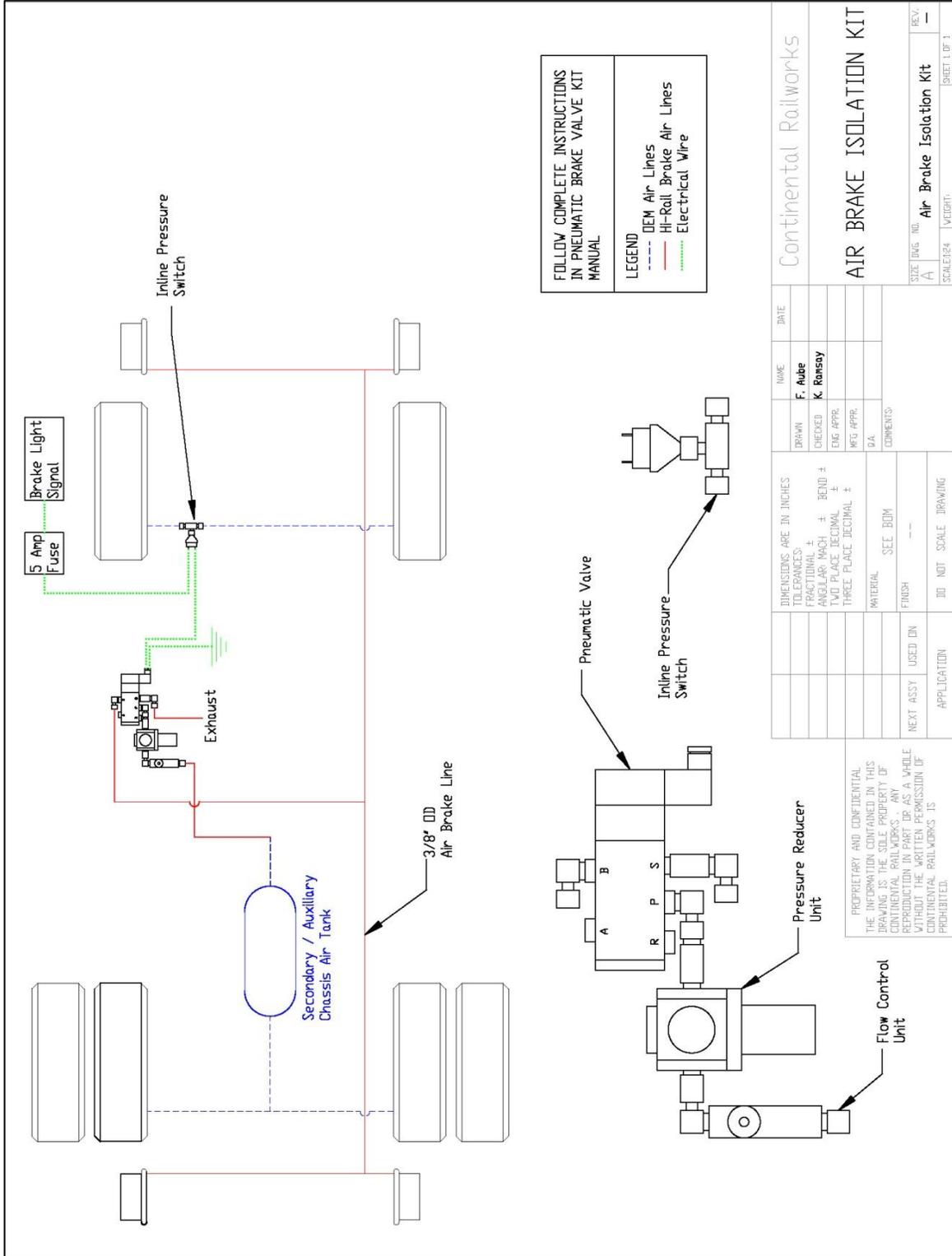
- 1. FLOW CONTROL VALVE
- 2. HYDRAULIC RESERVOIR
- 3. PUMP 3000 PSI 2 GPM
- 4. RELIEF VALVE 2500 PSI
- 5. PUMP MOUNTED ELECTRIC DIVERTOR VALVE
- 6. HYDRAULIC BRAKE CYLINDERS

HYDRAULIC SCHEMATIC
G-35 HI-RAIL
FRONT HYDRAULIC BRAKES



APPENDIX 4

PNEUMATIC BRAKE DIAGRAM



FOLLOW COMPLETE INSTRUCTIONS IN PNEUMATIC BRAKE VALVE KIT MANUAL

LEGEND
 --- OEM Air Lines
 - - - - Hi-Rail Brake Air Lines
 Electrical Wire

CONTINENTAL RAILWORKS	
AIR BRAKE ISOLATION KIT	
SIZE: DWG. NO. A	REV. -
SCALE: 1:24	WEIGHT: SHEET 1 OF 1

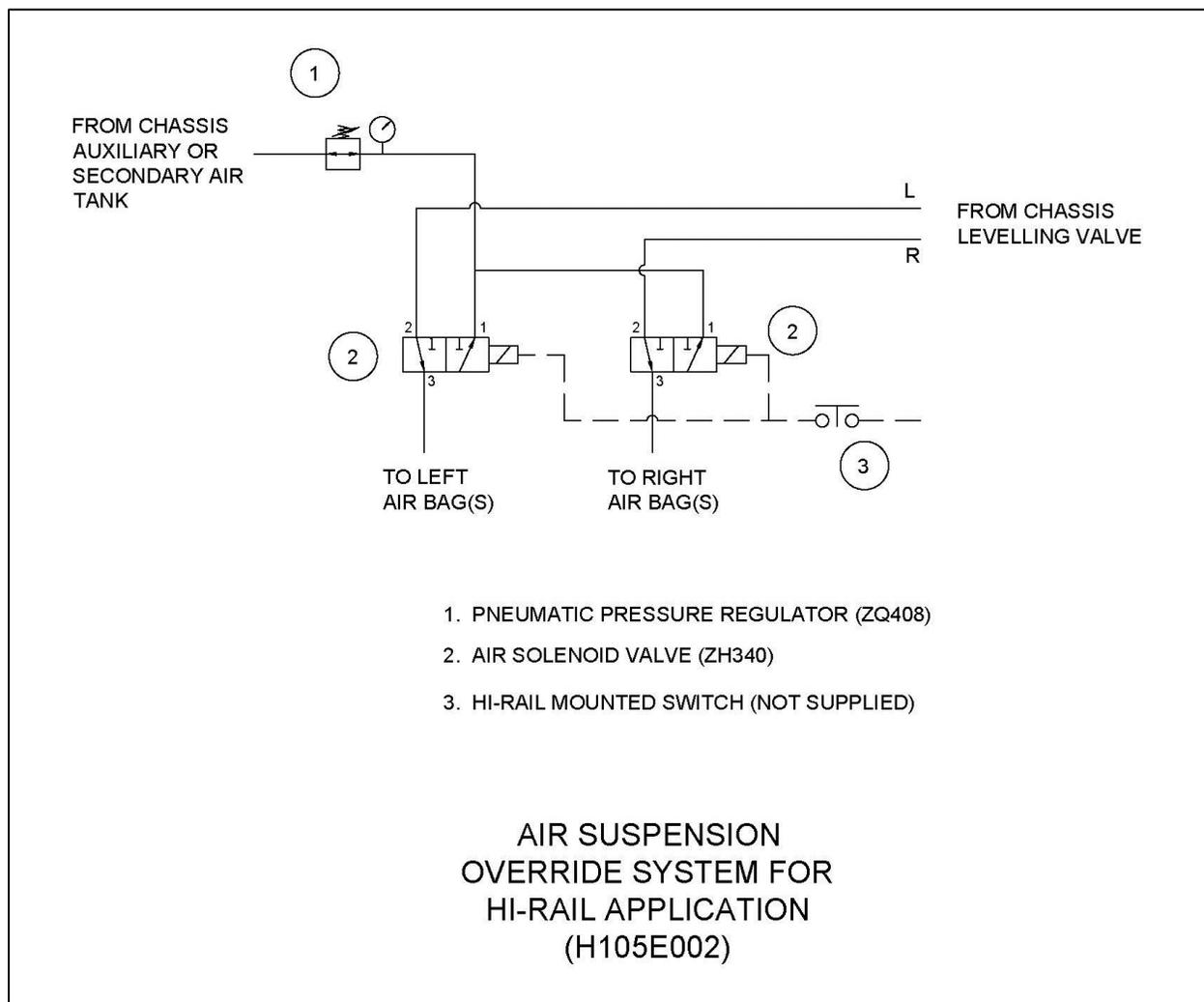
NAME	DATE
DRAWN: F. Aube	
CHECKED: K. Ransay	
ENG. APPR.	
MFG. APPR.	
QA	
COMMENTS:	

DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL ±	BEND ±
ANGULAR ±	
TWO PLACE DECIMAL ±	
THREE PLACE DECIMAL ±	
MATERIAL	SEE BOM
FINISH	---
USED ON	
NEXT ASSY	
APPLICATION	

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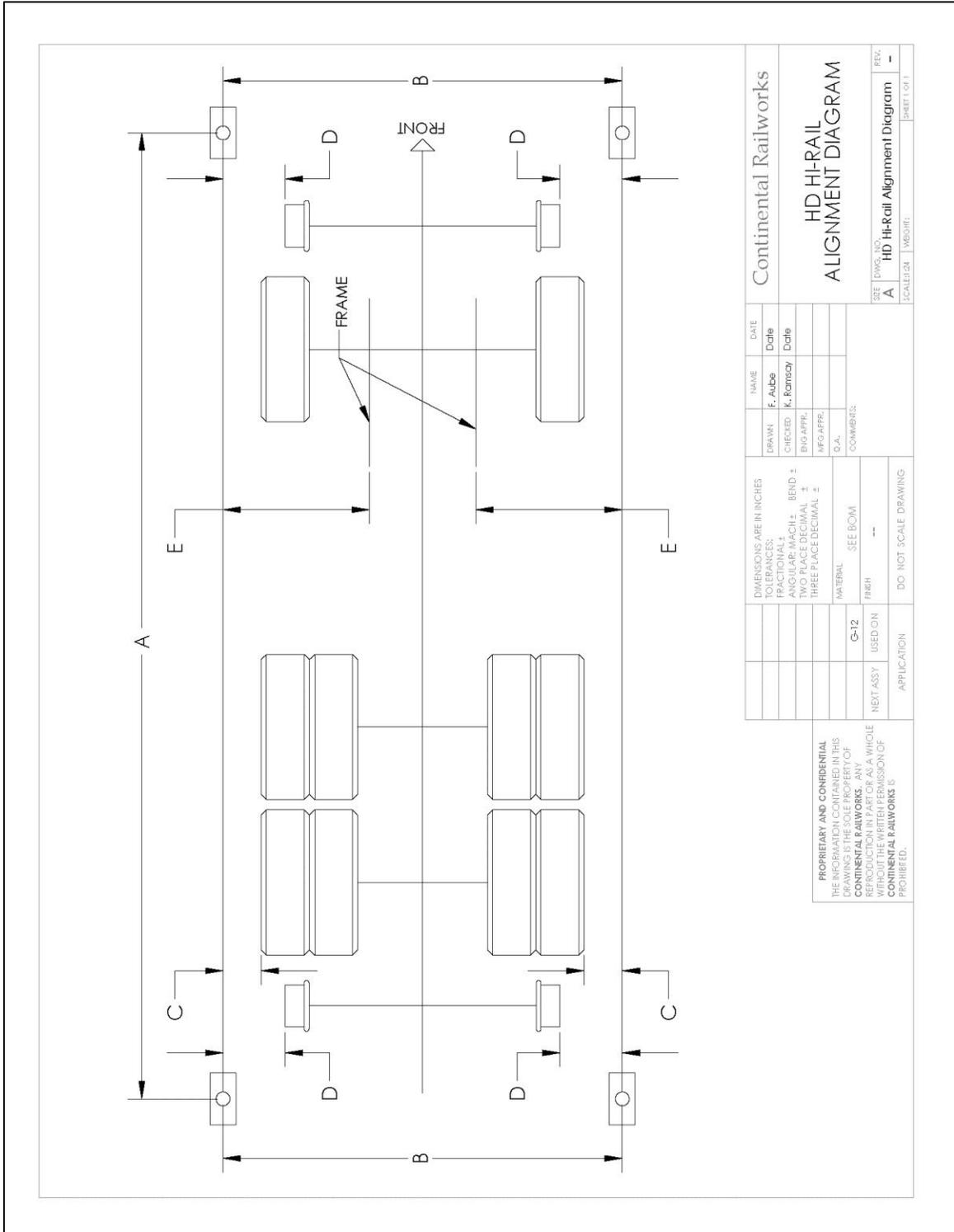
APPENDIX 5

PNEUMATIC SUSPENSION KIT



APPENDIX 6

ALIGNMENT DIAGRAM



APPENDIX 7

ALIGNMENT AND PRESSURE DATA FORM



Continental Railworks
7380 rue Vérité
St-Laurent, QC H4S 1C5

Tel : 514-956-8081
Fax : 514-956-0737

ALIGNMENT AND PRESSURE DATA FORM

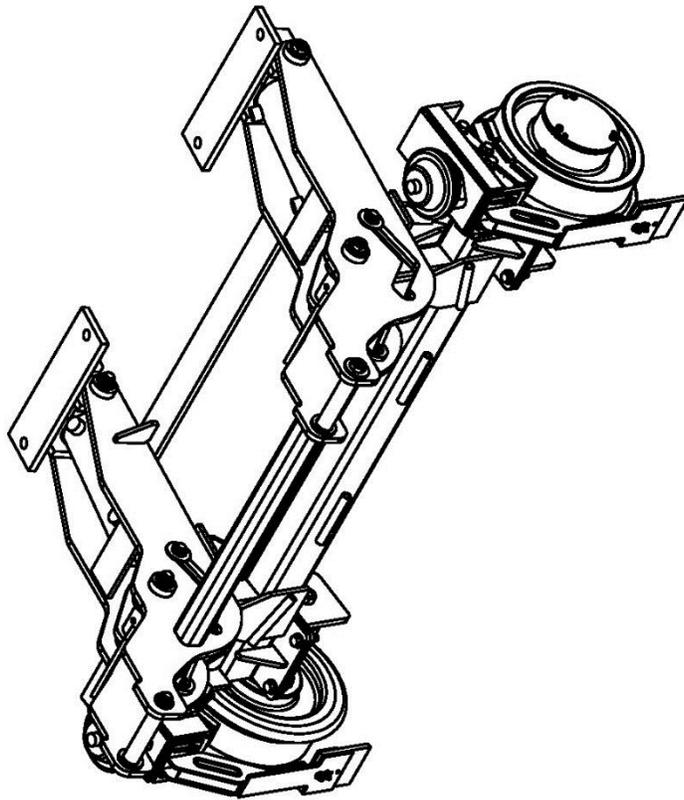
Customer: _____	License: _____
Vehicle Number: _____ Year: _____	Mileage: _____
VIN: _____	Date: _____
Hi-Rail Manufacturer: _____	
Hi-Rail Model Front: _____ Year: _____	Serial: _____
Hi-Rail Model Rear: _____ Year: _____	Serial: _____

DRIVER FRONT	PASSENGER FRONT	NOTES
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APPENDIX 8

FRONT G-35 DRAWINGS

NOTE – Some components may differ slightly from drawings shown.



Continental Railworks

G-35 FRONT
MODIFIED CAM

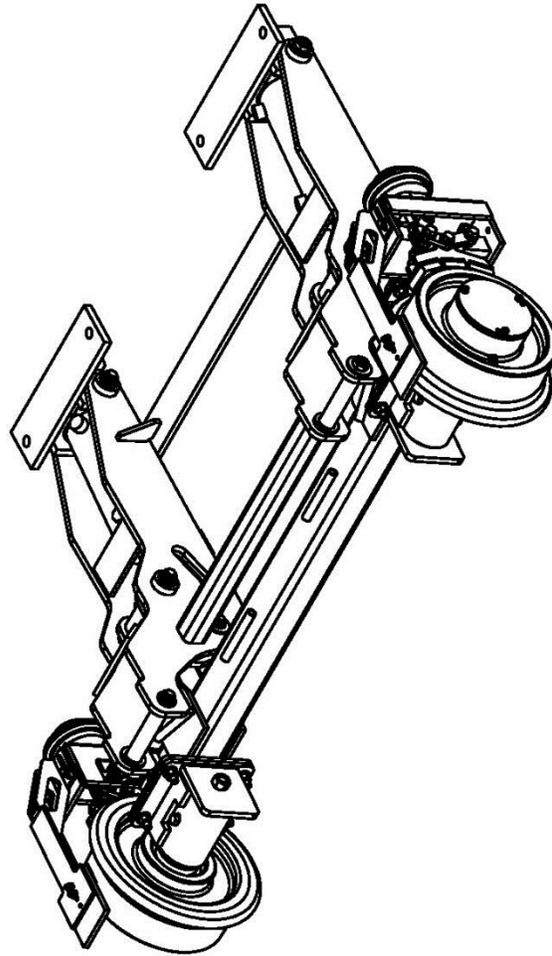
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DRAWN	NAME	DATE
L. Hazcraft	L. Hazcraft	11-NOV-16
CHECKED	F. Aube	11-NOV-16
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

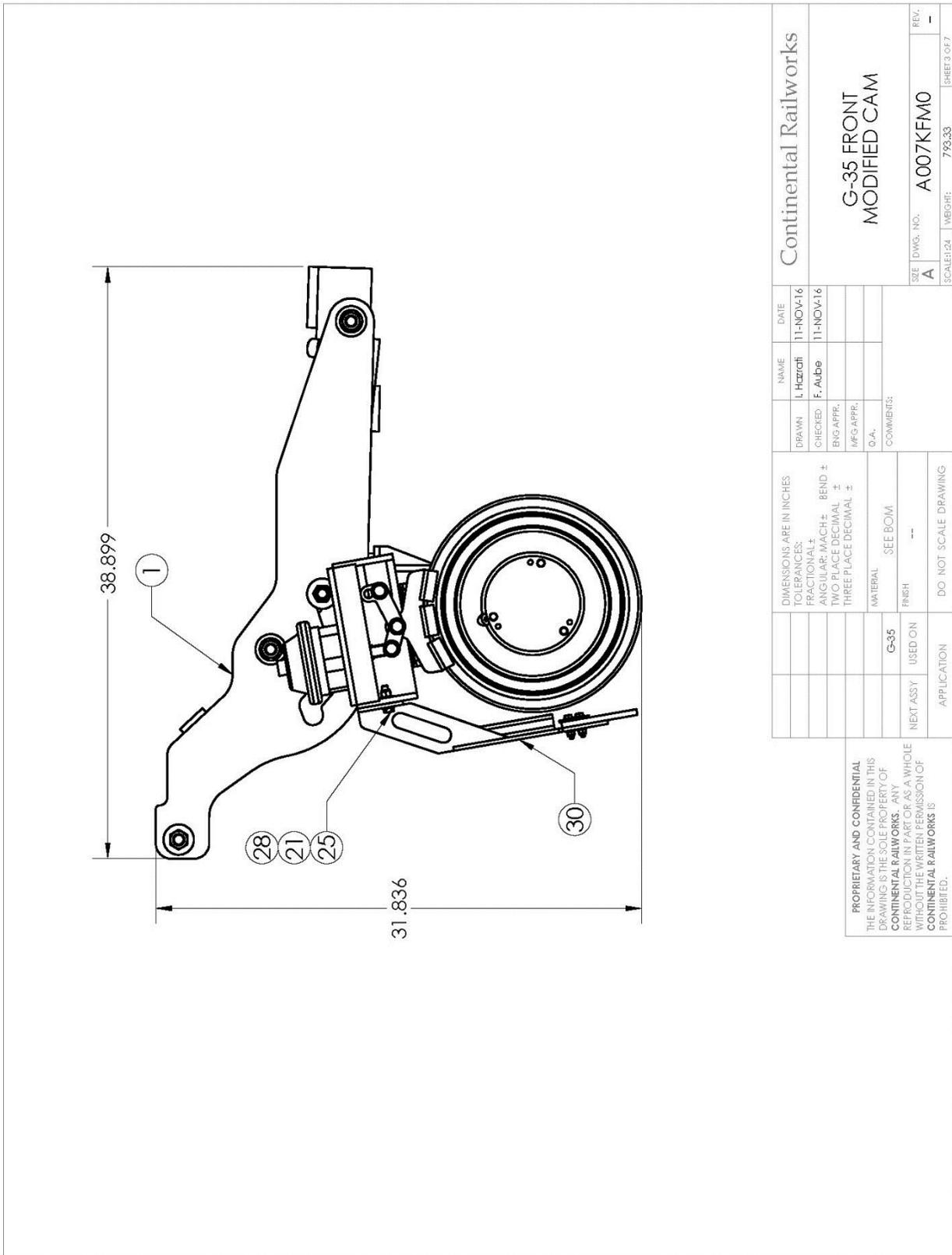
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 TOLERANCES:
 FRACTIONAL: ±
 ANGULAR: MACH ± BEND ±
 TWO PLACE DECIMAL ±
 THREE PLACE DECIMAL ±

MATERIAL	SEE BOM
FINISH	---
APPLICATION	DO NOT SCALE DRAWING

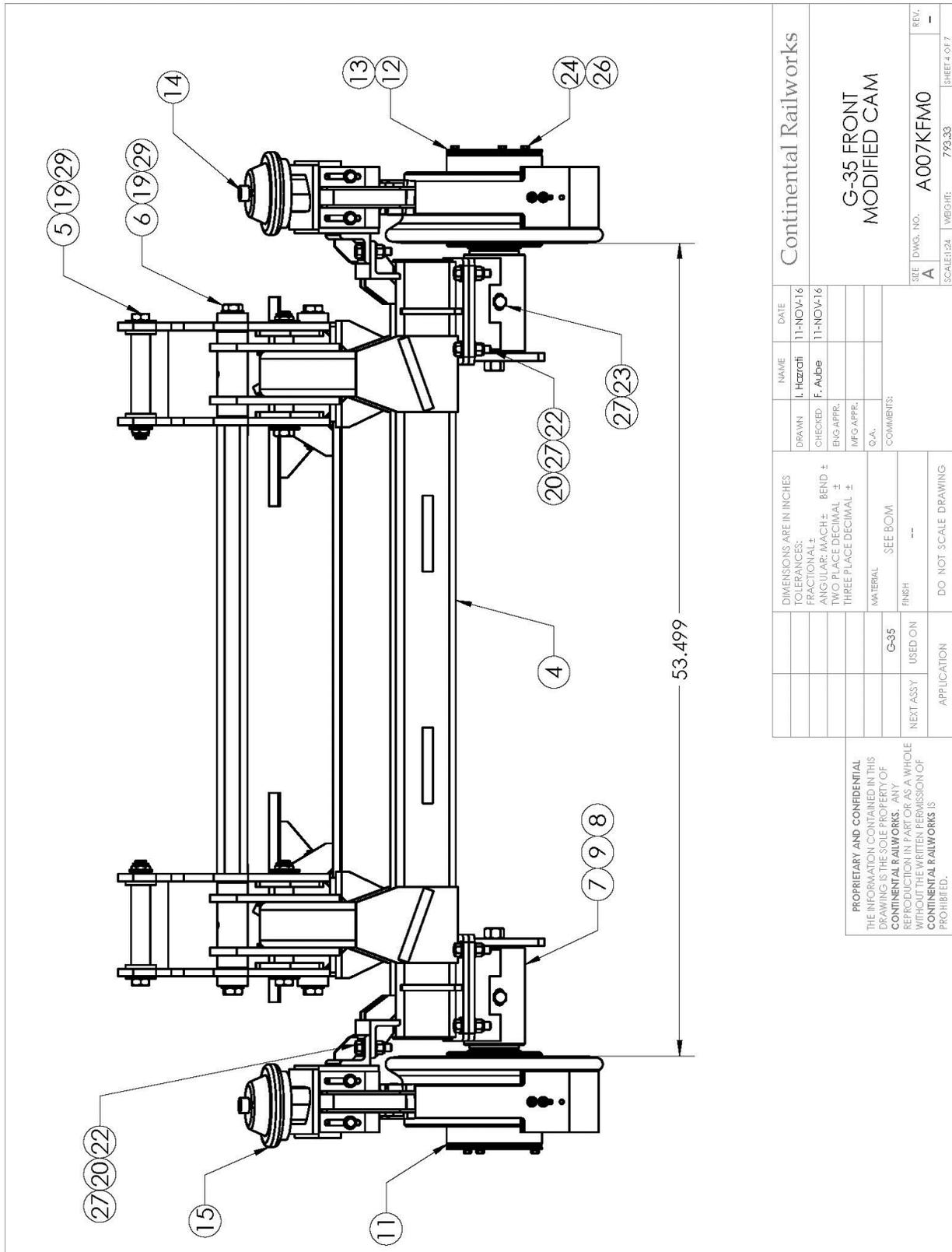
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		<p>G-35 FRONT MODIFIED CAM</p>	
<p>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± TWO PLACE DECIMAL: ± THREE PLACE DECIMAL: ±</p>	<p>DRAWN: L. Hazcraft CHECKED: F. Aube ENG APPR: MFG APPR: Q.A.:</p>	<p>NAME: L. Hazcraft F. Aube</p>	<p>DATE: 11-NOV-16 11-NOV-16</p>
<p>MATERIAL: SEE BOM FINISH: ---</p>	<p>APPLICATION: USED ON</p>	<p>COMMENTS:</p>	<p>SCALE: 1:24 WEIGHT: 793.33</p>
<p>DO NOT SCALE DRAWING</p>	<p>REVISIONS:</p>	<p>SIZE: A DWG. NO.: A007KFMO</p>	<p>REV: - SHEET 2 OF 7</p>



DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±		DRAWN	NAME	DATE
		CHECKED	L. Hazcraft	11-NOV-16
MATERIAL: SEE BOM FINISH: --- DO NOT SCALE DRAWING		ENG APPR.	F. Aulse	11-NOV-16
		MFG APPR.		
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 WRITTEN PERMISSION OF CONTINENTAL RAILWORKS IS PROHIBITED.		Q.A.		
		COMMENTS:		
APPLICATION	G-35	USED ON		
NEXT ASSY				
CONTINENTAL Railworks G-35 FRONT MODIFIED CAM		SIZE	DWG. NO.	REV.
		A	A007KFM0	-
		SCALE: 1:24	WEIGHT:	SHEET 3 OF 7
			793.33	

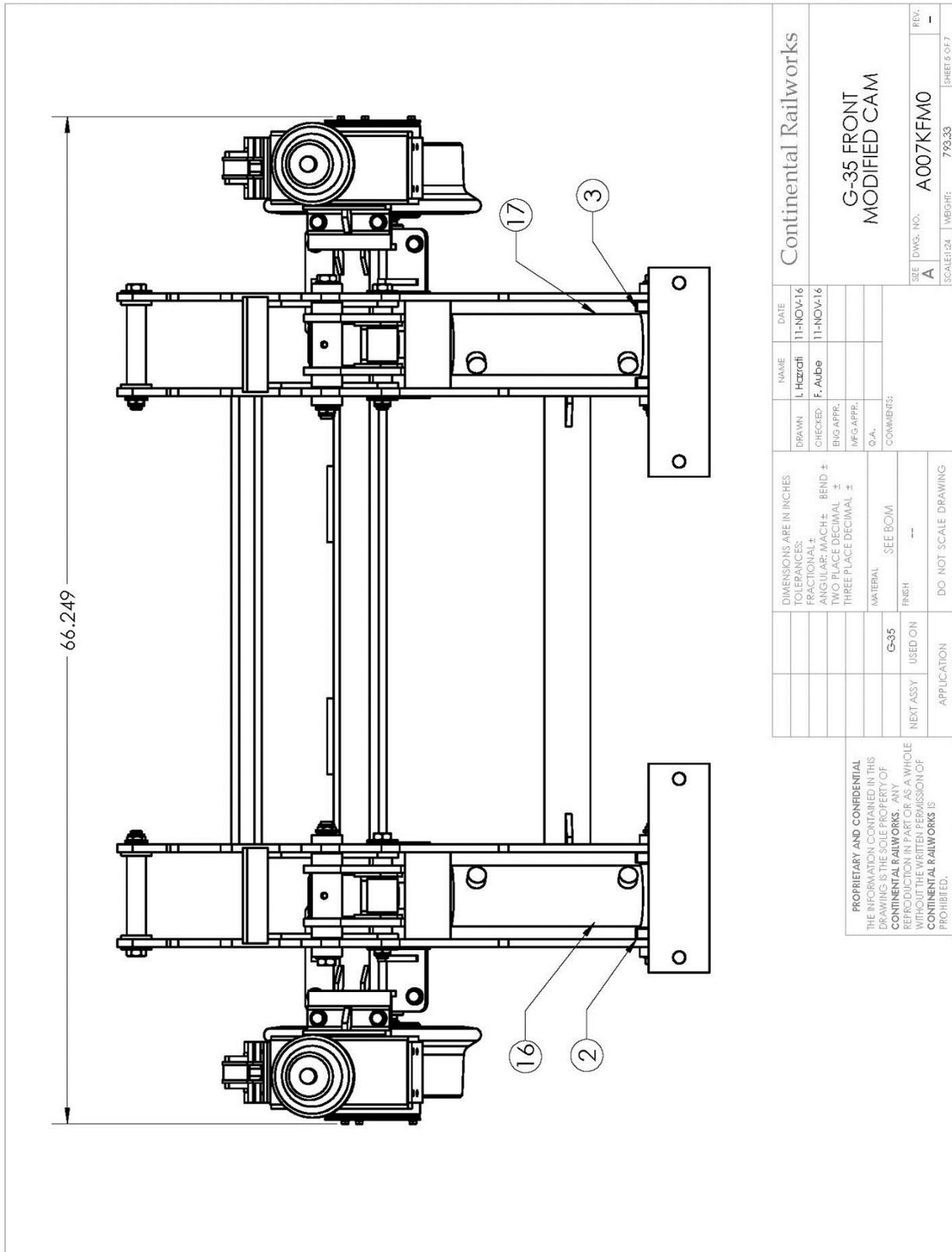


Continental Railworks	
NAME	I. Hazcraft
DATE	11-NOV-16
DRAWN	F. Aube
CHECKED	
ENG APPR.	
MFG APPR.	
Q.A.	
COMMENTS:	
G-35 FRONT MODIFIED CAM	
SITE	A
DWG. NO.	A007KFMO
SCALE:1:24	WEIGHT: 793.33
REV.	-
SHEET 4 OF 7	

DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL: ±	BEND ±
ANGULAR: MACH ±	TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±	
MATERIAL	SEE BOM
FINISH	--
DO NOT SCALE DRAWING	

APPLICATION	
NEXT ASSY	USED ON
G-35	

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DRAWN		NAME	DATE
CHECKED		L. Hazcraft	11-NOV-16
ENG APPR.		F. Aulsebrook	11-NOV-16
MFG APPR.			
Q.A.			
COMMENTS:			

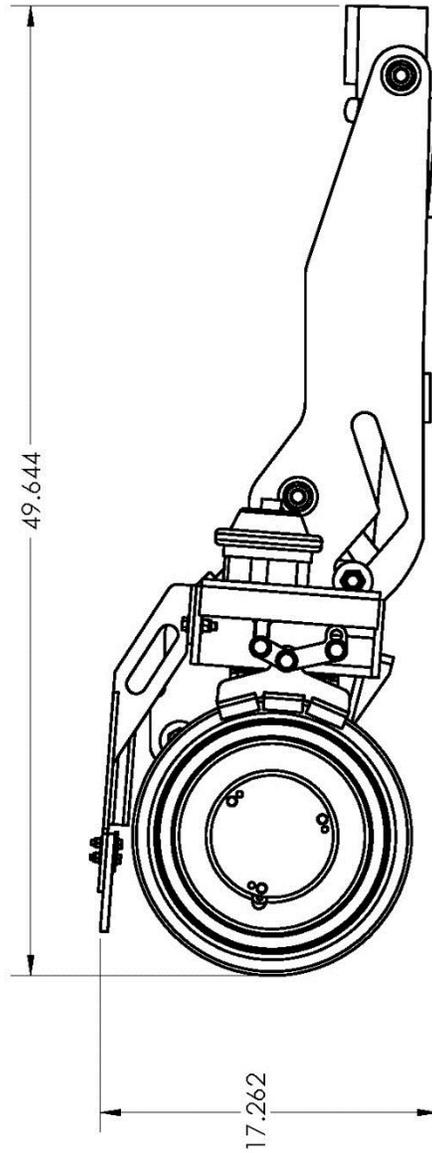
CONTINENTAL RAILWORKS
**G-35 FRONT
 MODIFIED CAM**

SIZE	DWG. NO.	WEIGHT:	SHEET 6 OF 7
A	A007KFM0	793.33	-

DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL ±	BEND ±
ANGULAR: MACH ±	TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±	
MATERIAL	SEE BOM
FINISH	--

APPLICATION	DO NOT SCALE DRAWING
G-35	USED ON
NEXT ASSY	

PROPRIETARY AND CONFIDENTIAL
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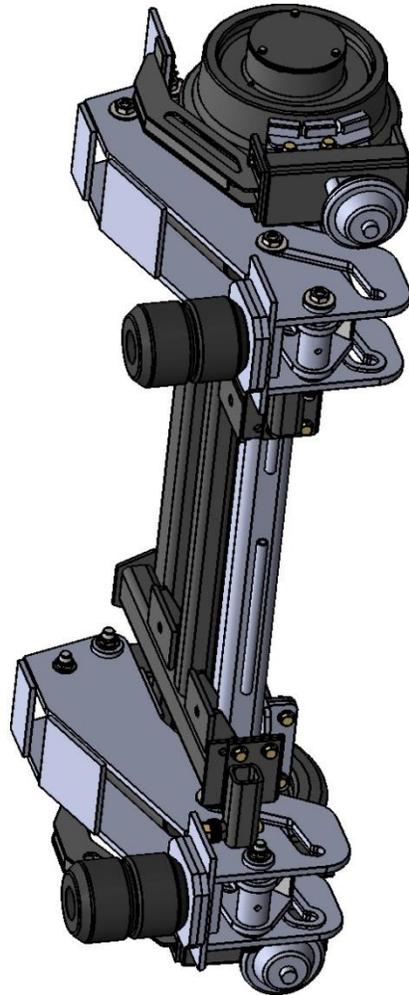


<p>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CONTINENTAL RAILWORKS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CONTINENTAL RAILWORKS IS PROHIBITED.</p>		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±		DRAWN: L. Hazcraft CHECKED: F. Aube ENG APPR: MFG APPR: Q.A.: COMMENTS:	NAME: L. Hazcraft DATE: 11-NOV-16	Continental Railworks
		MATERIAL: SEE BOM FINISH: --	G-35 USED ON	NEXT ASSY: APPLICATION:	DO NOT SCALE DRAWING	SIZE: A DWG. NO.: A007KFM0 SCALE: 1:24 WEIGHT: 793.33 SHEET 6 OF 7

APPENDIX 9

REAR G-35 DRAWINGS

NOTE – Some components may differ slightly from drawings shown.



Continental Railworks

REAR UNIT G-35

SIZE: **A** DWG. NO.: **A007HB00** REV. **-**
 SCALER:124 WEIGHT: 760.00 SHEET: OF 9

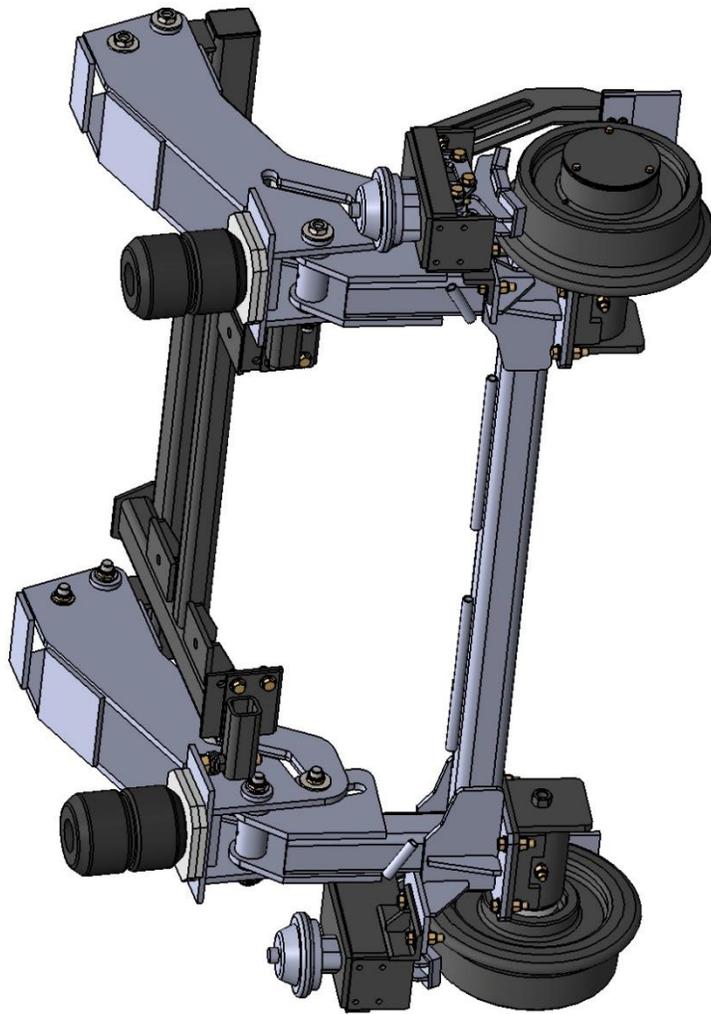
NAME	DATE
V. ZLATEV	22-NOV-10
K. RAMSAY	22-NOV-10
K. RAMSAY	22-NOV-10

DRAWN	CHECKED	ENG. APPR.	MFG. APPR.	Q.A.	COMMENTS:

DIMENSIONS ARE IN INCHES	
TOLERANCES:	FRACTIONAL: ±
ANGULAR: MACH: ±	BEND: ±
TWO PLACE DECIMAL: ±	THREE PLACE DECIMAL: ±
MATERIAL:	SEE BOM
FINISH:	---
DO: NOT SCALE DRAWING	

APPLICATION	G-35
NEXT ASSY	USED ON

PROPRIETARY AND CONFIDENTIAL
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Continental Railworks

REAR UNIT G-35

SIZE: **A** DWG. NO.: **A007HB00** REV. **-**
 SCALER124 WEIGHT: **760.00** SHEET 2 OF 9

DRAWN	NAME	DATE
V. ZLATEV	V. ZLATEV	22-NOV-10
CHECKED	K. RAMSAY	22-NOV-10
ENG. APPR.	K. RAMSAY	22-NOV-10
MFG. APPR.		
Q.A.		
COMMENTS:		

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL: ±
 ANGULAR: MACH ± BEND ±
 TWO PLACE DECIMAL ±
 THREE PLACE DECIMAL ±

MATERIAL: SEE BOM
 FINISH: ---

DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL
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APPLICATION	USED ON
G-35	USED ON
NEXT ASSY	

ITEM NO.	PART NUMBER	DESCRIPTION	WEIGHT	QTY.
1	F107BB00	REAR CAM ASSY	65.98	2
2	D007G800	REAR AXLE ASSY	110.00	1
3	F007B020	1" PIN X 6.125" ASSY	1.54	4
4	F007B010	1-1/4" PIN X 6.875" ASSY	2.56	4
5	F117B000	STOPPER, DRIVER'S SIDE	3.44	1
6	F117BFOO	STOPPER, PASSENGER'S SIDE	3.44	1
7		1/2" UNC GR. 8 BOLT X 1.500" LONG		4
8		1/2" UNC GR. 8 BOLT X 2.000" LONG		12
9		3/8" UNC BOLT X 1.500" LONG		4
10		1/2" UNC GR. 8 BOLT X 5.000" LONG		2
11		1/4" UNF BOLT X 0.750" LONG		6
12	H077BBD0	AIR BRAKE ASSY DRIVER'S SIDE	27.30	1
13	H077BBP0	AIR BRAKE ASSY PASSENGER'S SIDE	27.30	1
14	R007A000	RAILSWEEP ASSY 12"	4.88	2
15	E087D000	SPINDLE HOUSING ASSY	19.75	2
16	E027A001	SPINDLE - 12" WHEEL	17.77	2
17	E058A006	ISOLATING TUBE .500 ID	0.02	2
18	E047A001	12" SPINDLE INSULATOR	0.49	2
19	E0112A01	12" WHEEL	100.00	2
20	E127A001	HUB CAP	1.08	2
21	E177A001	12" HUB CAP GASKET	0.06	2
22	F067C025	RUBBER SPRING SPACER	0.62	4
23	V007A003	RUBBER SPRING .540-65	4.43	2
24	H026A020	2-1/2" HYDRAULIC CYLINDER X 8" STROKE	19.00	2
25	F007HB00	REAR FRAME ASSY	101.40	1
26		3/4" FLAT WASHER		14
27		1/2" FLAT WASHER		36
28		3/4" UNC GR. 8 BOLT X 3.500" LONG		2
29		3/8" FLAT WASHER		8
30		1/4" SPRING LOCK WASHER		6
31		1/2" UNC GR. 8 BOLT X 3.500" LONG		2
32		1/2" UNC GR. 8 NYLON INSERT LOCKNUT		20
33		3/4" WIDE FLAT WASHER		2
34		3/4" LIGHT UNC GR. 8 NYLON INSERT LOCKNUT		8
35		3/8" UNC GR. 8 NYLON INSERT LOCKNUT		4

PART NUMBER	DESCRIPTION	QTY.
E037A001	WHEEL 12" BEARING CONE TIMKEN 3984	4
E037A002	WHEEL 12" BEARING CUP TIMKEN 3925	4
E117A001	WHEEL 12" GREASE SEAL NATIONAL 415991	2
E067A001	WHEEL 12" 7/14" CASTLE NUT	2
E067A002	WHEEL 12" 7/14" WASHER	2
	3/16" COITER PIN X 2.000" LONG	2

PARTS NOT SHOWN ON DRAWING	
NAME	DATE
V. ZLATEV	22-NOV-10
K. RAMSAY	22-NOV-10
K. RAMSAY	22-NOV-10
MFS APPR.	
Q.A.	
COMMENTS:	

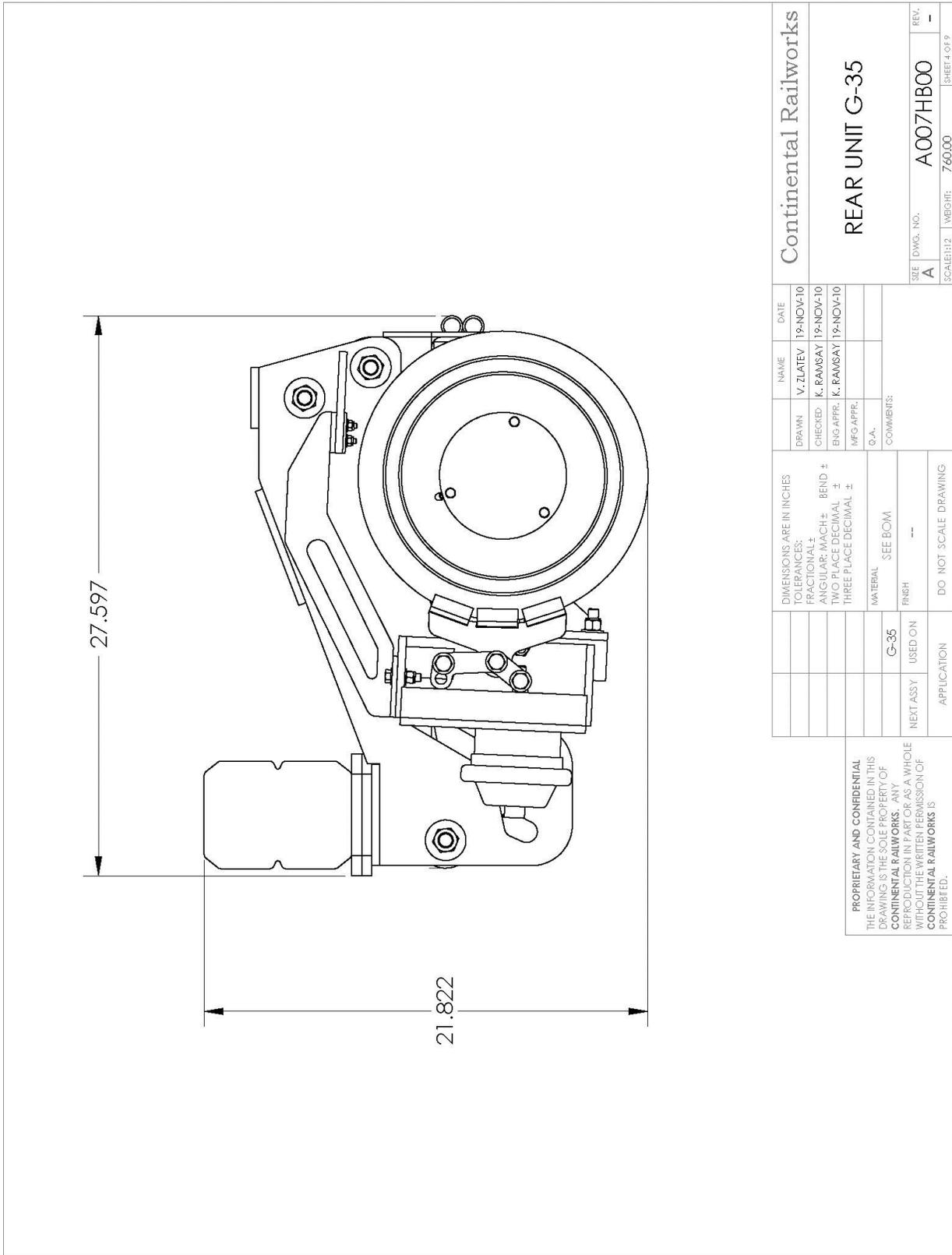
DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL ±	
ANGULAR: MACH ± BEND ±	
TWO PLACE DECIMAL ±	
THREE PLACE DECIMAL ±	
MATERIAL	SEE BOM
FINISH	---
NEXT ASSY	USED ON
APPLICATION	DO NOT SCALE DRAWING

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Continental Railworks

REAR UNIT G-35

SIZE	DWG. NO.	REV.
A	A007HB00	-
SCALE: 1:12	WEIGHT:	SHEET 3 OF 9
	760.00	



Continental Railworks

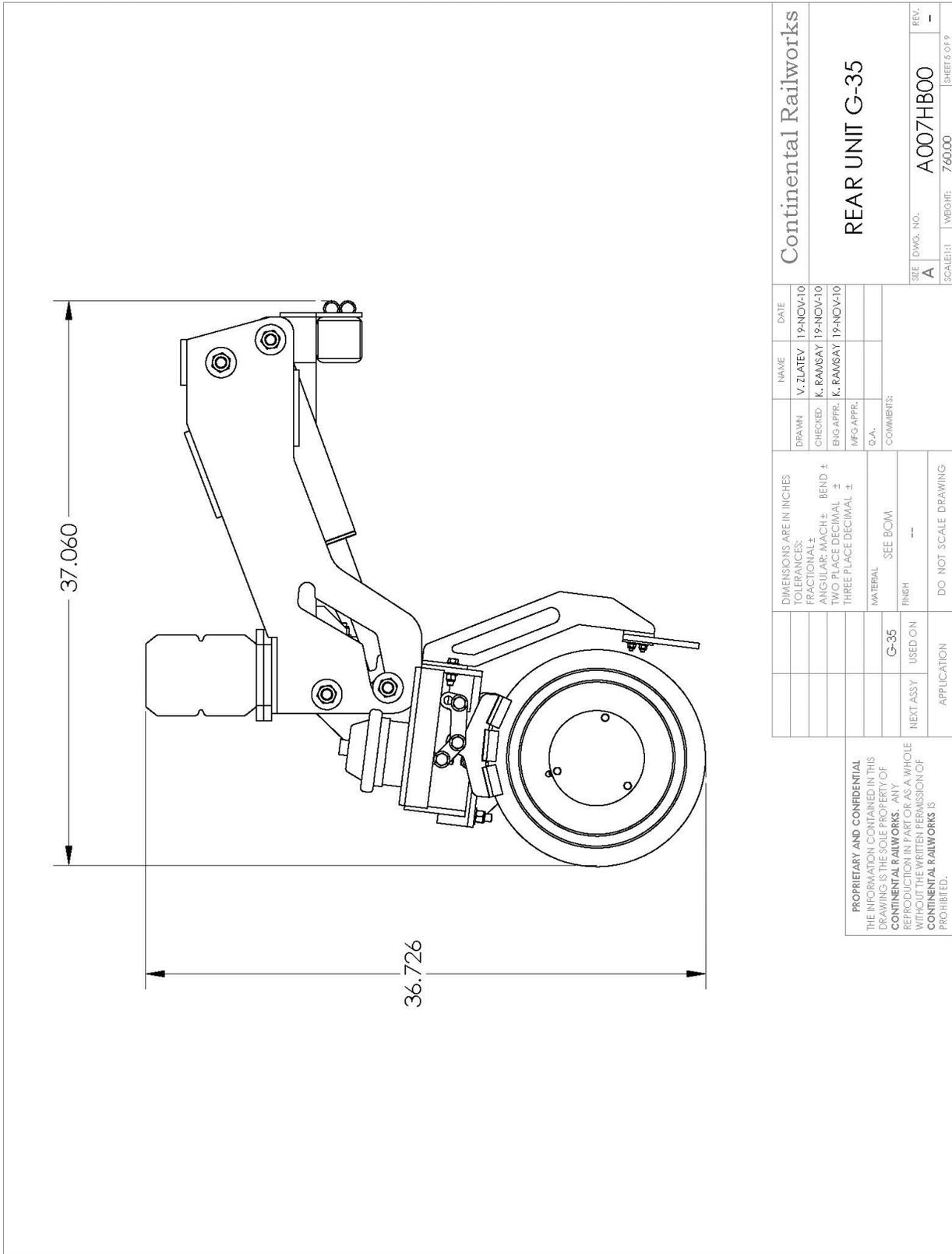
REAR UNIT G-35

SIZE: **A** DWG. NO.: **A007HB00** REV. **-**
 SCALE: 1:1 WEIGHT: **760.00** SHEET 4 OF 9

NAME	DATE
V. ZLATEV	19-NOV-10
K. RAMSAY	19-NOV-10

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APPLICATION	USED ON	FINISH	DO NOT SCALE DRAWING
	G-35	---	
	USED ON		



Continental Railworks

REAR UNIT G-35

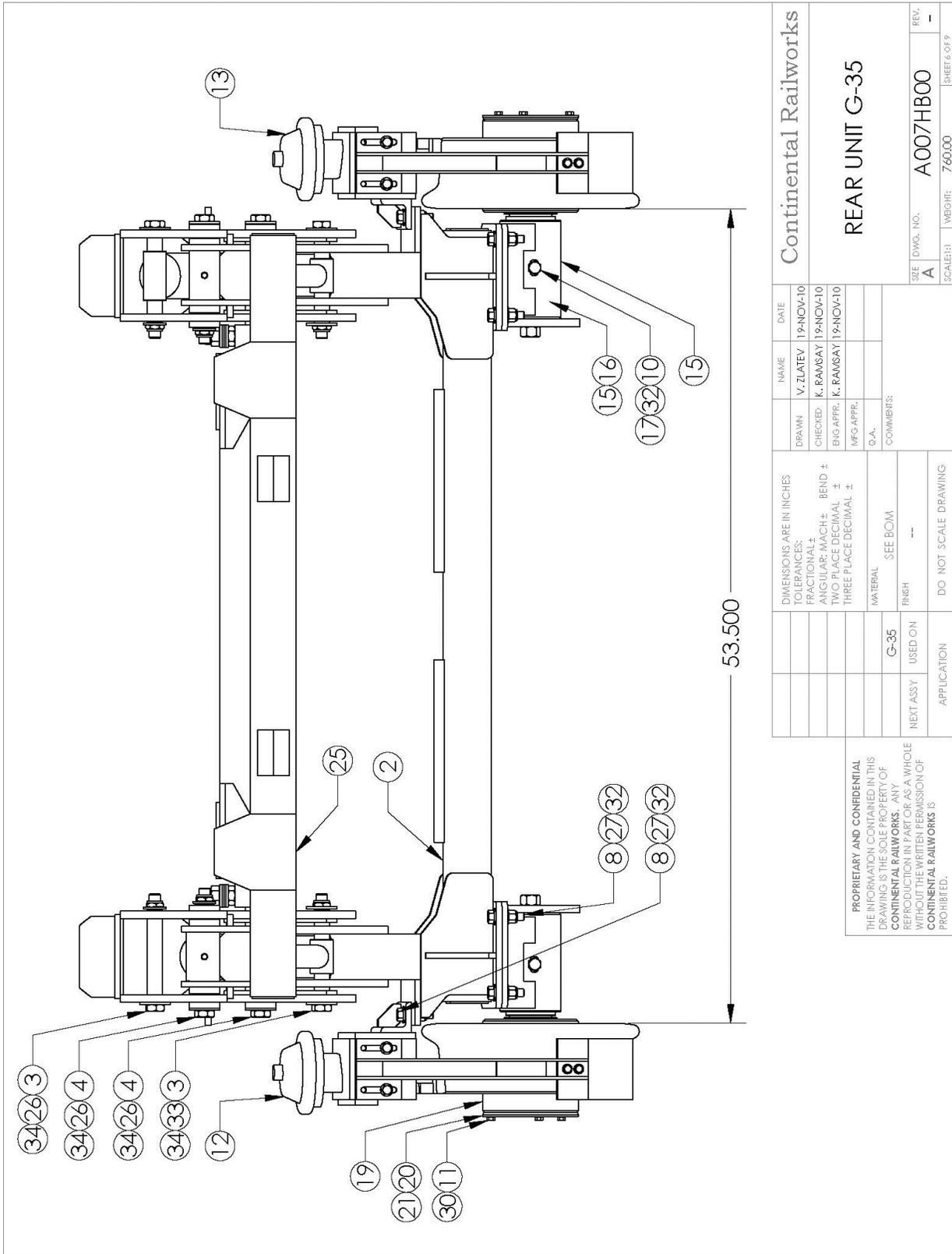
SIZE: **A** DWG. NO.: **A007HB00** REV. **-**
 SCALE: **1:1** WEIGHT: **760.00** SHEET: **6** OF **9**

NAME	DATE
V. ZLATEV	19-NOV-10
K. RAMSAY	19-NOV-10
K. RAMSAY	19-NOV-10

DRAWN	CHECKED	ENG APPR.	MFG APPR.	Q.A.	COMMENTS:
V. ZLATEV	K. RAMSAY	K. RAMSAY			

DIMENSIONS ARE IN INCHES	
TOLERANCES:	FRACTIONAL ±
	ANGULAR: MACH ± BEND ±
	TWO PLACE DECIMAL ±
	THREE PLACE DECIMAL ±
MATERIAL	SEE BOM
FINISH	---
APPLICATION	DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL
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Continental Railworks	
REAR UNIT G-35	
SIZE	DWG. NO.
A	A007HB00
SCALE: 1:1	WEIGHT: 760.00
REV.	-
SHEET 6 OF 9	

NAME	DATE
V. ZLATEV	19-NOV-10
K. RAMSAY	19-NOV-10
K. RAMSAY	19-NOV-10
K. RAMSAY	19-NOV-10
COMMENTS:	
Q.A.	
MFG APPR.	
ENG APPR.	
CHECKED	
DRAWN	

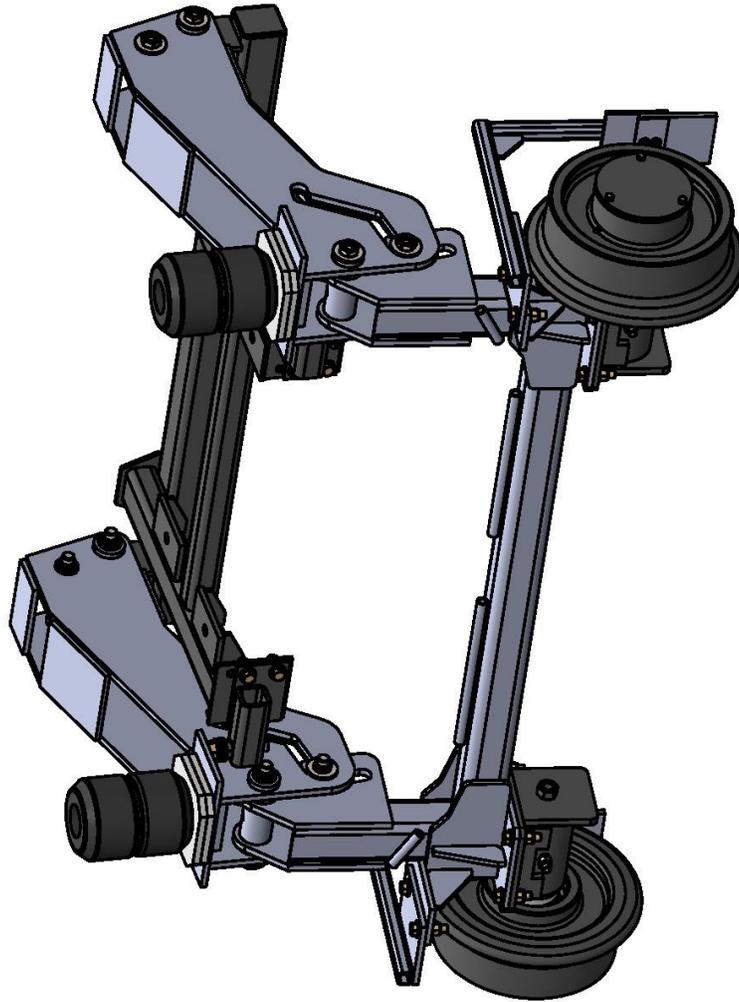
DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL ±	BEND ±
ANGULAR: MACH ±	TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±	
MATERIAL	SEE BOM
FINISH	---
APPLICATION	DO NOT SCALE DRAWING
NEXT ASSY	USED ON
G-35	

PROPRIETARY AND CONFIDENTIAL
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APPENDIX 10

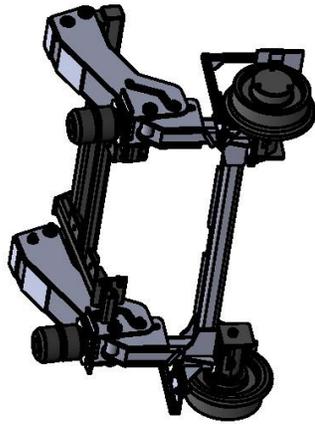
REAR G-35 DRAWINGS (NO BRAKES)

NOTE – Some components may differ slightly from drawings shown.



CONTINENTAL RAILWORKS		NAME	DATE
REAR UNIT G-35 (NO BRAKES)		V. Zlatev	8/27/15
DRAWN	CHECKED	F. Aube	8/27/15
ENG. APPR.	MFG. APPR.	K. Ramsay	8/27/15
Q.A.	COMMENTS:		
DIMENSIONS ARE IN INCHES			
TOLERANCES:			
FRACTIONAL: ±			
ANGULAR: ±MACH. ± BEND ±			
TWO PLACE DECIMAL: ±			
THREE PLACE DECIMAL: ±			
MATERIAL: SEE BOM			
FINISH: ---			
G-35 USED ON			
NEXT ASSY			
APPLICATION			
DO NOT SCALE DRAWING			
SIZE	DWG. NO.	WEIGHT	SHEET OF 9
A	A007WB00	710 lbs	1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	F007H800	REAR FRAME ASSY	1
2	F107B800	REAR CAM ASSY	2
3	D007G800	REAR AXLE ASSY	1
4	P007B020	1" PIN x 6.125" ASSY	4
5	P007B010	1-1/4" PIN x 6.875" ASSY	4
6	F117B000	3/4" FLAT WASHER	14
7	F117B000	STOPPER, DRIV SIDE	1
8	F117B000	STOPPER, PASS SIDE	1
9		1/2" UNC GR. 8 BOLT x 1.500" LONG	4
10		1/2" FLAT WASHER	36
11		3/4" UNC GR. 8 BOLT x 3.500" LONG	2
12		1/2" UNC GR. 8 BOLT x 2.000" LONG	12
13	E087D000	SPINDLE HOUSING ASSY	2
14	E027A001	SPINDLE - 12" WHEEL	2
15	E038A006	ISOLATING TUBE .500 ID	2
16	E047A001	12" SPINDLE INSULATOR	2
17	E0112A01	12" WHEEL	2
18		1/2" UNC GR. 8 BOLT x 5.000" LONG	2
19	E127A001	HUB CAP	2
20	E177A001	12" HUB CAP GASKET	2
21		1/4" UNF BOLT x 0.750" LONG	6
22		1/4" SPRING LOCK WASHER	6
23	F067C025	RUBBER SPRING SPACER	4
24	V007A003	RUBBER SPRING 560-65	2
25		1/2" UNC GR. 8 BOLT x 3.500" LONG	2
26	H026A020	2-1/2" HYDRAULIC CYLINDER x 8" STROKE	2
27		1/2" UNC GR. 8 NYLON INSERT LOCKNUT	20
28		3/4" WIDE FLAT WASHER	2
29		3/4" LIGHT UNC GR. 8 NYLON INSERT LOCKNUT	8
30	R007F000	RAIL SWEEP ASSY 12" WHEEL DRIVER'S SIDE	1
31	R007F000	RAIL SWEEP ASSY 12" WHEEL PASSENGER'S SIDE	1

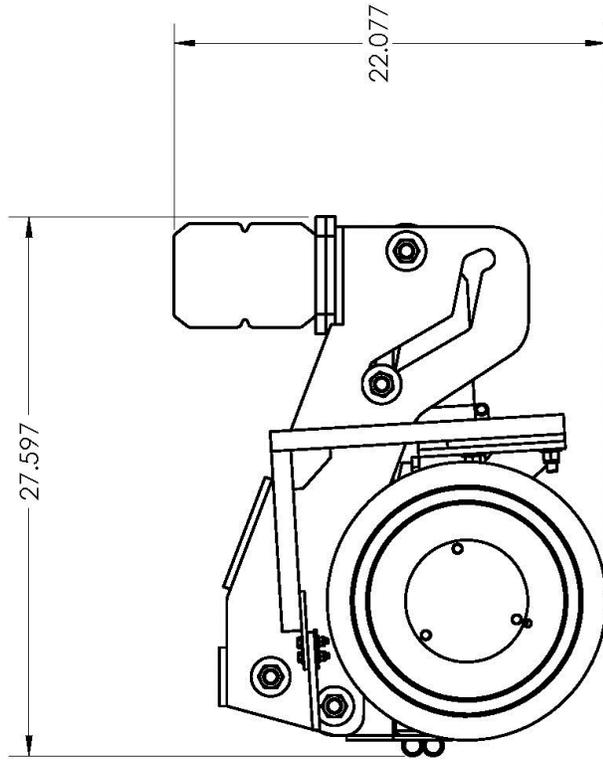
CONTINENTAL RAILWORKS	
NAME	V. Zlatev
DATE	8/27/15
DRAWN	F. Aube
CHECKED	K. Ramsay
ENG APPR.	
MFG APPR.	
Q.A.	
COMMENTS:	
DIMENSIONS ARE IN INCHES	
TOLERANCES:	FRACTIONAL ±
ANGULAR:	MACH ± BEND ±
TWO PLACE DECIMAL ±	THREE PLACE DECIMAL ±
MATERIAL	SEE BOM
FINISH	---
APPLICATION	DO NOT SCALE DRAWING

PART NUMBER	DESCRIPTION	QTY
E037A002	WHEEL 12" BEARING COIP - TAKEN 3884	4
E037A002	WHEEL 12" BEARING COIP - TAKEN 3884	4
E037A002	WHEEL 12" BEARING COIP - TAKEN 3884	4
E067A001	WHEEL 12" CASTLE NUT 415991	2
E067A001	WHEEL 12" 1/4" WASHER	2
E067A002	3/16" COTTER PIN x 2.000" LONG	2

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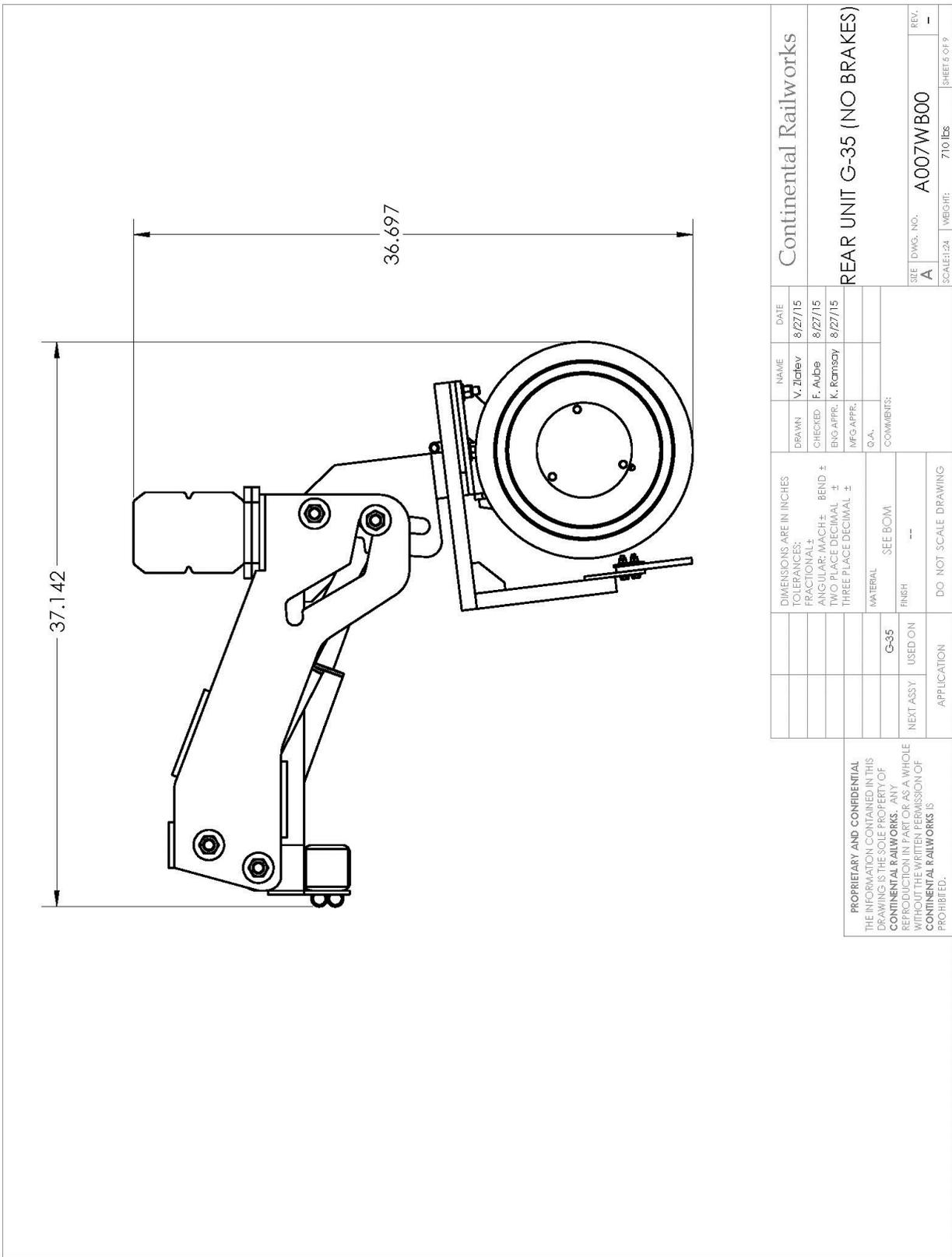
REAR UNIT G-35 (NO BRAKES)

SIZE	DWG. NO.	710 lbs
A	A007WB00	
SCALE: 1:24	WEIGHT:	
		SHEET 3 OF 9



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DIMENSIONS ARE IN INCHES		DRAWN V. Zlatev 8/27/15	NAME V. Zlatev 8/27/15	DATE 8/27/15	Continental Railworks	
TOLERANCES:	CHECKED F. Aube 8/27/15				REAR UNIT G-35 (NO BRAKES)	
FRACTIONAL: ±	ENG APPR. K. Ramsay 8/27/15	Q.A.		SIZE A	DWG. NO. A007WB00	REV. -
ANGULAR: MACH ±	BEND ±	COMMENTS:		SCALE: 1:24	WEIGHT: 710 lbs	SHEET 4 OF 9
TWO PLACE DECIMAL ±	THREE PLACE DECIMAL ±	MATERIAL G-35				
APPLICATION		SEE BOM				
NEXT ASSY		FINISH ---				
USED ON		DO NOT SCALE DRAWING				



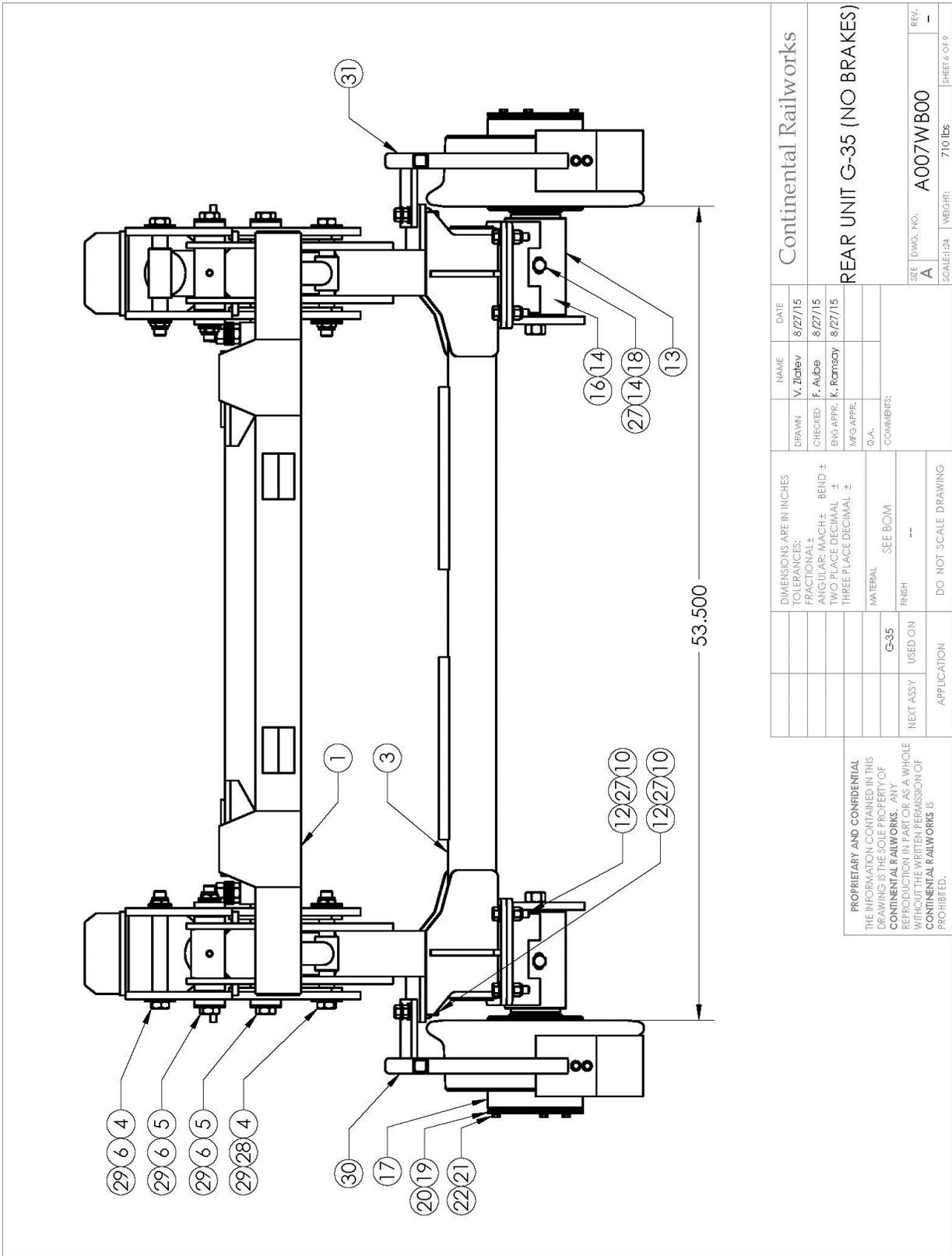
Continental Railworks	
SIZE	A
DWG. NO.	A007WB00
SCALE	1:24
WEIGHT	710 lbs
REV.	-

REAR UNIT G-35 (NO BRAKES)

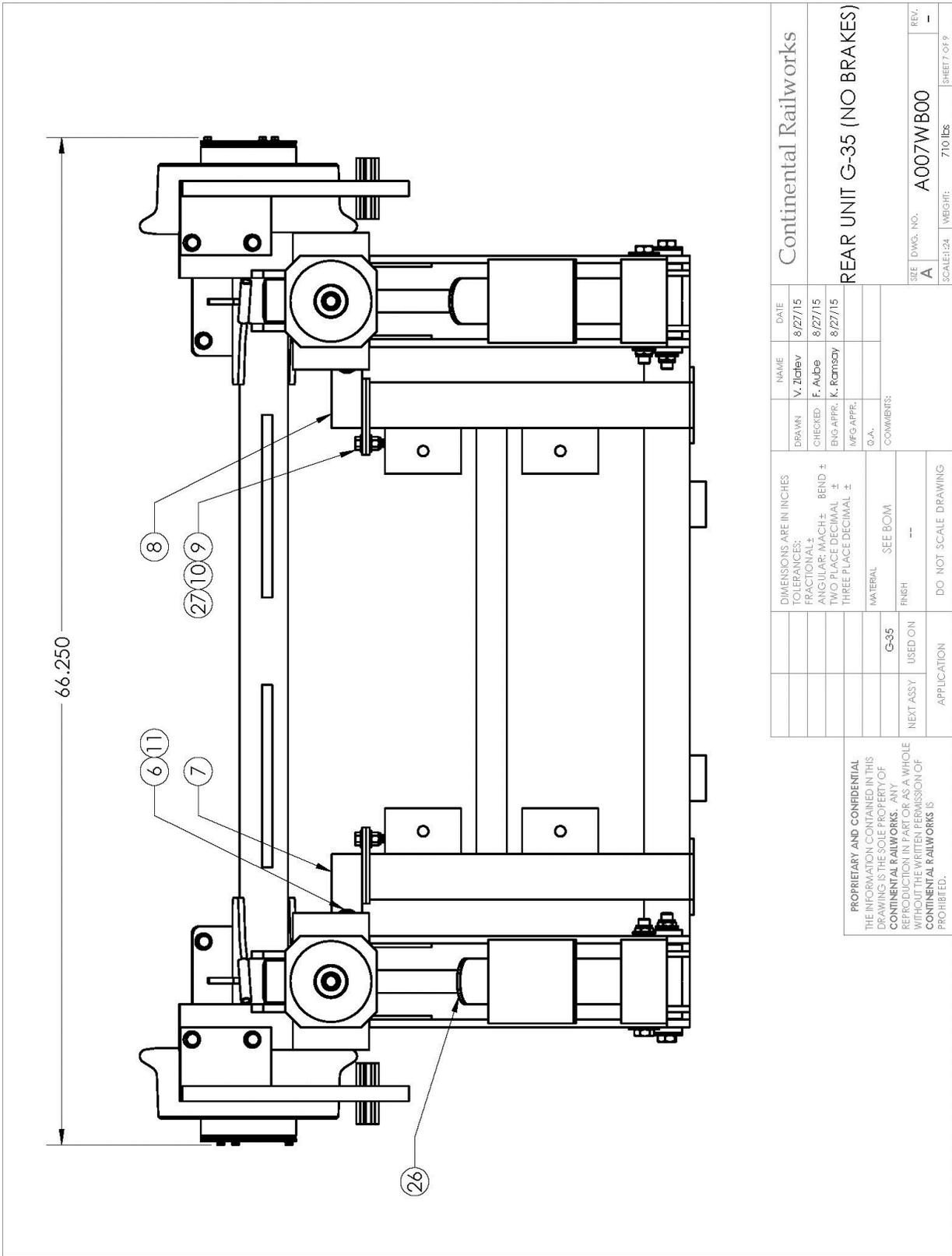
NAME	V. Zlatev
DATE	8/27/15
DRAWN	F. Aube
CHECKED	K. Ramsay
ENG APPR.	
MFG APPR.	
Q.A.	
COMMENTS:	

DIMENSIONS ARE IN INCHES	
TOLERANCES:	
FRACTIONAL:	BEND ±
ANGULAR:	MACH ±
TWO PLACE DECIMAL:	±
THREE PLACE DECIMAL:	±
MATERIAL:	SEE BOM
FINISH:	---
DO NOT SCALE DRAWING	

APPLICATION	
PROPRIETARY AND CONFIDENTIAL	
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CONTINENTAL RAILWORKS		NAME	DATE
DRAWN	V. Zlatev	8/27/15	
CHECKED	F. Aube	8/27/15	
ENG APPR.	K. Ramsay	8/27/15	
MFG APPR.			
Q.A.			
COMMENTS:			
DIMENSIONS ARE IN INCHES			
TOLERANCES:			
FRACTIONAL: ±			
ANGULAR: MACH ± BEND ±			
TWO PLACE DECIMAL: ±			
THREE PLACE DECIMAL: ±			
MATERIAL: SEE BOM			
FINISH: --			
DO NOT SCALE DRAWING			
APPLICATION			
NEXT ASSY	G-35	USED ON	
PROPRIETARY AND CONFIDENTIAL			
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SIZE	DWG. NO.	WEIGHT	SHEET 6 OF 9
A	A007WB00	710 lbs	
REAR UNIT G-35 (NO BRAKES)			

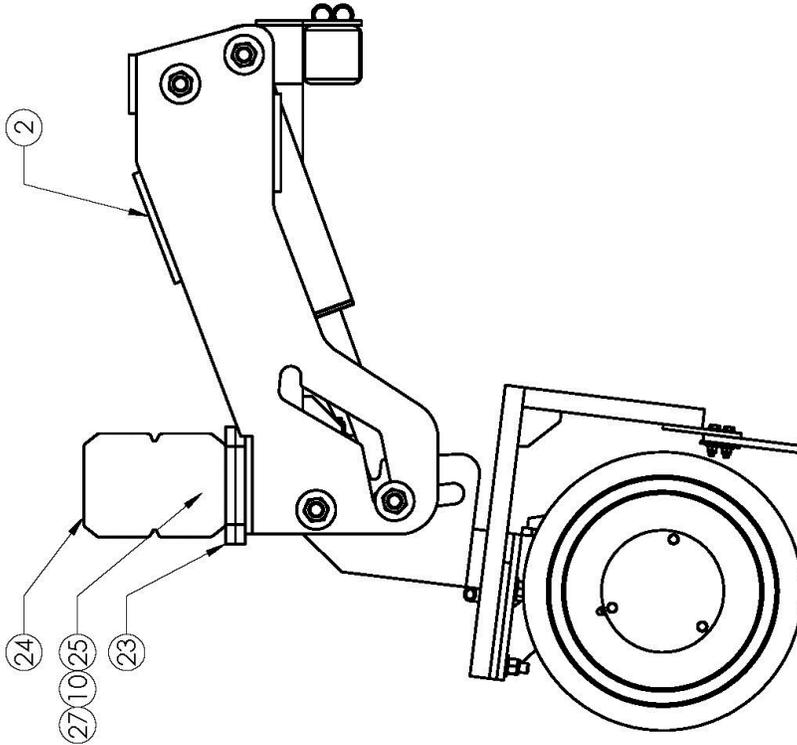


CONTINENTAL RAILWORKS		NAME	DATE
DRAWN	V. Zlatev	8/27/15	8/27/15
CHECKED	F. Aube	8/27/15	8/27/15
ENG APPR.	K. Ramsay	8/27/15	8/27/15
MFG APPR.			
Q.A.			
COMMENTS:			
DIMENSIONS ARE IN INCHES			
TOLERANCES:			
FRACTIONAL: ±			
ANGULAR: MACH ± BEND ±			
TWO PLACE DECIMAL: ±			
THREE PLACE DECIMAL: ±			
MATERIAL: SEE BOM			
FINISH: --			
G-35 USED ON			
NEXT ASSY			
APPLICATION			
DO NOT SCALE DRAWING			

REAR UNIT G-35 (NO BRAKES)

SIZE DWG. NO. A007WB00
 SCALE: 1:24 WEIGHT: 710 lbs
 REV. -
 SHEET 7 OF 9

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 DRAWING IS THE SOLE PROPERTY OF
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 REPRODUCTION IN PART OR AS A WHOLE
 WITHOUT THE WRITTEN PERMISSION OF
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CONTINENTAL RAILWORKS		NAME	DATE
DRAWN	V. Zlatev	8/27/15	
CHECKED	F. Aube	8/27/15	
ENG APPR.	K. Ramsay	8/27/15	
MFG APPR.			
Q.A.			
COMMENTS:			
DIMENSIONS ARE IN INCHES			
TOLERANCES:			
FRACTIONAL: ±			
ANGULAR: MACH ± BEND ±			
TWO PLACE DECIMAL: ±			
THREE PLACE DECIMAL: ±			
MATERIAL: SEE BOM			
FINISH: --			
G-35 USED ON			
NEXT ASSY:			
APPLICATION: DO NOT SCALE DRAWING			

PROPRIETARY AND CONFIDENTIAL
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Continental Railworks
 REAR UNIT G-35 (NO BRAKES)
 SIZE: A DWG. NO.: A007WB00 REV. --
 SCALE: 1:24 WEIGHT: 710 lbs SHEET 8 OF 9

APPENDIX 11

PACKING LIST