Ricon
A Wabtec company

FoldOver ™

ER6-Series 1:6
Low-Floor Bus Ramp

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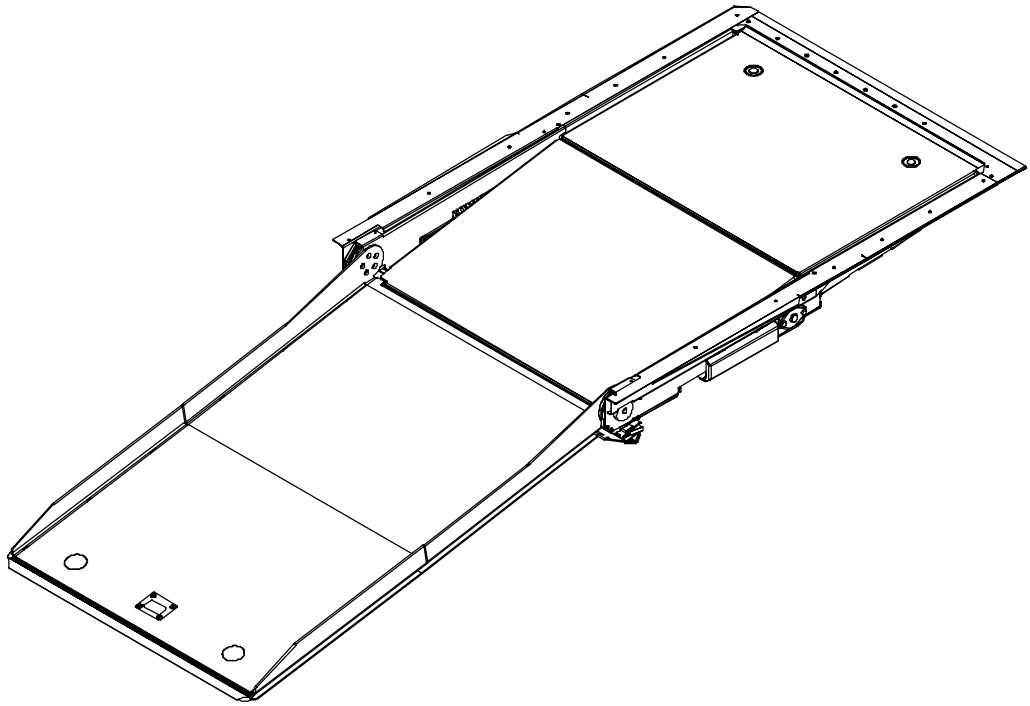

Service Manual

HOME

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32DER602.B

This Ricon service manual is only for use by qualified service technicians, and is not intended for use by non-professionals. 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 or visit our website at www.riconcorp.com.

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

REVISION RECORD

REV	PAGES	DESCRIPTION OF CHANGE	ECO
32DER602.B	CVR	Updated Cover.	6461
	1-1	Updated Figure 1-1, FoldOver.	
	1-5	Updated Figure 1-3 Major Ramp Components.	
	1-6	Updated Table 1-1, Major Ramp Components.	
	1-7	Updated Table 1-2, Ramp Part Number Explanation.	
	2-1	Revised Section A, Installation Guidelines.	
	2-1	Added Figure 2-1, Ramp Lifting Eye Bolts	
	2-2	Added Figure 2-2, Ramp Installation.	
	2-3	Added Figure 2-3, Ramp Trim Installation.	
	2-5	Revised Section 2.3, Was Stow-Lock Adjustment - Removed.	
	2-7	Added Section 2.	
	2-7	Updated Section B.2, Ramp Tray Adjustment. Now Section B.3.	
	2-7	Added Figures 2-14 and 2-15. Ramp Tray Alignment	
	2-8	Updated Section B.3, Sensor Target Adjustment for Position and Gap. Now Section B.4.	
	2-10	Updated Figure 2-23, Sensor Gap Adjustment.	
	3-3	Updated Section D.3, Electronic Controller	
	3-4	Updated Table 3-3.	
	3-4	Updated Figure 3-2.	
	3-5	Updated Table 3-4. Connection Pin Descriptions	
	3-8	Updated Figure 3-5.1, Wiring Diagram, Sheet 1.	
	3-9	Updated Figure 3-5.2, Wiring Diagram, Sheet 2	
	4-1	Updated Figure, FoldOver.	
	4-2	Updated Figure 4-1.	
	4-4	Updated Figure 4-2.	
	4-5	Revised Parts List 4-2.	
	4-8	Updated Figure 4-3.	
	4-9	Updated Parts List 4-3	
	4-10	Updated Figure 4-4.	
	4-11	Updated Parts List 4-4.	
	4-13	Revised Appendix 1.	

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I. ER6-SERIES FOLDOVER 1:6 RAMP INTRODUCTION

This manual applies to the Ricon FoldOver ER6-Series 1:6 Low Floor Bus Ramp when installed in transit vehicles. The chapters in this service manual contain a product description, maintenance instructions, and a spare parts list. The descriptions in this chapter apply to the Ricon FoldOver ER6-Series 1:6 Low Floor Bus Ramp when installed in transit vehicles. The FoldOver ramp is installed in transit vehicles to accommodate persons with disabilities using mobility-aid equipment or who cannot easily climb steps. The electro-mechanically powered ramp folds into the vehicle vestibule flooring when not in use.

All ER6-SERIES 1:6 RAMPS-series ramps have a 660 lb. (300kg) load limit. Passengers must use the ramp one at a time; **do not overload ramp**. Be certain that persons with mobility-aid equipment fit between the left- and right-side ramp barriers without any interference before allowing use of ramp.

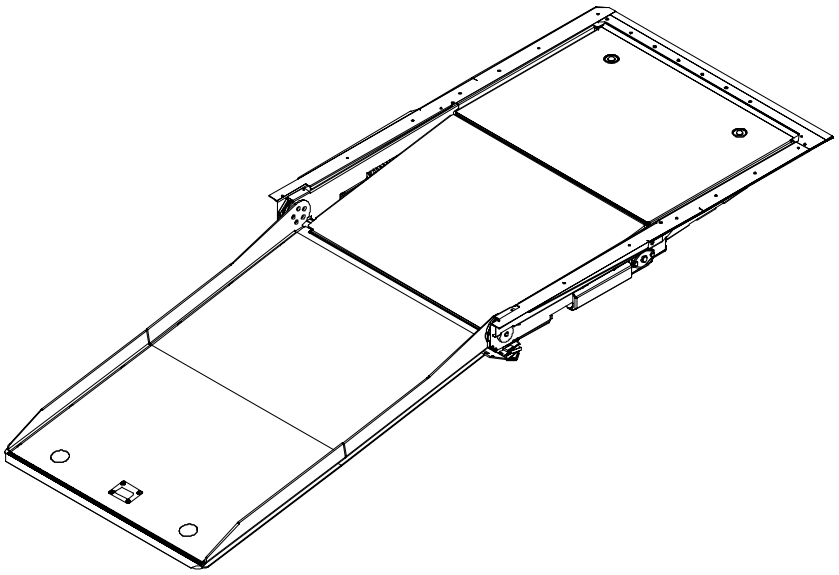

FIGURE 1-1: RICON FOLDOVER 1:6 RAMP

A. RAMP FEATURES

1. INTERLOCK SUPPORT

The ramp electronics can interface with the vehicle interlock circuitry to prevent vehicle departure when ramp is deployed. The ramp interlock circuitry senses the position of the ramp (stowed or deployed) and makes this information available at the J1 bus harness connector. A vehicle interlock circuit typically requires that the following conditions be met before operating power is supplied to ramp:

- Park vehicle and set parking brake.
- Place transmission in neutral.
- Open vehicle door adjacent to ramp.

2. AUDIBLE ALERT

NOTE: This feature is optional and may not have been connected during ramp installation.

The ramp supports an audible alert device that sounds while the ramp is in motion.

3. RAMP CONTROL PANEL

Refer to **Figure 1-2.** Ricon typically does not provide a control panel. However, the ramp can be operated with one similar to that shown (the actual panel appearance will vary between transit authorities and vehicles). The control panel is normally installed in the driver area. It should have a power ON/OFF switch, a power on indicator light, and a spring-loaded, three-position ramp control switch (center-off). The ramp receives power from the vehicle when the interlock conditions are met and the power on/off switch is ON. The control panel can then be used to transmit deploy or stow signals to the ramp.

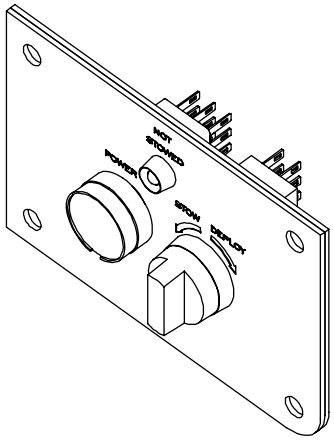

FIGURE 1-2: TYPICAL CONTROL PANEL

B. RICON PRODUCT SUPPORT

If you have questions about this manual, or you need additional copies, please contact Ricon Product Support at the locations listed. Also, refer to the Ricon website at: **www.riconcorp.com**

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C. RICON TWO-YEAR LIMITED WARRANTY

The following warranty provides two years of limited coverage for the Ricon FoldOver ER6-Series 1:6 Low Floor Bus Ramp.

RICON FOLDOVER ER6-SERIES 1:6 LOW FLOOR BUS RAMP
TWO-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 two years starting from the date ramp is put into service. Obtain a complete list of parts covered by this warranty from Ricon Product Support.
- Labor costs for specified parts replaced under this warranty for a period of two years from the date put into service. A Ricon rate schedule determines parts covered and labor allowed.

This Warranty Does Not Cover:

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

NOTE: Ricon recommends this product be inspected by an authorized Ricon service technician at least once every six months, or sooner if necessary. Perform required maintenance at this 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:

- The product is not installed and maintained by an authorized Ricon service technician.
- The product is modified, in any respect from its original design, without written authorization from Ricon.

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

Ricon 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 product installation to validate this warranty. The warranty is not transferable.

The warranty gives specific legal rights. There may be other rights that vary in each state.

D. SHIPPING 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 ramp assembly contains all items listed on the included bill of material. Please report any missing items immediately to Ricon Product Support. Save bill of material for later reference. Return the completed warranty and owner registration cards to Ricon within 20 days to validate warranty.

NOTE: The Sales or Service personnel must review the Warranty and this Operator Manual with the user to be certain that they understand how to safely operate the product. Instruct the user to follow the operating instructions without exception.

E. CUSTOMER ORIENTATION

1. **Figure 1-3** shows major components of the ER6-Series FoldOver 1:6 ramp. A description of each component is provided in **Table 1-1**. Refer to Chapter V "Parts Diagrams and Lists" for more details.

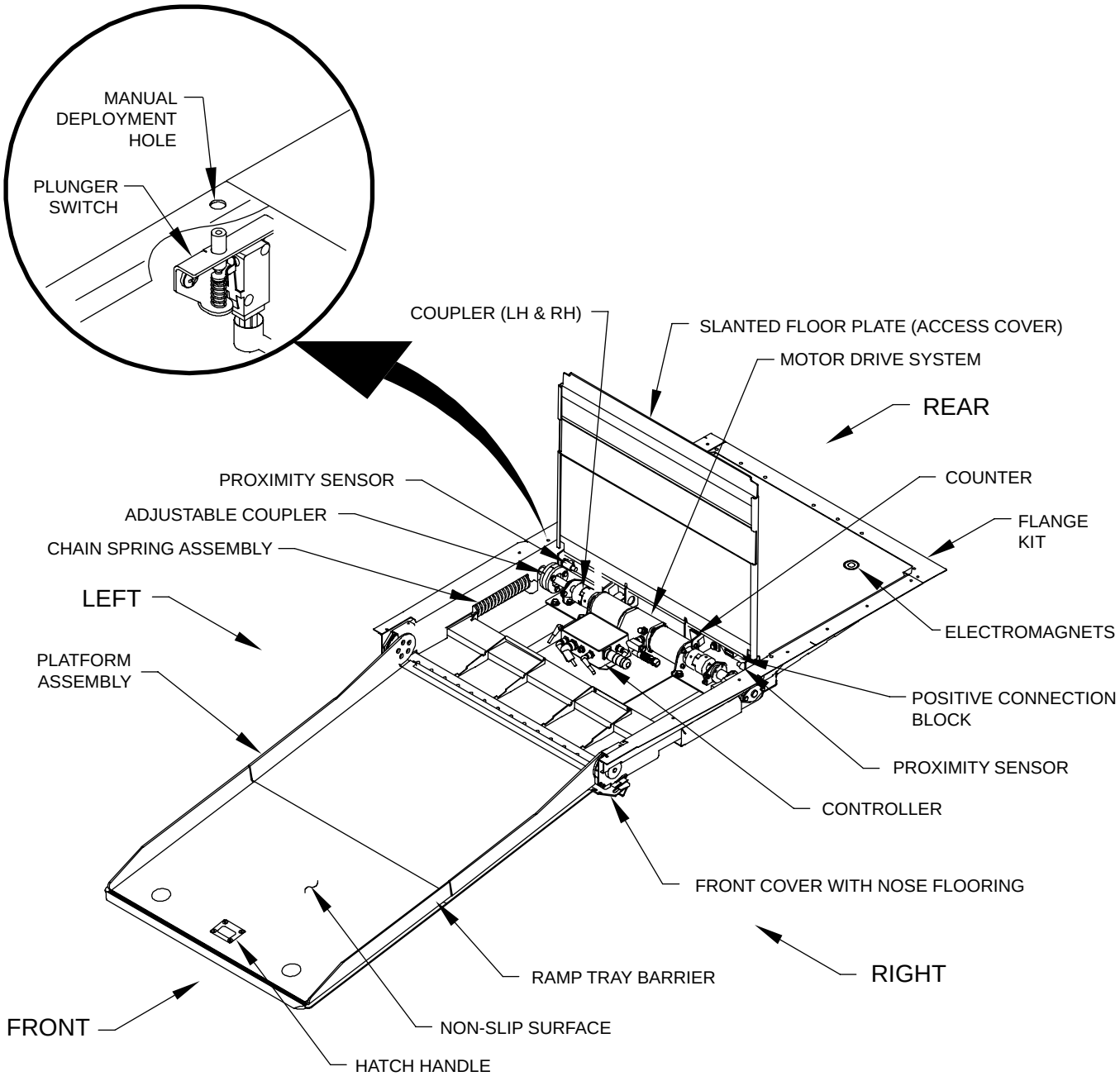

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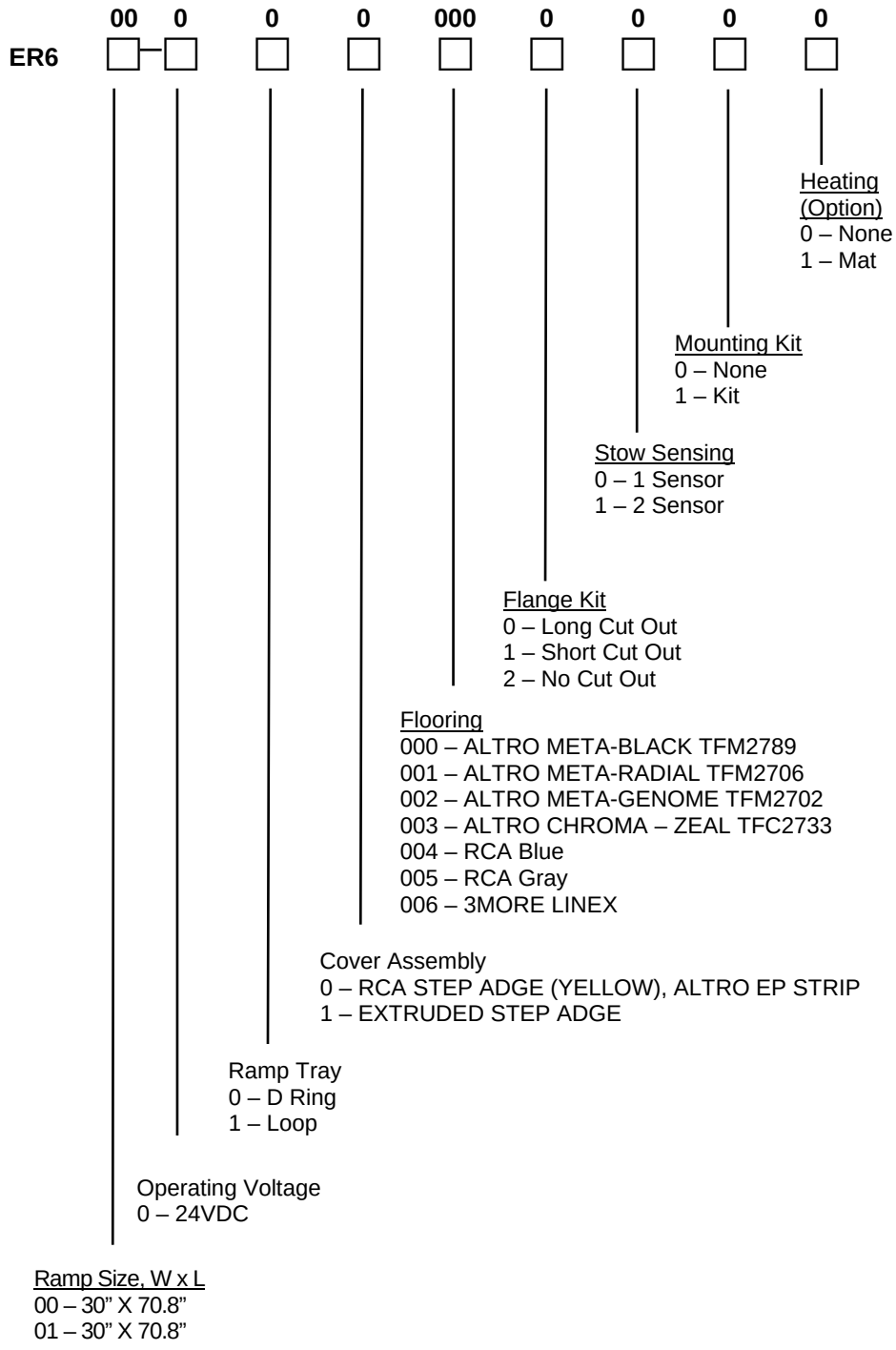
FIGURE 1-3: ER6-SERIES 1:6 RAMP MAJOR RAMP COMPONENTS

TABLE 1-1: MAJOR ER6-SERIES FOLDOVER 1:6 RAMP COMPONENTS	
NAME	**DESCRIPTION**
Front, Rear, Left and Right	Reference point from outside the vehicle looking inward.
Adjustable Coupler	Use for adjustment and alignment of chain sprocket.
Chain Spring Assembly	(Left & Right) Mechanism that assists in the Deploy and Stow of platform.
Couplings	(Left & Right) Transmits rotary motion and attaches the drive motor shaft assemblies to the dual gearboxes.
Electromagnets	Magnets that lock the ramp when ramp is fully stowed.
Electronic controller	Translates electrical commands from bus control panel into signals that control ramp electro-mechanical components. Monitors ramp position and drives counter.
Flange Kit	Perimeter trim pieces that are installed after the ramp has been installed in vehicle.
Front Cover	Front edge of ramp that opens and closes when platform is deployed or stowed.
Hatch Handle	Use to assist in manual deploy or stow ramp.
Plunger Switch	Switch that sends a signal to the ramp controller to disengage electromagnets and manually operate platform. Plunger Switch is activated when a tool is inserted and engages sensor through the Manual Deployment Hole.
Motor Drive System	Electro-mechanical motor-gearbox combination used to operate the ramp.
Platform	Area where passengers traverse over to enter and exit vehicle.
Proximity Sensors	Magnetic sensor devices that send signals to the ramp controller to indicate when the ramp is fully stowed (locks electromagnets) or deployed (unlocks electromagnets.
Ramp Tray Barrier	Left and Right side barrier of platform.
Slanted Floor Plate (Access Cover)	Portion of ramp that passenger traverses over to enter and exit vehicle which also provides access to electro-mechanical ramp components.
END OF TABLE	

F. RAMP PART NUMBERS

Refer to **Table 1-2** for an explanation of the ER6-Series ramp part number. Among other things, use of the table can determine whether your ramp is equipped with a mounting kit or the type of flooring material used. The table also provides ramp dimensions that can help to determine which mobility equipment fits safely on the ramp.

TABLE 1-2: ER6 –SERIES 1:6 RAMP PART NUMBER EXPLANATION



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II. FOLDOVER 1:6 RAMP INSTALLATION

A. INSTALLATION GUIDELINES

Careful installation of the Ricon FoldOver 1:6 ramp contributes to proper and safe operation. Use the electrical wiring diagrams in Figures 3-5.1 and 3-5.2 to supplement this section.

1. LOCATING MOUNTING BRACKETS ON BUS FRAME

Use a rigid fixture that substitutes for the ramp assembly when positioning ramp mounting brackets on bus frame. If the ramp assembly is used to position mounting brackets, verify that it is correctly located relative to the vehicle floor, etc. Accurate positioning of brackets prevents twisting or warping of ramp frame when installing and tightening mounting hardware. A warped frame may cause the ramp motion to be erratic. Set height of ramp flooring surface flush to surrounding floor structure to prevent a tripping hazard.

2. INSTALLING 1:6 RAMP IN FLOOR

The location of the ramp depends on its path of motion. The ramp must be positioned so it can move un-obstructed through its required range of travel.

a. Trim away floor material to allow ramp assembly to drop into floor opening.

NOTE: Do Not install ramp trim (flange kit) until ramp is installed in bus. The ramp trim overlaps the perimeter gap between the sides of the enclosure and bus structure. The typical gap between the sides of the enclosure and the bus structure is 1/8 inch. Use shims to fill gap.

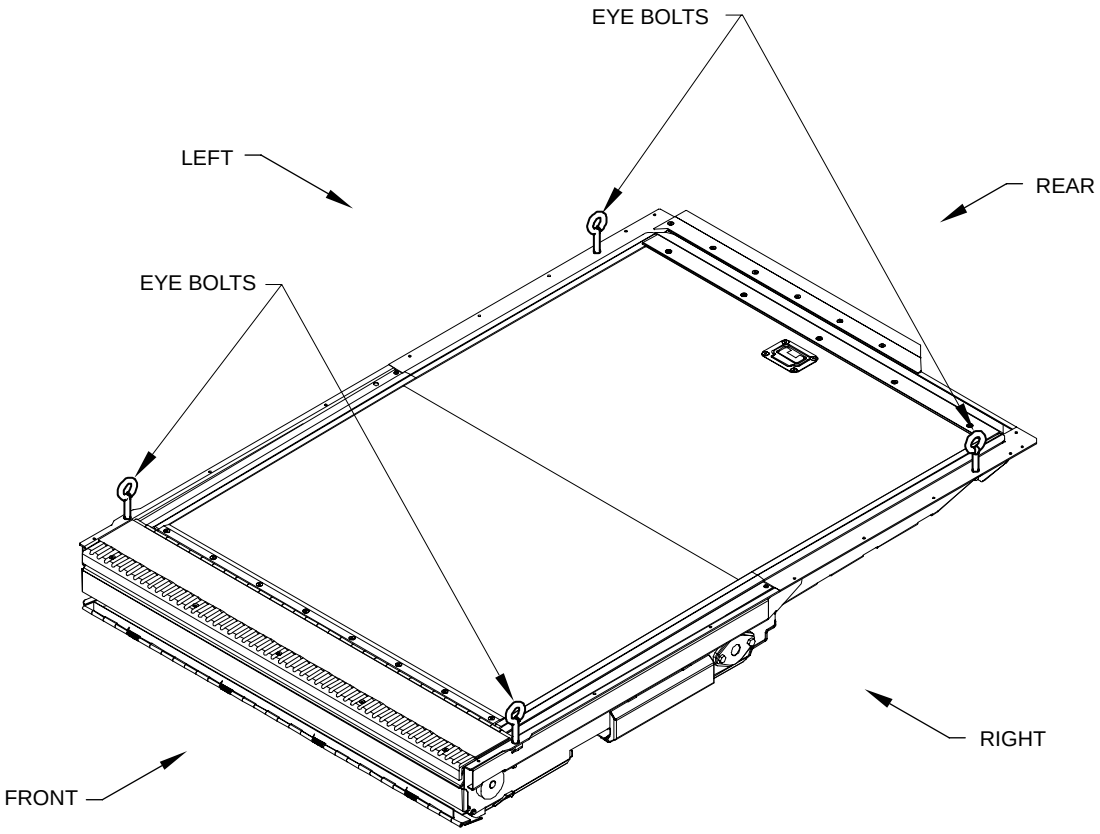


FIGURE 2-1: RAMP LIFTING EYE BOLTS

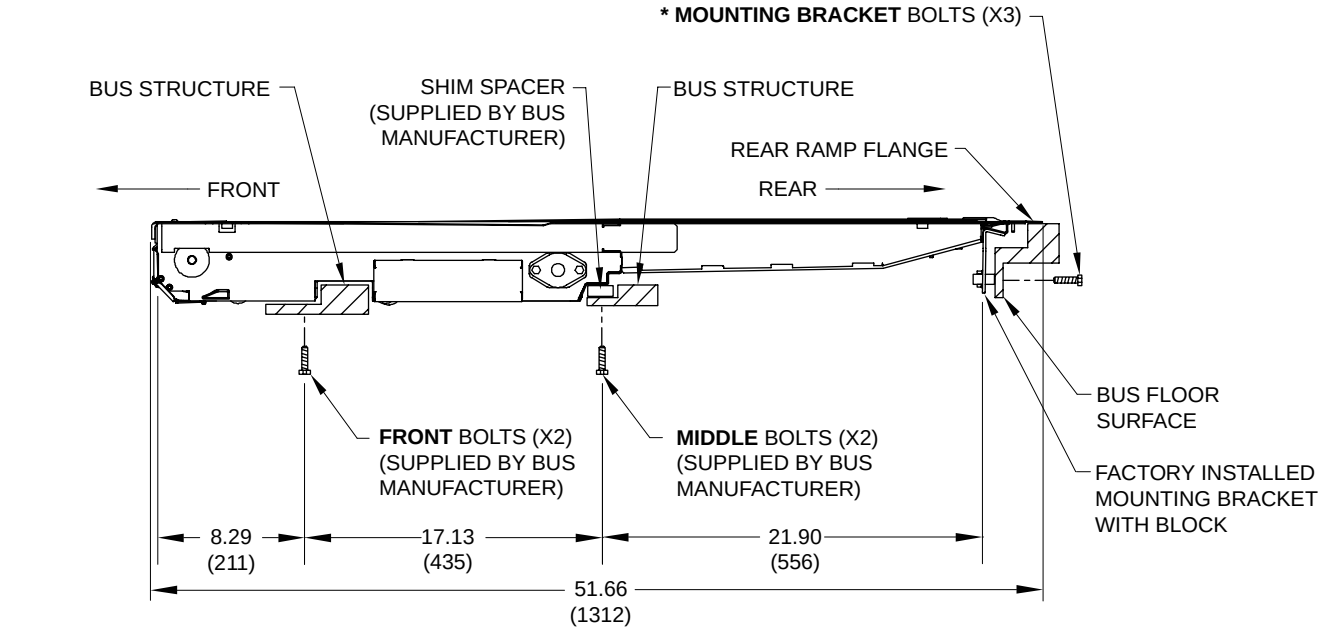
⚠ WARNING!

TAKE EXTREME CARE WHEN POSITIONING RAMP INTO BUS. BE SURE TO FOLLOW PROPER OPERATION AND SAFETY INSTRUCTIONS WHEN USING LIFTING DEVICE.

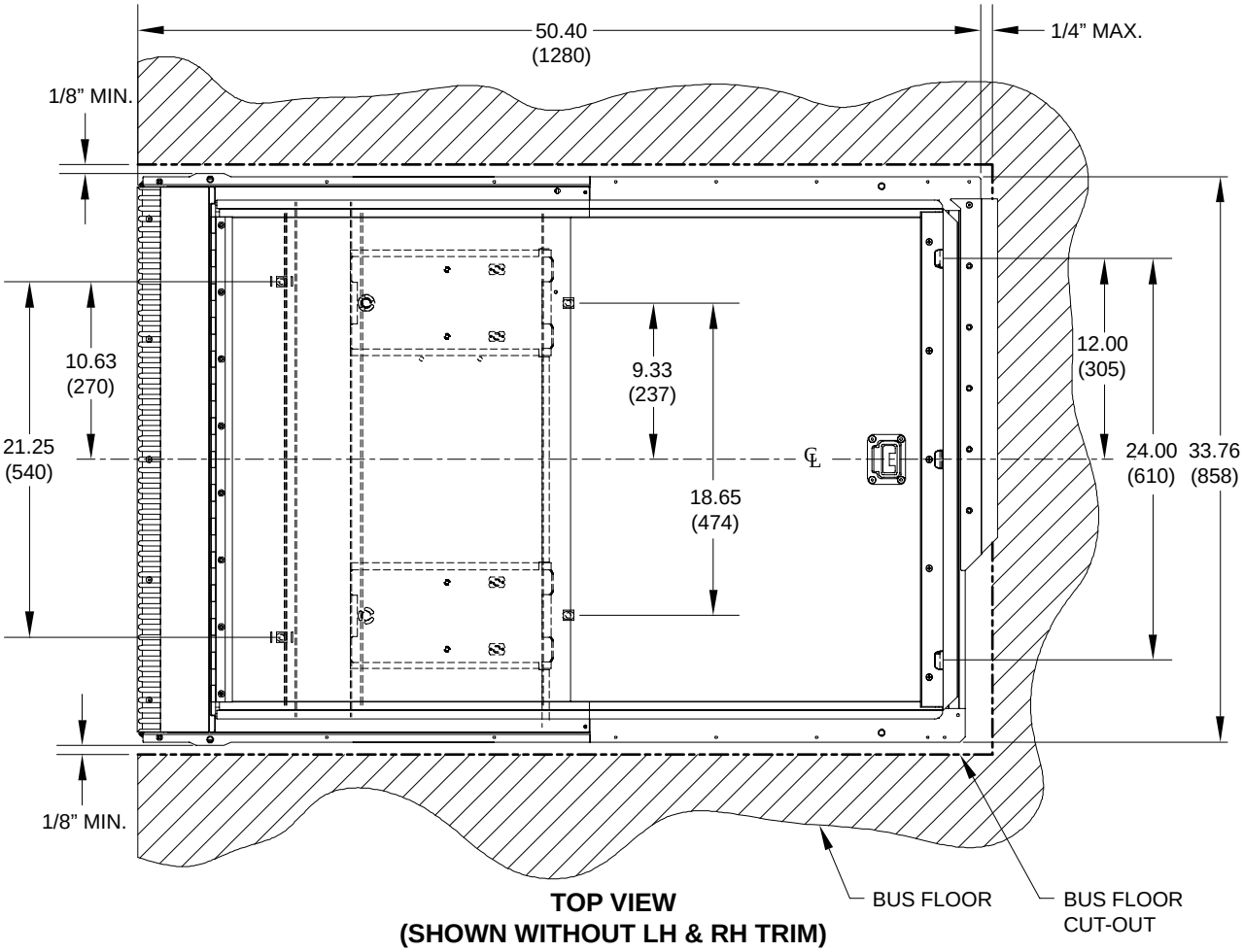
b. Refer to **Figure 2-1**. Attach lifting device hooks to pre-installed eye bolts.

c. Use lifting device to place ramp into bus.

d. Lower ramp onto bus floor. Ensure that rear ramp flange rests on bus floor.



RIGHT SIDE VIEW



TOP VIEW
(SHOWN WITHOUT LH & RH TRIM)

NOTES: DIMENSIONS IN INCHES
MILLLIMETERS IN PARENTHESES.
* REFERENCE MOUNTING BRACKET KIT (P/N 43936 OR 44754) PER SPECIFIED APPLICATION.

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FIGURE 2-2: RAMP INSTALLATION

NOTE: Refer to **Figure 2-2**. Ramp should sit securely and level on bus structure. If ramp does not sit level on bus structure, install appropriate shim spacers accordingly.

⚠ CAUTION!

FOLLOW SEQUENCE FOR SECURING RAMP ONTO BUS STRUCTURE. DEVIATION FROM THE INSTALLATION SEQUENCE CAN CAUSE RAMP WARPAGE.

e. Refer to **Figure 2-2**. Install and tighten two (2) ***front*** bolts.

f. Refer to **Figure 2-2**. Install and tighten three (3) ***rear*** *mounting bracket* bolts.

NOTE: Mounting bracket kit is pre-installed at the factory and is configured according to bus manufacturer. Refer to mounting bracket kit (i.e. Gillig Kit P/N 43936, Orion Kit P/N 44754) part number for vehicle in stallation.

g. Inspect middle hardware installation. If space is present between the ramp frame and bus structure, install appropriate shim spacer then install and tighten two (2) ***middle*** bolts.

h. Refer to **Figure 2-3**. Install left and right trim pieces with attaching hardware provided.

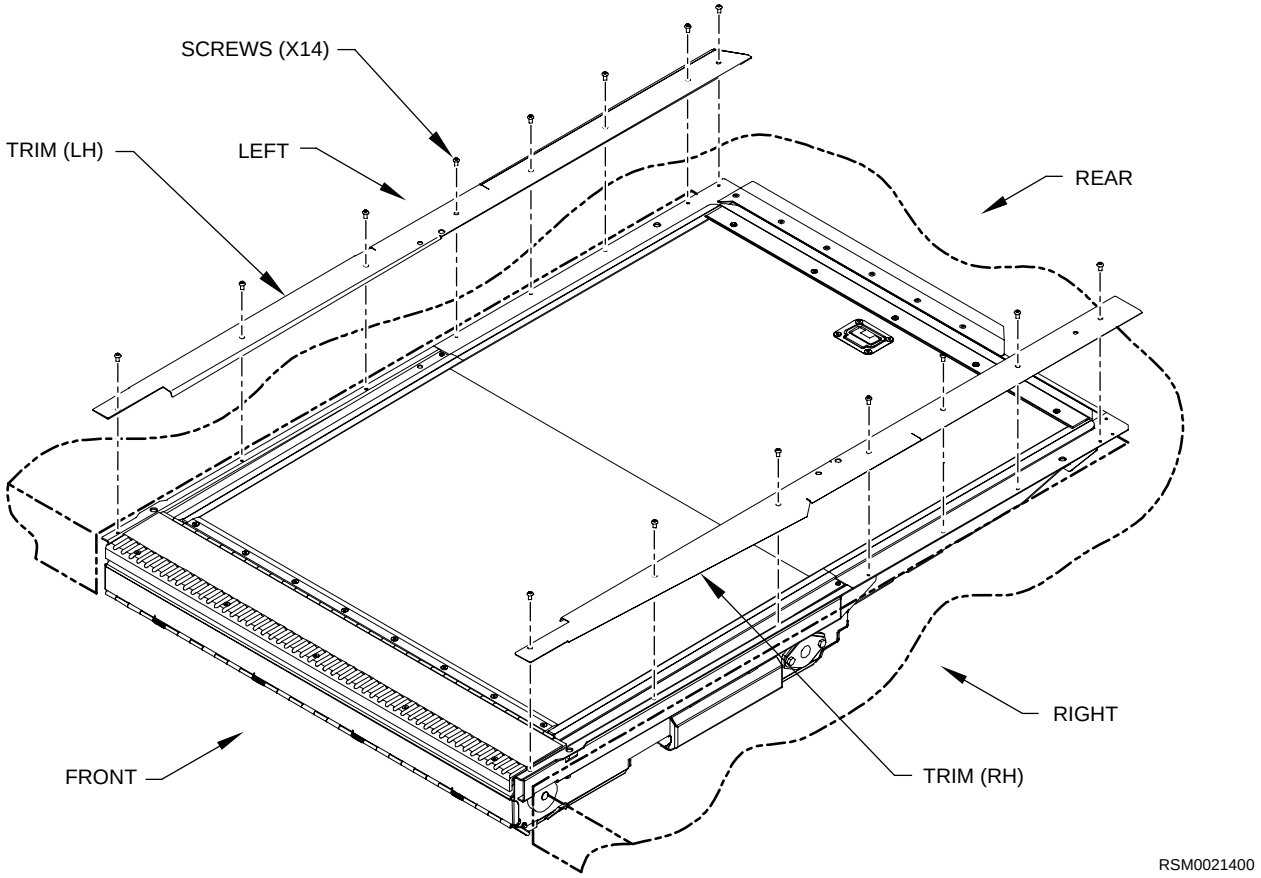


FIGURE 2-3: RAMP TRIM INSTALLATION

3. INSTALLING VEHICLE WIRING HARNESS

Route wiring harness from vehicle ramp controls to rear of ramp. Use the supplied electrical installation kit (Ricon P/N 44204) to connect vehicle control wiring to the ramp interface connector (Ricon P/N 43911). See **Table 2-1** for pin layout and signal descriptions.

a. Disconnect vehicle battery.

⚠ CAUTION

Be sure that harness does not interfere with any moving parts, or binds against any parts, or is pinched in any way.

b. Install Main Circuit Breaker Kit (P/N 36267). Avoid installing near a heat source.

c. Refer to Chapter 3.6 Electrical Diagrams and **Figures 3-5.1 – 3-5.2**. Route and install black ground cable (P/N 43929) to ground connection and red power cable (P/N 43928) to positive connection block.

d. Route and install ramp interface harness (supplied by bus manufacturer) to ramp interface connection.

Table 2-1: J8 PIN LAYOUT AND DESCRIPTION

Pin	Wire color	Description	Volts
1	Red	Bus Power	P24V
2	Blue	Bus Power	P24V
3	Black	Ground	N/A
4	Brown	Ground	N/A
5	Orange	HV (High Voltage)	P24V
6	Yellow	HV (High Voltage)	P24V

e. Cycle ramp a few times to ensure ramp is working properly.

B. FOLDOVER 1:6 RAMP ADJUSTMENTS

1. CHAIN SPRING ASSEMBLY INSTALLATION AND ADJUSTMENT FOR MOTOR DRIVE SYSTEM

Removal and installation of the chain spring assembly may be necessary. Unequal tension on the springs may cause different torques on ramp tray sprockets and will possibly cause ramp tray asymmetry error.

a. Refer to **Figure 2-4**. Install motor drive assembly into enclosure before installing chain spring assembly.

NOTE: Do not completely tighten bolts for motor drive system to allow some movement when installing chain spring assembly. Bolts will be tightened after chain spring assembly is installed.

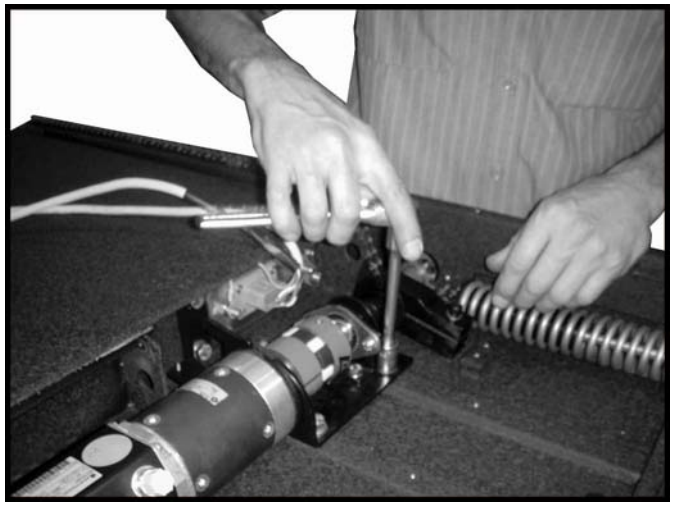
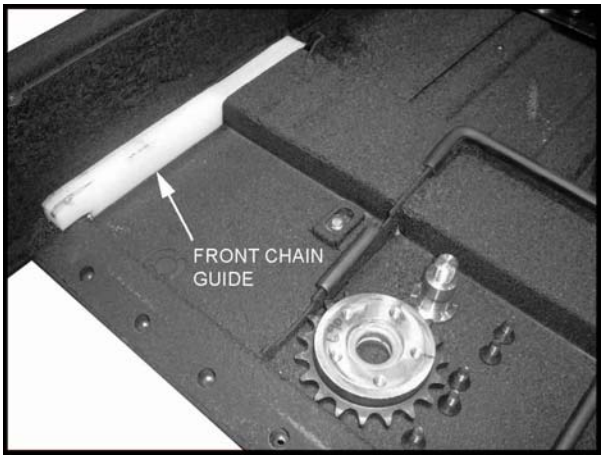


FIGURE 2-4: INSTALLED MOTOR DRIVE ASSEMBLY

b. Refer to **Figure 2-5 and 2-6**. Install left hand and right hand chain guides.



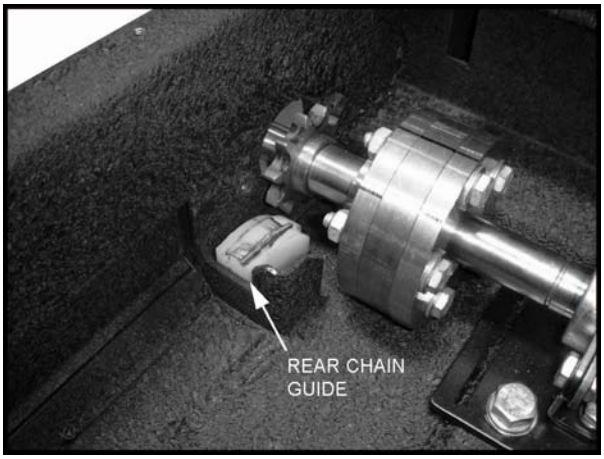


FIGURE 2-5 and 2-6: FRONT AND REAR CHAIN GUIDES (LH SIDE SHOWN)

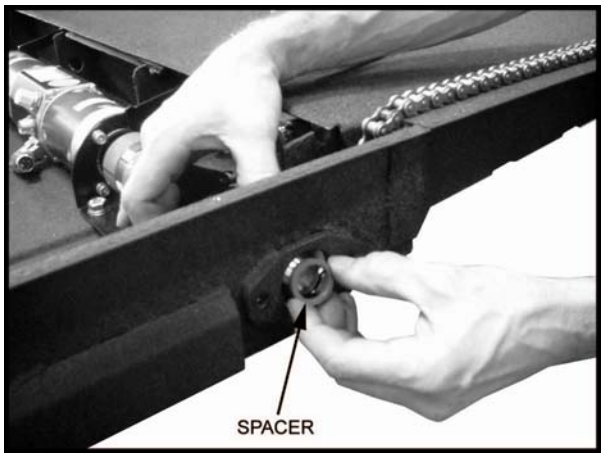
c. Refer to **Figure 2-7 and 2-8**. Install pre-assembled chain spring assembly by routing onto small sprocket.

NOTE: Pull chain spring assembly until spring is flush against spring supports.

FIGURE 2-7 and 2-8: ROUTE CHAIN SPRING (LH SIDE SHOWN)

d. Refer to **Figure 2-9 and 2-10**. Install spacer onto drive shaft then install self aligning bearing.

e. Install two washers and two bolts then tighten.



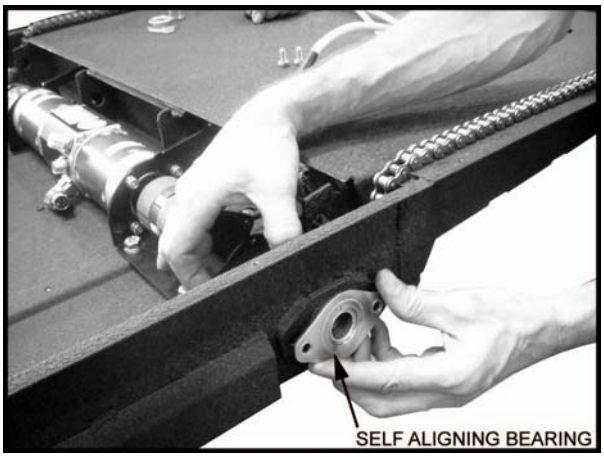


FIGURE 2-9 and 2-10: ROUTE CHAIN SPRING (LH SIDE SHOWN)

f. Refer to **Figure 2-11**. Install Chain Spring Assembly by pushing spring rod DOWN and INWARD into enclosure until Chain Spring Assembly is installed against the two spring supports in enclosure.

NOTE: Ensure that Chain Spring Assembly is securely installed against spring supports.

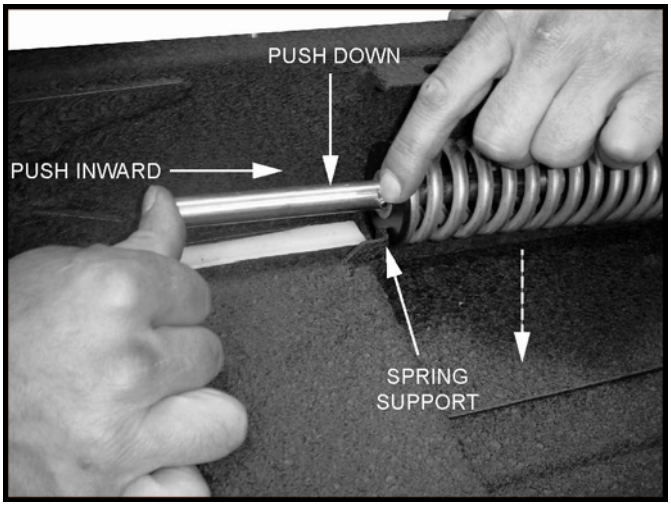


FIGURE 2-11: SPRING ASSEMBLY (LH SIDE SHOWN)

g. Refer to **Figure 2-12 and 2-13**. Locate and mark an alignment mark on sprocket for reference to maintain sprocket hole at 5° inboard.

NOTE: Ensure that spring is securely installed against spring supports.

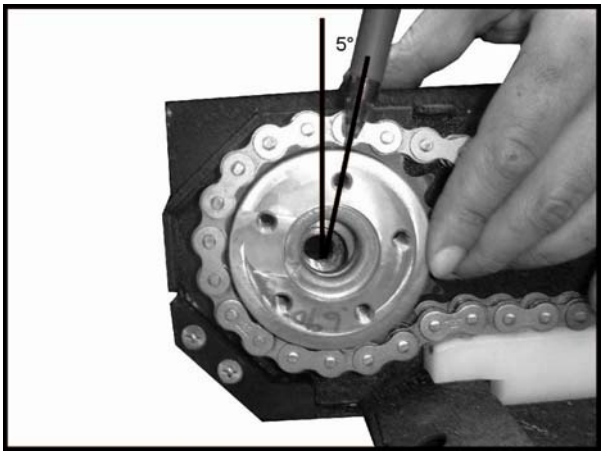


FIGURE 2-12 and 2-13: LARGE SPROCKET ALIGNMENT (LH SIDE SHOWN)

h. Refer to **Figure 2-13**. Ensure that sprocket maintains 5° inboard reference.
i. Wrap chain around sprocket then install onto enclosure.
j. Tighten pivot screw but leave a little slack on chain.
k. Refer to **Figure 2-14**. Insert turnbuckle into rod. Do not completely tighten.
l. Install Front Chain Cover with screw.

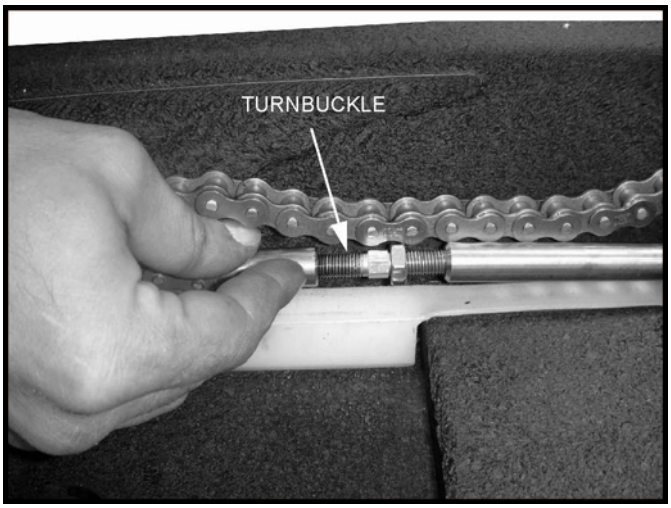


FIGURE 2-14: SPROCKET AND TURNBUCKLE ADJUSTMENT (LH SIDE SHOWN)

m. Refer to **Figure 2-15**. Tighten bolts to secure drive module.

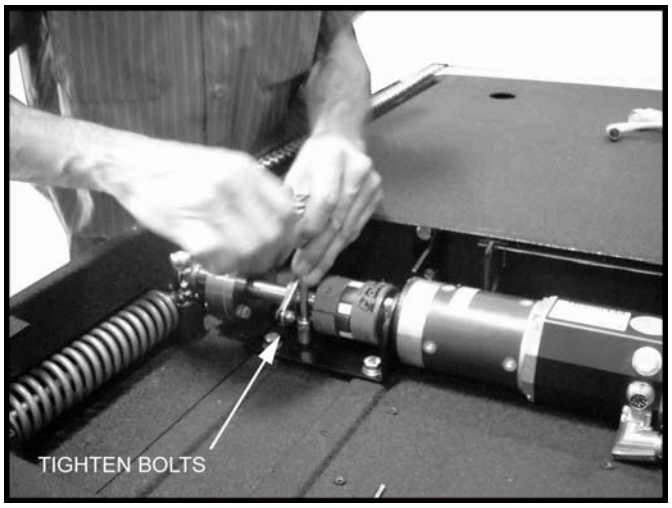


FIGURE 2-15: MOTOR DRIVE SYSTEM BOLTS (LH SIDE SHOWN)

n. Refer to **Figure 2-14**. Tighten turnbuckle to adjust stiffness on chain spring assembly.

NOTE: Turn CCW (counter-clockwise) to tighten. Ensure a little slack on chain.

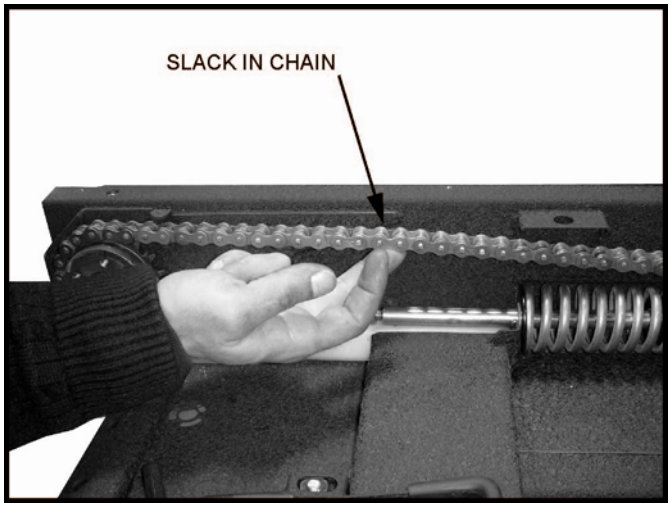


FIGURE 2-16: SLACK ON CHAIN (LH SIDE SHOWN)

2. COUPLER ADJUSTMENT

As noted in the Chain Spring Assembly Installation, unequal tension on the springs may cause different torques on ramp tray sprockets and will possibly cause ramp tray asymmetry error. The adjustable coupler will allow for adjustment and alignment of chain sprocket.

a. Refer to **Figure 2-17**. Loosen three bolts and nuts of the adjustable coupler.

FIGURE 2-17: ADJUSTABLE COUPLER

NOTE: Do not completely remove bolts and nuts. Only loosen enough to be able to adjust coupler. Nuts will need to be torque adjusted before completing procedure.

b. Adjust Chain Sprocket to align and balance chain tension.

c. Set torque wrench to 143-inch lbs.

NOTE: Ensure the torque wrench is calibrated before each use.

d. Refer to **Figure 2-18**. Torque each of three coupler nuts to 143-inch lbs. ± 6.

FIGURE 2-18: Torque Each Nut

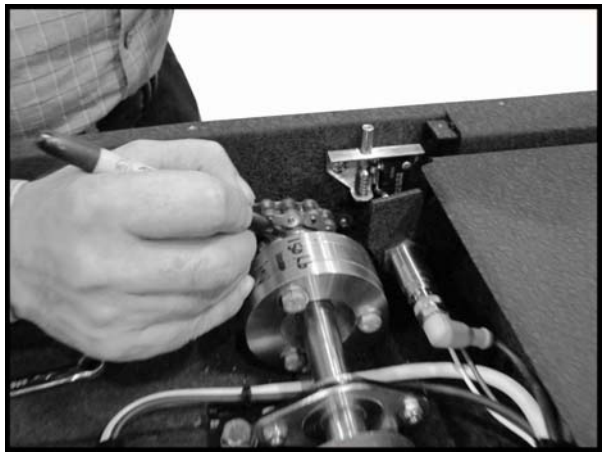


FIGURE 2-19: Torque Value

NOTE: Secure bolt with a box end wrench to prevent bolt from rotating while torque is applied.

e. Use a black fine point marker and write torque value near each of three nuts that have been torque as shown in **Figure 2-19**.

3. RAMP TRAY ADJUSTMENT.

Removal and installation of the chain spring assembly must be completed without the presence of the ramp tray. Re-installation of the ramp tray must be installed as follows.

a. Refer to **Figure 2-20**. Mark alignment holes of ramp tray to sprocket.

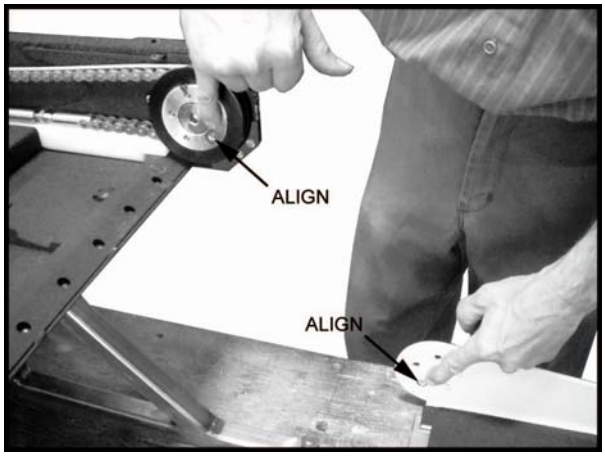


FIGURE 2-20: RAMP TRAY ALIGNMENT

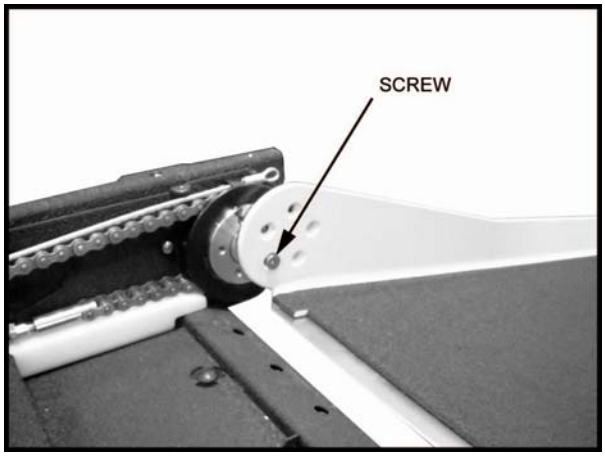


FIGURE 2-21: RAMP TRAY INSTALLATION

NOTE: Hole closest to inner edge of ramp must attach to hole of sprocket closest to outer edge of enclosure.

b. Refer to **Figure 2-21**. Attach ramp tray and install screw through aligned holes.

c. Refer to **Figure 2-22**. Position ramp tray in vertical position.

NOTE: Ramp tray should be installed 5° outboard.

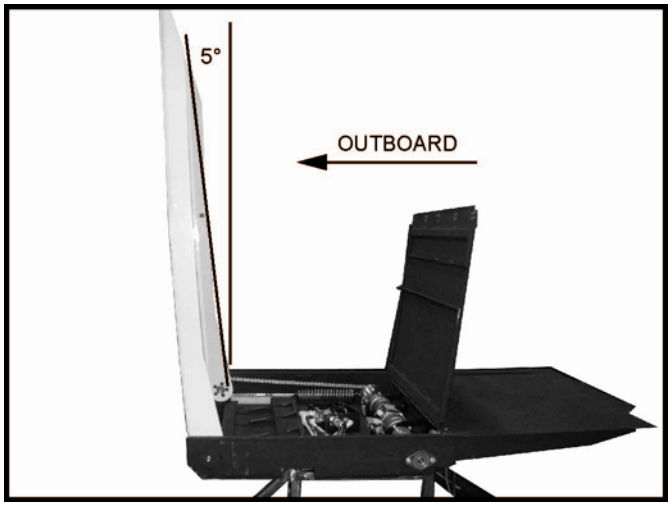


FIGURE 2-22: RAMP TRAY INSTALLATION

d. When ramp tray is correctly positioned 5° outboard, install screws through ramp tray and in through large sprocket.

e. Ensure that spring is relaxed and that spring is flush against both spring supports.

f. Tighten five screws to securely fasten ramp to enclosure.

4. SENSOR TARGET ADJUSTMENT FOR POSITION AND GAP

a. Verify that the ramp is completely stowed. This establishes a reference position for ramp during target adjustment.

NOTE: Use a straightedge as an artificial target to simulate ramp tray barrier when fully stowed.

b. Refer to **Figure 2-23.** Loosen jam nuts on sensor body. Adjust position of both nuts to achieve a gap between nose of sensor and outside diameter of target that is .060" ± .030" (gap is set on inside of ramp tray barrier). Do not allow sensor to contact target. Tighten jam nuts and recheck gap.

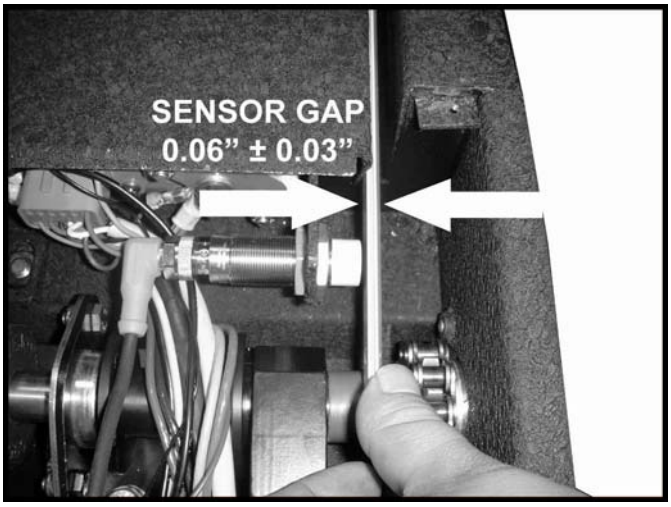


FIGURE 2-23: SENSOR GAP ADJUSTMENT (RIGHT SIDE VIEW)

5. FINAL INSPECTION

a. Visually inspect ramp for loose or missing hardware and fittings, and confirm that pockets are free of debris.
b. Verify that slanted plated cover is secure and closed on ramp.
c. Verify that non-skid flooring is clean, functional, and securely fastened.
d. Verify that manual operation strap is undamaged.

III. FOLDOVER 1:6 RAMP MAINTENANCE

The maintenance information in this chapter applies to the Ricon ER6-Series FoldOver 1:6 ramp when installed in transit vehicles. The information consists of safety precautions, a maintenance schedule, component information, and diagrams for the electrical system. This chapter is intended to supplement related sections of the vehicle manufacturer Owner and Service Manuals.

A. GENERAL SAFETY PRECAUTIONS

⚠ WARNING!

THIS RAMP IS DRIVEN WITH AN ELECTRO-MECHANICAL MOTOR DRIVE SYSTEM. USE EXTREME CAUTION WHEN DOING MAINTENANCE AND REPAIRS. DO NOT DISCONNECT ELECTRICAL CABLES OR FITTINGS WHEN RAMP IS IN MOTION OR WHEN POWER IS APPLIED TO THE RAMP.

Follow these safety precautions during service of the Ricon FoldOver 1:6 ramp:

- Under no circumstances is maintenance, repair, or adjustment of the FoldOver 1:6 ramp to be performed without the presence of an individual capable of giving aid.
- Give immediate attention to all injuries, and administer first-aid or seek medical attention as necessary.
- Protective eye shields and clothing should be worn during maintenance, repair, and adjustment of the FoldOver 1:6 ramp.
- The user must be cautious when operating the ramp. Be certain that hands, feet, legs, and clothing are not in the path of ramp movement.
- Batteries contain acid that can burn. Wear protective clothing and eye protection at all times. If acid comes in contact with skin, immediately flush affected area with water and wash with soap. Do not place anything electrically conductive on top of battery. Do not smoke or use an open flame near battery.
- Work in a properly ventilated area.
- Read and understand all instructions before attempting to operate the FoldOver 1:6 ramp.
- Inspect the ramp before use for unsafe conditions, unusual noises, or erratic movements. Do not use ramp if any of these are present, and arrange to have a Ricon authorized service technician inspect ramp.
- Keep others clear of the ramp while it is operating.
- Ricon strongly recommends that the vehicle be parked on level ground when using ramp. Using the ramp when vehicle is sloped may result in a ramp angle that is too steep for safe use. In addition, the sloped vehicle may not allow the ramp to make complete contact with the ground.
- The FoldOver 1:6 ramp and other system components require periodic maintenance. Ricon recommends a thorough vehicle inspection by a Ricon authorized service technician at least once every six months. To maximize safety, the ramp and related components should be maintained at their highest level of performance.
- Read and comply with warning labels attached to ramp.

B. DAILY INSPECTION

Check ramp daily, following the Daily Inspection outlined in **Table 3-1**. Meet all inspection criteria before allowing passengers on ramp.

TABLE 3-1: DAILY INSPECTION

INSPECTION POINT	CHECK
Ramp controller	• Power ON/OFF switch operates correctly. • Power On indicator illuminates when Power ON/OFF switch is ON. • DEPLOY and STOW switches operate correctly. • No unusual noises or erratic movements when ramp is deploying or stowing.
Ramp and surrounding area	Vestibule area is free of loose objects and trim pockets are free of debris.
Ramp non-slip surfaces	• Surface is clean and free of slippery or sticky substances that could compromise user safety. • Surface is intact and secure, and loose edges, if present, cannot create a stumbling hazard.

END OF TABLE

C. MAINTENANCE SCHEDULE

Regular maintenance and inspection of the Ricon FoldOver 1:6 ramp provides optimum performance and reduces the need for repairs. Maintain the ramp as directed in **Table 3-2**. Perform ramp maintenance more frequently during heavy use (more than 20 cycles per day).

⚠ CAUTION!

~ This Ricon Product Is Complex ~

Required warranty period maintenance and repairs must be done at a Ricon authorized facility. Improper maintenance, use of non-Ricon replacement parts, or product modification will void warranty and can result in unsafe operating conditions. We recommend that a Ricon authorized facility continue maintenance inspections when warranty ends.

TABLE 3-2: MAINTENANCE SCHEDULE

INSPECTION POINT	ACTION
– 6,000 MILE INSPECTION –	
Electrical System	• Check all electrical cables and fittings; tighten or replace as necessary • Check chain spring assembly for wear or missing parts.
Cover Fasteners	Check all threaded fasteners for looseness, and retighten as necessary.
Non-slip surface	Visually check for damage to surface, and for loose or missing non-slip material.
Ramp Interior	Visually check ramp interior area and remove accumulated dirt and debris.
Decals	Visually check for illegibility or damage, replace as necessary.
– 12,000 MILE INSPECTION –	
Wiring harnesses	Check wiring insulation for heavy abrasions, and connectors for looseness. Replace as necessary.
Fasteners	Check all threaded fasteners for tightness and retighten as necessary.
Non-slip surfaces	Check non-slip surface for excessive wear or damage (rips, tears, peeling, etc.), and replace as necessary.

TABLE 3-2: MAINTENANCE SCHEDULE	
INSPECTION POINT	**ACTION**
– 24,000 MILE INSPECTION –	
Chain Drive Assembly	Grease or oil to lubricate parts is NOT recommended. Keep components clean and free of debris. Refer to installation section for chain drive assembly replacement.
END OF TABLE	

D. RAMP COMPONENT INFORMATION

Ricon FoldOver 1:6 Ramp uses electrical power from the host vehicle to deploy and stow the ramp. Vehicle electrical power is converted to mechanical force, which is used to move the ramp. Electrical components are described below. Please refer to **Figures 3-10.1 and 3-10.2** for electrical schematics.

1. MOTOR DRIVE SYSTEM

The ramp employs an electro-mechanical motor drive system (contained within the ramp enclosure). Settings are programmed in the motor drive system and is preset at Ricon.

The motor drive system provides mechanical force to the chain/spring assembly when either the DEPLOY or STOW switch is activated. Ricon recommends operating the ramp while the vehicle engine is running in order to minimize current drain on the vehicle battery.

2. CHAIN/SPRING ASSEMBLY

Two factory adjusted chain spring assemblies control the Stow and Deploy motion of the FoldOver 1:6 ramp. Their adjustment determines the degree to which the ramp will rotate opened or closed.

3. ELECTRONIC CONTROLLER

The electronic controller interprets DEPLOY and STOW requests and controls ramp functions. It contains integrated circuits (ICs), relays, fuses, and associated parts. The ICs cannot be accessed externally. The ramp connector J8 receives 24V to power the controller and sends 24V to power the motor drive system. Connector J1 receives the solenoid “latch open” command from the motor, sends “lift enable out” (ramp enable power) command to the motor and “home out” command to the motor from the proximity sensor for when the ramp is stowed or deployed. Connector J2 receives counter “increment up” command from the motor and also sends STOW or DEPLOY commands to the motor. Connectors J3 and J7 supply power to the proximity sensors and receive the “home in” signal from the proximity sensors for when the ramp is stowed or deployed. Connector J4 receives 24V power from bus, receives the “lift on in” (ramp enable) signal and sends “interlock(+) or (-)” to the bus. Connector J5 receives STOW and DEPLOY signals from the control panel or pendant. Connector J6 sends “magnets out” (output power) to release the magnet and also sends “counter out” (output power) to increment the counter up.

Refer to **Figure 3-1** for locations of J1, J2, J3, J4, J5, J6, J7 and J8 connectors. The controller is filled with potting material and is not easily removed. Note fuse locations at top. Refer to **Table 3-3** for functions and ratings of fuses located at top controller. Access to the controller is gained by opening the slanted floor plate.

Refer to **Figure 3-2** for connector-pin description. Refer to **Table 3-4** for connector pin numbering, wire colors and signal description of each connector pin.

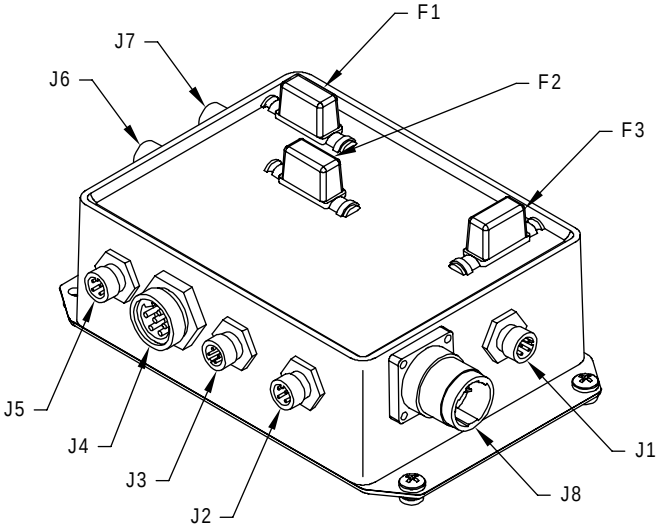


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FIGURE 3-1: CONTROLLER

TABLE 3-3: CONTROLLER FUSES		
FUSE	**RATING**	**CIRCUIT**
F1	5 AMP	Raw Bus Power
F2	5 AMP	Lift Enable (Ramp Switch)
F3	30 AMP	24V High Voltage (Motor Power)
END OF TABLE		

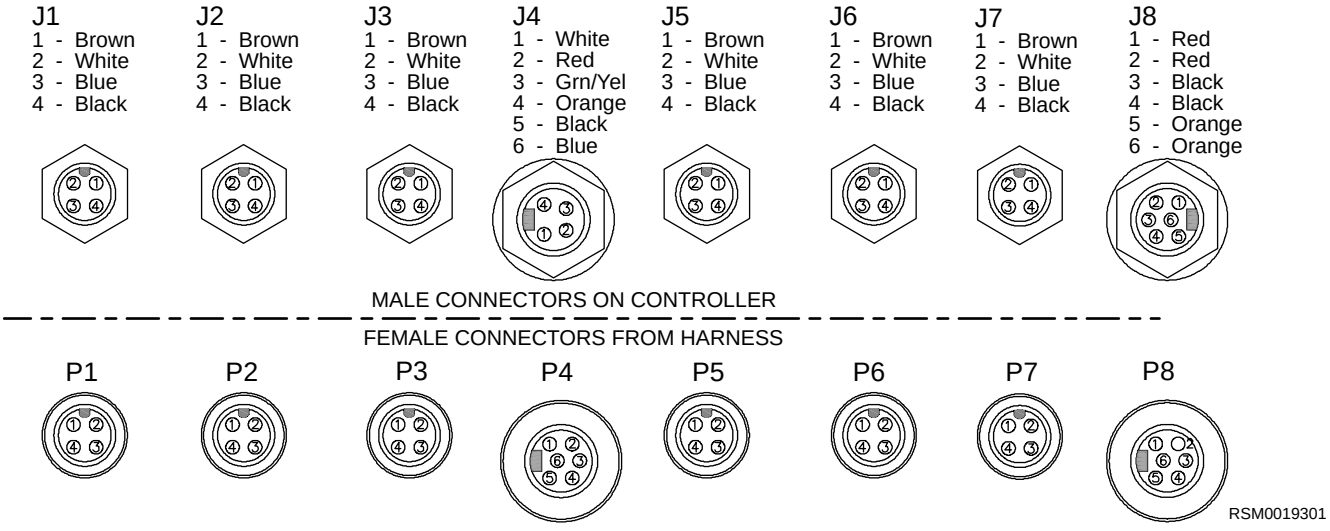

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FIGURE 3-2: CONTROLLER CONNECTOR-PIN NUMBERING

NOTE: Voltage levels are 24 to 28 VDC in this application.

TABLE 3-4: CONNECTOR-PIN DESCRIPTIONS FOR CONTROLLER					
PIN		COLOR	FUNCTION	AT REST	IN ACTION
J1	1	Brown	N/C	Not used	Not used
	2	White	Lift Enable Out	24 volts	24 volts
	3	Blue	Sol Request In	0 volts	24 volts
	4	Black	Home Out	0 volts	24 volts
J2	1	Brown	Deploy SW Out	0 volts	24 volts
	2	White	Stow SW Out	0 volts	24 volts
	3	Blue	Counter In	0 volts	24 volts
	4	Black	Interlock	0 volts	24 volts
J3	1	Brown	Raw Bus P24V F	24 volts	24 volts
	2	White	N/C	Not used	Not used
	3	Blue	Ground	Ground	Ground
	4	Black	Home In	0 volts	0 volts; Ramp Stowed
J4	1	White	Interlock-Out	0 volts	24 volts
	2	Red	Lift On In	0 volts	24 volts
	3	Grn/Yel	Ground	Ground	Ground
	4	Orange	Interlock+Out	0 volts	24 volts; Ramp Stowed
	5	Black	Ground	Ground	Ground
	6	Blue	Raw Bus P24V	24 volts	24 volts
J5	1	Brown	Stow SW In	0 volts	24 volts
	2	White	Deploy SW In	0 volts	24 volts
	3	Blue	N/C	Not used	Not used
	4	Black	N/C	Not used	Not used
J6	1	Brown	Magnets Out	0 volts	24 volts
	2	White	Ground	Ground	Ground
	3	Blue	Counter Out	0 volts	24 volts
	4	Black	Ground	Ground	Ground
J7	1	Brown	Bus P24V	24 volts	24 volts
	2	White	N/C	Not used	Not used
	3	Blue	Ground	Ground	Ground
	4	Black	Home In 2	0 volts	0 volts; Ramp Stowed
J8	1	Red	Bus P24V	24 volts	24 volts
	2	Blue	Bus P24V	24 volts	24 volts
	3	Black	Ground	Ground	Ground
	4	Brown	Ground	Ground	Ground
	5	Orange	P24V HV	24 volts	24 volts
	6	Yellow	P24V HV	24 volts	24 volts
END OF TABLE					

4. SENSOR LIGHT ACTIVITY DURING RAMP MOVEMENT

The FoldOver 1:6 ramps has two ramp positions that are monitored by the controller. This position is fully stowed to deployed position. The ramp must be in the fully stowed area before the electrical interlock output signal will turn on (24VDC). This is done to reduce the possibility of a passenger tripping on the front edge of the ramp when it is not stowed completely as well as preventing the bus from operating or moving when ramp is deployed.

Refer to **Table 3-5**. The status of the sensor lights (on or off) and the interlock output (0VDC or 24VDC) occur when the ramp is either STOWED or DEPLOYED. Note that the interlock output has both a normal and an inverted output. This table applies to the normal output.

TABLE 3-5: SENSOR LIGHT AND INTERLOCK OUTPUT STATUS

POSITION	DEPLOY LIGHT	STOW LIGHT	INTERLOCK OUTPUT
STOWED	OFF	OFF	0VDC
DEPLOYED	ON	OFF	24VDC

End of Table

5. CIRCUIT BREAKERS AND FUSES

The bus builder installs a 50-amp circuit breaker for 24V applications to protect ramp control circuits.

6. ELECTRICAL DIAGRAMS

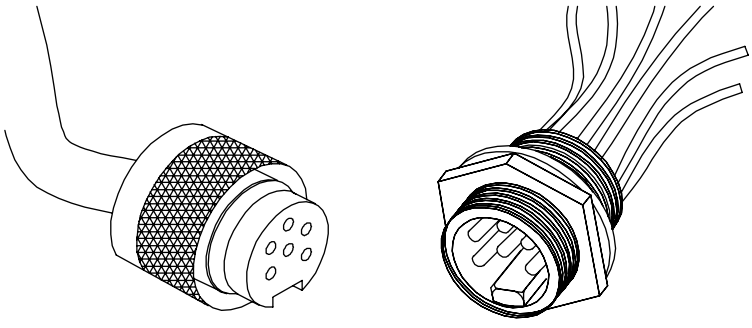
Refer to **Table 3-6** for wire color codes used on schematic. Refer to **Figure 3-3** for a description of plug and receptacle designations used on schematic. Refer to **Figure 3-4** for a list of symbols that may be used on wiring diagram. Refer to **Table 3-7** for an explanation of labels used on schematic.

Refer to **Figure 3-5.1 and 3-5.2** for an overall wiring diagram of the ramp system. The wiring diagram is located at the end of this chapter.

TABLE 3-6: WIRE COLOR CODES

CODE	COLOR	CODE	COLOR
BLK	BLACK	RED	RED
BLU	BLUE	TAN	TAN
BRN	BROWN	VIO	VIOLET
GRN	GREEN	WHT	WHITE
GRY	GRAY	YEL	YELLOW
ORG	ORANGE		

END OF TABLE



RECEPTACLE (R) PLUG (P)

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FIGURE 3-3: CONNECTOR CONFIGURATION

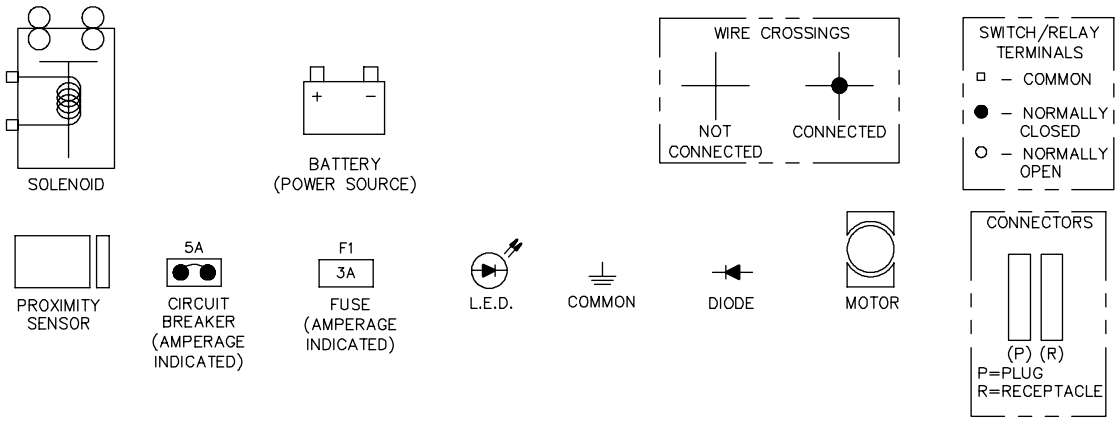

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FIGURE 3-4: SCHEMATIC SYMBOLS

TABLE 3-7: WIRING DIAGRAM LABELS	
LABEL	**DESCRIPTION**
+24 VDC	System power for interlocks, controller, sensor, motor and electronics.
COUNTER	Signal; pulse to auxiliary counter; generated by STOW function.
DEPLOY	Signal; to controller to request DEPLOY function of the ramp.
COM, COMMON, GROUND	System electrical common, ground.
INTERLOCK	Signal; to vehicle interlock circuit when ramp is fully stowed; 24V when ramp is stowed; signal is generated by the electronic controller.
INTERLOCK NEG	Signal; to vehicle interlock circuit when ramp is fully stowed; 0V when ramp is stowed; signal is generated by the electronic controller.
SENSOR GROUND	Constant ground from controller for sensors.
STOW	Signal; to controller to request STOW function of the ramp.
SENSOR OUTPUT	Signal; from the proximity sensor to indicate if the ramp is stowed or deployed.
END OF TABLE	

E. WIRING DIAGRAM

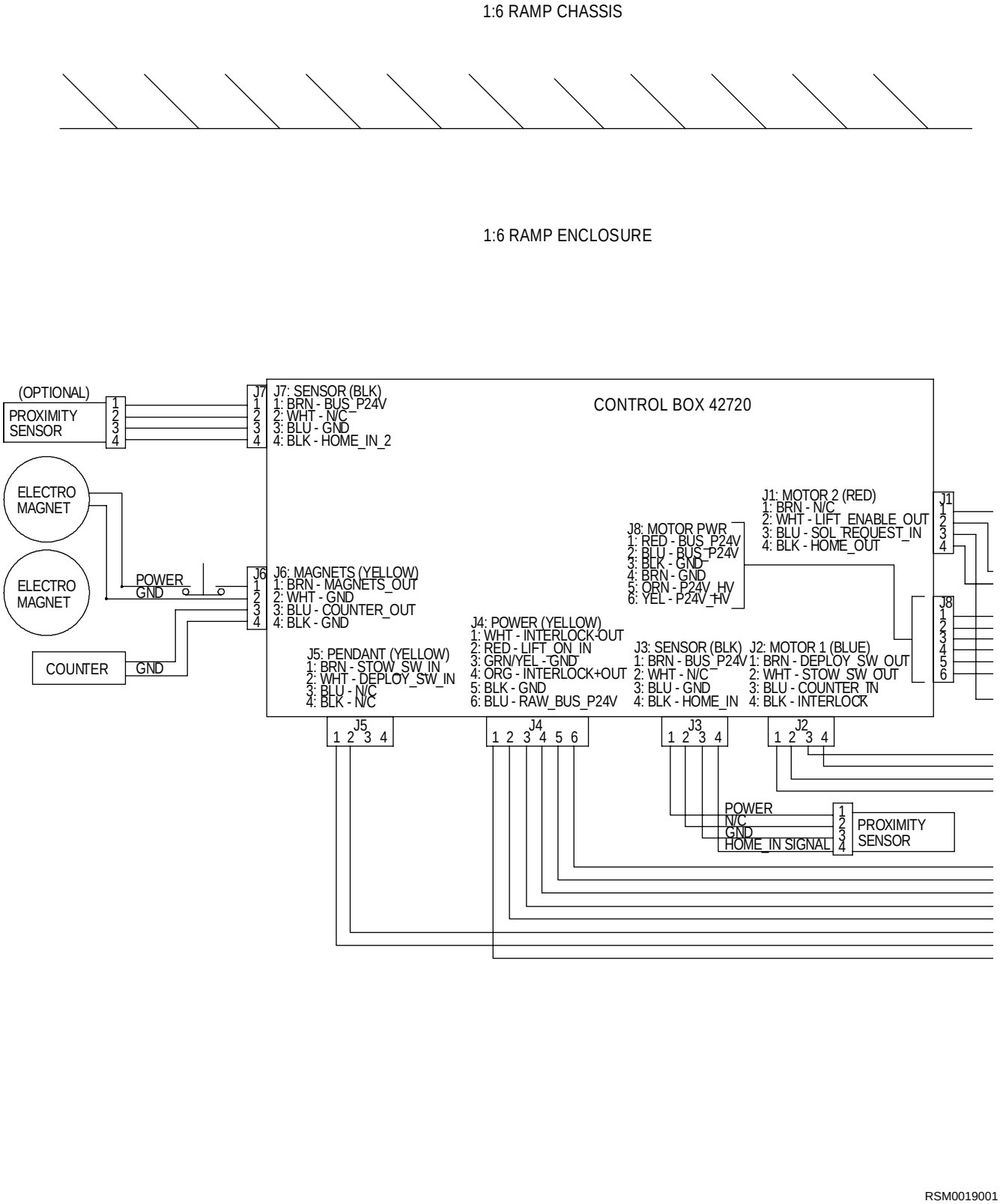

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FIGURE 3-5.1: ER6-SERIES 1:6 RAMP WIRING DIAGRAM (SHEET 1)

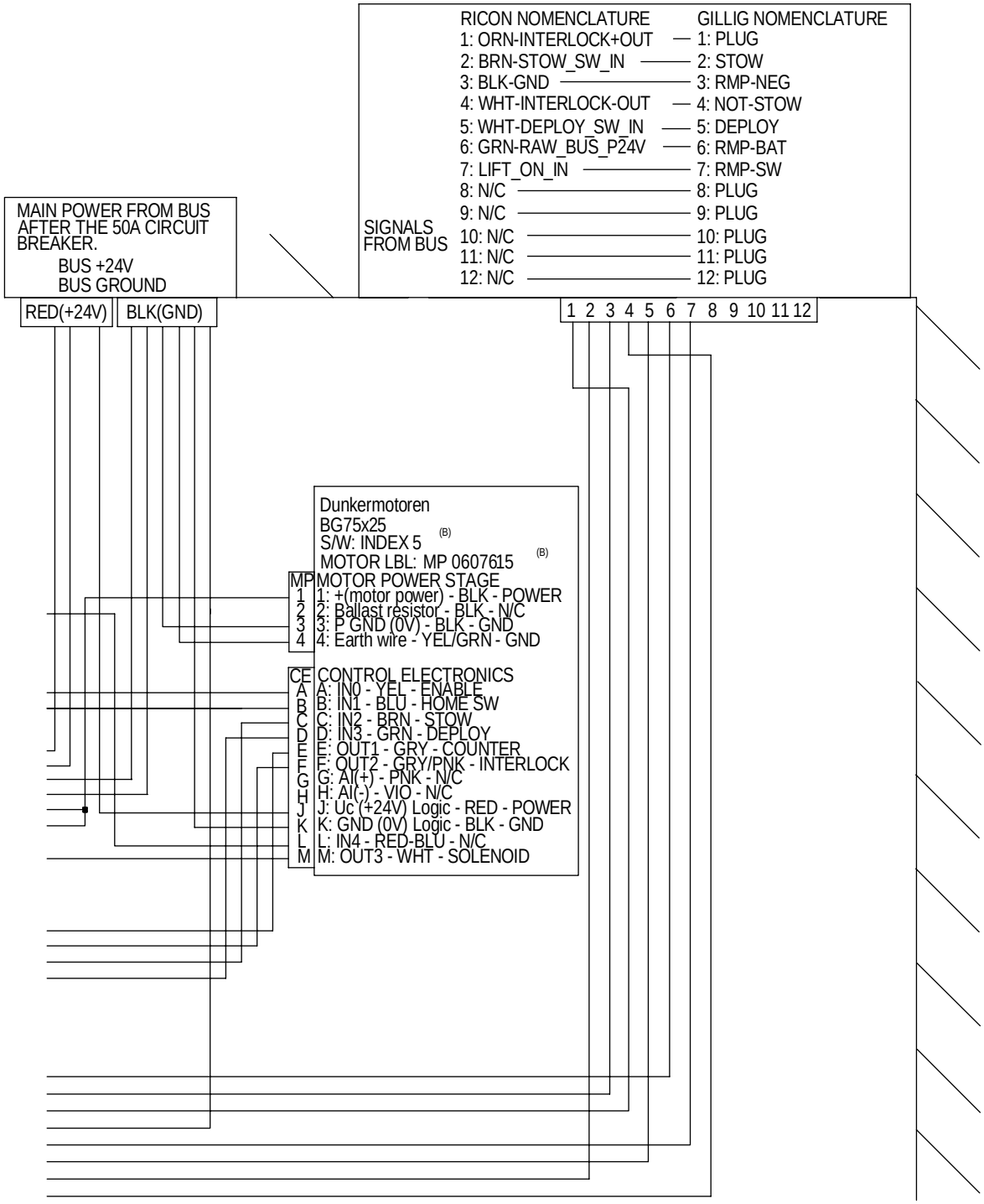

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FIGURE 3-5.2: ER6-SERIES 1:6 RAMP WIRING DIAGRAM (SHEET 2)

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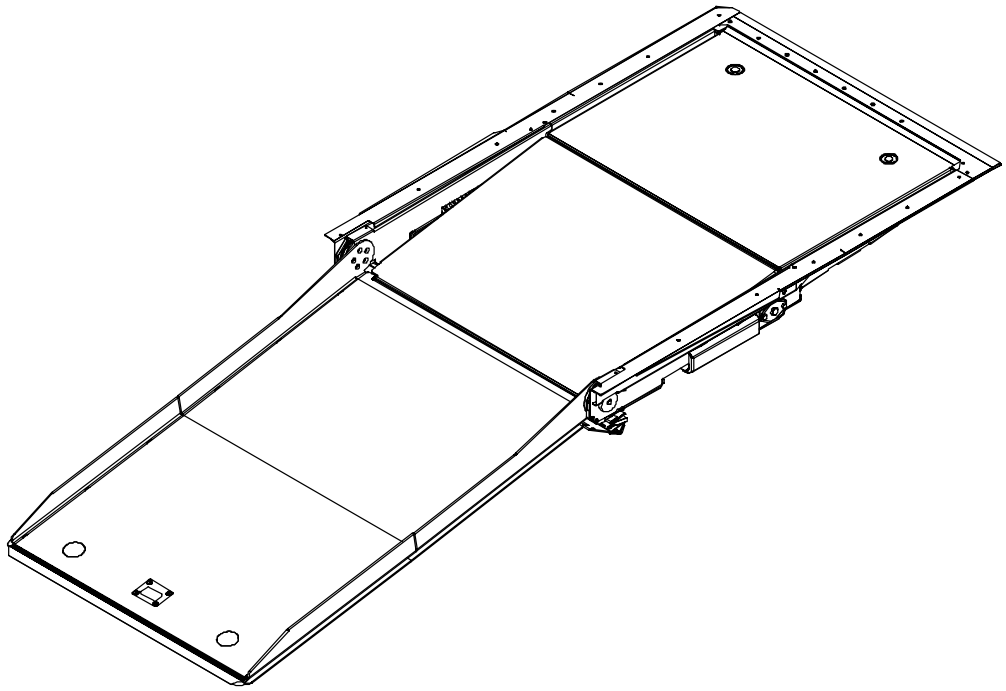
IV. ER6-SEIRES FOLDOVER 1:6 RAMP SPARE PARTS

The parts layouts and lists in this chapter apply to the Ricon ER6-Series FoldOver 1:6 ramp when installed in a transit vehicle. Replaceable ramp parts are illustrated in exploded views of major lift assemblies, which show smaller assemblies and components with reference numbers. Each associated parts list contains reference numbers, parts descriptions, and Ricon part numbers.

Each accompanying parts list contains figure item numbers, part descriptions, quantities used, configurations and the Ricon part number. To order parts, locate part on an appropriate diagram and note the figure item number. Find the figure item number on the accompanying parts list and use the part number in the far right column. Note that parts identified with (REF) in the QTY column of the spare parts list are for reference purposes only and are not sold for spare parts.

NOTE:

- Most items that are described as “kits” contain a single part (plus hardware). Therefore, you may need to order more than one kit if the part is used more than once on the assembly shown.
- Small, inexpensive hardware items are supplied in a minimum quantity of ten, and are packaged in a bag. A single bag may provide more parts than you need, or you may need multiple bags when working on a large assembly. The QTY column indicates how many individual parts are used on the assembly shown; you will need to determine the number of bags required for your task.
- The reference numbers for some parts have more than one part number listed. This occurs when variations of a part are used on different ramp models. These parts are followed by a model designation (ER600, ER601, etc).



PARTS DIAGRAMS **PAGE**

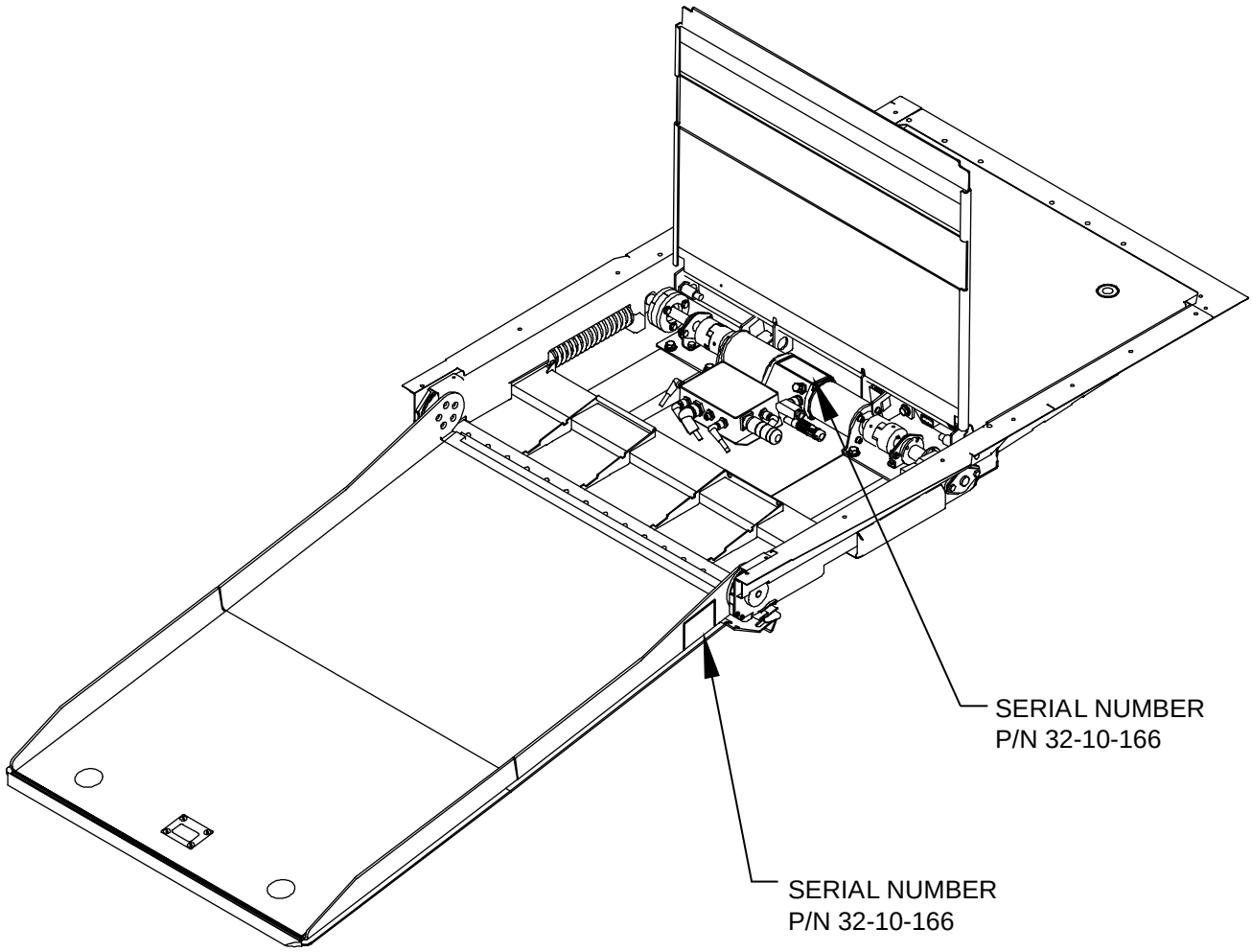


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FIGURE 4-1: ER6 DECAL LOCATIONS

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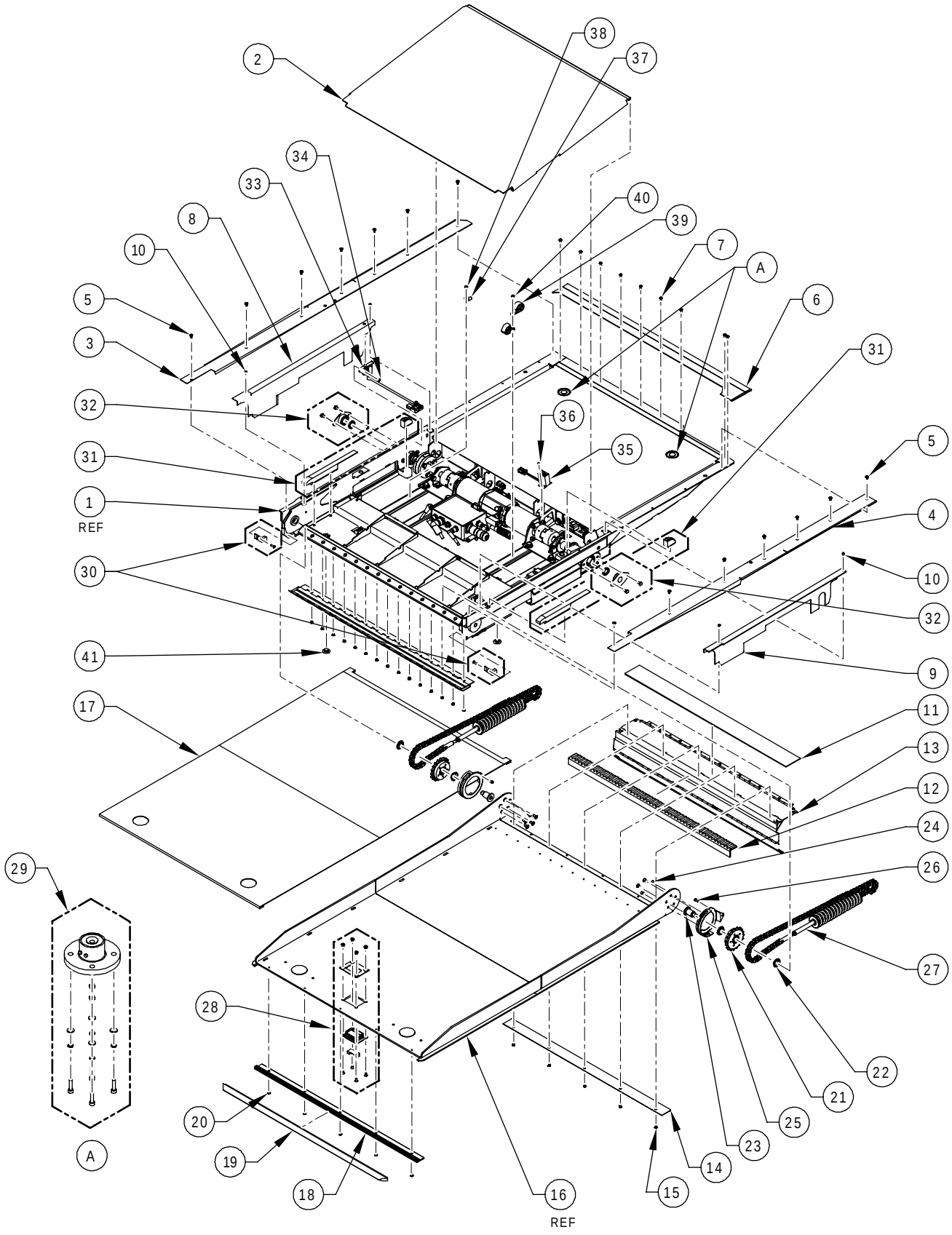

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FIGURE 4-2: ER6-SERIES RAMP ASSEMBLY

FIGURE 4-2: ER6 RAMP ASSEMBLY

FIG. ITEM	DESCRIPTION	QTY	CONFIG.	PART NO.
1	ENCLOSURE WLDT, RAMP	REF	ER600	44702
1A*	ENCLOSURE WLDT, RAMP	REF	ER601	44753
2	FLOOR WLDT, HINGED	1		43948
3**	FLANGE, TRIM, LH	1	ER600-0000011110	43962
		1	ER600-0000020110	43962*
		1	ER600-0000041110	43962*
		1	ER600-0000051110	43962*
		1	ER600-0000071110	43962*
3A**	FLANGE, TRIM, LH	1	ER600-0000043121	44913*
		1	ER600-0000053120	44913*
3B**	FLANGE, TRIM, LH	1	ER601-0000061110	44736*
4**	FLANGE, TRIM, RH, CUT	1	ER600-0000011110	43985
		1	ER600-0000020110	43985*
		1	ER600-0000041110	43985*
		1	ER600-0000051110	43985*
		1	ER600-0000071110	43985*
4A**	FLANGE, TRIM, RH, FLAT	1	ER600-0000043121	44912*
		1	ER600-0000053120	44912*
4B**	FLANGE, TRIM, RH, ORION	1	ER601-0000061110	44737*
5	SCREW, BHT #10-32, SST (BAG OF 10)	1		44235
6**	FLANGE, REAR, SHORT CUT OUT	1	ER600-0000011110	43977
		1	ER600-0000041110	43977*
		1	ER600-0000051110	43977*
		1	ER600-0000071110	43977*
6A**	FLANGE, REAR, LONG CUT OUT	1	ER600-0000020110	43973*
6B**	FLANGE, REAR, FLAT	1	ER600-0000041110	43911*
		1	ER600-0000051110	43911*
6C**	FLANGE, REAR, LONG CUT-OUT, ORION	1	ER601-0000061110	44738*
7	RIVET, POP, 3/16 X 3/8 AL FLUSH HD	7		14-30-308
8	COVER, CHAIN, LH	1		43989
9	COVER, CHAIN, RH	1		43990
10	SCREW, PHP, 6-32 X 1/4 MS SST (BAG OF 10)	1		14427
11	STRIP, ALTRO, FRONT GATE	1		43912
12	STEP EDGE, RCA, YELLOW	1		43916
13	FRONT COVER ASSEMBLY	1		44703
14	PLATE WLDT, HINGED FRONT COVER	1		43137
15	SCREW, FHP, 10-24 X 1/4 UNDERCUT SST (BAG OF 10)	2		15936
16	TRAY WLDT, RAMP	REF		43954
17	SAFETREAD, 4FT X 60FT, BLK, 3M #31	REF		17792
18	EXTRUSION, ALUMINUM, 29.50" LONG	1		39883
19	RUBBER EXTRUSION, LH	REF		43197
20	SCREW, FHP, 10-24 X 3/8, SST (BAG OF 10)	1		15982
21	SPROCKET, NO.40, 19 TEETH, MACHINED	1		39896
22	KIT FLANGE BEARING, 3/4 ID (BAG OF 10)	1		19576
23	SCREW, PLATFORM, PIVOT	2		39857
24	SCREW, FHH, 1/4-20 X 1/2 BLK OXIDE (BAG OF 10)	1		15929

FIGURE 4-2: ER6 RAMP ASSEMBLY (CONT'D)

FIG. ITEM	DESCRIPTION	QTY	CONFIG.	PART NO.
25	COVER, CHAIN, FRONT	2		43626
26	SCREW, PHP, 10-24 X 0.500 SST	2		16058
27	CHAIN-SPRING ASSEMBLY	2		43164
28	KIT, HATCH HANDLE	1		30962
29	KIT, ELECTROMAGNET	2		44222
30	KIT, FRONT GATE GUIDE (DELRIN)	2		44223
31	KIT, CHAIN GUIDE, FRONT AND REAR (DELRIN)	2		44224
32	KIT, SELF ALIGNING BEARING	2		44221
33	KIT, SWITCH ASSY, PLNGR TAPPED	1		44218
34	KIT, COUNTER	1		44219
35	KIT, CLAMP, CABLE W/HARDWARE	1		18660
36	KIT, DUAL CLAMP, CABLE W/HARDWARE	1		44209
37	KIT, DRAIN PLUG	1		44208
38A***	FLOORING, ALTRO, META, GENOME	1	ER600-0000011110	43922*
38B***	FLOORING, ALTRO, META, GENOME	1	ER600-0000020110	43923*
38C***	FLOORING, RCA, RIBBED 452 (ROYAL BLUE)	1	ER600-0000041110	44758*
	FLOORING, ALTRO, META, GENOME	1	ER600-0000043121	44758*
38D***	FLOORING, RCA, RIBBED, SLATE 766	1	ER600-0000051110	44758*
	FLOORING, RCA, RIBBED, SLATE 766	1	ER600-0000053120	44758*
38E***	FLOORING, ALTRO, CHROMA, 27320 (MINERAL)	1	ER600-0000071110	44929*
38F***	FLOORING, ALTRO, META, BLACK	1	ER601-0000061110	43921*

NOTE: (REF) in QTY column is for Referenced Parts Only and are not sold as spare parts.

* Not shown.

** Some applications require alternate flange trim for alternate applications. Refer to Config. Column for alternate applications.

*** Some applications require alternate floor coverings. Refer to Config. Column for alternate applications. Consult Ricon Product Support if your covering is not listed.

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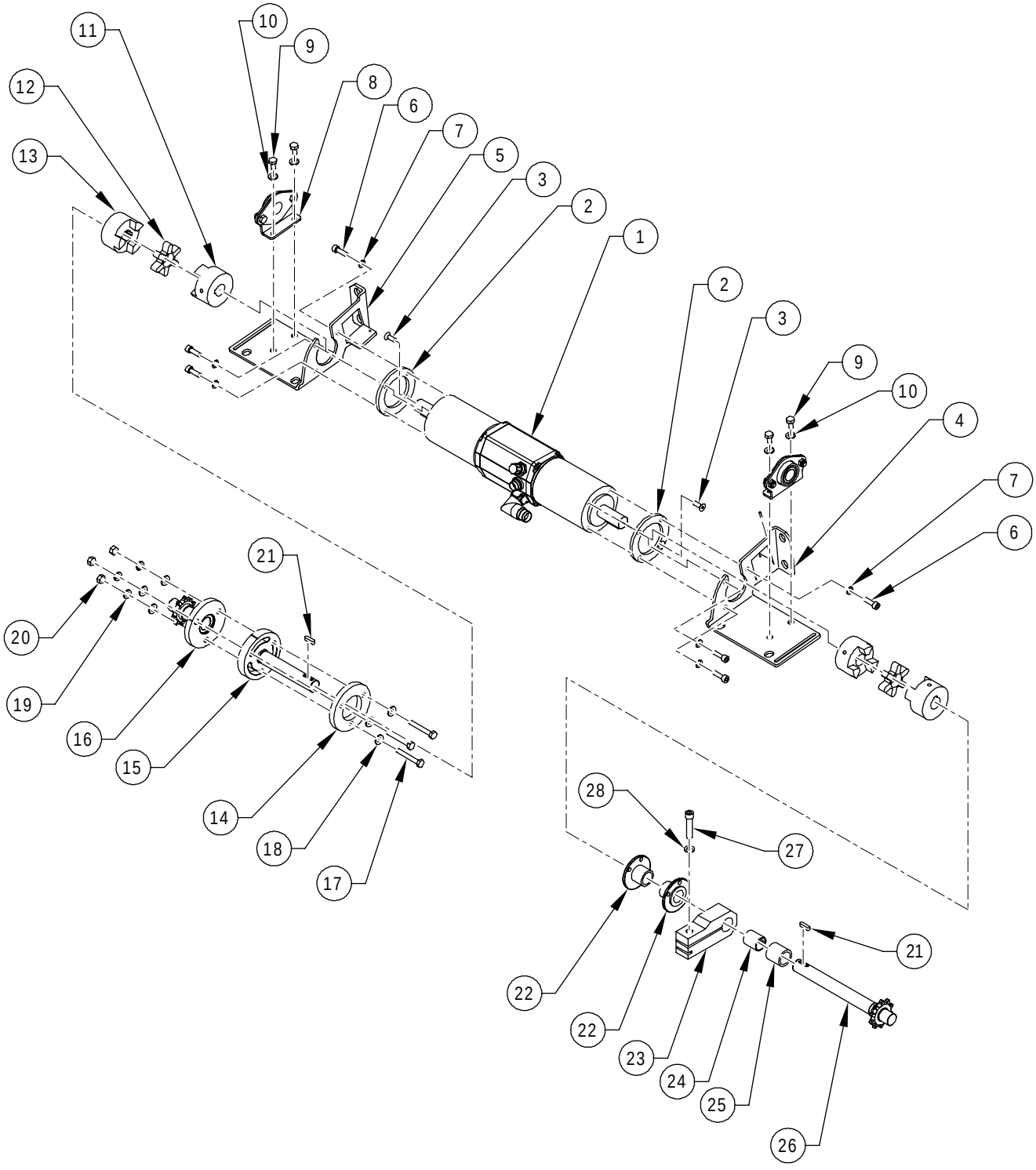

RSM0019501

FIGURE 4-3: MOTOR DRIVE ASSEMBLY

FIGURE 4-3: MOTOR DRIVE ASSEMBLY				
FIG. ITEM	**DESCRIPTION**	**QTY**	**CONFIG.**	**PART NO.**
0	GEARMOTOR ASSY	REF	ER600	43959
0	GEARMOTOR ASSY	REF	ER601	44744
1	MOTOR, DUAL GEAR BOX ASSY	1		43054
2	SPACER, GEAR MOTOR	2		43960
3	SCREW, FHH, M6-1 X 16MM SST	2		19217
4	BRACKET, MOTOR MOUNT LEFT HAND	1	ER600	43958
4A*	BRACKET, MOTOR MOUNT LEFT HAND	1	ER601	44741
5	BRACKET, MOTOR MOUNT RIGHT HAND	1	ER600	43957
5A*	BRACKET, MOTOR MOUNT RIGHT HAND	1	ER601	44740
	ATTACHING HARDWARE			
6	SCREW, SHC, M6-1.0 X 20MM LNG, SST	6		43991
7	WASHER, SPL, M6 X 11.8MM X 1.6MM THK SST (BAG OF 10)	1		20921
8	BEARING ASSY	2		43043
9	SCREW, HEX, 1/4-20 X 1/2 GR5 (BAG OF 10)	1		34518
10	WASHER, SPL, 1/4"	4		28274
11	COUPLING, TYPE L, 19MM ID, 6MM KEYWAY	2		43048
12	SPIDER COUPLING	2		43049
13	COUPLING, TYPE L, .750 ID	2		43051
14	WASHER, COUPLER	1		43981
15	SHAFT, CLUTCH ASSY	1		43983
16	SHAFT ASSY	1		43982
17	SCREW, HEX,1/4-20 X 1 3/4 GRADE 8 COATED	6		43087
18	NUT, ESN, 1/4-20 THIN, SST (BAG OF 10)	2		13339
19	WASHER, SPL, 1/4"	6		28274
20	NUT, HEX, 1/4-20, 8 GRADE	6		42716
21	KEY, PARALLEL, 3/16 X 3/16 X .726	2		39877
22	BUSHING, CABLE	2		43984
23	BLOCK, BRAKE	1		43167
24	BEARING, BRAKE, MODIFIED	1		43168
25	SPACER, SHAFT, RH	1		43907
26	SHAFT ASSY, RH	REF		43044
27	SCREW, SHC 5/16-24 X 1.25L, CORRO RESIST	1		36280
28	WASHER, FLT, .32 X .59 X .06 SST	1		28630
29	PLATE, BEARING, KEEPER	1		43196
30	ROLLPIN, 3/32 X 1/2	1		28349

NOTE: (REF) in QTY column is for Referenced Parts Only and are not sold as spare parts.

* Not shown.

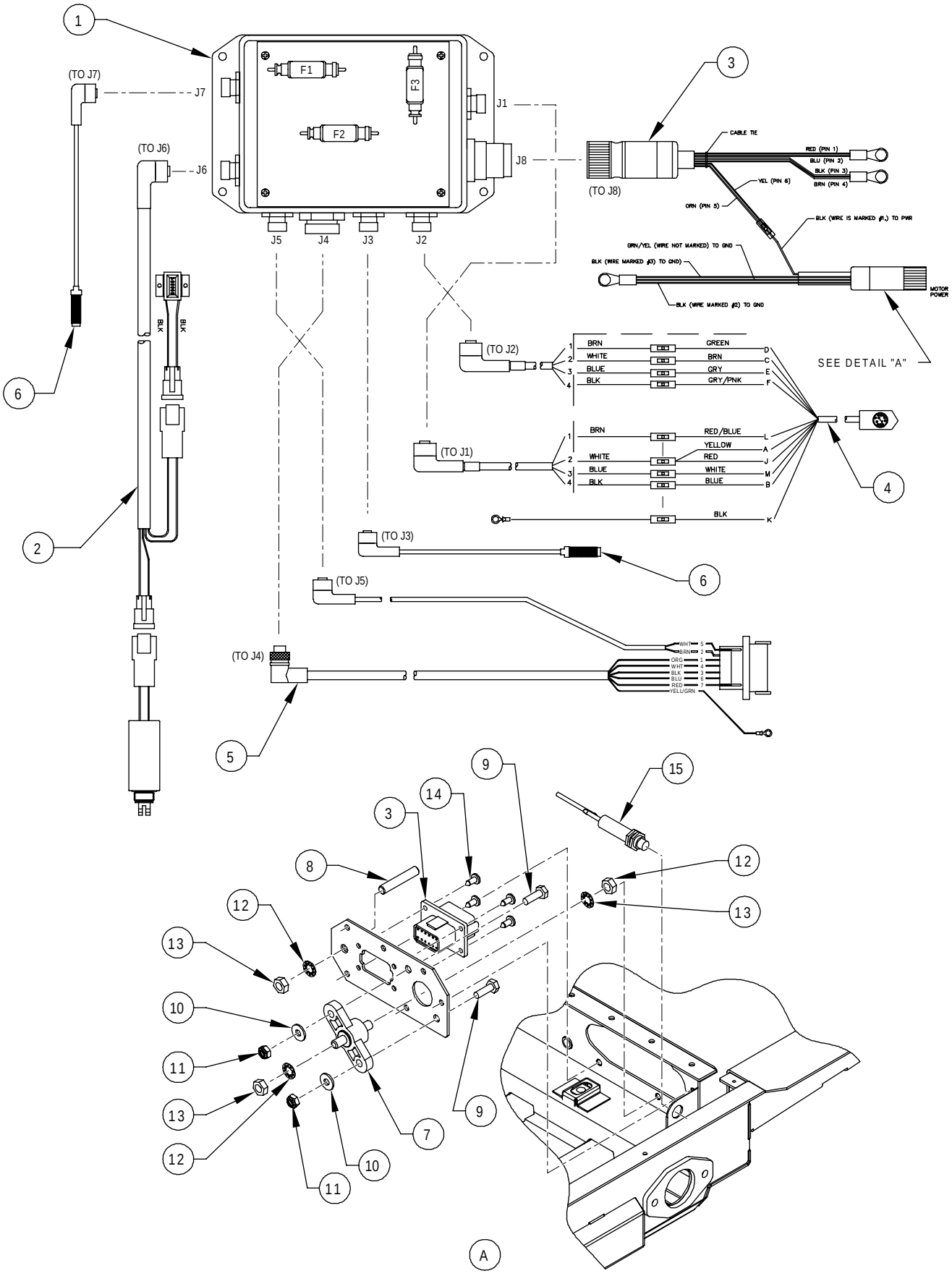

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FIGURE 4-4: ELECTRICAL HARNESSES AND CONNECTORS

FIGURE 4-4: ELECTRICAL HARNESSES AND CONNECTORS				
FIG. ITEM	**DESCRIPTION**	**QTY**	**CONFIG.**	**PART NO.**
1	CONTROLLER	1		42720
2	HARNESS, ELECTROMAGNET TO SWITCH	1		43935
3	HARNESS, MOTOR POWER	1		43911
4	CABLE, ASSY, MOTOR, LOGIC	1		42739
5	HARNESS, RAMP POWER	1		42740
6	CABLE, PROXIMITY SENSOR	2		43950
7	BLOCK, POSITIVE CONNECTION	1		37229
	ATTACHING HARDWARE			
8	STUD, 5/16-18 X 1.7	1		14-60-050
9	SCREW, HEX, 1/4-20 X 3/4 SST	2		281665
10	WASHER, FLT, .281 X .625 X .065	2		282735
11	NUT, ESN, 1/4-20 THIN	2		14-08-304
12	WASHER, ISL, 5/16 X .61 X .03 BRZ	2		28965
13	NUT, HEX, 5/16-18 SST	2		283135
14	SCREW, PHP, 10A X ½	4		283895
15	INDUCTIVE PROXIMITY SENSOR	2		43951

NOTE: (REF) in QTY column is for Referenced Parts Only and are not sold as spare parts.

* Not shown.

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APPENDIX 1

TABLE 2-4: RICON LOW-FLOOR-VEHICLE ACCESS 1:6 RAMP SPECIFICATIONS

Power System ..... Electro-mechanical motor drive system

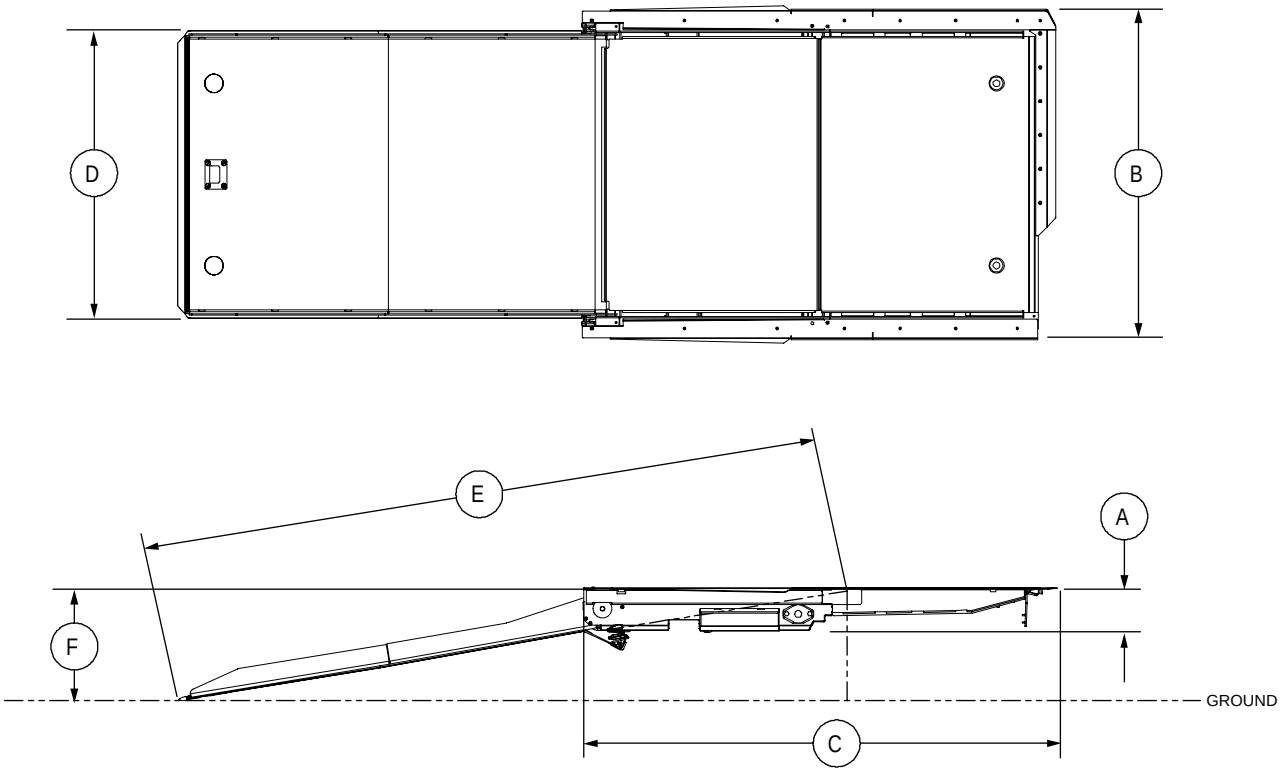
Power Requirements:

Electric * ..... 24 VDC

Maximum Current Draw * ..... 1.5 amps

Rated Load Capacity ..... 660 lbs. (300kg)

Ramp Weight ..... 210 lbs. (91 kg)



DIMENSIONS – Inches (MM)

	A	B	C	D	E	F
MODEL	Ramp Frame Height	Ramp Trim Width	Ramp Trim Length	Useable Platform Width	Sloped Surface Length	Floor-To-Ground Travel
ER600	4.5 (114)	33.8 (859)	51.6 (1311)	30 (762)	71 (1803)	12 (305)
ER601	4.5 (114)	33.8 (859)	51.6 (1311)	30 (762)	71 (1803)	12 (305)

END OF TABLE

NOTES: