RICON®

INNOVATION IN MOBILITY™

PF 4000 Series™
Low Floor Vehicle Access Ramp For Custom Installation

PRINT

Operator Manual

02/29/02/01 **32DPF401.A**

This RICON product must be installed and serviced by authorized RICON service technicians.

The operator must refer to this manual for operating instructions, then retain it for future reference.

Customer Name:_____
Installing Dealer:_____
Date Installed:_____
Serial Number:_____

REVISION RECORD

REV	PAGES	DESCRIPTION OF CHANGE	ECR/ECO
32DPF401.A	All	New Release in two book format.	3842/4829
END OF LIST			

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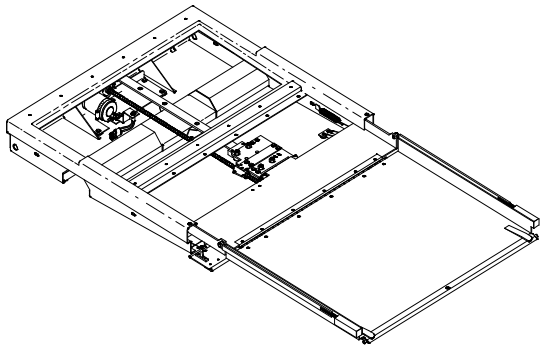
I. INTRODUCTION

The RICON PF4000 Series Low-Floor Vehicle Access Ramp is an electrically operated ramp that allows easy access to vehicles for people using mobility equipment; wheelchairs, scooters, etc. The ramp has been designed for custom installations and is operated by the vehicle driver using a dashboard mounted control switch.



When the vehicle is safely parked with the doors open and driver holds the control switch in the DEPLOY position, the ramp extends from the vehicle and stops when it contacts the ground. As a safety function, if the ramp encounters an obstruction, movement will automatically stop. After the ramp is used, the driver holds the switch in the STOW position and the ramp retracts into the vehicle. The rated load capacity is 800 pounds (364 kilograms).

This manual contains operation and maintenance instructions for the ramp. It is important to user safety that the vehicle operators be completely familiar with the operating instructions. For installation instructions, please refer to the service manual. Once the ramp is installed, it is very important that it be properly maintained by following the Ricon recommended cleaning, lubrication, and inspection instructions.

If there are questions about this manual, or additional copies are needed, please contact Ricon Product Support at one of the following locations:

Ricon Corporation
7900 Nelson Road
Panorama City, CA 91402 ..... (818) 267-3000
Outside (818) Area Code ..... (800) 322-2884
World Wide Website ..... WWW.RICONCORP.COM

Ricon U.K. Ltd.
Littlemoss Business Park, Littlemoss Road
Droylsden, Manchester
United Kingdom, M43 7EF ..... (+44) 161 301 6000

A. RICON ONE-YEAR LIMITED WARRANTY (refer to following page)

RICON CORPORATION
ONE-YEAR LIMITED WARRANTY

Ricon Corporation (Ricon) warrants to original purchaser of this product that Ricon will repair or replace, at its option, any part that fails by reason of defective material or workmanship as follows:

- Repair or replace parts for a period of one year from date of purchase. A complete list of parts covered by this warranty can be obtained from Ricon Product Support.
- Labor costs for specified parts replace under this warranty for a period of one year from date of purchase. A Ricon rate schedule determines the parts covered and labor allowed.

If You Need to Return a Product: Return this product to Ricon. Please give as much advance notice as possible and allow a reasonable amount of time for repairs.

This Warranty does not Cover:

- Malfunction or damage to product parts caused by accident, misuse, lack of proper maintenance, neglect, improper adjustment, modification, alteration, the mechanical condition of the vehicle, road hazards, overloading, failure to follow operating instructions, or acts of Nature (i.e., weather, lightning, flood).

Note: Ricon recommends that this product be inspected by an authorized Ricon service technician at least once every six months, or sooner if necessary. Any required maintenance should be performed at that time.

⚠ WARNING!

THIS PRODUCT HAS BEEN DESIGNED AND MANUFACTURED TO EXACT SPECIFICATIONS. MODIFICATION OF THIS PRODUCT IN ANY RESPECT CAN BE DANGEROUS.

This Warranty is Void if:

- The product has been installed or maintained by someone other than an authorized Ricon service technician.
- The product has been modified or altered in any respect from its original design without written authorization by Ricon.

Ricon disclaims liability for any personal injury or property damage that results from operation of a Ricon product that has been modified from the original Ricon design. No person or company is authorized to change the design of this Ricon product without written authorization by Ricon.

Ricon's obligation under this warranty is exclusively limited to the repair or exchange of parts that fail within the applicable warranty period.

Ricon assumes no responsibility for expenses or damages, including incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply.

Important: The warranty registration card must be completed and returned to Ricon within 20 days after installation of this Ricon product for the warranty to be valid. The warranty is not transferable.

The warranty gives specific legal rights, and there may be other rights that vary from state to state.

B. SHIPMENT INFORMATION

- When the product is received, unpack the product and check for freight damage. Claims for any damage should be made to the carrier immediately.
- Be sure the installation kit contains all items listed on the kit packing list. Please report any missing items immediately to Ricon Product Support. The warranty and owner's registration cards must be completed and returned to Ricon within 20 days for the warranty to be valid.

NOTE: The Sales/Product Support Personnel must review the Warranty and this Service/Owner Manual with the user to be certain that they understand the safe operation of the product. Instruct the user to follow the operating instructions without exception.

C. GENERAL SAFETY PRECAUTIONS

The following general safety precautions must be followed during installation, operation, service, and maintenance:

- Under no circumstances should installation, maintenance, repair, and adjustments be attempted without the immediate presence of a person capable of rendering aid.
- An injury, no matter how slight, should always be attended. Always administer first aid or seek medical attention immediately.
- Protective eye shields and appropriate clothing should be worn at all times.
- To avoid injury, always exercise caution when operating and be certain that hands, feet, legs, and clothing are not in the path of product movement.
- Batteries contain acid that can burn. If acid comes in contact with skin, flush affected area with water and wash with soap immediately.
- Always work in a properly ventilated area. Do not smoke or use an open flame near a battery.
- Do not lay anything on top of a battery.
- Check under vehicle before drilling so as not to drill into frame, subframe members, wiring, hydraulic lines, fuel lines, fuel tank, etc.
- Read and thoroughly understand the operating instructions before attempting to operate.
- Inspect the product before each use. If an unsafe condition, unusual noises or movements exists, do not use it until the problem is corrected.
- Keep others clear during operation.
- The product requires regular periodic maintenance. A thorough inspection is recommended at least once every six months. The product must always be maintained at the highest level of performance.

D. PRODUCT TERMINOLOGY

The references used throughout this manual are illustrated in **Figure 1-1** and defined in **Table 1-1**. Refer to Service Manual, Chapter V for more details.

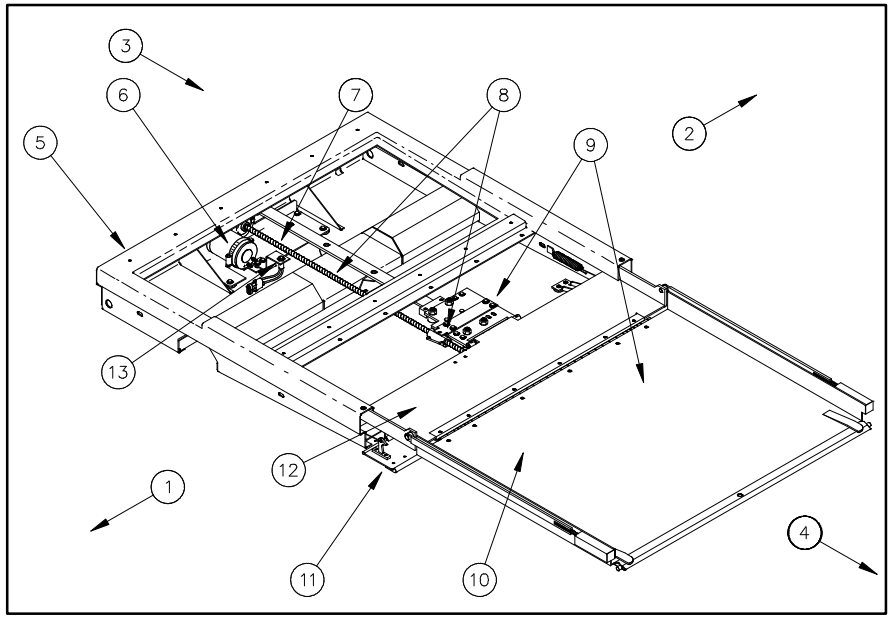


FIGURE 1-1: RAMP REFERENCE

TABLE 1-1: PF4000 RAMP COMPONENTS		
REF.	**NAME**	**DESCRIPTION**
1	Left	Reference point from outside the vehicle looking inward.
2	Right	
3	Back	
4	Front	
5	Ramp Enclosure	Cassette type enclosure, rigidly attached to the vehicle, which contains the ramp.
6	Drive System Motor	Electric motor used to operate the ramp.
7	Drive System	Components used to extend/DEPLOY and retract/ STOW the ramp.
8	Ball Nut/Screw Assembly	Mechanical component of the drive system used to operate the ramp.
9	Traveling Frame	Mechanical assemblies that operate the ramp and maintain ramp-assembly alignment.
10	Ramp Assembly	Assembly that extends from the vehicle during ramp operation.
11	Enclosure Door	Mechanical door that protects the ramp internal components from road debris, etc.
12	Carriage Assembly	Mechanical assembly that operates the ramp assembly.
13	Sensor Assembly	Magnetic device used to signal the ramp controller when the ramp is in the fully stowed position.
END OF TABLE		

II. OPERATING INSTRUCTIONS

This chapter contains safety precautions, daily safety check instructions, control and indicator descriptions, and operating instructions for the RICON PF4000 Series Low-Floor Vehicle Access Ramp. This chapter must be read and thoroughly understood before attempting to use the ramp.

A. SAFETY PRECAUTIONS

The following safety precautions must be observed at all times:

- Vehicle must be safely parked with the parking brake set before using ramp.
- Always face outward when exiting vehicle.
- Persons using mobility equipment (e.g., wheelchairs, scooters, etc.) should always enter or exit the vehicle slowly and carefully.
- Unusual noises or movements should be inspected immediately by a selected, authorized Ricon service technician.
- Inspect the ramp prior to each use. Check for loose nuts and bolts. If any unsafe condition exists or unusual noises or movements are noticed, **DO NOT** use the ramp. Return the vehicle to a selected, authorized Ricon Service technician for repair.
- Wheelchair and scooter brakes are less effective if the ramp and/or mobility equipment wheels are wet. Use extreme care in wet conditions.
- Keep others clear while operating ramp.
- The ramp is designed for one user at a time. Do not overload the ramp. Be certain mobility aid equipment fits safely on the ramp before entering or exiting the vehicle.
- Never leave ramp outside of vehicle. Always return ramp to its stowed position after use.
- Do not allow children or others to play with the ramp as this may be dangerous.
- Close supervision is necessary if the ramp is used near children.
- Do not place your arms or legs in or near any moving parts of the ramp or other components.
- Avoid operating ramp while vehicle is parked on a slope, since the ramp will also slope creating an unsafe condition.

Be sure that these safety precautions have been read and understood. Review them periodically, and ask any other operators to read them as well. If there are any questions, contact Ricon Product Support.

B. DAILY SAFETY CHECK

Inspect the ramp each day prior use and check that the following conditions are met before operating:

- All functions operate properly. If unusual noises or movements exist, DO NOT use and contact a selected, authorized Ricon Service technician for repair.
- No objects that may interfere with operation are present.
- General appearance and lubrication are satisfactory.
- All fasteners are tight.

C. CONTROLS AND INDICATORS

Refer to **Figure 2-1**. The controls and indicators of the ramp are not supplied or installed by Ricon. It is recommended that a momentary, three-position (ON/OFF/ON) toggle switch be installed as a Ramp Control Switch. The switch should be spring-loaded and the function operates as long as the switch is held in the desired position. When the switch is positioned to DEPLOY, the ramp extends from the vehicle. When positioned to STOW, the ramp retracts into the vehicle. A switch cover is also recommended to prevent an unintentional attempt to operate the ramp.

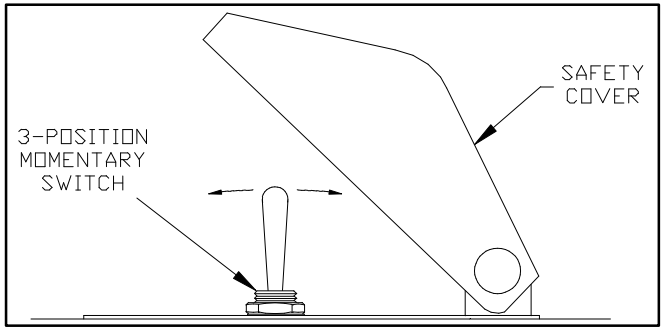


FIGURE 2-1: EXAMPLE CONTROL SWITCH

D. RAMP OPERATION

The ramp interface with the vehicle electrical system provides the following conditions:

- The ramp WILL NOT deploy until the vehicle is completely stopped and the parking brake is set.
- The parking brake WILL NOT be released until the ramp is fully stowed.

> **⚠ WARNING!**
>
> THE RAMP OPERATES INDEPENDENTLY OF THE VEHICLE DOORS. USE CAUTION TO AVOID OPERATING THE RAMP AND DOORS IN AN UNSAFE MANNER.

To operate the ramp, follow this procedure:

1. Kneel vehicle, if applicable, and open vehicle door.
2. If installed, observe warning lights. Check ramp deploy area for people or obstructions.

> **⚠ CAUTION!**
>
> Ramp does not need to be fully deployed to be used, however, it must be extended at least 24" (61 cm), to prevent damage to ramp hinge.

3. Position and hold control switch to DEPLOY until ramp is deployed at least 24" (61 cm).
4. Allow wheelchair occupants to enter or exit vehicle.
5. Position and hold control switch to STOW. Release switch when function is complete.
6. Make sure vehicle is not in kneel position or raise vehicle, if applicable, and close vehicle door.

III. MAINTENANCE

The maintenance chapter for the RICON PF4000 Series Low-Floor Vehicle Access Ramp consists of routine safety checks and reference descriptions of the electrical wiring. Routine maintenance and any repairs should be performed by selected, authorized Ricon service personnel only.

A. MAINTENANCE INFORMATION

Additional maintenance information is available in the PF4000 Series Low-Floor Vehicle Access Ramp Service manual, part number 32DPF402. This manual is available from Ricon in printed hard copy, or at the Ricon website in PDF format. The website is located at www.riconcorp.com. Click on RICON CORPORATION and then DEALER'S ROOM at the website. Entry to the dealer's room will require a Dealer Number and a Password.

B. MAINTENANCE SCHEDULE

For the maintenance schedule of the ramp, refer to **Table 3-1**. Under conditions of heavy use (in excess of 20 cycles per day), maintenance should be performed more frequently. Modifying or failing to properly maintain the ramp will void the warranty and may result in unsafe operating conditions for the users. Safety checks/inspections should be performed according to the following intervals:

TABLE 3-1: MAINTENANCE SCHEDULE

SERVICE POINT	DESCRIPTION
DAILY SAFETY CHECK	
Operate and Inspect	Inspect underside of vehicle and check for loose nuts and bolts. If any unsafe condition exists or unusual noises or movements are noticed, **DO NOT** use the ramp. Return the vehicle to an authorized Ricon service technician for repair.
MONTHLY OR EVERY 5,000 KILOMETERS SAFETY CHECK	
Clean Flutter Valve	If so equipped, clean the flutter (drain) valve.
3-MONTH OR EVERY 15,000 KILOMETERS SAFETY CHECK	
Clean and Lubricate	Follow these steps: ✦ Remove the top wooden panel. ✦ Using a water hose, clean the tracks where the side cam followers travel. ✦ Vacuum the inside of the ramp thoroughly. ✦ With a shop towel, clean the ball screw. ✦ Grease all six Cam Followers using low-temperature grease such as Aeroshell Grease #22, Starfak EP or equivalent. Grease fittings should be wiped clean prior to grease injection. ✦ Using a brush, apply a light coat of low-temperature grease to the ball screw, the metal parts of the ball nut wiper, the cam follower screws and nuts, and the rear of the motor.
Main Pivot Points	Verify that carriage/ramp pivot pins are installed properly, free from damage and locked in position with proper fasteners.
ANNUAL SAFETY CHECK	

TABLE 3-1: MAINTENANCE SCHEDULE	
WITH RAMP IN STOWED POSITION	
Ramp Mounting and Support Points	Verify that all ramp support points under vehicle are in proper working order and free from damage. Verify that all mounting bolts are properly tight.
DEPLOY RAMP TO FULL EXTENSION	
General Operation Stow/Deploy	Listen for any abnormal noises as the ramp deploys (i.e., grinding or scraping noises). Carriage stops are in place and stop ramp squarely.
Ramp Points	Verify ramp operates properly during deploy and stow modes without obstruction.
END OF TABLE	

C. RAMP CONTROLLER ADJUSTMENTS

For ramp controller adjustments, refer to the Service Manual, Chapter II.

D. RAMP CONTROLLER ELECTRICAL WIRING

1. DIAGRAM LEGENDS

a. Color Codes

TABLE 3-2: COLOR CODE DEFINITIONS			
LETTER	**COLOR**	**LETTER**	**COLOR**
BK	Black	R	Red
BL	Blue	VI	Violet
BR	Brown	VI/BK	Violet w/ Black
GN	Green	W	White
GN/BK	Green w/ Black	W/O	White w/ Orange
O	Orange	Y	Yellow
O/BK	Orange w/ Black	Y/BK	Yellow w/ Black
END OF TABLE			

b. Labels

24V–SPLY	24V POWER SUPPLY
GND	GROUND
MOT–	MOTOR NEGATIVE
MOT+	MOTOR POSITIVE
SNSR IN	SENSOR INPUT
24V–RGLTD	24V–REGULATED
ST OUT	STOW SIGNAL OUTPUT
CL/OV C	CLOSED OR OVER CURRENT
SPARE	SPARE
RMP IN SIG	RAMP IN SIGNAL
RMP OUT SIG	RAMP OUT SIGNAL
O/OV C	OPEN OR OVER CURRENT
PWR	POWER

2. ELECTRICAL SIGNAL DESCRIPTIONS

a. Indication of Stowed Output (ST OUT)

The Indication of Stowed Output is located at the DB 9 connector, pin 1. The pin goes to +24 volts direct current (VDC) when the ramp is completely stowed. Because the tolerance of the sensor is within approximately ½" of the fully stowed position, this signal can only be used as an indication that the ramp is at within ½" from being completely stowed. The signal is buffered and capable of driving a 250 milliampere (mA) inductive load, such as an automotive relay.

b. Close Overcurrent Output (CL/OV C)

The close overcurrent output provided at pin 2 of the DB 9 connector is used to indicate when the system has reached an overcurrent condition in the STOW/retract direction. Overcurrent occurs either when the system encounters a resistance greater than the normal forces generated in travel or when the system comes to the end-of-travel within the enclosure. The signal is a 24-volt pulse approximately 500 milliseconds (ms) in duration.

c. Control Inputs (RMP IN SIG and RMP OUT SIG)

Ricon provides to the user two control inputs at the DB 9 connector. 'Close' input (pin 5) is used to stow the ramp and 'Open' input (pin 6) is used to deploy the ramp. Both inputs accept signals ranging from +12VDC to +24VDC, referenced to the module's ground. The module is provided with pull-down resistors, so the input signal is allowed to float when not being used.

d. Open Overcurrent Output (0/0V C)

The open overcurrent output provided at DB 9 connector pin 9, is used to indicate when the system has reached an overcurrent condition in the DEPLOY/extend direction. Overcurrent occurs either when the system encounters a resistance greater than the normal forces generated in travel or when the system comes to the end of travel at the fully deployed position. The signal is a 24-volt pulse approximately 500ms in duration.

e. Power Connections (24V-SPLY and GND)

Power is connected through the AMP 10-Pin connector, pins 1 thru 4. To facilitate better current carrying capabilities, two pins are used for each polarity (four pins total). Pins 1 and 2 are used for the positive supply of the module. Pins 3 and 4 are used for the negative supply. All four pins should be used in the connection of the power to the module.

f. Motor Connections (MOT- and MOT+)

The motor is connected to the module through the AMP 10-Pin connector, pins 5 thru 8. The connector uses two pins for each pole (four pins total). During the ramp STOW function, pins 5 and/or 6 receive positive voltage and pins 7 and/or 8 receive negative voltage. During the DEPLOY function, pins 5 and/or 6 receive negative voltage and pins 7 and/or 8 receive positive voltage.

g. Sensor Connections (SNSR IN and 24V-RGLTD)

The sensor connections are located on the AMP 10-pin Connector, pins 9 and 10. Pin 9 is used as an input for the unconditioned signal from the stow indicator sensor. Pin 10 is a +24VDC regulated supply for the sensor only, and should not be used for any other purpose.

3. WIRING DIAGRAM

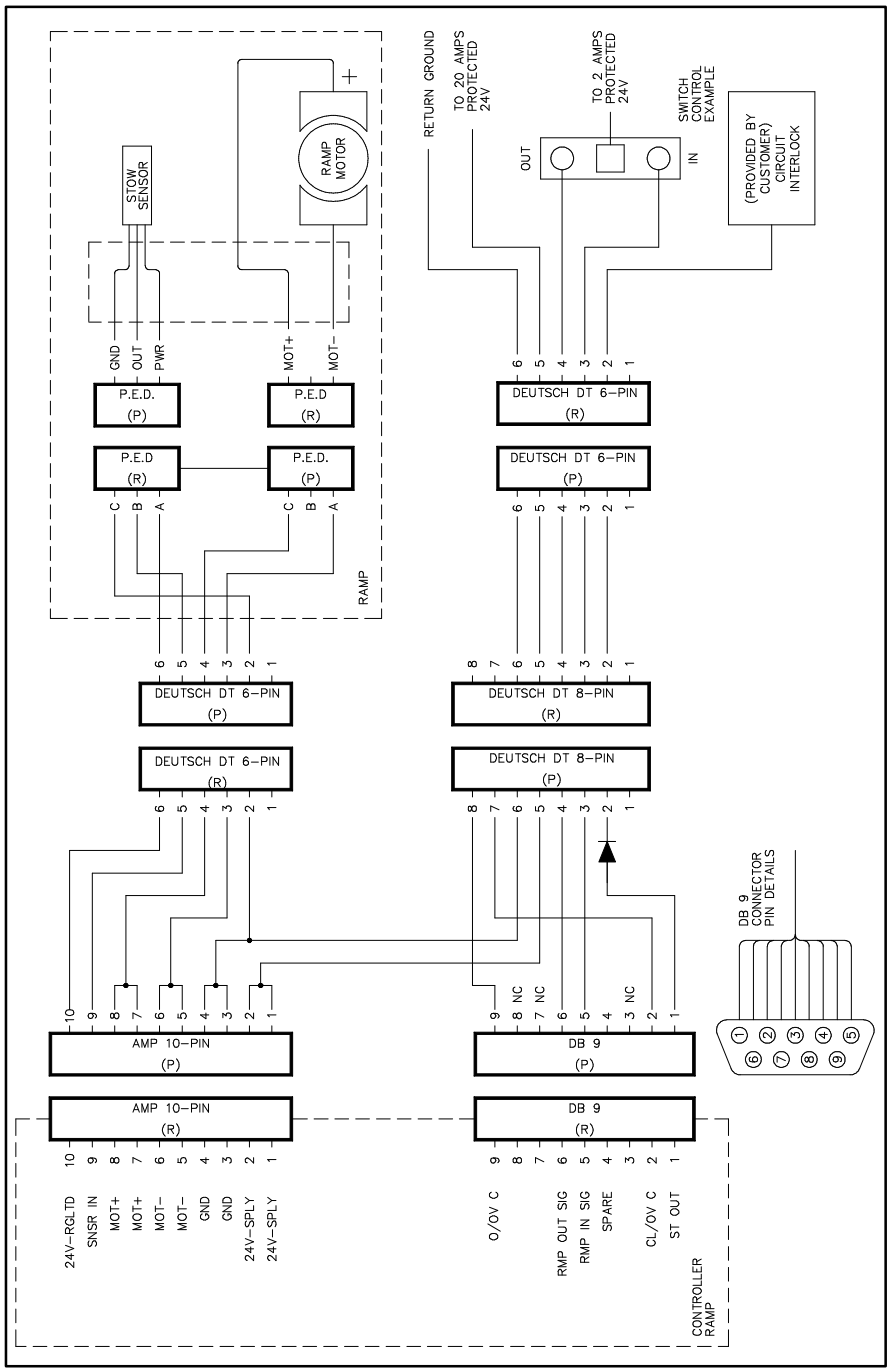


FIGURE 3-1: PF4000 RAMP ELECTRICAL WIRING SYSTEM

E. LIFT DECALS

Refer to **Figure 3-2**. Inspect decals at intervals in **Table 3-1**. Inspect for chipping, peeling, fading, and illegibility. Order replacement decals by part number given in **Figure 3-2**, and apply where shown.

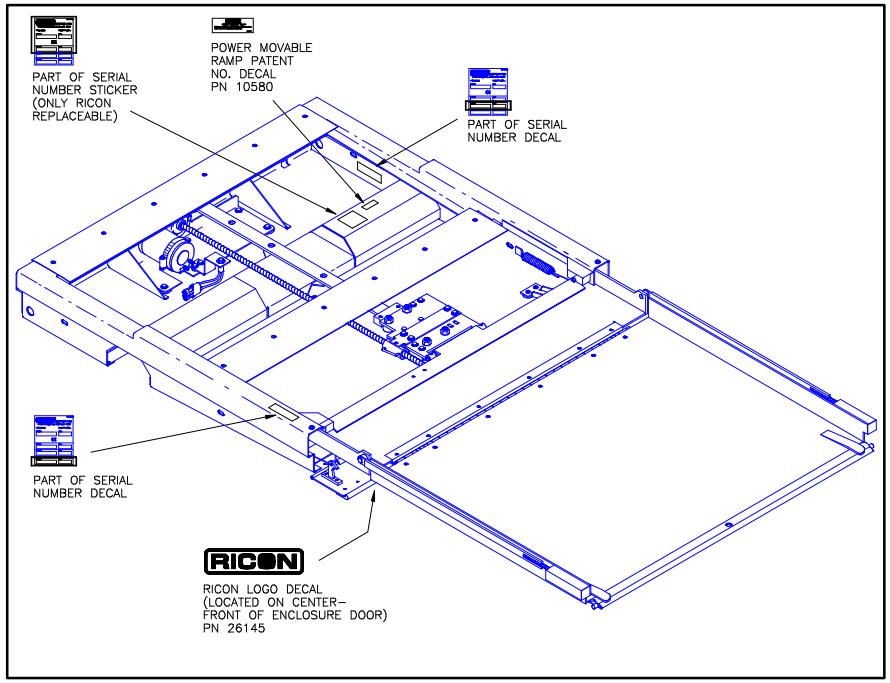


FIGURE 3-2: DECAL LOCATIONS AND PART NUMBERS