

CONTINENTAL RAILWORKS

OPERATION, PARTS, AND SERVICE MANUAL

MODEL V-60 HI-RAIL UNIT

CONTINENTAL RAILWORKS

7300 St-Francois, St-Laurent, Quebec, H4S 1B8

phone: (514) 956-8081 fax: (514) 956-0737 e-mail: contrail@total.net

INTRODUCTION

The following operation, parts, and service manual has been prepared to be used with the Continental Railworks **model V-60** hi-rail unit.

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. Virtually all steel to steel contact has been eliminated through the use of wear rings, which also eliminates the requirement for constant lubrication. 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., by calling **(514) 956-8081** or by faxing **(514) 956-0737**. 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.

TABLE OF CONTENTS

PAGE

OPERATION

Rear Unit	4
Front Unit	4
Front Axle Lock-up	5
Steering Wheel Lock	5
Speed Limit	5

PARTS

Front Unit Parts List	6
Rear Unit Parts List	7
Front Axle Lock-up Parts List	8
Hydraulics Components Parts List	8

SERVICE

Interval Schedule	9
Removal of Hi-Rail Unit	9
Alignment and Adjustment	
• Alignment procedure	10
• Front Axle Lock-up Adjustment	11
• Pressure adjustment	11

APPENDICES

Hydraulics Schematic	13
Alignment Diagram	

OPERATION

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. Engage the hydraulics system to provide hydraulic pressure to the hi-rail circuit.
3. Actuate the rear operating valve to lower the hi-rail unit. The Continental V-60 rear is equipped with an automatic unlock feature, therefore it is not necessary to disengage a rear hi-rail locking mechanism, such as a lever, hook, or pin. **The operator of the vehicle does not need to perform any special steps to disengage the rear locking system.**
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. Lower the hi-rail unit completely. Ensure the cylinders are completely stroked and the unit has rotated over center.

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.
2. Actuate the front operating valve to raise the front hi-rail unit. Disengage the safety hook system by rotating the lever located on the driver's side of the vehicle.
3. 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.
4. Lower the hi-rail unit completely. Ensure the cylinders are completely stroked.
5. Disengage the hydraulics system providing hydraulic pressure to the hi-rail circuit.
6. Ensure that there is adequate clearance between the front wheels of the vehicle and the track rail (at least two inches).

Front Axle Lock-up

The front axle lock-up system is used to lock the front axle of the vehicle in position before the hi-rail unit is lowered. This is done to minimize the distance the front axle of the vehicle drops when the front of the truck is raised, allowing a lower overall height of the hi-rail vehicle in the working position on rail.

The front axle lock-up system engages automatically when the front hi-rail unit is lowered, and disengages automatically when the front hi-rail unit is raised. ***The operator of the vehicle does not need to perform any special steps to engage or disengage the front axle lock-up system.***

Steering Wheel Lock

The steering wheel lock must be engaged when the unit operates on rail. Although the front wheels are raised above the rail head, the wheels are to be locked straight ahead so that the vehicle will continue straight ahead in the event of a derailment.

1. After the vehicle has been placed on the track, position the steering wheel so that the wheels are pointing straight ahead.
2. Lock the steering wheel in position by placing the steering lock lever in position and pinning the lever to the lock clamp mounted on the steering column.

Speed Limit

The maximum speed limit of a vehicle equipped with a model V-60 hi-rail unit is 40 kilometres per hour. 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 if lower than 40 kilometres per hour must be followed.

PLEASE DRIVE SAFELY !!!

PARTS

Model V-60 Front Unit Parts List

Item no.	Part no.	Description	Quantity
1	VF8A031	mounting plate driver	1
2	VF8A030	mounting plate passenger	1
3	VF8A038	mounting assembly driver	1
4	VF8A039	mounting assembly passenger	1
5	VF8A001	4" wear ring	2
6	VF8A052	inner tube assembly	2
7	VF8A002	hydraulic cylinder	2
8	H077AFP0	air brake assembly	2
9	VF8A076	brake housing assembly - driver	1
10	VF8A075	brake housing assembly - passenger	1
11	E0114A01	14" wheel	2
12	A18A0802	rail sweep plate	2
13	A18A0801	rail sweep rubber	2
14	VF8A003	4-1/4" wear ring	2
15	A18A1101	rubber spring (optional)	2
16	VF8A021	axle assembly	1
17	VF8A050	top plate	2
18	VF8A004	2-1/8" wear ring	4
19	VF8A049	small inner tube (optional)	2
20	VF8A073	axle	1
21	VF8A072	lock-up hook assembly	1
22	VF8A078	handle assembly	1
23	VF8A061	spacer	4
24	VF8A048	cylinder axle	1
25	VF8A056	1" pin 7-1/2" long	2
26	VF8A058	1" pin 7-1/4" long	2
27	VF8A060	1" pin 6-3/4" long	2
28	VF8A005	heavy hex nut (optional)	2
29	E0314A02	bearing cup	4
30	E0314A01	bearing cone	4
31	E0214A01	wheel spindle	2
32	E1114A01	grease seal	2
33	E0614A01	washer	2
34	I038A001	lock cap	2
35	I04A0308	cotter pin 3/16" x 2"	2
36	E1214A01	hub cap	2
37	E058A006	insulating tube	2
38	IF2B1680	heavy hex nut	2

Model V-60 Rear Unit Parts List

Item no.	Part no.	Description	Quantity
1	E14A0101	14" diameter steel wheel	2
2	E12A0303	wheel bearing cup	4
3	E12A0302	wheel bearing cone	4
4	E14A1101	grease seal	2
5	E8A02002	14" wheel spindle	2
6	E18A0401	spindle insulator	2
7	E8A05006	Isolating tube	2
8	E8A06001	spindle washer	2
9	I02B16A0	heavy hex nut	2
10	I18A0301	locking nut cap	2
11	E14A1201	hub cap	2
12	D8A00BA0	rear axle ass'y	1
13	A18A0801	rail sweep rubber	2
14	A18A0802	rail sweep plate	2
15	F8B00B00	rear frame ass'y	1
16	A18A0602	wear ring	4
17	B8A00BD0	rear inner tube - driver	1
18	B8A00BP0	rear inner tube - passenger	1
19	H35C0200	Hydraulic cylinder	2
20	B8C02000	inner tube end cap ass'y	2
21	A18A1102	rear rubber spring	2
22	H8A06LB0	rear brake housing - lhs	1
23	H8A06RB0	rear brake housing - rhs	1
24	H048A001	brake chamber	2
25	H18A0701	brake linkage	4
26	H8A08000	brake shoe	2
27	N8A02FR0	lockup hook rhs	1
28	N8A02FL0	lockup hook lhs	1
29	N8A04R00	linkage ass'y rhs	1
30	N8A04L00	linkage ass'y lhs	1
31	N8A01000	rubber plate ass'y	2
32	A8A11003	lockup rubber spring	2
33	N8A06000	cylinder stopper ass'y	2
34	A8A01A01	5-1/4" pin	1
35	A8A01A02	5-1/2" pin	3
36	A8A01A04	6" pin	2
37	G018A009	mounting plate spacer	8
38	G008AB00	rear mounting plate	2

Model V-60 Front Axle Lock-up Parts List

Item no.	Part no.	Description	Quantity
1	K038A000	bracket ass'y	2
2	K068A010	support plate	2
3	K028B000	hook ass'y	2
4	K068A009	end plate	2
5	K058B000	cylinder rod extension	1
6	H0215C00	Hydraulic cylinder ass'y	1
7	K018B000	Hook	2
8	K048B000	hook support	4
9	K108A000	spacer ass'y	4

Model V-60 Hydraulics Parts List

Item no.	Part no.	Description	Quantity
1	H105A001	control valve	2
2	H105A002	lock valve	2
3	H105A004	Pneumatic brake valve	1

SERVICE

Model V-60 Recommended Maintenance Interval Schedule

Item	Frequency	Description
Nuts and Bolts	Weekly	Inspect for loose fasteners. Tighten.
Wheel	Monthly	Inspect for excessive wear in tread or flange, cracking, or pitting. Replace as necessary.
Wheel Bearings	Every 6 Months	Remove wheels and bearings. Clean bearings and inspect for excessive wear, burning, pitting, or discoloration. Replace as necessary. Repack and re-install.
Wheel Insulators	Monthly	Visually inspect for damage.
	Every 6 months	Inspect for excessive wear or cracking. Replace as necessary.
Wheel Spindle	Every 6 Months	Inspect surfaces for excessive wear, burning, pitting, or discoloration. Replace as necessary.
Inner Tube	Every 2 Years	Inspect surfaces for excessive wear. Replace as necessary.
Inner Tube Wear Rings	Every 2 Years	Inspect for excessive wear. Ensure a good fit with inner tube. Replace as necessary.
Axle and Frame Assemblies	Monthly	Visually inspect for damage, cracks, or broken welds. Repair as necessary.
	Every 2 Years	Inspect all pins for excessive wear. Replace as necessary.
		Inspect all holes and slots for excessive wear. Rebuild as necessary.
Rubber Springs	Every 6 Months	Visually inspect for cracks or deformation. Replace as necessary.
Hydraulics	Monthly	Inspect for leaking or damaged hoses or cylinders. Repair as necessary.

Removal Hi-Rail Unit

Either the front or the rear hi-rail unit can be removed from the vehicle very easily. The use of independent mounting plates permits the removal of the unit but allows the mounting hardware to remain on the vehicle, ensuring easy re-installation and re-alignment. The following procedure applies to both the front and the rear units:

1. Mark the existing location of the hi-rail unit in reference to the mounting plates.
2. Tag, remove, and cap the hydraulic hoses at the hydraulic cylinders on the hi-rail unit.

3. Remove the air brake lines from the brake chambers.
4. Support the hi-rail unit, so that the unit will not drop once the mounting bolts are removed.
5. Remove the bolts connecting the base of the mounting plates to the hi-rail unit cross frame (6 bolts on the front unit, 8 bolts on the rear unit).

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 pilons.

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):

1. Ensure the vehicle is on a hard flat surface with the front wheels pointing straight ahead
2. Lower the rear unit until it just rests on the ground
3. Lower the front unit until it just rests on the ground
4. Set up pilons at the four corners of the vehicle
5. Attach 2 high tension strings of exactly equal length (dimension A) to the pilons, running them along the length of the vehicle (strings are not required along the front and rear of the vehicle)
6. Position the pilons so that the strings are an equal distance from each rear rim (dimension C), an equal distance from each front rim (dimension E), and the pilons are an equal distance apart front and rear (dimension B)

7. 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)
8. Adjust the rear hi-rail unit toe-in and toe-out so that the distance from the front of the rear hi-rail wheel to the string (dimension D) is equal to the distance from the rear of the rear hi-rail wheel to the string, and is equal on both sides of the vehicle
9. 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)
10. Adjust the front hi-rail unit toe-in and toe-out so that the distance from the front of the front hi-rail wheel to the string (dimension D) is equal to the distance from the rear of the front hi-rail wheel to the string, and is equal on both sides of the vehicle
11. Ensure all bolts are properly tightened after adjusting the unit
12. Perform a track test on the unit ensuring there is no excessive flanging

Front Axle Lock-up Adjustment

1. Adjust the height of the hook assemblies to provide a clearance of $\frac{1}{2}$ " between the hook assembly and the u-bolt bracket. This is achieved by either tightening or loosening the $\frac{3}{4}$ " nylon insert locknuts on the threaded sections of the hook assemblies.
2. Adjust the distance between the two cylinder bolts so that there is $\frac{1}{4}$ " of side-to-side motion of the cylinder assembly with the cylinder completely stroked. This is achieved by removing the bolt connecting the rod end of the cylinder to the hook assembly, loosening the locknut, and rotating the clevis until it is in the correct position. Ensure the hook assemblies are adequately engaging the u-bolt brackets in all possible positions of the lock-up cylinder assembly when stroked.
3. Verify there is a minimum $\frac{1}{2}$ " of clearance between the hook assembly and the u-bolt bracket with the cylinder completely collapsed.

Pressure Adjustment

The rear unit may require adjustment to allow for the proper balance between traction and guidance.

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 one (or two) of the ¼" shims installed between the rear hi-rail mounting plates and the cross frame, which will in effect raise the hi-rail unit and increase the vehicle traction. It is recommended that shims are removed from only one side at a time, so that the alignment of the vehicle is not compromised. It is also recommended that only one thickness of shim be removed at a time, and the vehicle re-checked.

SAFETY CAUTION!!! Operating a hi-rail equipped vehicle at excessive speed or in unsafe conditions may result in personal injury or damage to property. Please use caution.

APPENDICES