

RAFNA "CUSHION-RIDE" RAILGEAR

**OPERATION, SERVICE AND
PARTS MANUALS
&
INSTALLATION MANUALS**

**READ THESE MANUALS BEFORE
INSTALLING THE RAILGEAR EQUIPMENT
AND/OR BEFORE OPERATING THE
RAILGEAR EQUIPPED VEHICLE**

**THIS SET OF MANUALS IS FOR RAILGEAR
SERIAL NUMBERS:**

_____ & _____

SAFETY PRECAUTIONS

If any problems are encountered, please call G&B Specialties, Inc. for technical assistance.



- Failure to heed to any of the following warnings could result in severe bodily injury and/or equipment damage.
- Read and understand all manuals completely before attempting operation of the railgear equipped vehicle or service or installation of the railgear
- General instructions provided below only address the RAFNA railgear equipment. Applicable railway company procedures and policies must be adhered to.
- Ensure that the position and function of all railgear controls are known before attempting operation.
- Railway company rules governing rail travel must be observed at all times.
- Rail travel speed should always be in conformance with railway company regulations and should be reduced during inclement weather, passing through road crossings, switches, frogs, bridges, and curves. Curves of greater than 20 degrees should be negotiated with extreme caution. Operation of this vehicle at unsafe speeds could result in derailment.
- Ensure the railgear is locked in road or rail position before starting road or rail travel respectively.
- This vehicle will not operate crossing signals. At level crossings, ensure that no other vehicles are approaching and flag the crossing to ensure safety. Use caution when approaching and traversing level crossings.
- Never operate the vehicle if the Gross Vehicle Weight Rating (GVWR), Gross Axle Weight Rating Front or Rear (GAWR), or the wheel or tire load ratings are exceeded.
- Before performing any work under the vehicle or railgear, ensure the engine is turned off and the parking brake is set.
- Ensure all body parts and loose clothing are clear of any moving parts of the equipment.

- **If misalignment of the railgear equipment is indicated, promptly perform the alignment procedure. Note that excessively worn rail wheels, vehicle pulling to one side while on rail, and vibration through the vehicle while on rail are indicators of railgear misalignment.**
- **Following the first 100 km (62 miles) of combined road and rail travel, the vehicle road wheel and spacer lug nuts should be re-torqued as per the Road Wheels and Tires Kit Operation, Service, and Parts manual if applicable.**
- **On newly installed railgear, following the first eight (8) hours of rail travel, inspect the rail wheel bearing end-play as per the Railgear Kit Operation, Service, and Parts manual. During this time period, the bearings will have seated and may require adjustment of end-play. If the end-play is not in accordance with specifications, bearing failure could occur and would not be covered under warranty. Also check for sufficient grease in the wheel bearings.**
- **If the vehicle was derailed or involved in an accident, a thorough inspection of the complete railgear package for damaged parts should be carried out before the vehicle is put back in service.**

GENERAL RAILGEAR INFORMATION

The RAFNA railgear is a hydraulically operated road-to-rail conversion system. The front and rear railgear are mounted to the vehicle frame and hydraulically raise and lowered via a 12 VDC electric hydraulic pump or an alternative hydraulic pump (eg PTO driven pump). During road travel, the front and rear railgear are mechanically locked in the road position. During rail travel, the front and rear railgear are locked in rail position via hydraulic check valves or mechanical locks, depending on model. A steering wheel lock keeps the vehicle front wheels straight during rail travel. The railgear's spring suspension system ensures constant rail wheel to rail contact and a comfortable ride. Propulsion and braking on rail is provided by the vehicle original systems through the vehicle's wheels contact with the rail. Additional on rail braking may be provided by an optional rail wheel brake package.

The RAFNA railgear is supplied with a group of Operation, Service, and Part Manuals and Installation Manuals which are specific to the railgear, mounting, hydraulic, wheel, steering wheel lock, and/or other or optional kits ordered. As a group, the manuals provide all the information relative to the particular railgear package. The group of manuals may not be interchangeable with other railgear equipped vehicles due to different options and/or applications. If replacement manuals need to be ordered, the railgear serial number and/or the kit numbers must be provided to G&B Specialties.

All of the manuals should be read in their entirety before any installation or operation is attempted. This will ensure that all the information is covered.

All manuals use the "Driver's Seat" orientation convention. All directions, ie right, left, front and back, are from sitting in the driver's seat of the vehicle.

The railgear serial numbers, model numbers, and dates of manufacture for both the front and rear railgear should be recorded below for future reference. This information is stamped on the railgear identification plate riveted to each railgear.

	Front Railgear Info	Rear Railgear Info
Serial Number:	_____	_____
Model Number:	_____	_____
Date of Manufacture:	_____	_____

TECHNICAL SERVICE BULLETINS

Any changes and/or additional procedures that are issued for this equipment can be found in the G&B Specialties Technical Service Bulletins. These technical service bulletins are available on the RAFNA web site (www.rafna.com) as well as from G&B Specialties directly.

GENERAL INSTALLATION INFORMATION

The installation procedure consists of installing various supplied kits. Each kit is supplied with an Installation Manual as well as an Operation, Service and Parts Manual. Consult the respective kit manuals for installation instructions. The kits should be installed in the following order, as applicable:

- Road Wheels & Tires Kit
- Steering Wheel Lock Kit
- Front & Rear Mounting Kits
- Front & Rear Railgear Kits
- Front Axle Lock-up Kit
- Hydraulics Kit
- Rail Wheel Brakes Kit
- Option Kits

Ensure the serial numbers on the railgear on the vehicle match the serial numbers on this set of manuals and then ensure this entire set of manuals is given to the operator upon delivery of the vehicle.

GENERAL OPERATION INFORMATION

The following are only general operation instructions. For detailed operation instructions, consult the Operation, Service and Parts Manual provided with each individual kit.

Placing The Vehicle On Rail – General Info:

1. Prior to using the railgear equipment the following items should be inspected:
 - a) Inspect the condition of rubber tread rail wheels if applicable
 - b) Check for damaged or worn parts
 - c) Check for loose wheels and/or fasteners
 - d) Check for leaking or damaged hydraulic hoses, fittings, cylinders, etc
 - e) Check for leaking or damaged air brake hoses, fittings, chambers, etc if applicable
 - f) Check for proper lubrication at the specified intervals
 - g) Ensure the vehicle is in good operating condition as per the manufacturer's operating guide

2. At a level crossing, reverse the vehicle onto and parallel to the rails so that the rear railgear rail wheels are aligned directly over the rails and the front railgear rail wheels are somewhat aligned with the rails.
3. Deploy the rear railgear as per the Railgear Kit Operation, Service, and Parts manual.
4. Reverse the vehicle until the front railgear rail wheels are aligned with the rails.
5. Deploy the front railgear and front axle lock-up (if applicable) as per the Railgear Kit and Front Axle Lock-up Kit Operation, Service and Parts manuals.
6. Turn on the rail wheel brake system as per the Rail Wheel Brake Kit Operation, Service, and Parts manual.
7. Engage the steering wheel lock as per the Steering Wheel Lock Kit Operation, Service and Parts manual.

Driving The Vehicle On Rail – General Info:

Before and while driving the vehicle on rail, the following general guidelines, as well as those in all the Operation, Service and Parts manuals, must be followed.

1. The vehicle may be driven on rail as normal however without steering and at reduced speeds.
2. Braking ability on rail is considerably reduced and the brakes must be applied gradually to avoid skidding the vehicle wheels.
3. Ensure that both the front and rear railgear are fully deployed.
4. Ensure that the railgear lock systems are engaged.
5. Ensure that the vehicle front axle lock-up is engaged if applicable.
6. Ensure that the steering wheel lock is engaged.
7. Ensure that the rail wheel brake system is turned on if applicable.
8. Ensure that the railgear hydraulic pump is turned off if applicable.

Removing The Vehicle From Rail – General Info:

1. Remove the vehicle from rail at a level crossing or other suitable location.

2. Retract the front railgear and front axle lock-up (if applicable) as per the Railgear Kit and Front Axle Lock-up Kit Operation, Service and Parts manuals.
3. Retract the rear railgear as per the Railgear Kit Operation, Service and Parts manual.
4. Turn off the rail wheel brake system as per the Rail Wheel Brake Kit Operation, Service and Parts manual.
5. Disengage the steering wheel lock as per the Steering Wheel Lock Kit Operation, Service and Parts manual.
6. Drive the vehicle carefully off the rails and onto the road.

GENERAL SERVICE INFORMATION

If any technical service issues arise, please contact the G&B Specialties, Inc. Also, please find attached the G&B Specialties Limited Warranty policy and procedures.

GENERAL PARTS INFORMATION

For general parts orders, please contact the G&B Specialties, Inc.

G&B Specialties, Inc. Limited Warranty

G&B Specialties warranty covers a period of TWELVE (12) months after the date of the railgear's entry into service and a period of TWENTY FOUR (24) months for the hydraulic pump/motor assembly provided with our R-290 Railgear. The warranty asserts that each new railgear sold will be free from defects in material and workmanship under normal use and service. G&B Specialties's obligation under this warranty is limited to repairing or replacing at its factory, or other locations as designated by the company. Any defective part or parts must be returned within 30 days of the date of failure or notice of defect for factory inspection or as designated by G&B Specialties, Inc.

Equipment or parts not manufactured by G&B Specialties, but which are furnished in connection with G&B Specialties products are covered directly and solely by the warranty of the original equipment manufacturer supplying them.

The obligation of G&B Specialties under this warranty is limited to the replacement of parts that appear to be defective after review and inspection by our firm or designated representative. This warranty does not oblige G&B Specialties to bear the Customer's cost of labor or transportation charges concerning the return of defective parts. However, if found to be defective the outbound direct ground freight on the part will be prepaid to locations within continental United States and Canada by G&B Specialties, Inc. The warranty does not cover normal wear parts such as rail wheels, guide tubes, bearings, seals, rail sweeps or responsibility for customer's claims arising from abuse, misuse, neglect, or alteration of the railgear. All claims are subject to inspection of said parts by our firm.

This warranty is in lieu of other warranties, expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose and any liability for special or consequential damages.

PRODUCT IMPROVEMENT LIABILITY DISCLAIMER

G&B Specialties, Inc. reserves the right to make any changes in or improvements on its products without incurring any liability or obligation whatever and without being required to make any corresponding changes or improvements in products previously manufactured or sold.

IMPORTANT NOTICE

This warranty will be considered void if G&B Specialties Installation instructions or Service and Maintenance schedule is not followed according to the detailed instructions contained in both our Installation Manual and our Operation and Service Manual.

Rev. date: 8/31/07

Warranty Policies And Procedures For Installers And Customers

Installers & Customer Warranty:

To prevent unnecessary delays or misunderstandings in handling Installers' or Customers' warranty claims, it is required that all warranty requests be authorized prior to any repairs, modifications or adjustments being started.

Warranty information and authorization can be obtained from G&B Specialties.

G&B Specialties' warranty will not apply if the railgear or any of its components have been modified or replaced without the written consent of the company.

Additional Billing, Installers & Customers:

If during installation, it is found that incorrect parts have been shipped, G&B Specialties will cover all costs involved in replacing these parts and return of incorrectly shipped parts.

All warranty claims concerning short / incorrect shipment of parts or accessories must be made within 30 days of delivery.

In order to maintain control over extra or additional billing due to incorrect shipments, only the Engineering Manager or Customer Service Manager can issue a Purchase Order authorizing replacement parts, shipping or work to be performed by an outside source.

Warranty Claim information and requirements:

G&B Specialties will require the following information at time of claim as well as the a properly filled out "**Warranty Claim Form**" reference "Warranty Form v#2 04/01"

- Information Required:
- 1) Customer Purchase Order number.
 - 2) G&B Specialties railgear serial number.
 - 3) Vehicle unit number.
 - 4) Vehicle VIN number.
 - 5) Purchaser of G&B Specialties railgear.
 - 6) Date of purchase.
 - 7) Name of end user.
 - 8) Company requesting warranty claim.
 - 9) Ship to Address.
 - 10) Bill to Address.

On approval of warranty claim, and where return of parts is requested by G&B Specialties, the Installer or Customer will issue a Purchase Order to G&B Specialties, Inc. to cover the defective parts and out bound freight for part values exceeding \$50.00 US and \$75.00 CDN. G&B Specialties will in turn ship all required parts pre-paid ground direct to the Installer or Customer. On receipt of claimed warranty parts, G&B Specialties or their sub supplier will inspect defective parts and if deemed warranty, a credit will be issued to the Installer or Customer. If claimed warranty parts are not received within 30 days, a credit will not be issued.

Labor Warranty and /or additional labor charges:

Either the G&B Specialties Warranty or any of G&B Specialties sub-suppliers does not cover labor or additional labor charges such as travel.

Faulty Railgear Installations:

If a warranty claim arises due to incorrect installation by an installer who has not followed the written instructions as outlined in our manual or as trained by either G&B Specialties Customer Service or Sales Department, warranty claims will not be honored.

Parts Warranty:

G&B Specialties manufactured parts will be warranted and replaced if found to be defective due to poor materials or workmanship for up to one year from date of the railgear's entry into service. Parts not manufactured by G&B Specialties, Inc. will be covered by the Original Equipment Manufacturer's warranty. Based on the OEM's investigation of the warranty claim against their manufactured component their decision will stand.

WARRANTY CLAIM FORM

This form must be completed prior to starting any warranty work Warranty #

Customer		Date	
Tel/Fax		Railgear S/N	
Vehicle No.		Vehicle VIN	
End User		Date of Purchase	
P.O. Number		Ref #	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	
Inv. Address		Ship to Address	

Shipping instructions:
Shipper:

Standard Ground	Special Air
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Standard 5 day +	Select 3 day	Expedition 2-3 day	Express 2 day
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Way Bill #

PART No.	QUANTITY	DESCRIPTION

PROBLEM DESCRIPTION

Required Documentation from the Customer (For issuing Credit)

Description of G&B Specialties Parts (Ordered or Used)	Invoice #	Total Claimed \$	US/CAD

G&B SPECIALTIES approved by: _____ DATE: _____

CUSTOMER'S REPRESENTATIVE: _____ DATE: _____