



Innovation in Mobility

**FR2000 SERIES
FOLD OVER[®] RAMP
LOW-FLOOR VEHICLE
ACCESS RAMP
for
NEOPLAN**

PRINT

SERVICE MANUAL

This Ricon service manual is for use by qualified service technicians, and is not intended for use by non-professionals (do-it-yourselfers). The manual provides essential instructions and reference information, which supports qualified technicians in the correct installation and maintenance of Ricon products.

Qualified service technicians have the training and knowledge to perform maintenance work properly and safely. For the location of a Ricon authorized service technician in your area, call Ricon Product Support at 1-800-322-2884.

Customer Name: _____

Installing Dealer: _____

Date Installed: _____

Serial Number: _____

Revision Record

REV	DATE	PAGES	DESCRIPTION OF CHANGE	ECR/ECO
32DFR102 .B	11-12-01	5-3	New release. Added 19970 Bushing Rebuild kit to parts list.	3860/4839
32DFR102 .C	09/23/02	Inside Cover	Updated disclaimer on inside cover.	3990/4918

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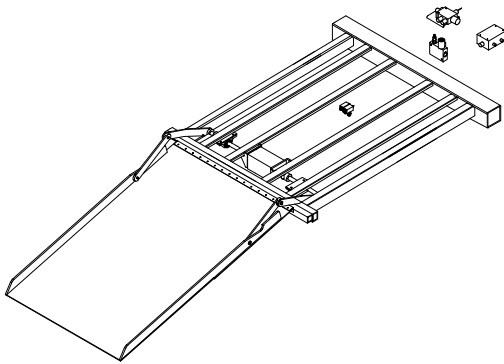
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I. INTRODUCTION

The RICON FR2000 FoldOver Ramp is a hydraulic powered ramp that provides bus access to people who have difficulty climbing steps or that are using mobility equipment (wheelchairs, scooters, etc). The ramp is designed for custom installation and will be operated by the vehicle attendant.



This manual contains a product description, operating instructions, troubleshooting guide, overhaul instructions, and an illustrated parts list. Once the lift is installed, it is very important that it be properly maintained by following the recommended cleaning, lubrication and inspection instructions.

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

Ricon Corporation
7900 Nelson Road
Panorama City, CA 91402

Telephone (818) 267-3000
..... (800) 322-2884 (outside 818 area code)

Ricon U.K. Ltd.
Littlemoss Business Park,
Littlemoss Road
Droylsden, Manchester
United Kingdom, M43 7EF

Telephone:..... (+44) 161 301 6000

World Wide Website: www.riconcorp.com

A. WARRANTY INFORMATION

Ricon Corporation provides a one-year limited warranty for the FoldOver Ramp. Refer to the warranty on the following page for detailed information.

Authorized Ricon service technicians must perform maintenance and repair on the FoldOver Ramp. Written authorization from Ricon is required prior to any repair or maintenance of the FoldOver Ramp that modifies the original design. Unauthorized modifications to the ramp will cause the warranty, or any portion remaining thereof, to be void.

If it is necessary to return this product to Ricon for repair or replacement, contact Ricon Product Support at the locations listed above.

RICON CORPORATION ONE-YEAR LIMITED WARRANTY

Ricon Corporation (Ricon) warrants to the original purchaser of this product that Ricon will repair or replace, at its option, any parts that fail because of defective material or workmanship as follows:

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

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

This Warranty Does Not Cover:

- Labor or service charges.
- 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 or repair should be performed at that time.



WARNING!

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

This Warranty Is Void If:

- Product has been installed or maintained by someone other than an authorized Ricon service technician.
- Product has been modified 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. There may be other rights that vary from state to state.

B. GENERAL SAFETY PRECAUTIONS

These general safety precautions must be followed during service and maintenance:

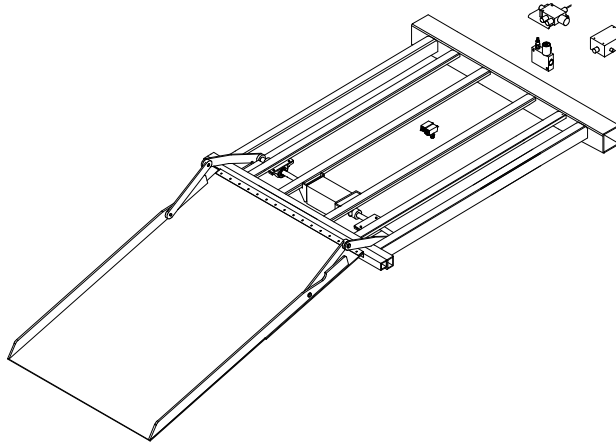
- ? Under no circumstances should maintenance, repair, or adjustments be attempted without the immediate presence of a person capable of rendering aid.
- ? An injury, no matter how slight, should be attended to. Administer first aid or seek medical attention immediately.
- ? Protective eye shields and appropriate clothing should be worn at all times.
- ? To avoid injury, exercise caution when operating lift and be certain that hands, feet, legs, and clothing are not in the path of the lift platform as it moves.
- ? Be cautious when using metallic (conductive) tools near heavy-current power supplies.
- ? Check under vehicle before drilling or cutting to avoid damage to the frame, subframe members, wiring, hydraulic lines, etc.
- ? Read and thoroughly understand operating instructions before attempting to operate lift.
- ? Inspect product before each use. If an unsafe condition exists, or there are unusual noises or movements, do not use it until the problem is corrected.
- ? Keep others clear during lift operation.
- ? The product requires regular maintenance. A thorough inspection is recommended at least once every six months. The product should be maintained at its highest level of performance.

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II. DESCRIPTION

The RICON FoldOver Ramp is installed in transit vehicles to accommodate passengers using mobility-aided equipment or passengers that cannot climb steps to board and exit the vehicle.

The ramp diverts hydraulic power from the vehicle power steering system, and uses this to provide ramp functions. The ramp folds away into the vestibule flooring.



A. RAMP FEATURES

1. INTERLOCK SUPPORT

The ramp electrical circuitry interfaces with the vehicle interlocks to avoid accidental ramp deployment. The vehicle interlock circuitry senses the status of the brakes, transmission, and the door adjacent to the ramp. The interlock provides power to the ramp only when all of the following conditions apply:

- ? Vehicle parking brake must be set
- ? Transmission must be in neutral
- ? Vehicle door must be open

2. RAMP CONTROL PANEL INTERFACE

The ramp is designed to operate with a control panel similar to that shown in **Figure 2-1**. It is normally installed in the driver area of the vehicle. The ramp control panel will typically have a power on/off switch, a power on indicator light, and a three-position ramp control switch. The ramp receives power from the vehicle when the power on/off switch is activated and the interlock conditions are met. The control panel can then transmit deploy or stow signals to the ramp hydraulic system.

3. NON-SKID SURFACES

The ramp is covered with a non-skid surface to aid in the prevention of accidental slips and falls as passengers exit and enter the vehicle.

4. AUDIO ALERT

The ramp is designed to support an audible warning signal that sounds while the ramp is in motion. (The audio alert is a feature that may not have been connected during ramp installation).

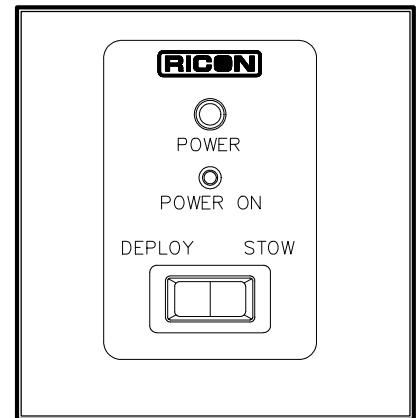


FIGURE 2-1: TYPICAL CONTROL PANEL

5. LOAD CAPACITY AND CLEARANCE

Refer to **Table 2-1**. The ramp is to be used by **one** passenger at a time; **do not overload the ramp**. Before allowing a passenger to use the ramp to board or exit the vehicle make sure the mobility equipment fits safely between the left and right side barriers of the ramp.

TABLE 2-1: RAMP LIMITS	
Measurement	Limit
Maximum Load.....	600 lb (272 kg)
Available Width.....	30.2 inches (76.7 cm)

B. MAJOR COMPONENTS

The major components of the FoldOver Ramp are shown in **Figure 2-3**. A description of each of the components is provided in **Table 2-2**. Refer to the Parts List in **Section V** of this manual for additional information.

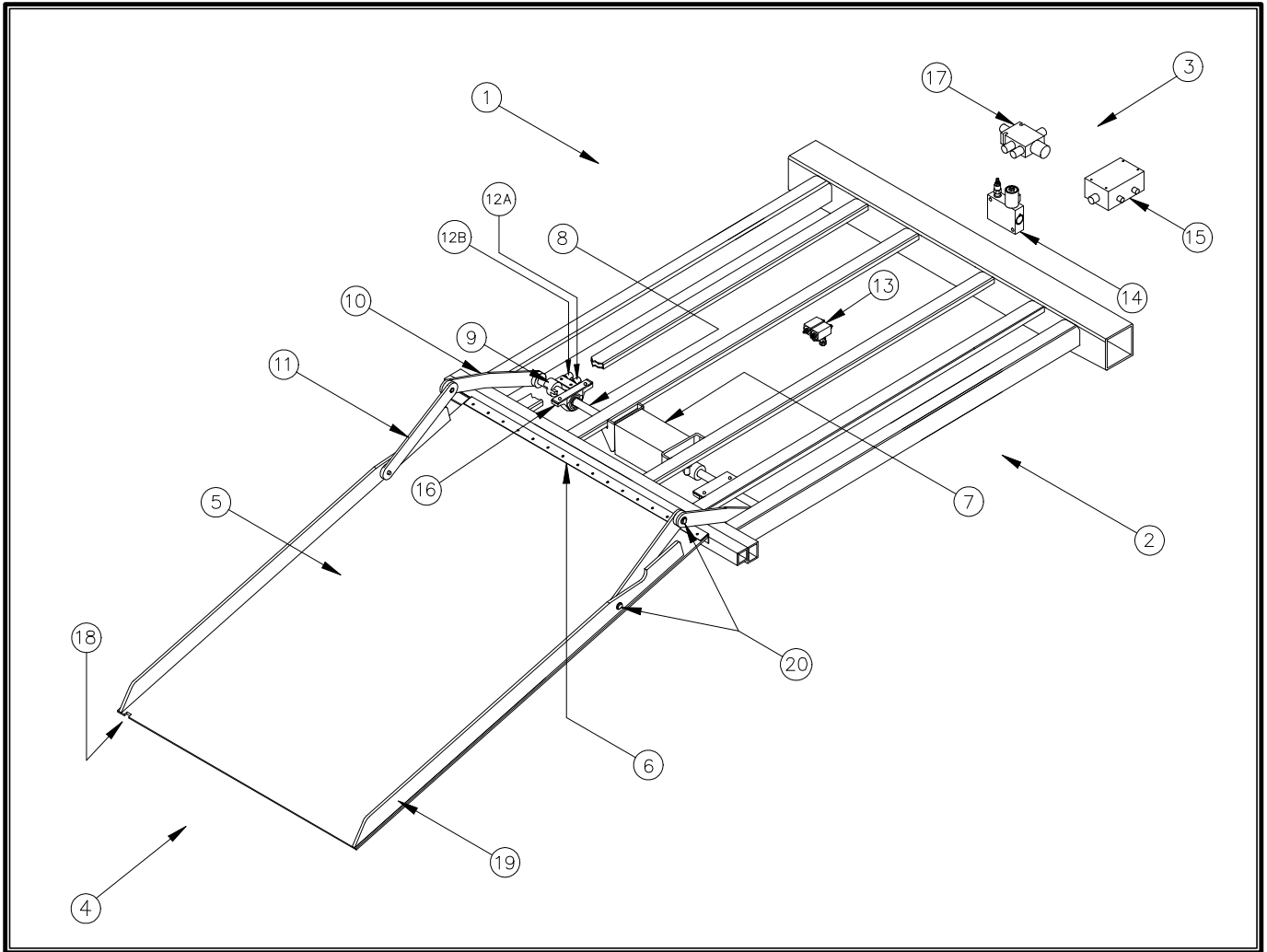


FIGURE 2-3: MAJOR RAMP COMPONENTS

TABLE 2-2: MAJOR RAMP COMPONENTS

REF	NAME	DESCRIPTION
1	Left	Ramp references when installation is viewed from outside of vehicle.
2	Right	
3	Rear	
4	Front	
5	Ramp	Platform that deploys from vehicle, allowing mobility-aided passengers to enter or exit vehicle.
6	Hinge	Pivoted connection where ramp attaches to vehicle.
7	Hydraulic actuator	Hydraulic-powered component that provides rotary motion needed to deploy ramp.
8	Drive shafts	Connects actuator motion to ramp linkage (drive arms).
9	Sensor target	Rotating target, on left-hand drive shaft, that provides ramp position.
10	Drive arms	Ramp linkage arm attached to drive shafts; driven by actuator.
11	Driven arms	Ramp linkage arm attached to ramp; driven by driving arm.
12A	Proximity sensor - stow	Electrical sensor located near sensor target that detects if ramp is in a stowed position; connected to controller.
12B	Proximity sensor - deploy	Electrical sensor located near sensor target that translates ramp position during deploy movement; connected to controller.
13	Flow control valves	Needle valves (manually adjusted) that are set to control the rate of ramp movement.
14	Diverter valve	Diverts vehicle's hydraulic system power to the ramp's hydraulic components.
15	Controller	Translates commands from bus operator into signals that control ramp hydraulic components.
16	Pillow blocks	Provide support for outer ends of drive shafts.
17	Directional valve	Hydraulic component that controls deploy and stow actions.
18	Manual deploy notch	Notch in front edge of ramp that can be used as a pry point to lift ramp from its stowed position.
19	Side barriers	Vertical curbs that help confine user to platform.
20	Shoulder bolts/ bushings/ thrust washers	Pivoting, load carrying hardware at ends of ramp arms. Bushings and washers are oilite material.

END OF TABLE

III. OPERATION

The Neoplan FoldOver Ramp is an electro-hydraulic unit that uses electric and hydraulic power from the vehicle to provide the deploy (fold-out) and stow (fold-in) movements of the ramp. The hydraulic and electrical operations of the ramp are described below. Refer to **Figures 3-3** and **3-4** for hydraulic schematics and flow charts.

A. GENERAL INFORMATION

? Diverter Valve

The ramp employs a diverter valve (installed inline with the vehicle power steering system) to redirect pressure to the ramp (when the ramp has power and the control box receives a DEPLOY or STOW signal). Pressure that is in excess of 1150 psi is released by the relief valve and returned to the vehicle catch tank.

NOTE: When the ramp is inactive, with power OFF, the diverter valve directs full pressure to the steering.

The diverter contains a solenoid that controls the position of an internal shuttle valve. When the ramp has power and the DEPLOY switch is activated, the shuttle valve diverts pressure from the vehicle steering system to the ramp directional valve. The default state for the diverter valve supplies pressure to the vehicle steering.

? Directional Valve

The directional valve also contains a shuttle valve. It controls the direction of fluid flow through the C1 and C2 manual flow control valves and through the actuator. When the control box sends a DEPLOY signal to the S1 coil in the directional valve the shuttle valve directs flow to the C1 flow control valve. From here fluid passes through the actuator, out to the C2 flow control valve, back to the directional valve and then to the vehicle catch tank.

When the control box sends a STOW signal to the S2 coil in the directional valve the shuttle valve directs flow to the C2 flow control valve. From here fluid passes through the actuator, the C1 flow control valve, back to the directional valve and then to the vehicle catch.

? Electrical Functions

Refer to **Figure 3-5** at the end of this chapter for an electrical schematic.

The foldover ramp receives 24VDC from the vehicle when the power button on the ramp control panel is turned on. When the operator toggles the panel controller switch to a DEPLOY or STOW setting, a signal is sent to the ramp controller. In addition, the controller receives signals from the deploy and stow sensors to determine present ramp position.

The controller then transmits a signal to the coil in the diverter valve assy sending pressure to the directional valve. The controller sends a Deploy signal to the S1 coil or a Stow signal to the S2 coil in the directional valve. The S1 and S2 coils control the position of the shuttle valve in the directional valve.

? Flow Control Valves

Two manually adjusted needle valves are provided to control the volume of hydraulic fluid passing through the actuator. The adjustment of these needle valves determines the rate of ramp movement. There is one valve for deploy and one for stow. Turning a valve CCW increases the rate of ramp movement and turning a valve CW decreases the rate of ramp movement.

B. OPERATING RAMP WITH CONTROL PANEL



WARNING!

BEFORE OPERATING RAMP, MAKE SURE PEOPLE ARE A SAFE DISTANCE FROM RAMP AREA.

1. DEPLOYING RAMP

a. Vehicle Preparation

- 1) Refer to **Figure 3-1**. Stop vehicle on level ground. Lower vehicle, if applicable.
- 2) Set vehicle parking brake.
- 3) Put transmission in neutral and open vehicle door.

NOTE: The ramp will deploy only after the parking brake is set, the transmission is in neutral, and the vehicle door is open.

b. Ramp Deployment

- 1) On the ramp control panel, actuate the power switch to apply power to the ramp; the power on indicator should illuminate.
- 2) Refer to **Figure 3-2**. Toggle the ramp control switch to the deploy position. Hold switch in deploy until the ramp has passed its midpoint (vertical position), then release switch; after the ramp has passed through the midpoint it will lower to the ground without assistance.

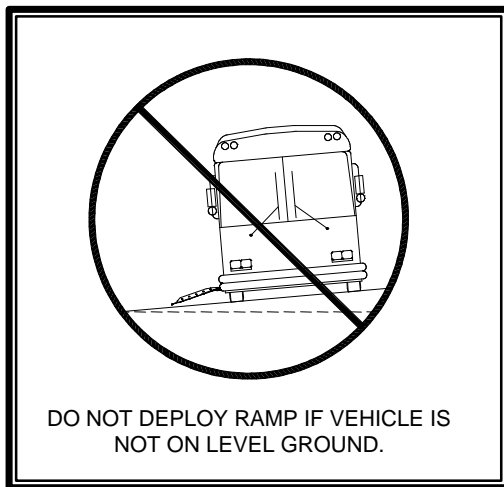


FIGURE 3-1: PARKING DANGER

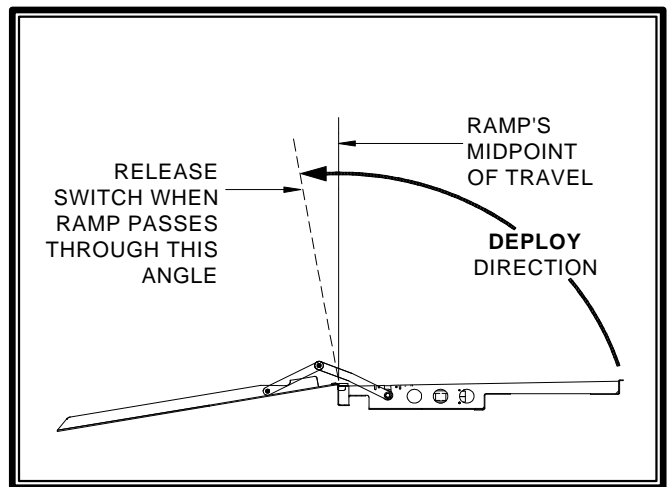


FIGURE 3-2: RAMP MIDPOINT (DURING DEPLOY)

NOTE: The audible alert, if connected, will sound while the ramp is in motion.

NOTE: Ramp movement can be reversed at any time during its travel. To reverse the direction of ramp while it is moving, toggle control switch to the opposite setting (from deploy to stow, or from stow to deploy).

- 3) Passengers must carefully enter or exit vehicle one at a time. Passengers using mobility equipment (e.g., wheelchairs and scooters) should travel **facing forward** on ramp.

NOTE: The transmission and brakes are temporarily disabled while the ramp is deployed. Operation is restored after the ramp is fully stowed.

2. STOWING RAMP



WARNING!

BEFORE OPERATING RAMP, MAKE SURE PEOPLE ARE A SAFE DISTANCE FROM RAMP AREA.

- a. Toggle the control switch to the stow position. Hold switch in the stow position until the ramp has passed its midpoint (refer to **Figure 3-3**), then release switch. After the ramp has passed through the midpoint, it will fold down to the stowed position without assistance.

NOTE: The audible alert, if connected, will sound while ramp is in motion.

- b. Be certain the ramp is fully stowed before you try to move the vehicle.
- c. Close the vehicle door,
- d. If applicable, raise the vehicle,
- e. Release the vehicle parking brake.

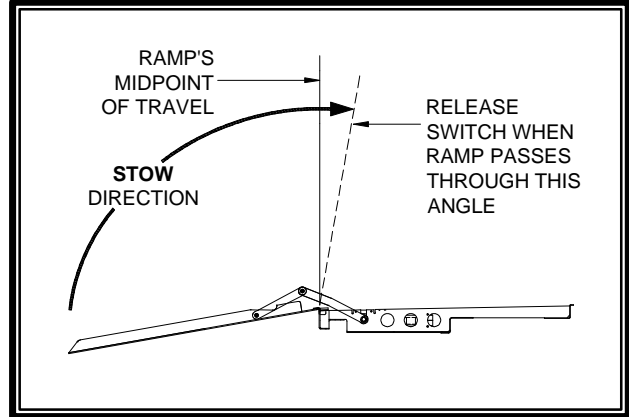


FIGURE 3-2: RAMP MIDPOINT (DURING STOW)

C. OPERATING RAMP MANUALLY

1. DEPLOYING RAMP

- a. Stop the vehicle in a safe area. Lower vehicle, if possible.
- b. Set the vehicle parking brake.
- c. Put the transmission in neutral and open the vehicle door.
- d. Locate the strap on the edge of the ramp (refer to Figure 2-1 in chapter II).
- e. Lift the ramp enough to get a handhold on the ramp.



CAUTION!

Do not use excessive force to lift the ramp.

- f. Grasp the edge of ramp with both hands. Unfold the ramp from its stowed position while keeping your back vertical and legs straight.
- g. Release the ramp after it passes its midpoint (refer back to **Figure 3-3**) and it will continue to unfold without assistance.

2. STOWING RAMP

Grasp the strap attached to the front edge of ramp. Keep your back vertical, legs straight and lift the ramp enough to gain a grip (with both hands) on the left and right side barriers. Continue to fold ramp into vehicle, and release it when it passes its midway point. The ramp will fold into the floor without further assistance.

NOTE: Be certain the ramp is fully stowed before attempting to move the vehicle.

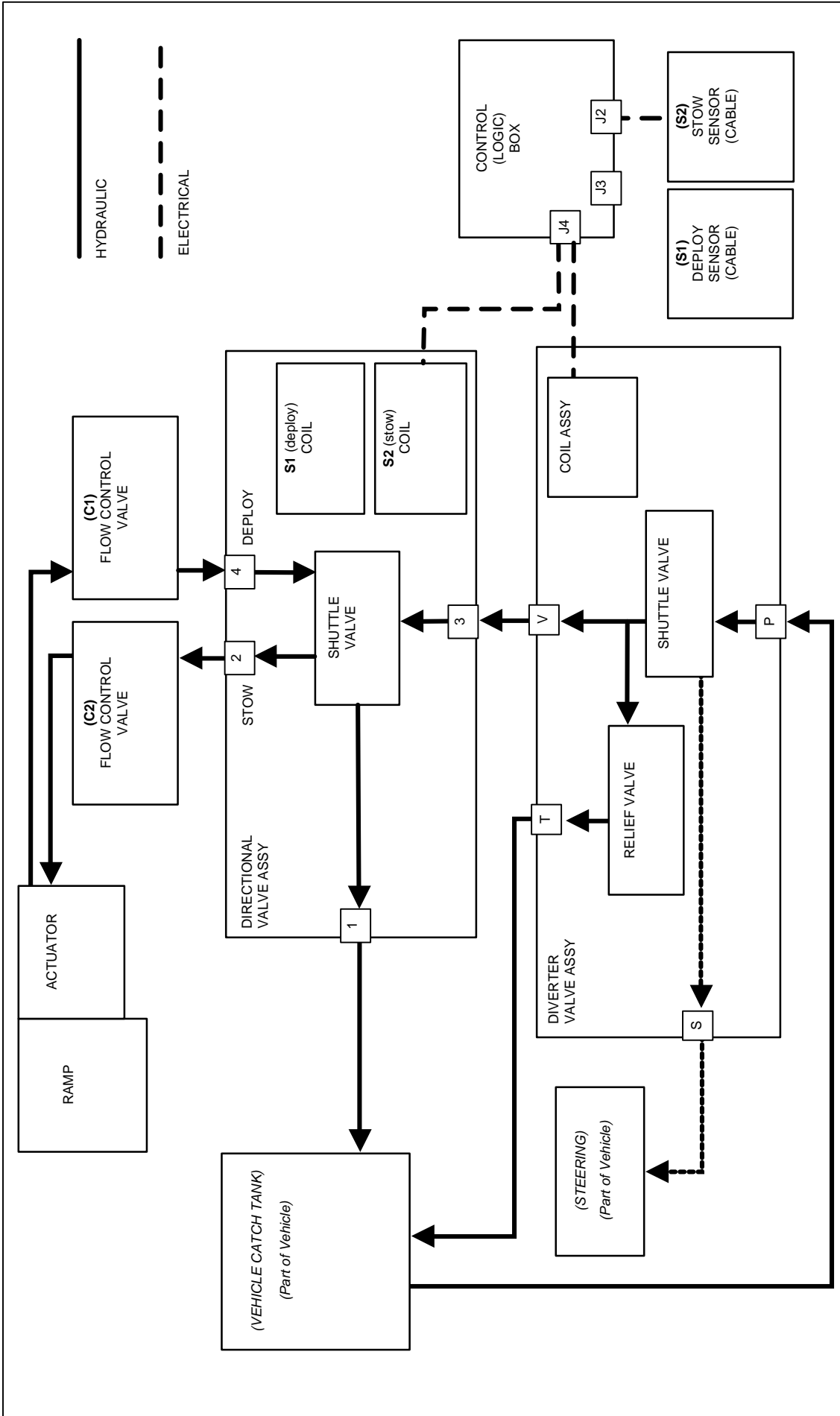


FIGURE 3-4: HYDRAULIC SCHEMATIC (STOW)

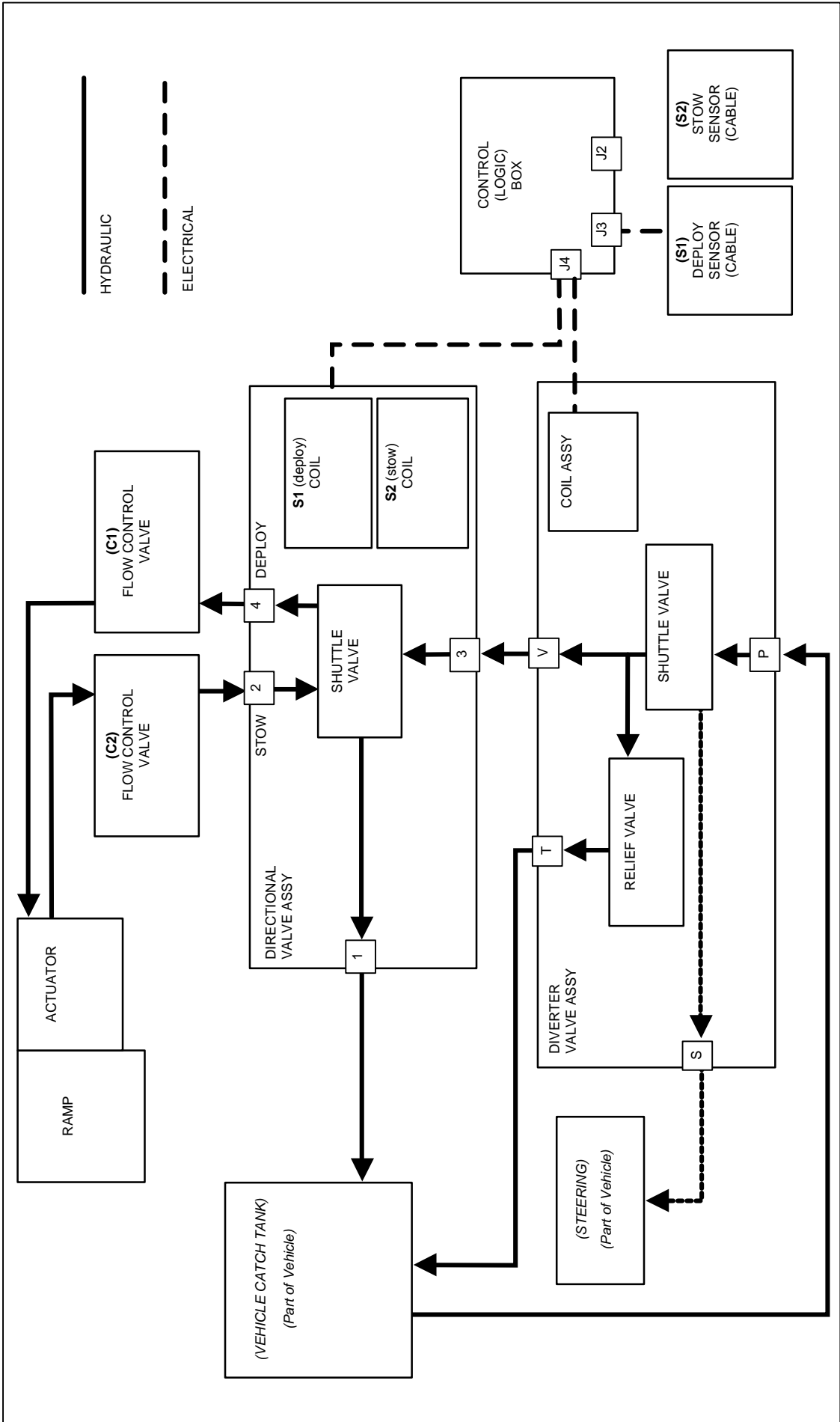


FIGURE 3-5: HYDRAULIC SCHEMATIC (DEPLOY)

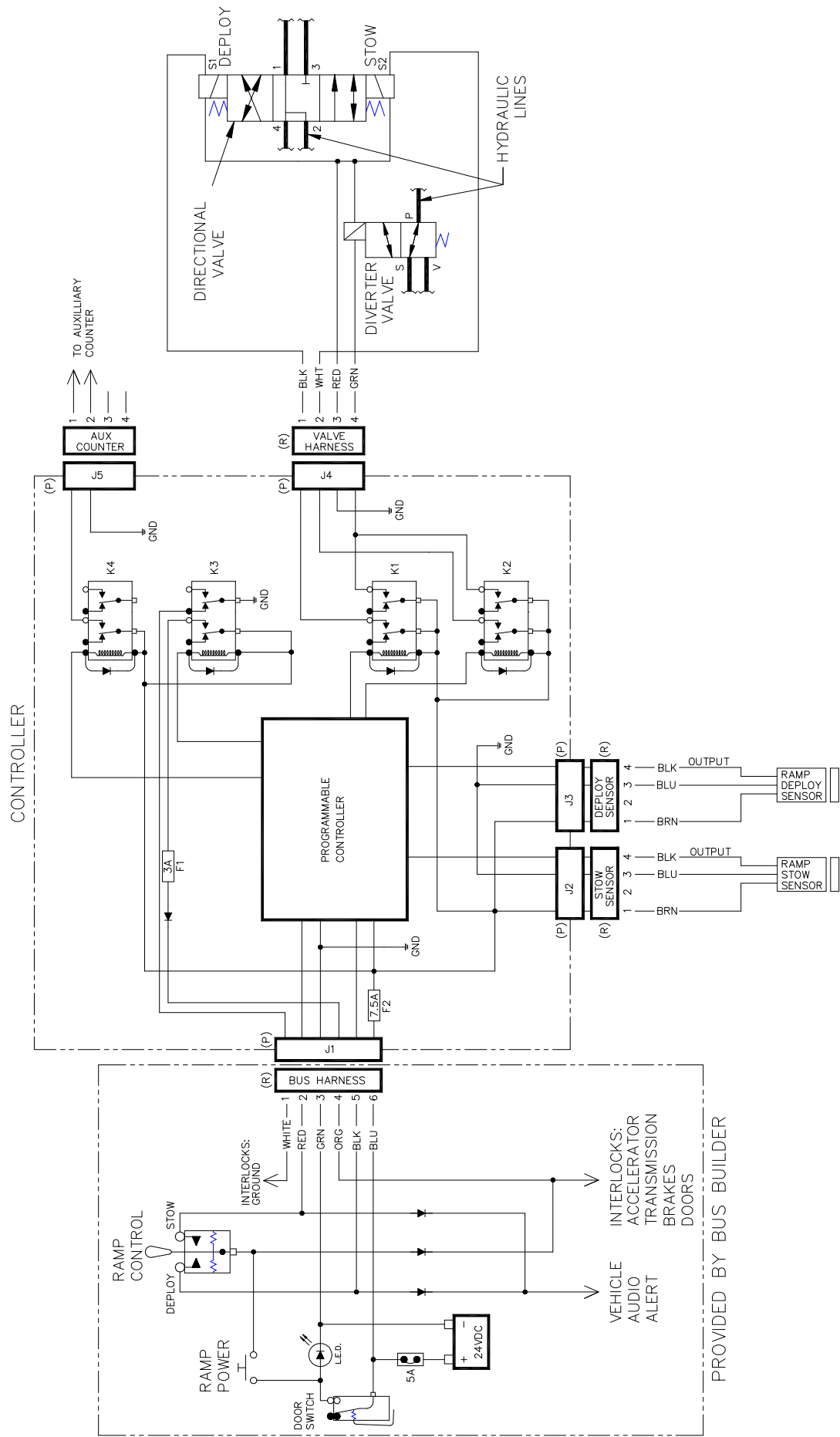


FIGURE 3-6: ELECTRICAL SCHEMATIC

IV. MAINTENANCE INSTRUCTIONS

Regular maintenance of the RICON FoldOver Ramp will provide optimum performance and reduce the need for repairs. Maintain the ramp as described in **Table 4-1**. Maintenance of the ramp should be performed more frequently under conditions of heavy use (in excess of 20 cycles per day). Modification to the ramp or failing to properly maintain the ramp will void the warranty and may result in unsafe operating conditions.



CAUTION!

This Ricon product is highly specialized. Maintenance and repairs must be performed by a Ricon authorized service technician using Ricon replacement parts. Modification or improper maintenance of this product will void warranty and may result in unsafe ramp operating conditions.

A. RAMP DECALS

Refer to **Figure 4-1**. Check the condition of all decals. Inspect for chipping, peeling, fading, and illegibility. Do inspections at the intervals recommended in **Table 4-1**. Replace decals as necessary, in the locations shown. When replacing a decal, order it by the part number shown in **Figure 4-1**.

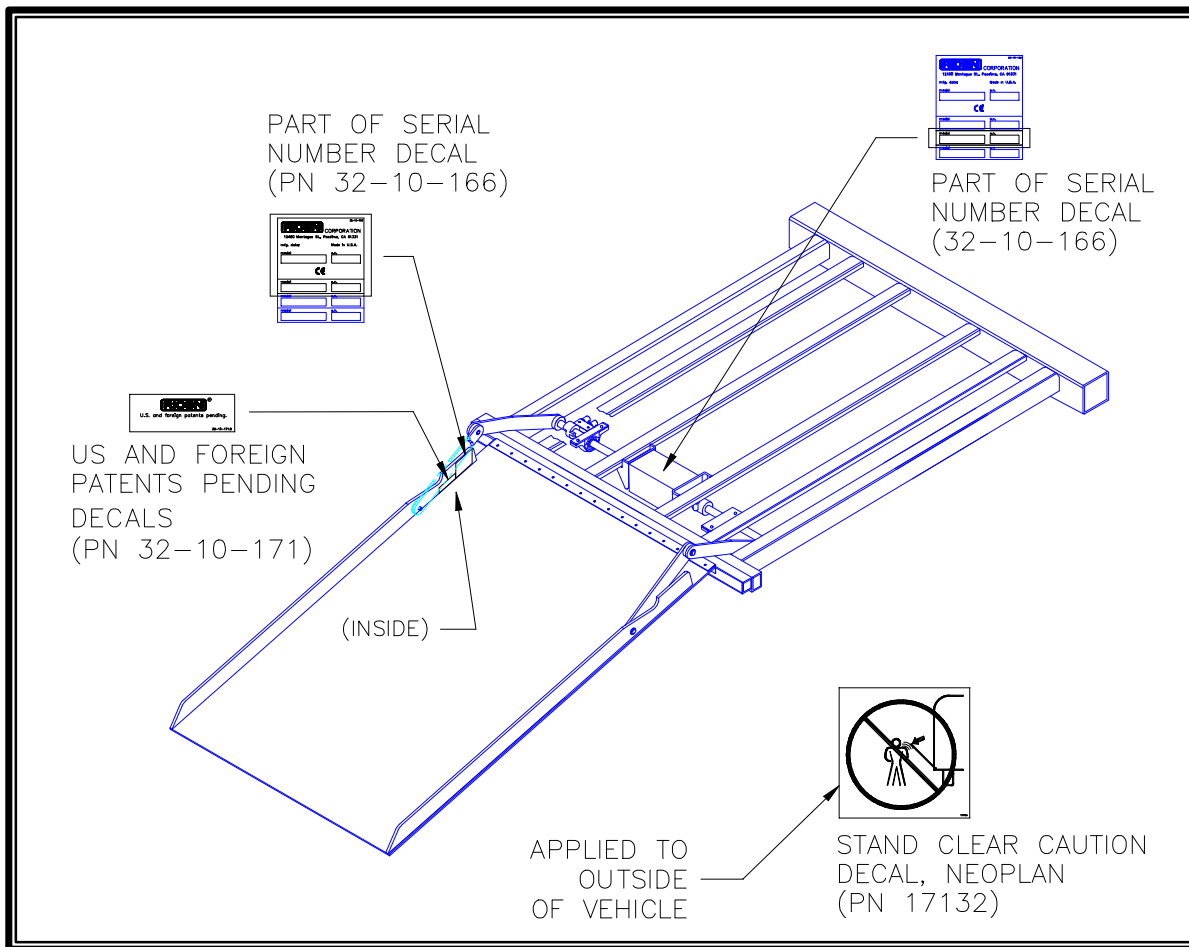


FIGURE 4-1: DECAL LOCATIONS

TABLE 4-1: MAINTENANCE SCHEDULE	
INSPECTION POINT	ACTION
– 6,000 MILE SAFETY CHECK –	
Hydraulic fluid leaks	Check all hoses and fittings; tighten or replace as necessary.
Setscrews	<p>Check for loose or missing setscrews at these locations:</p> <ul style="list-style-type: none"> • Driveshaft couplings (4 ea) • Ramp/Actuator arms (3 per side) • Sensor Target (2 ea) • Pillow Blocks (2 ea) <p>Tighten and apply thread locker (Loc-tite®), as necessary.</p>
Actuator arm screws	Check for loose shoulder screws; retighten the screws as necessary.
Ramp Interior (for Debris)	Check the Ramp interior area for accumulated dirt and debris. Remove as necessary.
Non-slip surface	Visually check for damaged surfaces, and loose or torn non-skid.
Decals	Visually check for damage or poor attachment.
– 12,000 MILE SAFETY CHECK –	
Wiring harnesses	Check wiring for abrasions, and connectors for looseness; replace as necessary.
Fasteners	Check all threaded fasteners for tightness and retighten as necessary.
Non-skid surfaces	Check non-skid surface for excessive wear or damage (rips, tears, peeling, etc.) and replace as necessary.
– 24,000 MILE SAFETY CHECK –	
Pillow block (lubrication)	Lightly grease pillow blocks (note that they are sealed).
Bushing & thrust washer wear	Refer to Figure 5-1 and Table 5-1 . Check these parts for excessive play and replace if necessary.

B. TROUBLESHOOTING

Refer to **Table 4-2**. The troubleshooting guide is designed to provide a logical starting point to locate general problems that could occur with the lift. However, not all possible problems or combinations of problems are listed. The guide does not incorporate routine safety precautions or preliminary procedures, and presumes vehicle battery is fully charged and battery terminals/connectors are clean and tight.

TABLE 4-2: TROUBLESHOOTING			
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Fold out ramp will not deploy	Deploy Switch is activated, but no sound or action occurs	No power to ramp	Main circuit breaker is blown, reset breaker
		Check main input power from bus harness to pin-6-Blue wire on terminal J1	Battery that feeds power to ramp is not sufficiently charged
		Vehicle door switches are misadjusted	Check vehicle power supply
			Readjust door switches
		No power from switch	Reset circuit breaker for door switch interlock
		Check on Deploy input power from bus harness to pin 5-Black wire on terminal J1	Replace or repair main ramp power switch
			Replace or repair Deploy switch
			Replace or repair door switch interlock
		Ramp Deploy Sensor is malfunctioning	Align ramp sensor target
		Replace ramp deploy sensor	
	Defective Ramp Controller	Replace Ramp Controller	
	Deploy Switch is activated, a solenoid is heard clicking, but no ramp action occurs	Manual flow control valves are closed	Open valves 1/4 counter clockwise
		Manual flow control valves are clogged	Remove, clean, and re-install the valves
		Vehicle steering line is not supplying hydraulic pressure to the Diverter Valve	Repair OEM steering system; add fluid if necessary
		Defective Ramp Controller	Replace ramp controller
		Diverter Valve not functioning	Repair or replace harness from
Repair or replace Diverter Valve			
Directional Valve not functioning		Repair or replace harness from Controller to Directional Valve	
		Repair or replace Directional Valve	
Hydraulic Actuator is not Operating	Replace Hydraulic Actuator		
(continued)			

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Fold out ramp deploys erratically	Deploy switch is activated, ramp either moves very slowly and then stalls	Bind in ramp hinges or actuator arms	Repair or replace part that is binding
		Maladjusted deploy sensor target	Adjust deploy sensor target
		Leak in hydraulic lines of vehicle's steering system	Repair OEM system to assure that there is sufficient pressure.
		Damaged or defective pressure relief valve in Diverter Valve Assembly	Remove, clean, and re-install; Replace Diverter Valve Assembly
		Damaged or defective Directional Valve	Replace Directional Valve Assembly
		Leak in hydraulic lines for ramp assembly	Repair or replace faulty line
		Damaged or defective hydraulic actuator	Replace hydraulic actuator
	Deploy switch is activated, ramp moves very slowly	Manual flow control valves are set too restrictive	Turn both manual flow control valves completely clockwise (to completely close valves) and readjust from this reference point
		Low hydraulic steering pressure	Repair OEM hydraulic system for obstructions or leaking pump
		Defective pressure regulator on Diverter Valve	Remove, clean, and reinstall; Replace Diverter Valve
		Defective Directional Valve	Replace Directional Valve
		Binding action in the hinge or actuator arms	Repair or replace part that is binding
	Ramp deploys to almost halfway and then falls short	Deploy Sensor Target is out of adjustment with Deploy Sensor	Adjust Sensor Target.
(continued)			

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Fold Out Ramp will not stow	Stow Switch is activated, a solenoid is heard clicking, but no ramp action occurs	Manual flow control valves are clogged or closed	Open valves a quarter turn counter clockwise
		Remove, clean and re-install; Replace Flow Control Valves	
		Vehicle is not supplying hydraulic pressure to the Diverter Valve	Repair OEM steering system; add fluid if necessary
		Diverter Valve not functioning	Repair or replace harness from Controller to Diverter Valve
			Repair or replace Diverter Valve
		Directional Valve not functioning	Repair or replace harness from Controller to Directional Valve
			Repair or replace Directional Valve
	Hydraulic Actuator is not operating	Replace Hydraulic Actuator	
	Defective Ramp Controller	Replace Ramp Controller	
	Stow Switch is activated, but no sound or action occurs	No power from switch. Check on Stow input power from bus harness to pin-2- Red wire on terminal J1	Reset circuit breaker for door switch interlock
			Replace or repair main ramp power switch
			Replace or repair Stow switch
		Replace or repair door switch interlock	
		No power to ramp. Check main input power to Pin-6, blue wire on terminal J1	Verify that main circuit breaker is not blown, reset if necessary
Battery that feeds power to ramp is not sufficiently charged; charge battery			
Defective Ramp Controller	Replace ramp controller		
(continued)			

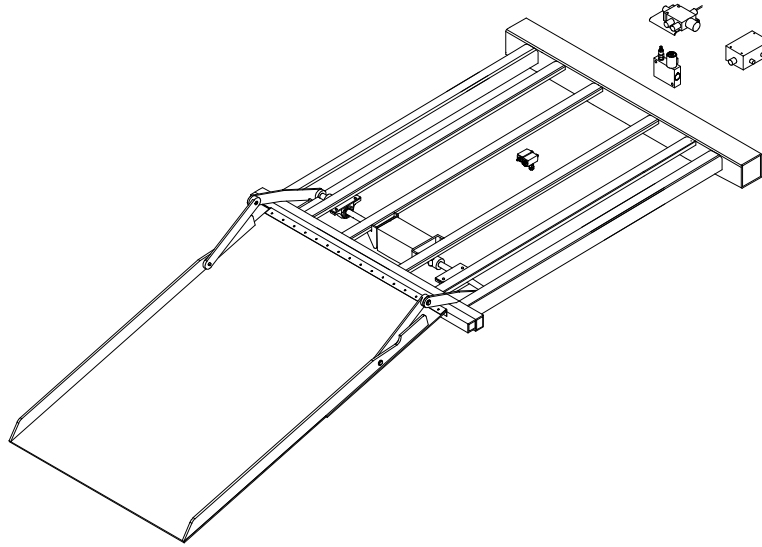
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Fold out ramp stows erratically	Stow switch is activated, ramp moves very slowly and then stalls	Leak in hydraulic lines of vehicle's steering system	Repair OEM system to assure that there is sufficient pressure.
		Damaged or defective pressure relief valve in Diverter Valve Assembly	Replace Diverter Valve Assembly
		Damaged or defective Directional Valve	Replace Directional Valve Assembly
		Leak in hydraulic lines for ramp assembly	Repair or replace faulty line
		Damaged or defective Hydraulic Actuator	Replace Hydraulic Actuator
	Stow switch is activated, ramp moves very slowly	Bind in ramp hinges or actuator arms	Repair or replace part that is binding
	Stow switch is activated, ramp moves very slowly	Manual flow control valves are set too restrictive	Turn both manual flow control valves completely clockwise (completely closed) and readjust from this reference point
		Low hydraulic steering pressure	Repair OEM hydraulic system for obstructions or leaking pump
		Defective Pressure Regulator on Diverter Valve	Remove, clean, and reinstall; Replace Diverter Valve
		Defective Directional Valve	Remove, clean, and reinstall; Replace Directional Valve
Reversed operation	Ramp stows when deploy switch is ON; deploys when stow is ON	Binding action in the hinge or actuator arms	Repair or replace part that is binding
		Hydraulic lines are not connected correctly	Verify that the line from port 4 of the Directional valve goes to C1 on the actuator; port 2 goes to C2
			Verify that the line from port V of the Diverter valve goes to port 3 of the Directional valve; port T goes to port 1 and then to tank return
		Ramp control harness to J1 on the Controller is not wired correctly	Verify that Stow command on switch is connected to the Red wire (Pin 2); Deploy command is wired to Black wire (Pin 5)
(continued)			

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Ramp will deploy but will not stow	Ramp will deploy with power all the way to the ground, but will not stow; unit will stow if the ramp is manually lifted to the vertical position	Connectors (receptacles) are not connected to the right solenoid on Directional Valve	Verify that the receptacle with the Black and Red wires is connected to S1; the White and Red is connected to S2
		Two erroneous conditions exist (either hydraulic lines incorrectly connected, ramp control harness not connected correctly, or connectors (receptacles) on the Directional valve not connected correctly)	Verify that the line from port 4 of the Directional valve goes to C1 on the actuator; port 2 goes to C2
			Verify that the line from port V of the Diverter valve goes to port 3 of the Directional valve; port T goes to port 1 and then to catch tank return
			Verify that Stow command on switch is connected to the Red wire (Pin 2); Deploy command is wired to Black wire (Pin 5)
Interlocks will not disengage	No output Pin 4- Orange wire on terminal J1	Ramp not fully stowed	Remove possible obstruction and verify that ramp is fully stowed
		Misadjusted Sensor Target	Adjust Sensor Target
		Ramp fully Stowed Sensor is damaged/defective	Replace Stowed Sensor
		Defective or damaged Controller	Replace Controller
END TABLE			

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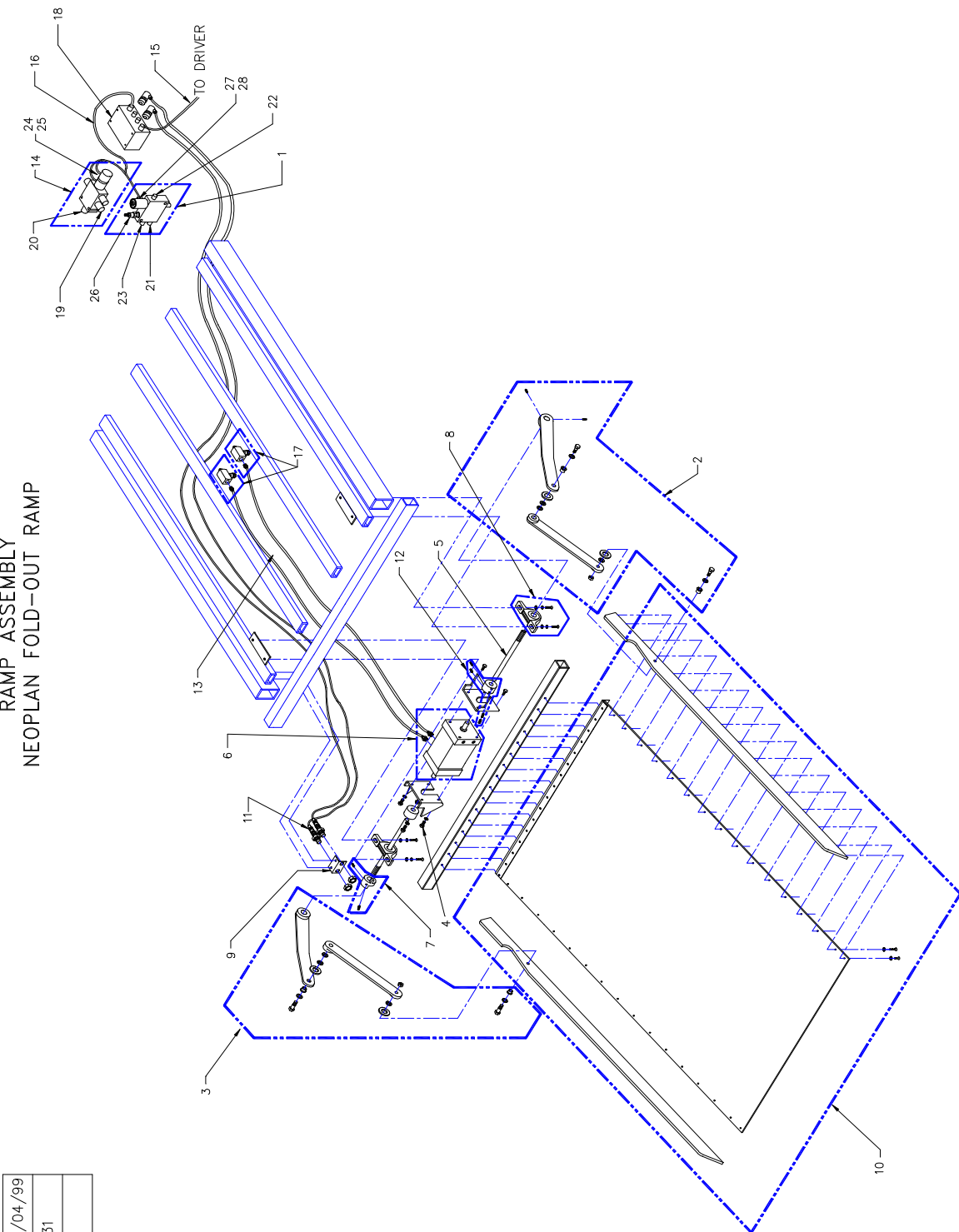
V. SPARE PARTS

This chapter contains a parts diagram for the RICON FR2000 FoldOver Ramp. The exploded view shows individual components referenced by numbers. On the associated parts list is the reference number, a part description, the quantity used, and the Ricon part number. Refer to Figure 4-1 in Chapter IV for an illustration of the decal locations and their part numbers.



LIFT MODEL AND KIT NUMBERS	
PRODUCT NUMBER	98100
PRODUCTION DECAL SET NUMBER	(to be supplied)
SPARE DECAL KIT NUMBER	(to be supplied)

RAMP ASSEMBLY
NEOPLAN FOLD-OUT RAMP



DATE: 05/04/99
DWG. 17131
REV. A

FIGURE 5-1: FR2000 FOLDOVER RAMP ASSEMBLY

FIGURE 5-1: FR2000 FOLDOVER RAMP ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	KIT, DIVERter VALVE ASSY, W/ ADAPTERS	1	18629
2	KIT, RAMP ARM ASSY, RH W/ HDWR	1	18617
3	KIT, RAMP ARM ASSY, LH W/ HDWR	1	18616
4	KIT, ACTUATOR MTG HDWR	1	18612
5	SHAFT, RAMP DRIVE, SPLINED ¾" x 11 5/16"	2	98047
6	KIT, ROTARY ACTUATOR ASSY W/ ADAPTERS	1	18619
7	KIT, TARGET SENSOR W/ HDWR	1	18613
8	KIT, PILLOW BLOCK W/MTG HDWR	1	18611
9	BRKT, SENSOR MOUNTING	1	98052
10	KIT, PLATFORM ASSY, W/RAILS AND HDWR	1	18615
11	SENSOR ASSY, HARNESS 84" (INCLUDES CABLE AND CONNECTORS)	2	98066
12	KIT, COUPLER SHAFT W/ HDWR	2	18614
13	HYDRAULIC HOSE ASSY, 31" X ¼JIC X ¼JIC	2	V7-SH-001
14	KIT, DIRECTIONAL VALVE ASSY, W/ADAPTERS	1	18630
15	ELECTRICAL HARNESS, J1	1	17267
16	ELECTRICAL HARNESS, J4	1	17268
17	FLOW CONTROL VALVE ASSY, W/ ADAPTERS	2	17211
18	CONTROLLER, FR2	1	17799
19	ADAPTER, ORB,4xJIC,4 STL	3	17208
20	ADAPTER, ORB,4xJIC,6 STL	1	17210
21	ADAPTER, ORB,6xJIC,4 STL	3	26591
22	ADAPTER, ORB,6xJIC,6 STL	2	17209
23	ADAPTER, ORB,8xJIC,10 STL	1	17207
24	VALVE, SPOOL, 4 WAY, 3 POSITION	1	98200
25	SOLENOID COIL	2	98201
26	VALVE, RELIEF, POPPET, ADJ 500-3300	1	98198
27	VALVE, SPOOL, 3 WAY	1	98197
28	COIL ASSY, DIVERter VALVE	1	98073

APPENDIX 1 RAMP SPECIFICATIONS

FR2000 FOLDOVER RAMP NEOPLAN LOW FLOOR VEHICLE ACCESS

Power..... Electro-Hydraulic

Power requirements:

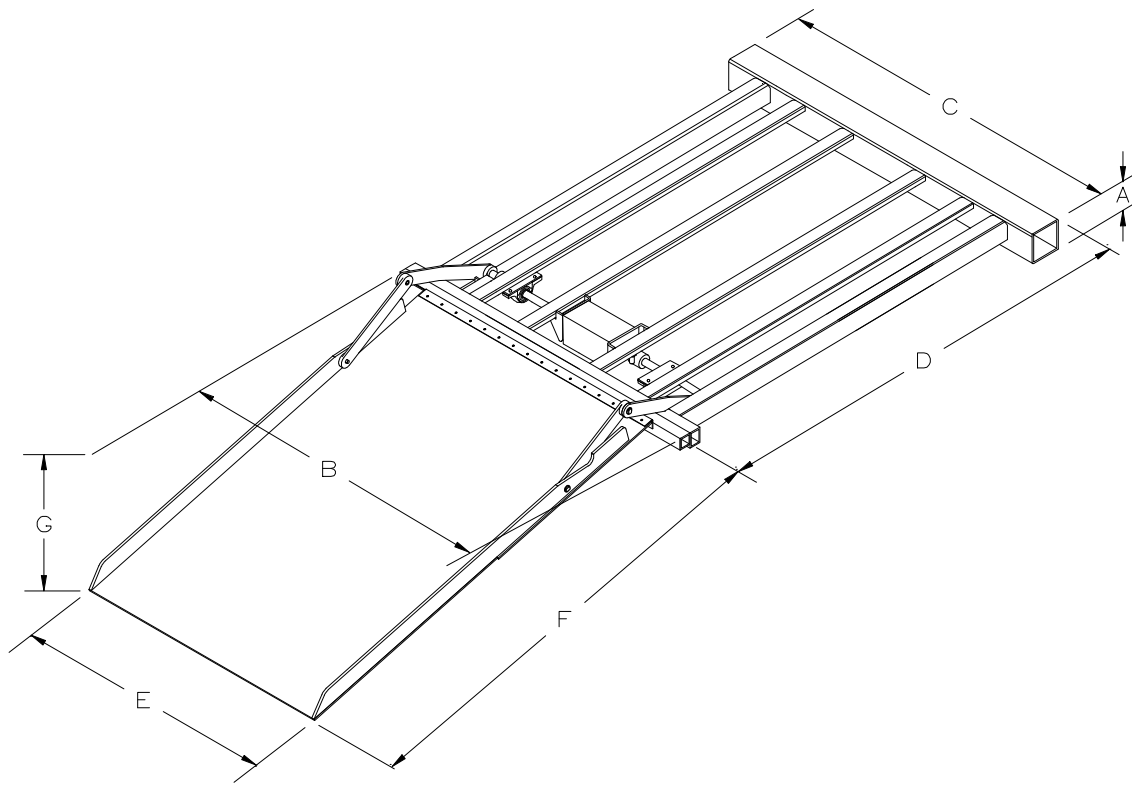
Electric..... 20VDC to 30VDC; 24VDC nominal

Hydraulic..... 1150±25 PSI

Maximum current draw..... 3 amps

Rated load capacity..... 600 lbs. (272kg)

Ramp assembly weight..... approx. 300 lbs. (136kg)



DIMENSIONS – inches (cm)

	A	B	C	D	E	F	G
MODEL	Ramp Support Height	Ramp Support Width, front	Ramp Support Width, rear	Ramp Support Length	Useable Platform Width	Useable Platform Length	Floor-to-Ground Travel, max
FR2000	4.8 (12.2)	39.4 (100.0)	30.7 (80.0)	48.4 (122.9)	30.2 (76.7)	48.9 (124.2)	10 (25.4)

