



Innovation in Mobility

FOLDOVER^ä RAMP
Low-Floor Vehicle
Access Ramp
for
GILLIG

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
32DFR104. B	11-12-01	5-4	Added 19970 Bushing Rebuild Kit to parts list.	
	03/21/02	Inside cover	Updated disclaimer on inside cover.	3990/4918

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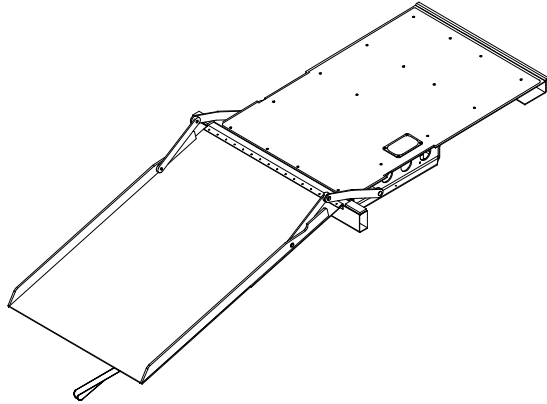
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I. INTRODUCTION

A. GENERAL INFORMATION

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.

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B. WARRANTY INFORMATION

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

Only authorized Ricon dealers are allowed to perform maintenance or repair to 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 the Ricon Product Support department at one of 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 starting 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 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 should be performed at that time.



WARNING!

THIS PRODUCT HAS BEEN DESIGNED AND MANUFACTURED TO EXACT SPECIFICATIONS. ANY MODIFICATION OF THIS PRODUCT 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 twenty (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.

GENERAL SAFETY PRECAUTIONS

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

1. Under no circumstances should maintenance, repair or adjustments be attempted without the immediate presence of a person capable of rendering aid.
2. An injury, no matter how slight, should always be attended to. Always administer first aid or seek medical attention immediately.
3. Protective eye shields and appropriate clothing should be worn at all times.
4. To avoid injury, always 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.
5. Be cautious when using metallic (conductive) tools near heavy-current power supplies.
6. Check under vehicle before drilling or cutting to avoid damage to the frame, subframe members, wiring, hydraulic lines, etc.
7. Read and thoroughly understand operating instructions before attempting to operate lift.
8. 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.
9. Keep others clear during lift operation.
10. The product requires regular maintenance. A thorough inspection is recommended at least once every six months. The product should always be maintained at its highest level of performance.

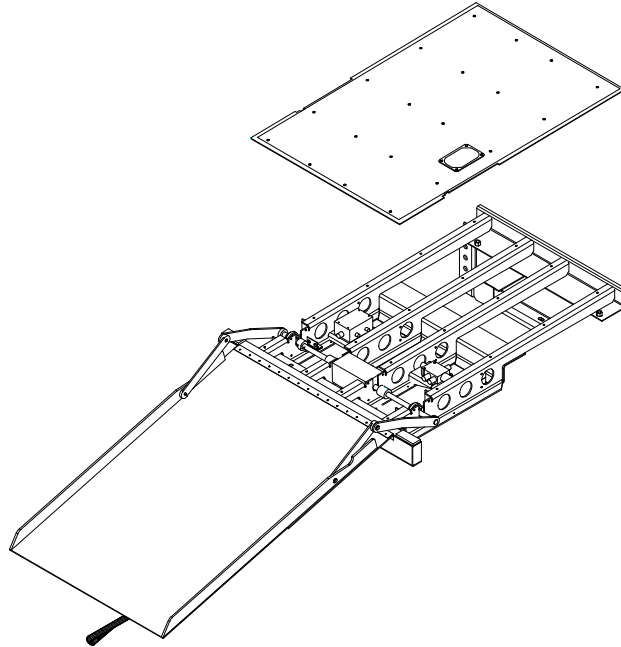
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II. DESCRIPTION

A. GENERAL

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 and uses this to provide ramp functions. The ramp folds away into the vestibule flooring.



B. 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:

- a. the vehicle parking brake must be set
- b. the transmission must be in park/neutral
- c. the 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.

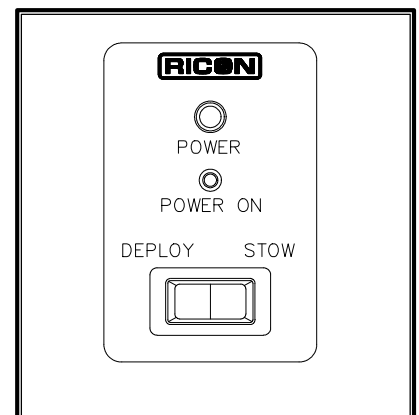


Figure [2-1]: Typical Control Panel

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 or may not have been connected during ramp installation).

C. 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 their mobility equipment fits safely between the left and right side barriers of the ramp.

Table [2-1]: Ramp Load Limits

Measurement	Limit
Maximum Load	600 lb (272 kg)
Available Width	30.2 inches (76.7 cm)

D. MAJOR COMPONENTS

The major components of the fold out ramp are shown in **Figure [2-2]**. A description of each of the components is provided in **Table [2-3]**. Refer to the Parts List in Chapter V of this manual for a complete listing of the ramp components.

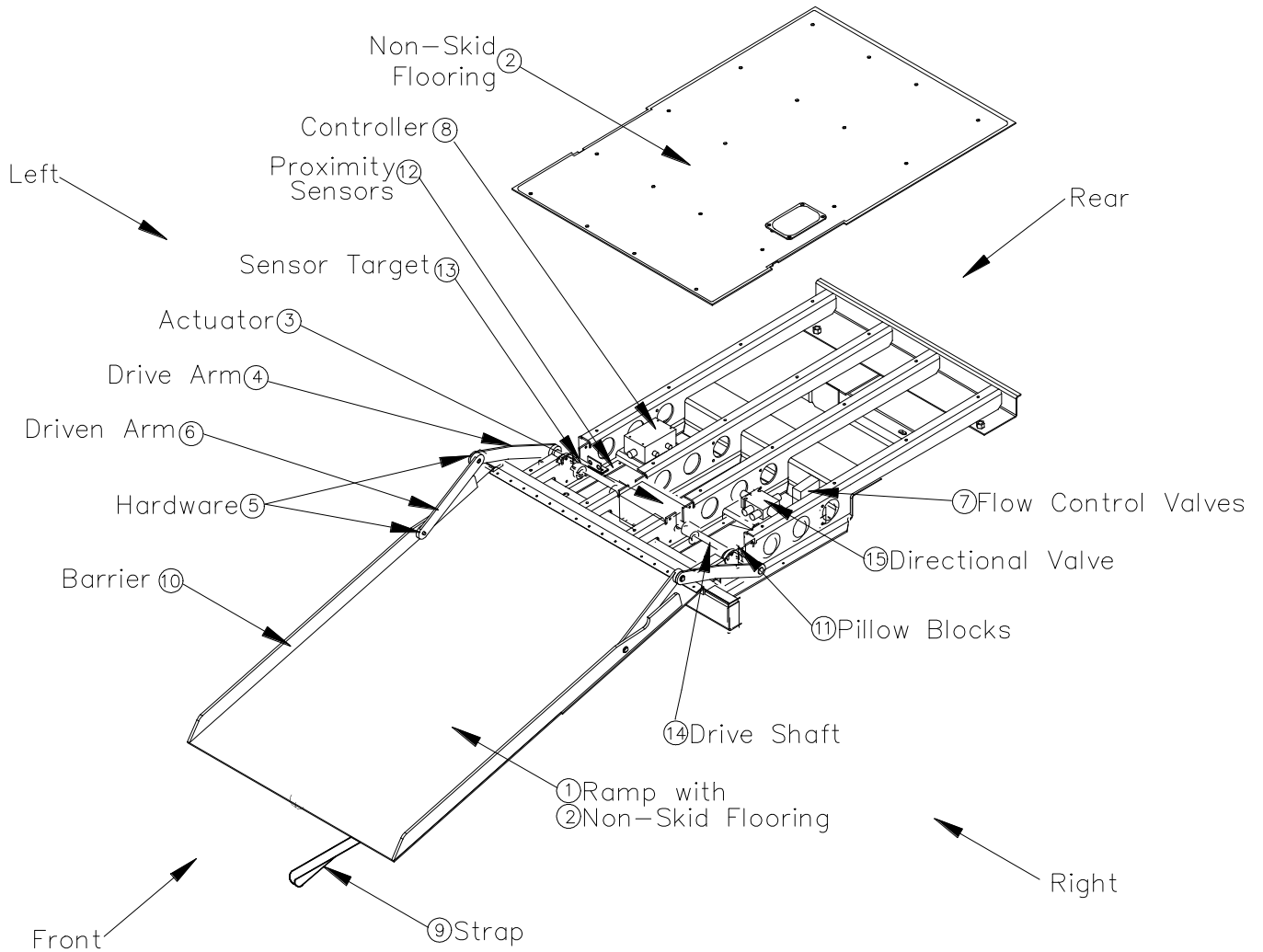


Figure [2-2]: Major Ramp Components

Table [2-2]: Major Ramp ComponentsPart numbers for these components can be found in the **Chapter V Parts List**

No.	Item	Description
1	Ramp	Platform that flips out (deploys) or folds (stows) into the stepwell to assist passengers on and off the vehicle.
2	Non-Skid Flooring	Textured material attached to the flooring and ramp walkway to reduce passenger and equipment slippage.
3	Rotary Actuator	Hydraulic component that receives hydraulic fluid pressure from the directional valve. The actuator converts fluid pressure to torque; providing rotary motion to actuator arms. (The range of motion for the actuator is 270°.)
4	Drive Arms (Left & Right)	Ramp linkage arms driven by the actuator.
5	Hardware	(Shoulder Bolts, Bushings, Thrust Washers). Pivoting, load bearing surfaces at ends of ramp arms. Bushings and washers are oilite.
6	Driven Arms (Left & Right)	Ramp linkage arms attached to the ramp, and driven by the actuator arms.
7	Flow Control Valves	Manually adjusted needle valves that control rate of ramp movement.
8	Controller	Receives DEPLOY and STOW commands from ramp control panel and translates these commands into signals that control the ramp hydraulic components. Receives signal from target sensors to determine ramp position (deployed or stowed).
9	Lifting Strap	Used to manually deploy or stow the ramp.
10	Side Rail Barriers	Vertical curbs that help confine users to the ramp during boarding and exiting.
11	Pillow Blocks	Mounted ball bearings that support the ramp drive shafts. Each block has a grease fitting.
12	Sensors; Deploy/Stow	Read sensor target to detect the ramp position (deployed ↔ stowed); one sensor detects ramp deploy motion, the other detects the stow position.
13	Sensor Target	Located on left ramp drive shaft; provides position of ramp (deployed/stowed) to the sensors.
14	Drive Shafts	Connect ramp actuator arms to hydraulic actuator.
15	Directional Valve	Part of the ramp hydraulic system. Consists of valve body, a shuttle valve and two electric solenoids. Controls fluid flow direction through hydraulic actuator. Receives signal from controller to either stow or deploy the ramp.
16	Diverter Valve (not shown)	Part of ramp hydraulic system; Connected between the vehicle hydraulic steering system and pressure tank to direct flow to either steering or ramp (not both). Consists of valve body, an electric solenoid, pressure regulator and relief valve. The relief valve bleeds excess pressure (greater than 1150 psi) to pressure tank. The diverter valve is not installed in the ramp: it is installed in-line with the OEM power steering hose.

III. OPERATION

A. GENERAL INFORMATION

The Gillig FoldOver Ramp is an electro-hydraulic unit that uses vehicle electric and hydraulic power to control 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.

1. **DIVERTER VALVE ASSEMBLY**

The ramp employs a diverter valve (installed inline with the vehicle power steering system) to redirect hydraulic fluid 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 no power, the diverter valve directs full pressure to the vehicle steering system.

The diverter contains a solenoid (coil) 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.

2. **DIRECTIONAL VALVE**

The directional valve also contains a shuttle valve. It controls the direction of fluid flow through the C1 and C2 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 tank.

3. **ELECTRICAL FUNCTIONS**

Refer to **Figure [3-5]** at the end of this section 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.

4. **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 the valves CCW increases the rate of ramp movement and turning the valves CW decreases the rate of ramp movement.

B. OPERATING THE RAMP WITH THE RAMP CONTROL PANEL

WARNING

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

1. DEPLOYING THE RAMP

a. Vehicle Preparation

- (1) Stop the vehicle on level ground; refer to **Figure [3-1]**. Lower the vehicle, if applicable.
- (2) Set the vehicle parking brake.
- (3) Put the transmission in park/neutral and open the vehicle door.

NOTE: The ramp will deploy only after the parking brake is set, the transmission is in park/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) Toggle the ramp control switch to the deploy position. Hold the switch in deploy until the ramp passes its midpoint (vertical position; refer to **Figure [3-2]**), then release the switch. After the ramp reaches midpoint it will lower to the ground without assistance.

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

- (3) Movement of the ramp can be reversed at any time during its travel. To reverse the direction of the ramp while it is moving, toggle the control switch to the opposite setting (from deploy to stow, or from stow to deploy).
- (4) Passengers must carefully enter or exit vehicle one at a time. Passengers using mobility equipment (e.g., wheelchairs and scooters) must travel **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.

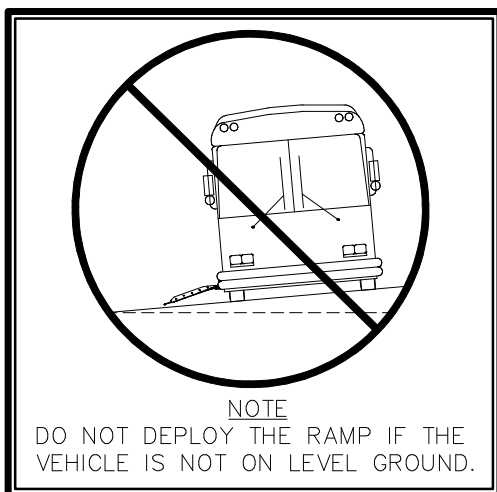


Figure [3-1]: Parking Danger

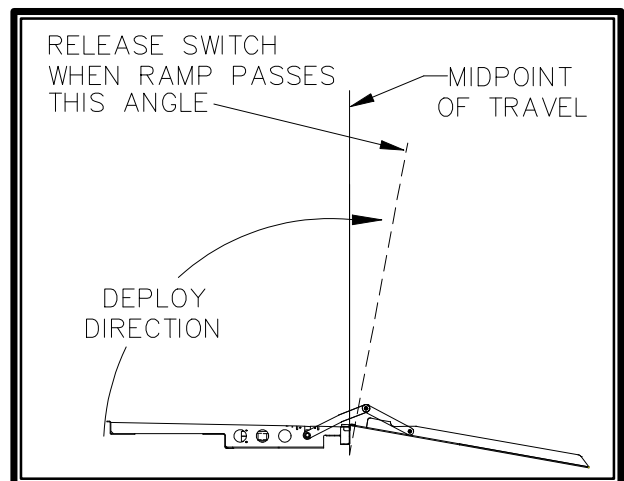


Figure [3-2]: Ramp Midpoint (during travel)

2. STOWING THE RAMP

WARNING

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

- a. Toggle the control switch to the stow position. Hold the switch in the stow position until the ramp passes its midpoint (refer to **Figure [3-3]**), then release the switch. After the ramp passes this midpoint, it will fold down to the stowed position in the step well without further assistance.

NOTE: If connected, the audible alert 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.

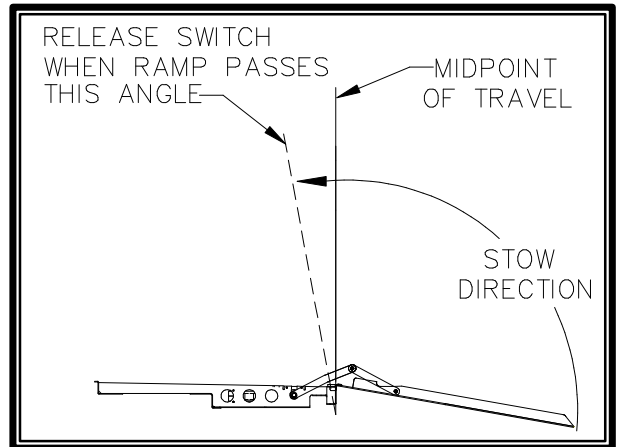


Figure [3-3]: Ramp Midpoint (during stow)

C. OPERATING THE RAMP MANUALLY

1. Deploying the ramp manually

- a. Stop the vehicle in a safe area. Lower vehicle, if possible.
- b. Set the vehicle parking brake.
- c. Put the transmission in park/neutral and open the vehicle door.
- d. Locate the strap on the edge of the ramp (refer to **Figure [2-3]**).
- 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 front edge of the ramp with both hands. Unfold the ramp from its stowed position while keeping your back vertical and legs together.
- g. Release the ramp after it passes its midpoint (see **Figure [3-2]**) and it will continue to unfold without assistance.

2. Stowing the ramp manually

- a. Grasp the strap attached to the front edge of ramp. Keep your back vertical and lift the ramp enough to gain a grip (with both hands) on the left and right side barriers, (refer to **Figure [2-2]**). 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.

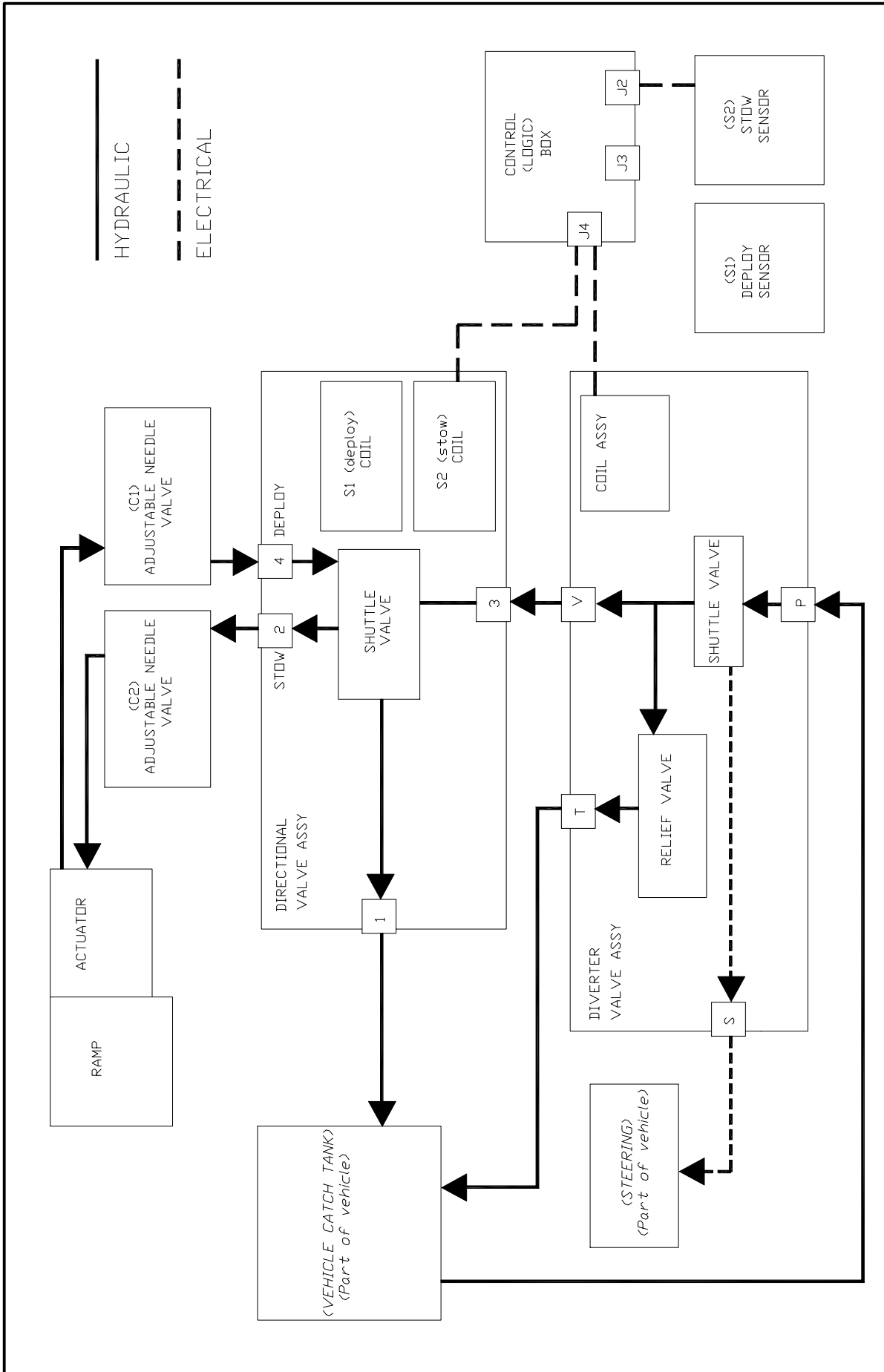


Figure [3-3]: Hydraulic Schematic (Stow)

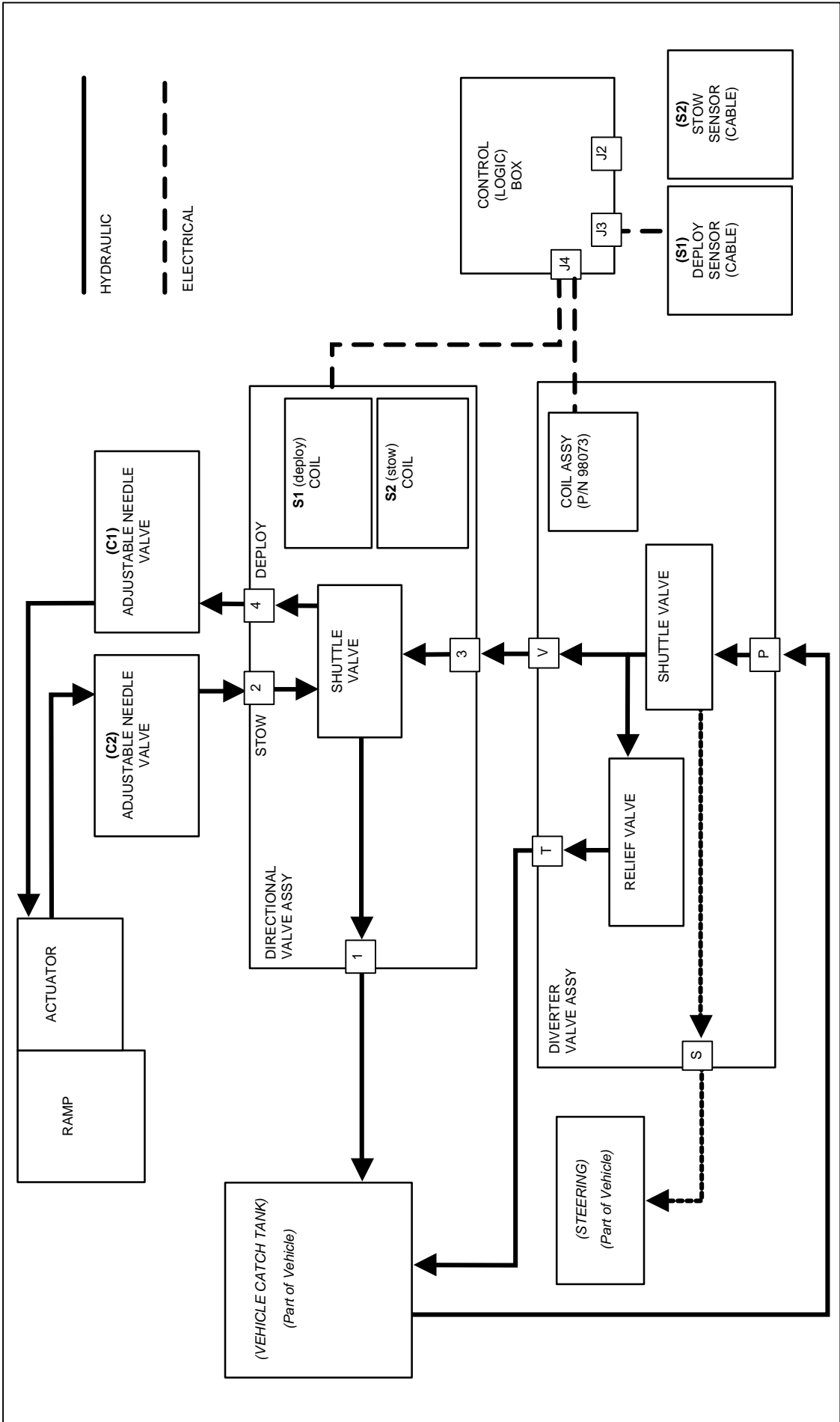


Figure [3-5]: Hydraulic Schematic (Deploy)

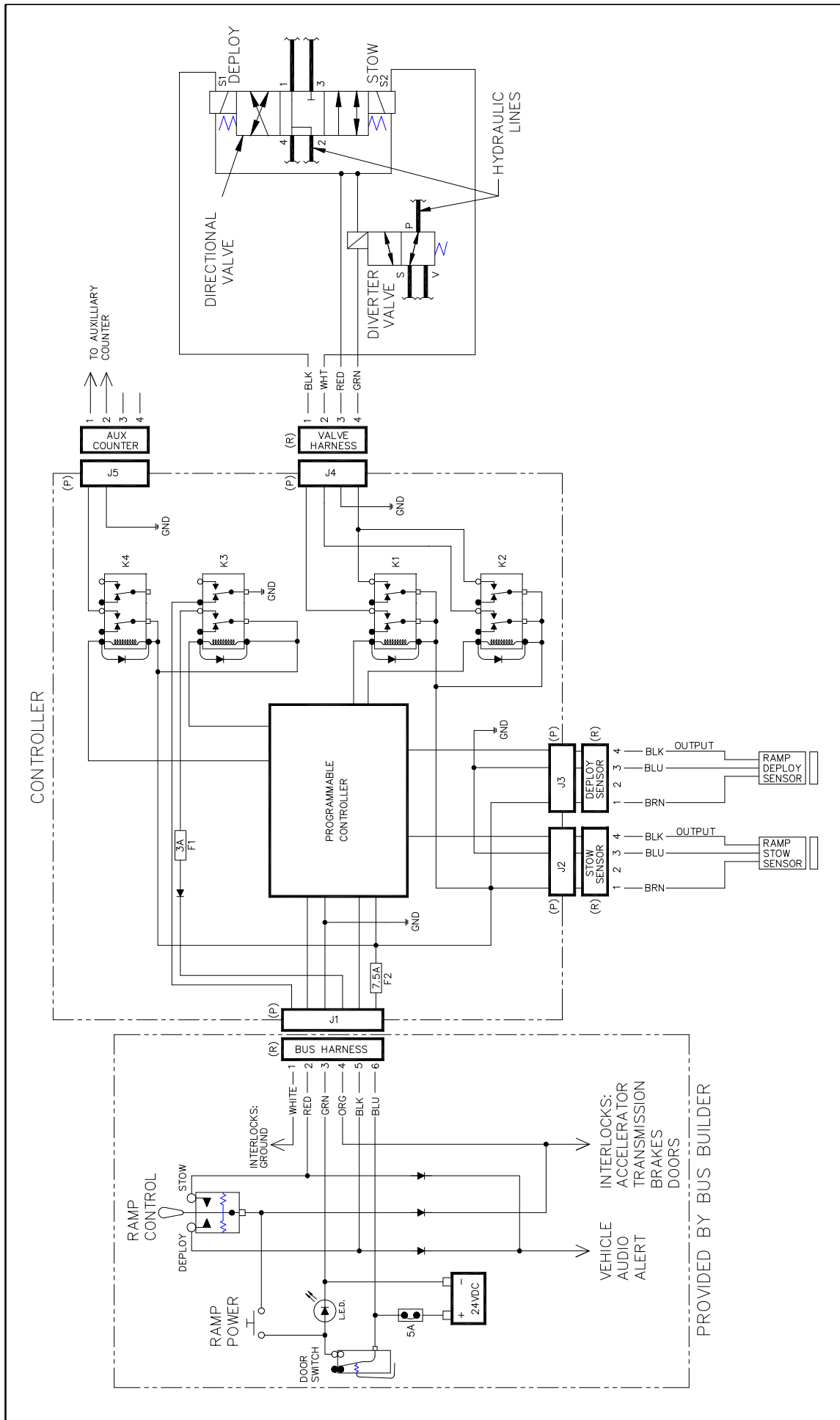


Figure [3-6]: Electrical Schematic


IV. MAINTENANCE INSTRUCTIONS

Regular maintenance and safety inspections of the RICON FoldOver Ramp will provide optimum performance and reduce the need for repairs.

A. GENERAL

Maintain the ramp as described in **Table [4-1]**. Under conditions of heavy use (in excess of 20 cycles per day), maintenance of the ramp should be performed more frequently.

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 facility using Ricon replacement parts. Modification or improper maintenance of this product will void warranty and may result in unsafe ramp operating conditions.

B. RAMP DECALS

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

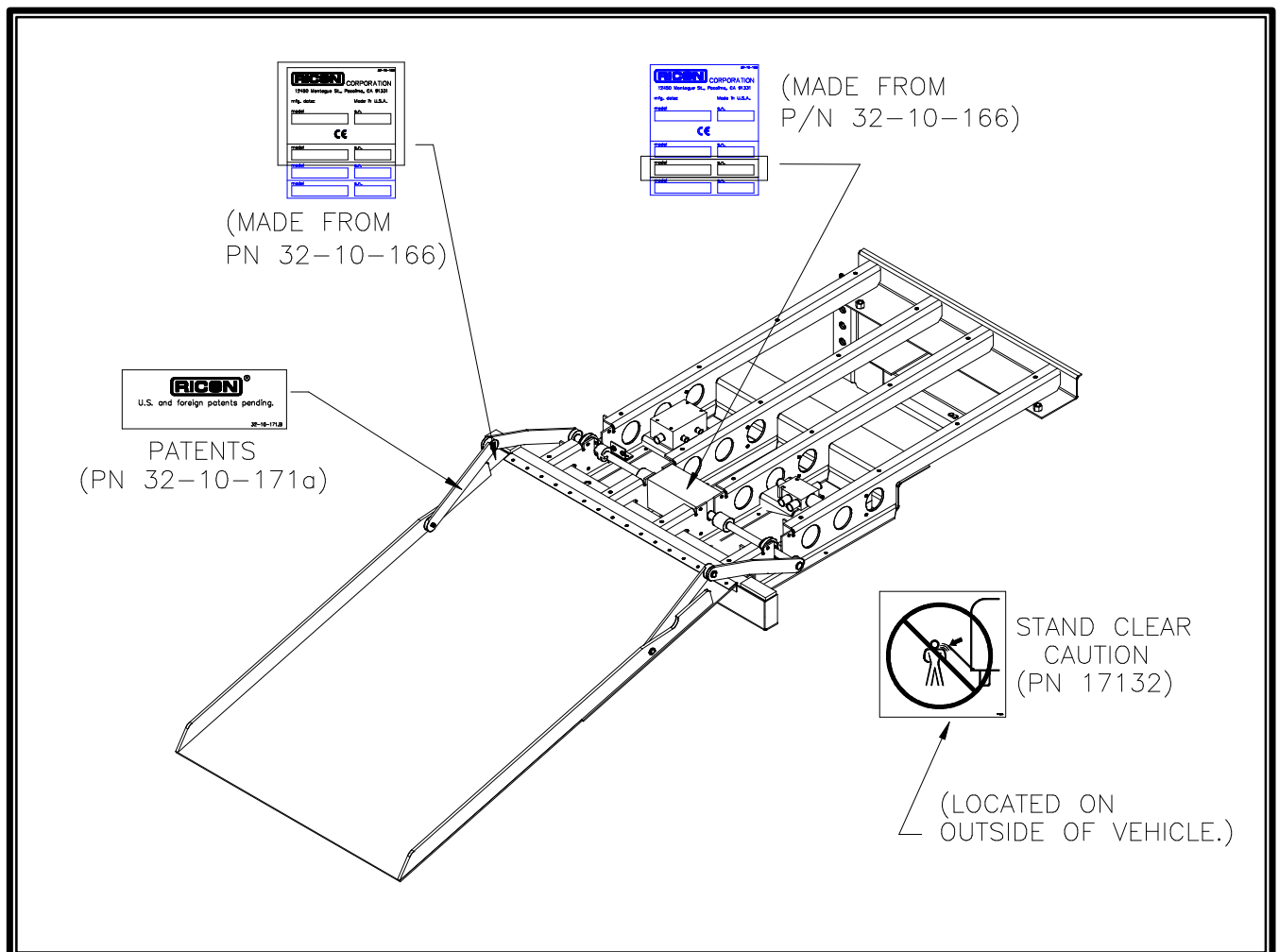


Figure [4-1]: Decal Location

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	Check for loose or missing setscrews at these locations: <ul style="list-style-type: none"> • Driveshaft couplings (qty 4) • Sensor Target (2 ea) • Ramp/Actuator arms (3 per side) • Pillow Blocks (2 ea) Tighten and apply thread locker (Loc-tite®), as necessary.
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.

C. TROUBLESHOOTING

For troubleshooting the lift, 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 Check main input power from bus harness to pin-6-Blue wire on terminal J1 Vehicle door switches misadjusted	Main circuit breaker is blown, reset breaker Battery that feeds power to ramp is not sufficiently charged Check vehicle power supply Readjust door switches
		No power from switch Check on Deploy input power from bus harness to pin 5-Black wire on terminal J1	Reset circuit breaker for door switch interlock
			Replace or repair main ramp power switch
			Replace or repair Deploy switch
		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	Defective Ramp Controller	Replace ramp controller
		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's steering lines 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		

(continued)

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY	
Fold out ramp deploys erratically	Deploy switch is activated, ramp either moves very slowly and then stalls	Maladjusted deploy sensor target	Adjust deploy sensor target	
		Bind in ramp hinges or actuator arms	Repair or replace part that is binding	
		Leak in hydraulic lines of vehicle 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 reinstall; 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	
		Binding action in the hinge or actuator arms	Repair or replace part that is binding	
		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	
	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	Defective Ramp Controller	Replace Ramp Controller
		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 Directional Valve
			Repair or replace harness from Controller to Directional Valve
		Hydraulic Actuator is not operating	Replace Hydraulic Actuator
		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	
	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	Replace or repair Stow switch
			Replace or repair main ramp power switch
			Replace or repair door switch interlock
			Reset circuit breaker for door switch interlock
		Defective Ramp Controller	Replace ramp controller
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		
(continued)			

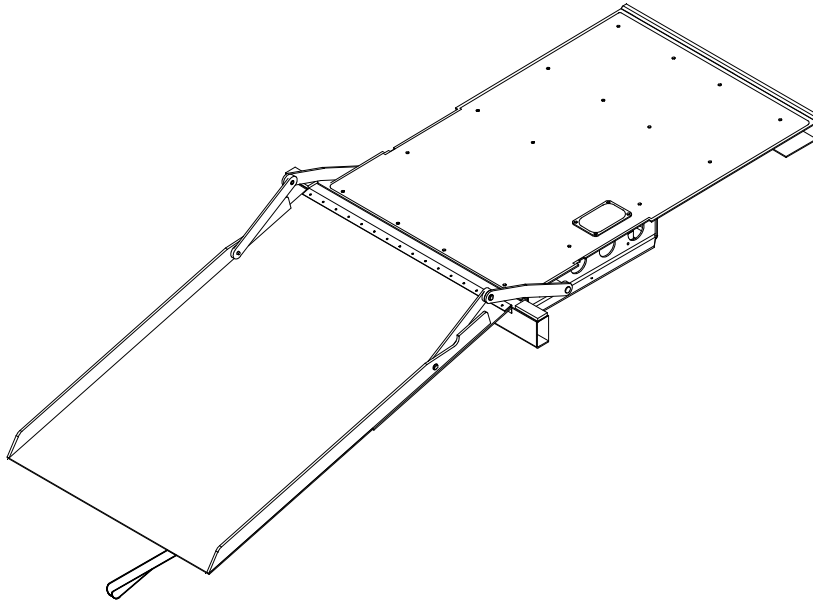
FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Fold out ramp stows erratically	Stow switch is activated, ramp moves very slowly and then stalls	Leak in hydraulic lines of vehicle's steering system	Repair OEM system to assure that there is sufficient pressure.
		Damaged or defective pressure relief valve in Diverter 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 Low hydraulic steering pressure	Turn both manual flow control valves completely clockwise (completely closed) and readjust from this reference point 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
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

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V. FOLDOVER RAMP SPARE PARTS

Replaceable parts for the FoldOver Ramp are illustrated in **Figures 5-1A** and **5-2B** and are listed in **Table 5-1**. Parts are identified in the figure with item numbers which correspond to those on the associated parts list.



PARTS DIAGRAMS

PAGE

FIGURE 5-1A: ELECTRICAL AND HYDRAULIC ASSEMBLY	5-2
FIGURE 5-2B: RAMP AND SUPPORT ASSEMBLY	5-3

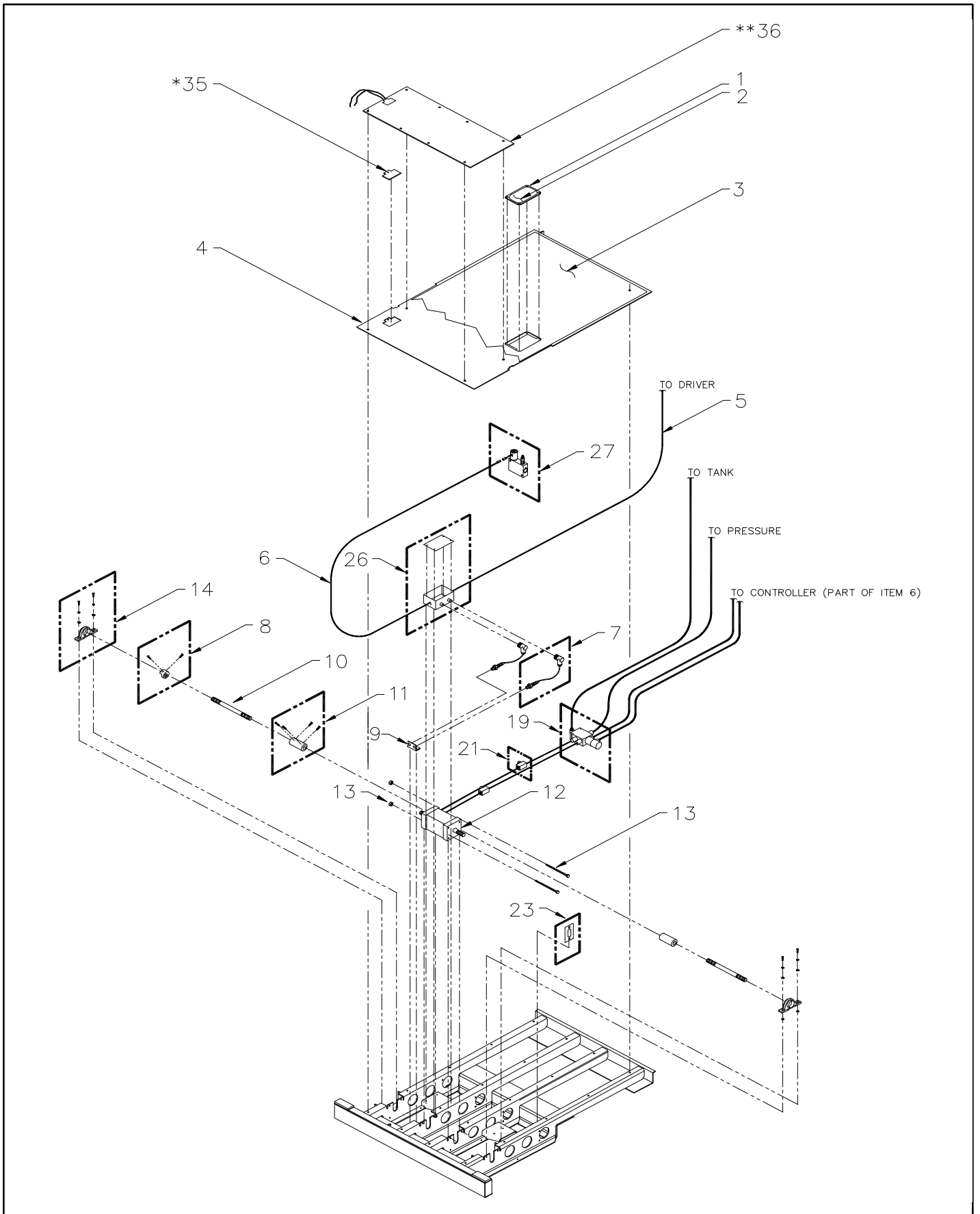


FIGURE 5-1A: ELECTRICAL AND HYDRAULIC ASSEMBLY

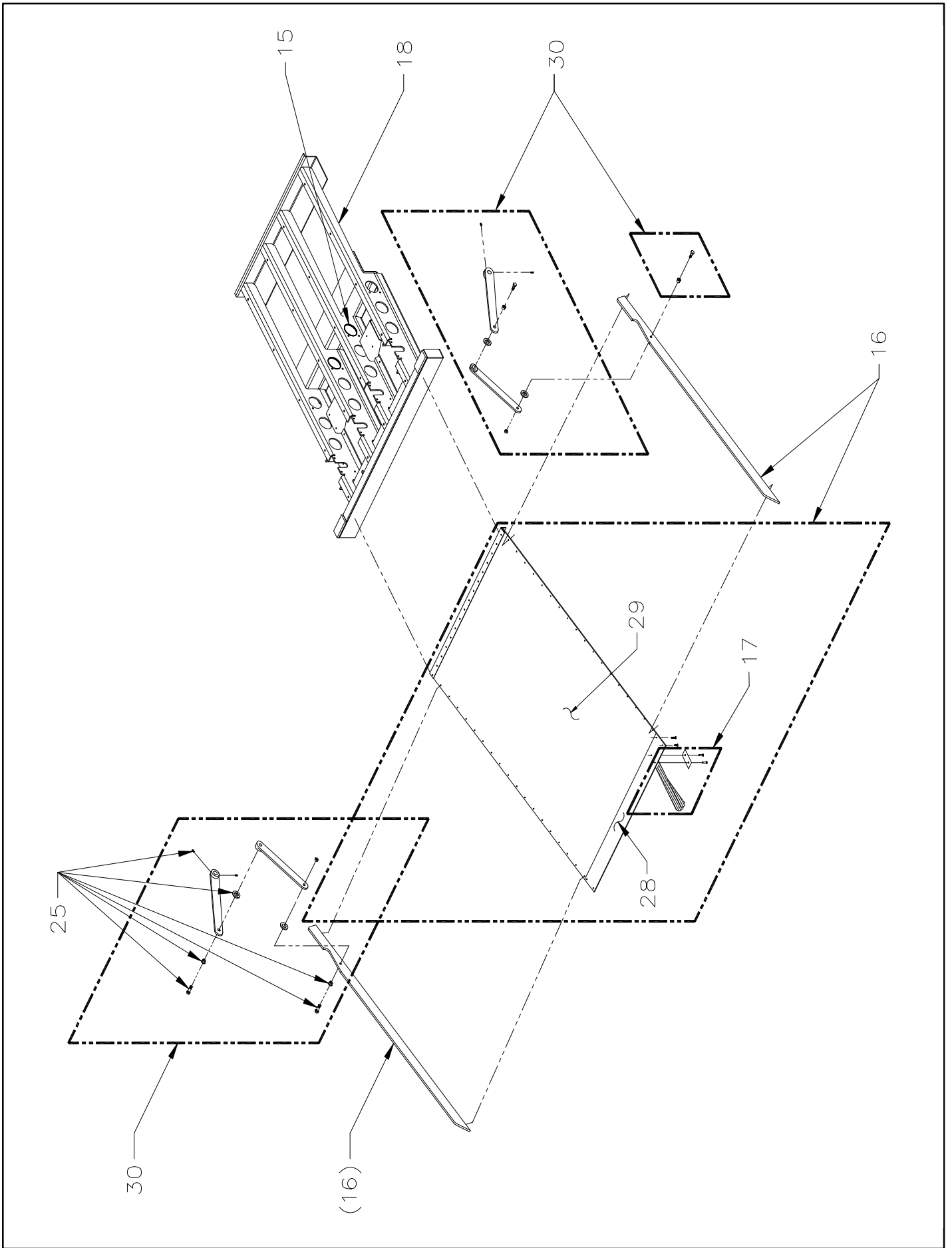


FIGURE 5-1B: RAMP AND SUPPORT ASSEMBLY

Table 5-1: FoldOver Ramp Assembly

ITEM	DESCRIPTION	QTY	PART NO.
–	RAMP ASSEMBLY, FOLD OUT, GILLIG	(REF)	98110
1	ACCESS COVER	1	16739
2	NON-SKID, BLACK (INSTALLS ON 16739 ACCESS PANEL COVER)	1	16729
3	NON-SKID, BLACK (INSTALLS ON 16737 FLOORING PLATE)	1	16728
4	FLOORING ASSY, PAINTED	1	17937
5	HARNESS ASSEMBLY, J1	1	17286
6	HARNESS ASSEMBLY, J4	1	98060
7	SENSOR ASSY, MOLDED CABLE	2	98071
8	KIT, TARGET SENSOR, W/ HARDWARE	1	18613
9	BRACKET, SENSOR MOUNTING	1	98052
10	SHAFT, SPLINED RAMP DRIVE	2	98063
11	KIT, COUPLER SHAFT, W/ HARDWARE	2	18614
12	KIT, ROTARY ACTUATOR, W/ ADAPTERS	1	18619
13	KIT, ACTUATOR MOUNTING HARDWARE	1	18622
14	KIT, PILLOW BLOCK, W/ MOUNTING HARDWARE	2	18611
15	SEAL, RUBBER "U" CHANNEL .40X.34	1.3FT	13445
16	KIT, PLATFORM ASSEMBLY, W/ RAILS AND HARDWARE	1	18627
17	KIT, LIFTING STRAP	1	18625
18	RAMP FRAME ASSY (PAINTED)	1	17284
19	KIT, DIRECTIONAL VALVE ASSEMBLY, W/ ADAPTERS	1	18628
20	HYDRAULIC HOSE ASSEMBLY, 13.5"	2	16752
21	VALVE, FLOW CONTROL ASSEMBLY, W/ ADAPTERS	2	17211
22	HYDRAULIC HOSE ASSEMBLY, 25.0"	2	98065
23	KIT, MOUNTING BRACKET	1	18624
24	HYDRAULIC HOSE ASSEMBLY, 90"	2	98072
25	KIT, BUSHING & SHOULDER SCREW REBUILD (LEFT AND RIGHT)	1	19970
26	KIT, CONTROLLER, FR2	1	17799
27	KIT, DIVERTER VALVE ASSEMBLY, W/ ADAPTERS	1	18623
28	NON-SKID, YELLOW (RAMP)	1	16731
29	NON SKID, RAMP, BLACK	1	16730
30	KIT, ARM ASSEMBLY, LEFTHAND OR RIGHTHAND, W/ HRDWR	2	18621
31	ADAPTER, #8 STR THD, 37DEG FLR, 0503-8-8	2	17203
32	ADAPTER, ORB, 4XJIC, 4 STL	2	17208
33	ADAPTER, ORB, 6XJIC, 4 STL	3	26591
34	FITTING, STE, 1/4J/9/16-18 STL	1	V2-SH-14
**35	KIT, ACCESS COVER, FLOOR PLATE	1	18631

Table 5-1: FoldOver Ramp Assembly

ITEM	DESCRIPTION	QTY	PART NO.
***36	MAT HEATER, "WARM WELCOME"	1	17192
37	SETSCREW, ¼ - 20 X 3/8" W/ NYLON INSERT (BAG OF 10)	1	19971
38	KIT, THRUST WASHER, RAMP AND ARM JOINT (BAG OF 10)	1	19972
39	KIT, FLANGED BUSHING, ELBOW JOINT (BAG OF 10)	1	19973
40	KIT, FLANGED BUSHING, RAMP JOINT (BAG OF 10)	1	19974
41	SHOULDER BOLT, .438, 5/16 – 18 X 1.00"	1	98051
42	SHOULDER BOLT, .500, 5/16 – 18 X 1.00"	1	17282

* Not shown.

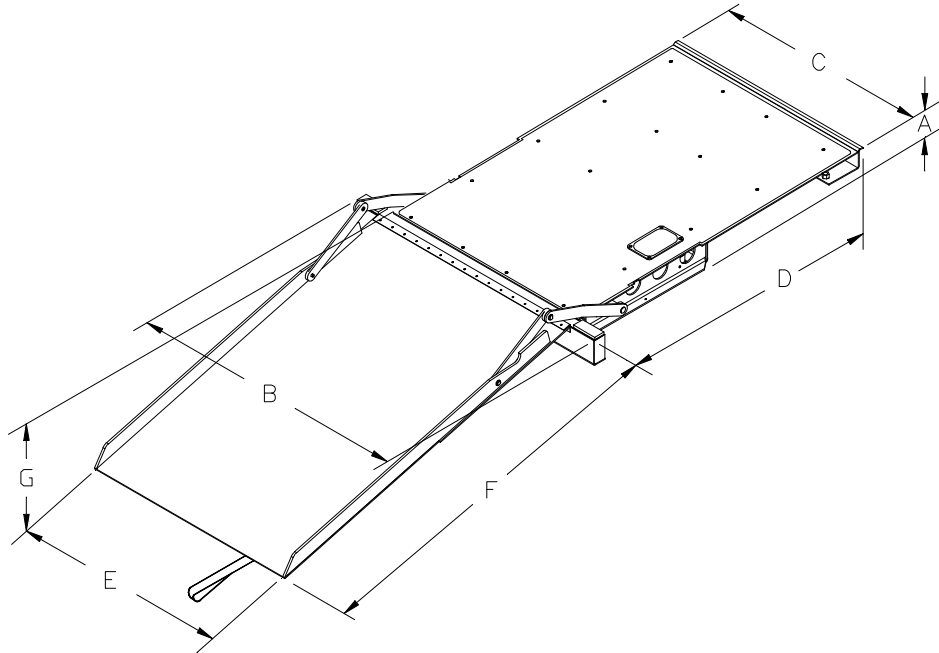
** For ramps without heater.

*** For ramps with heater.

APPENDIX 1 RAMP SPECIFICATIONS

GILLIG LOW-FLOOR VEHICLE ACCESS FOLDOVER RAMP

Power	Electro-Hydraulic
Power requirements:	
Electric	20VDC to 30VDC; 24VDC nominal
Hydraulic	1350±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
GILLIG	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)

RICON