RICON®

Innovation in Mobility

MIRAGE™
F9B Series
Export Use
Wheelchair and Standee Lift

PRINT

Service Manual

09/23/02 **32DF9BE02.B**

Ó**99-2002 RICON CORPORATION**
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U.S. Patent Nos. 5,228,538; 5,253,973; 5,373,915; 5,556,250;
Australian Patent Nos. 661127, 680501; Canadian Patent No. 2,129,821;
French Patent No. 0-446-224; German Patent Nos. 68925368.0-08, EP 0625896 B1;
U.K. Patent Nos. EP 0625896 B1, EP 0703766
GB 2,224,992 B; Other U.S. and foreign patents pending.
Printed in the United States of America

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	PAGES	DESCRIPTION OF CHANGE	ECR / ECO
32DF9BE02.A	ALL	New release in two-book format.	3802/4820
32DF9BE02.B	Inside Cover	Updated disclaimer on inside cover.	3990/4918
END OF LIST			

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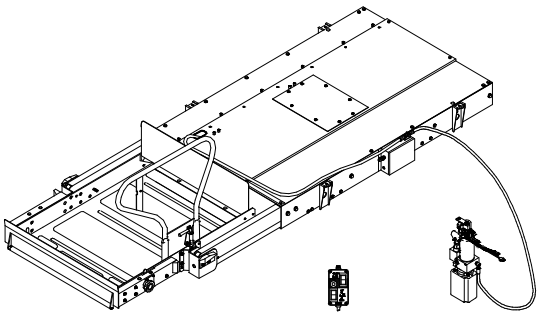
I. INTRODUCTION

The RICON Mirage F9B Series Export Use Wheelchair and Standee Lift is an under-floor, electro-hydraulic wheelchair lift for use by persons requiring assistance for entering and exiting a vehicle. The patented movement ensures smooth, safe entry and exit and easily lifts up to 660 pounds (300 kilograms). It is operated by a wheelchair occupant, an attendant, or the vehicle driver. By using the lift control switches, the lift extends (or deploys) from the vehicle and rises to the vehicle floor height. The user boards the large non-skid platform and the operator uses the control switches to gently lower the platform to the ground. After the user departs, the platform is raised and retracted (stowed).



The lift is an underfloor lift with a powerful electrical hydraulic pump. The lift also contains a built-in manual backup pump and rollstop manual control knob. If the lift loses electrical power, two or more people can raise and/or lower the lift manually.

This manual contains installation and maintenance instructions and a troubleshooting guide for the lift. It is important to user safety that the lift operator(s) be completely familiar with the operating manual. Once the lift is installed, it is very important that the lift be properly maintained by following the Ricon recommended cleaning, lubrication, and inspection instructions.

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

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

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

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

RICON CORPORATION

ONE-YEAR LIMITED WARRANTY

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

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

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

If You are Traveling: All authorized Ricon dealers honor this warranty. Consult telephone directory or call our Product Support department for the name of the nearest authorized Ricon dealer.

This Warranty does not Cover:

- Malfunction or damage to product parts caused by accident, misuse, lack of proper maintenance, neglect, improper adjustment, modification, alteration, the mechanical condition of 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. Any required maintenance should be performed at that time.

⚠ WARNING!

THIS PRODUCT HAS BEEN DESIGNED AND MANUFACTURED TO EXACT SPECIFICATIONS. MODIFICATION OF THIS PRODUCT IN ANY RESPECT CAN BE 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, and there may be other rights that vary from state to state.

B. SHIPMENT INFORMATION

Ricon does not sell directly to user because of the specialized nature of this product. Instead, the product is distributed through a worldwide network of authorized Ricon dealers, who perform actual installation.

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

  NOTE: The Sales/Service personnel must review Warranty and Operator Manual with user to be certain they understand safe operation of product. Instruct user to follow operating instructions without exception.

C. GENERAL SAFETY PRECAUTIONS

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

- Under no circumstances should installation, maintenance, repair, and adjustments be attempted without immediate presence of a person capable of rendering aid.
- An injury, no matter how slight, should always be attended. Always administer first aid or seek medical attention immediately.
- Protective eyeshields and appropriate clothing should be worn at all times.
- To avoid injury, always exercise caution when operating and be certain that hands, feet, legs, and clothing are not in the path of product movement.
- Batteries contain acid that can burn. If acid comes in contact with skin, flush affected area with water and wash with soap immediately.
- Always work in a properly ventilated area. Do not smoke or use an open flame near a battery.
- Do not lay anything on top of a battery.
- Check under vehicle before drilling so as not to drill into frame, subframe members, wiring, hydraulic lines, fuel lines, fuel tank, etc.
- Read and thoroughly understand operating instructions before attempting to operate.
- Inspect product before each use. If an unsafe condition, unusual noises or movements exist, do not use it until problem is corrected.
- Never load or stand on platform until installation is complete. Upon completion of installation, always test load the lift to 125% of its rated load capacity.
- Stand clear of doors and platform and keep others clear during operation.
- The product requires regular periodic maintenance. A thorough inspection is recommended at least once every six months. The product must always be maintained at the highest level of performance.

D. MAJOR LIFT COMPONENTS

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

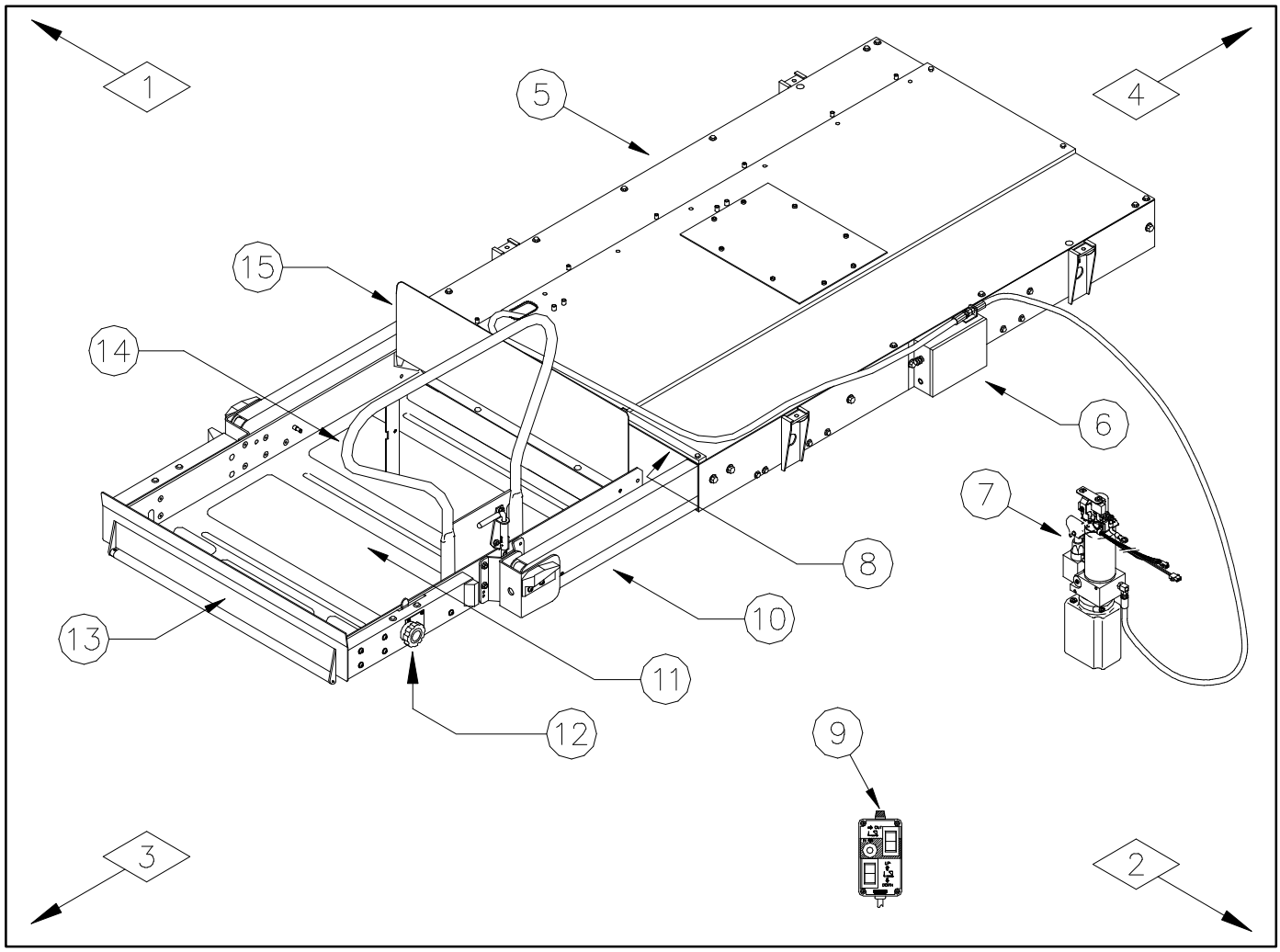


FIGURE 1-1: LIFT REFERENCES

TABLE 1-1: F9B SERIES EXPORT USE LIFT TERMINOLOGY		
REF	**NAME**	**DESCRIPTION**
1	Left	Reference points from outside the vehicle looking inward at the platform.
2	Right	
3	Front	
4	Rear	
5	Lift Enclosure	Cassette type structure, rigidly attached to the vehicle, that contains the lift.
6	Pull Box	Contains electrical connections/terminals
7	Power Unit	Electro-hydraulic pump that performs the lift raise/UP and lower/DOWN functions.
8	Carriage	(Not shown) Part of traveling frame that contains the necessary components to extend/deploy the platform OUT and retract/stow the platform IN.
	Deployment System	(Not Shown) The electrical gear-motor and associated mechanical hardware used to extend/deploy the platform OUT and retract/stow the platform IN.
	Lower Parallel Arms	(Not Shown) Located within lifting frame, they connect the platform to the carriage to maintain the platform horizontal position.
9	Control Pendant	Hand-held device used to control the lift operating functions.
10	Lifting Frame	Part of the frame that connects the platform to the hydraulic cylinder for raising/UP and lowering/DOWN.
11	Platform	Component where the occupant sits or stands during lift operations.
12	Rollstop Manual Control Knob	Provides manual control of the rollstop in the event of a loss of electrical power.
13	Platform Rollstop	Front barrier to prevent the wheelchair from slow, inadvertent rolling off the platform during lift operation.
14	Handrails	Provide a hand-hold for platform occupant.
15	Bridgeplate	Plate bridging the gap between platform and vehicle threshold. Also serves as a rear rollstop when the platform is deployed.
END OF TABLE		

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II. INSTALLATION

The RICON Mirage F9B Series Export Use Wheelchair and Standee Lift stows in a cassette mounted to the underside of the vehicle and behind the bottom step riser. Due to the wide range of applications, it is impossible to provide specific information about every possible installation. Therefore, we have developed the following general procedures that will apply to many installations. Contact the Ricon Product Support Department for instruction about installations not covered herein.

Lift installation is performed in four steps:

- Mechanical
- Electrical
- Final Adjustments
- Verify Installation

A. MECHANICAL

1. LIFT LOCATION

- The location of a wheelchair lift depends on the motion path of the platform. The lift must be located so that the platform will move unobstructed through its required range of motion. The conventional doorway mounted lift has a fixed base, from which a platform moves away on descent and returns on ascent.
- Principles for locating the under-floor lift differ from those used to locate the conventional doorway mounted platform lift. The platform does not return to a fixed doorway mounted base as the platform approaches the vehicle floor. Instead, the platform stows in a cassette attached to the vehicle frame located under the vehicle floor, which makes location specific for each vehicle.
- As floor to ground travel requirements increase, the location of the lift relative to the side of the vehicle becomes critical. Proper operation of the bridge plate requires a minimum threshold gap of 3". The location of the front of the lift relative to the side of the vehicle and the upward travel (portion of total travel above the lift enclosure) will affect the gap. The further back from the side of the vehicle that the lift is located, THE SMALLER THE ALLOWABLE UPWARD TRAVEL due to the special requirement for operation of the bridgeplate. It is, therefore, necessary that ALL APPLICATIONS OF THIS LIFT BE REVIEWED WITH A RICON APPLICATIONS ENGINEER.

2. LIFT MOUNTING

- Refer to **Figure 2-1**. Regardless of vehicle type, mechanical support of the lift will be provided at four attachment points. Unless otherwise arranged through OEM applications engineering, the lift is shipped with two cross members that define four mounting support points.
- Since lift mounting varies from one model to another, and to be certain that the lift installation meets the 125% of its rated load capacity, the vehicle mounting brackets must meet the following criteria. Refer to **Table 2-1.**

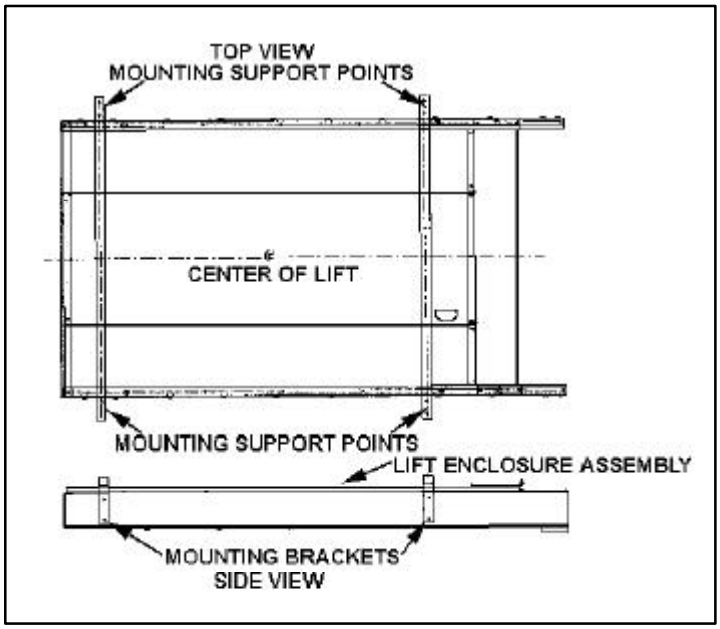

FIGURE 2-1: LIFT MOUNTING

TABLE 2-1: LIFT MOUNTING SUPPORT CAPACITY		
Loading Direction	**Front Supports** (total capacity for both left and right support points)	**Rear Supports** (total capacity for both left and right support points)
Vertical	4500 lbs	3500 lbs
Longitudinal (perpendicular to vehicle drive axles)	3000 lbs	3000 lbs
Lateral (parallel to vehicle drive axles)	1500 lbs	1500 lbs
END OF TABLE		

- Lift-mounting hardware must be a minimum of 5/16" diameter, with a grade of 5 or better.

3. AUXILIARY EQUIPMENT MOUNTING

- Refer to **Table 2-2.** The design capacity of the brackets used to mount the hydraulic power unit must meet the following criteria. Meeting these criteria verifys that the pump mounting can withstand loads applied during manual pump operation.

TABLE 2-2: HYDRAULIC POWER BRACKET CAPACITY	
LOADING DIRECTION	**HYDRAULIC POWER UNIT BRACKET CAPACITY**
Vertical	125 lbs
Longitudinal (perpendicular to vehicle drive axles)	200 lbs
Lateral (parallel to vehicle drive axles)	100 lbs
END OF TABLE	

B. ELECTRICAL

Refer to **Figure 2-2**. Whether the vehicle electrical system is 12V or 24V, insulated return or chassis ground, the electrical installation is similar.

1. INSTALL MAIN CIRCUIT BREAKER

a. Disconnect the battery. Avoid heat sources.

b. Mount the circuit breaker as near the battery as possible (within 10"-12") to minimize the amount of electrically unprotected cable.

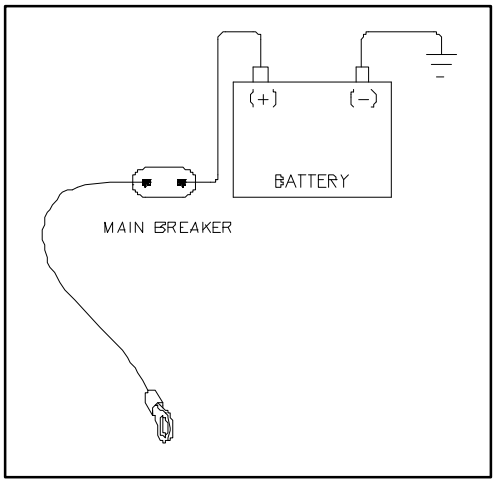

FIGURE 2-2: INSTALL MAIN CIRCUIT BREAKER

⚠ CAUTION!

- Never route a live wire. Verify the battery is disconnected.
- Always route the electrical wires clear of any moving parts, brake lines and exhaust system.
- Securely attach wires to the vehicle frame or subframe.
- When routing electrical wires through vehicle walls or floors, use a suitable grommet to protect the wires from chafing.

2. ROUTE MAIN POWER CABLE:

> **⚠ CAUTION!**
>
> If drilling is necessary always check underside of vehicle before drilling so as not to damage any fuel lines, vent lines, brake lines or wires.

NOTE: Cable must be routed properly and should not exceed 9' in length. Consult with our Service Department should cable lengths greater than 9' be required.

a. Trim cable to required length. Terminate wire ends using the ring terminal and crimping tool.

c. Route and attach power cable to the vehicle frame using cable clamps and tie wraps.

d. The control pendant cable must be anchored with cable clamps to avoid excessive stress to wires and/or termination points.

3. ROUTE GROUNDING STRAP

Refer to **Figure 2-3**. To assure proper operation of the pump motor, a grounding strap of #4 gauge or heavier wire must be installed.

a. 12VDC Systems:

Route the ground strap from the pump body to the bare metal on the vehicle chassis or other appropriate location.

b. 24VDC Systems:

The ground strap should be routed from the grounding stud on the pump motor to the bare metal of the vehicle chassis or other appropriate location.

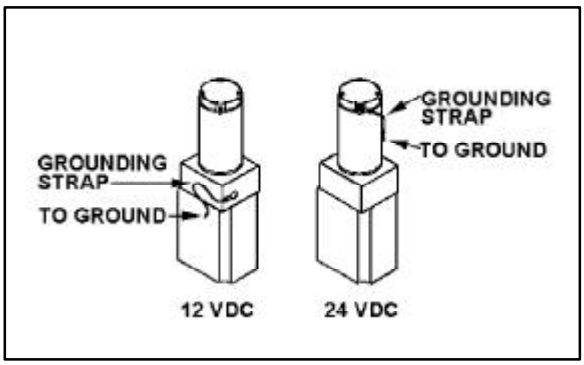

FIGURE 2-3: LOCATION OF GROUNDING STRAPS

4. CONNECT MAIN CIRCUIT BREAKER TO BATTERY

a. Use excess cable to make this connection. Attach one end of cable to the ring terminal provided, and connect the opposite end to the main breaker terminal farthest from the battery.

b. Connect the short cable from the positive battery terminal to the main breaker terminal closest to the battery.

5. SAFETY INTERLOCKS

NOTE: Ricon approves only installations that are interlocked as described in ADA code 49 CFR.

> **⚠ CAUTION!**
>
> The lift controls must be disabled anytime vehicle is ***not*** safely parked (reference ada code 49 cfr).

Ricon-supplied vehicle specific installation kits contain an interlock kit complete with installation instructions. The lift must be interlocked even when installed into a non-ADA compliant installation. Properly installed, the interlock prevents the lift from operating unless vehicle is safely parked, and prevents the vehicle from moving until lift is fully stowed.

For information and/or components required to affect the interlock, refer to the installation instructions supplied with the kit. For applications where the vehicle specific installation kit is not available, contact The Ricon Applications Engineering Department for assistance. The electrical system for the lift is equipped with a jumper that, when removed, will disable the control of the lift. To disable the lift for interlock purposes, it is recommended that the jumper be used as the point of attachment. Refer to wiring schematic for illustration of jumper circuit.

C. FINAL ADJUSTMENTS

⚠ WARNING!

FAILURE TO PROPERLY ADJUST EQUIPMENT MAY RESULT IN UNSAFE OPERATING CONDITIONS FOR THE LIFT USER.

1. PLATFORM TRAVEL LIMIT ADJUSTMENT

This procedure provides for setting the location of the Vertical Travel Limit Switch (labeled "TOP") to stop the platform at the vehicle floor level. The Vertical Travel Limit Switch is located in the Carriage Assembly along with the three Stow Level Position Switches.

a. Extend the platform to the deployed position.
b. Gain access to underside of lift carriage.
c. Remove the bridgeplate actuator link.

NOTE: Refer to **Figure 2-4**. The bridgeplate actuator link assembly attaches between the bridgeplate and platform. This assembly includes pneumatic springs, rod ends, and hex adjusting links.

d. Fold the bridgeplate and hold it in position with a heavy object.
e. Raise the platform enough to verify that there is no compression on the pneumatic springs.
f. Remove the two snap rings retaining the link assemblies. There is one snap ring on each side of the lift frame assembly.
g. Remove the link assemblies from the mounting studs starting at the bridgeplate end.
h. Manually raise platform to vehicle floor level.

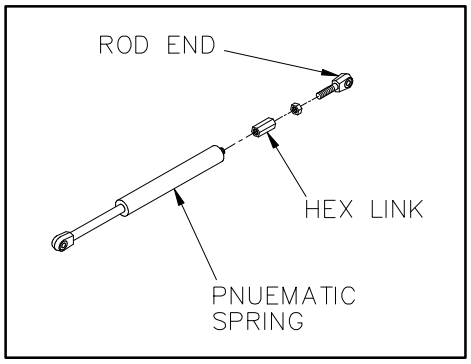

FIGURE 2-4: BRIDGEPLATE ACTUATOR LINK

NOTE: The platform will deflect vertically approximately 0.75" under rated load. The platform travel limit should, therefore, be set so that the top platform surface is between 1" and 1.6" above the vehicle floor.

2. SET THE VERTICAL TRAVEL LIMIT SWITCH

a. Raise the lift platform to the vehicle floor level.
b. Refer to **Figure 2-5**. Loosen the two mounting screws on the switch labeled TOP.

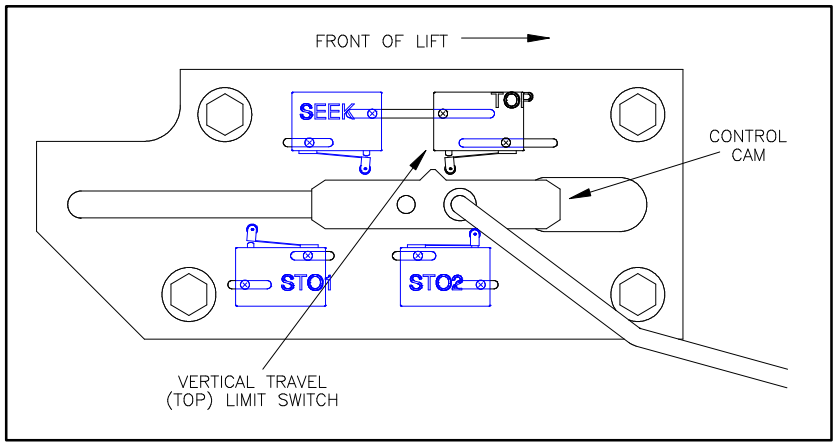

FIGURE 2-5: LIMIT SWITCH (TOP) LOCATION

c. Slide the TOP switch all the way to the right and back again until it contacts the Control Cam with a faint click.
d. Tighten the mounting screws sufficiently to allow the switch to be moved with light tapping.
e. Operate the lift to verify that the lift stops at the correct vehicle floor level. Readjust the Vertical Travel Limit Switch if necessary. Do not strike the switch with a sharp tool.
f. Fully tighten the switch mounting screws.

3. SET THE THRESHOLD GAP

The threshold gap is the space between the back of the platform and the bottom of the vehicle doorway. Proper operation of the bridgeplate requires a minimum gap of 3". The location of the front of the lift relative to the outside surface of the vehicle and the upward travel (portion of total travel above the lift enclosure) affect the gap.

NOTE: As floor to ground travel requirements increase, the location of the lift relative to the side of the vehicle becomes critical. The further back from the side the lift is located, the smaller the allowable upward travel. BE SURE THE LOCATION OF THE LIFT HAS BEEN CONSIDERED to avoid unnecessary, last minute vehicle modifications (see Mechanical Installation section of this manual).

4. BRIDGEPLATE ADJUSTMENT

The Bridgeplate deployment is controlled by the bridgeplate pneumatic spring and hex link. While the length of the spring determines the position of the bridgeplate relative to the platform, the actuator link must be adjusted to allow the bridgeplate to be fully deployed as the platform reaches vehicle floor level. Thus, by either adding or removing length from the hex link will set the correct actuator link length between the bridgeplate and platform. Both hex links should be adjusted so that both rods are continuously in contact with the bridgeplate cam (i.e. one rod should not drive the motion of the bridgeplate, while the other rod is free of contact with the cam.)

NOTE: This adjustment procedure is ***only*** to be performed after the vertical travel and threshold gap have been set.

c. Raise platform to its vertical limit.

d. Unfold bridgeplate onto the door threshold.

e. Slacken the locking nut and turn the adjustable hex-link to shorten or lengthen the pneumatic spring. As such, turning the hex length clockwise will lengthen the spring, and turning counter-clockwise will shorten the spring.

f. Refer to **Figure 2-6**. The correct pneumatic spring link length should produce no greater than a 1/4" distance between the bridgeplate support assembly and bridgeplate stirrup assembly as shown.

NOTE: The bridgeplate slope must not exceed a 1:6 ratio.

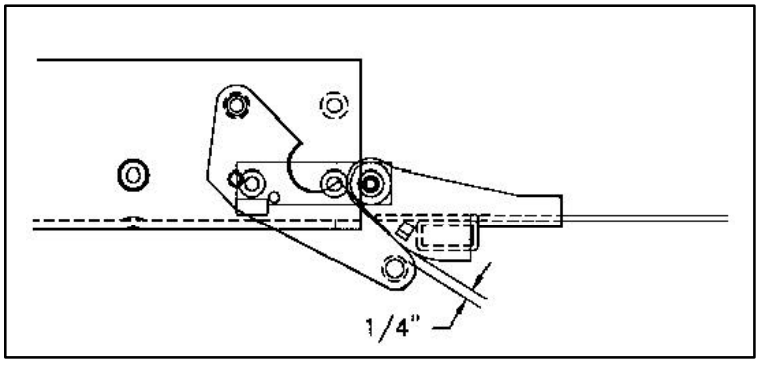

FIGURE 2-6: CORRECT PNEUMATIC SPRING LINK LENGTH

g. Reinstall the bridgeplate actuator link assemblies to their respective lifting frame arms using washers and snap rings previously removed.

D. VERIFY INSTALLATION

- Be certain there is no interference with operation of the lift by interior or exterior components.
- The lift is designed to carry the weight of a wheelchair and its passenger. The vehicle structure must be adequate to support all loads produced during lift operation, as well as forces incurred by the motion of the vehicle during driving.

⚠ CAUTION!

- Do not operate the lift electrically or manually during the load test. The load test is designed to test the installation mounting of the lift **not** its lifting capacity. Remove the test weight immediately after the test.
- When the test weight is placed on the platform, the vehicle suspension will compress and the vehicle will lean. If the weighted platform touches the ground, remove the weight, raise the platform, and retest.

- The lift must be test loaded to 125% of its rated 660 pound load capacity to verify the integrity of the installation. Position the lift platform 2" - 6" above the ground, place **825** pounds in the center of the platform, and inspect the lift mounting points. REMOVE THE TEST WEIGHT.
- Run the lift through several complete cycles to verify proper operation.

E. CUSTOMER ORIENTATION

IMPORTANT

~ Customer Orientation ~

Ricon Sales/Product Support must review the Warranty and Operator Manual with the customer to be certain he/she understands the safe operation of the lift. Instruct the customer to always follow the operating instructions without exception.

- Refer to **Figure 2-7** and verify that all decals are properly located and affixed as shown

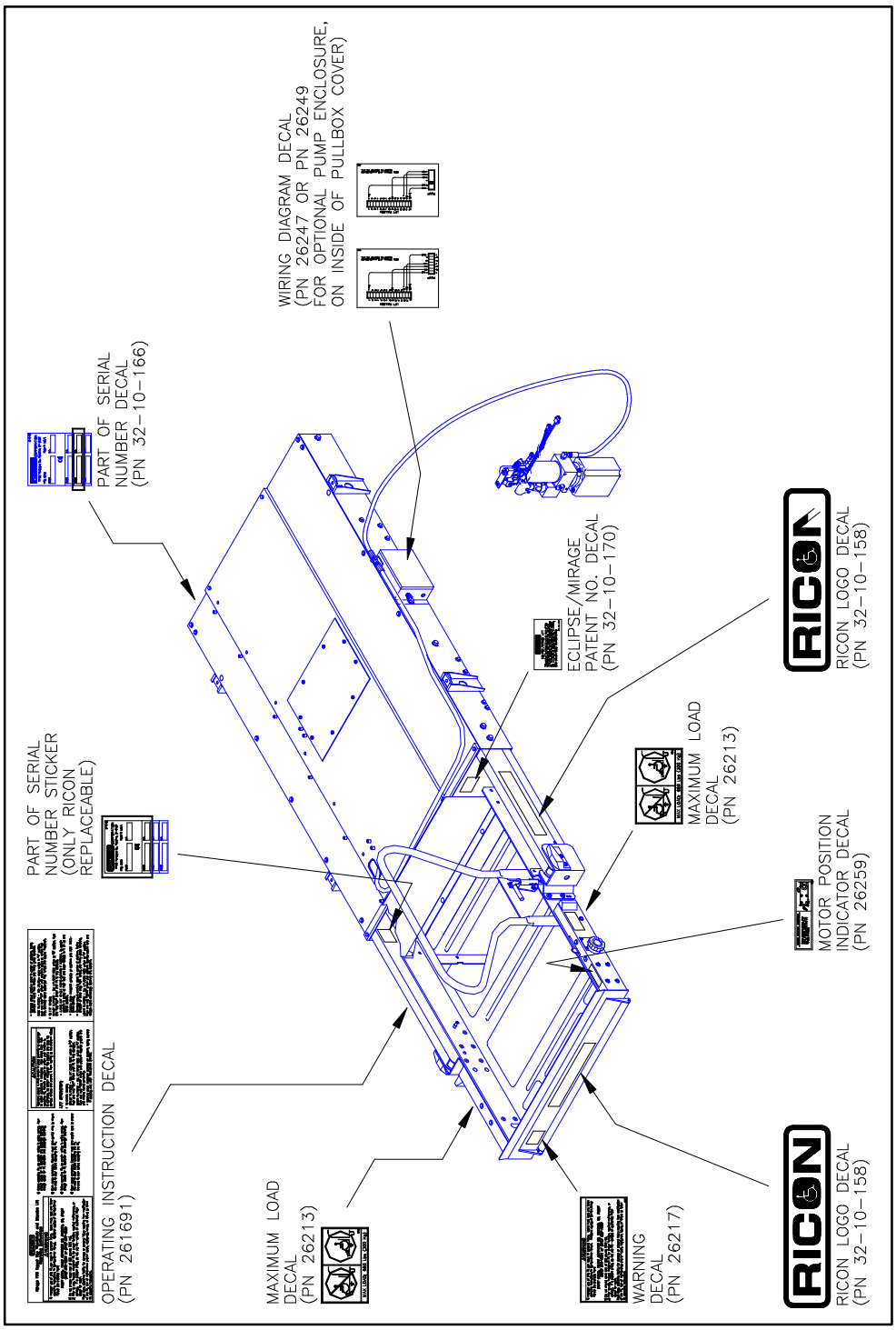

FIGURE 2-7: DECAL LOCATIONS AND PART NUMBERS

III. MAINTENANCE

Regular maintenance of the RICON Mirage F9B Series Export Use Wheelchair and Standee Lift is required to verify its optimum performance and reduce the need for repairs. This chapter contains cleaning and lubrication instructions, maintenance schedule, troubleshooting section, and maintenance diagrams.

⚠ WARNING!

THIS RICON PRODUCT IS HIGHLY SPECIALIZED. MAINTENANCE AND REPAIRS MUST BE PERFORMED BY AN AUTHORIZED RICON SERVICE TECHNICIAN USING RICON REPLACEMENT PARTS. MODIFYING OR FAILING TO PROPERLY MAINTAIN THIS PRODUCT WILL VOID WARRANTY AND MAY RESULT IN UNSAFE OPERATING CONDITIONS.

A. MAINTENANCE SCHEDULE

Maintenance inspections must be performed by an authorized Ricon service technician at least once every six months or sooner, depending on usage. Maintenance inspections are required at least every six months and a thorough inspection should be performed at the service intervals referenced in **Table 3-1**. Under conditions of excessive use (more than 10 cycles per day), service should be increased.

TABLE 3-1: MAINTENANCE SCHEDULE

SERVICE POINT	DESCRIPTION
DAILY SAFETY CHECK (or @ 10 - 20 cycles of operations)	
LIFT IN STOWED POSITION	
Lift Mountings and Support Points	Verify that all lift mounting and support points are in proper order and free from damage. Verify that all mounting bolts are of appropriate grade and fastened properly. Verify carriage stops are fastened properly.
DEPLOY LIFT TO FULL EXTENSION AT STOW LEVEL	
Labeling and Signage	Verify Rated Load Capacity decal is affixed properly, clearly visibl, and legible. Replace if necessary. Verify all Operating Instruction decals and labels are affixed properly, clearly visible and legible. Replace if necessary.
General Operation Stow/Deploy	Listen for any abnormal noises as the lift deploys (i.e, grinding or binding noises). Torque Limit Clutch overloads properly at end of travel. Carriage stops are in place and stop lift squarely.
Main Lifting Pivots	Verify carriage/lifting frame/platform pivot pins are installed properly, free from damage and locked in position with proper fasteners. Verify all cotterpins are engaged and secured properly. Verify hydraulic cylinder pivot pins are free from damage and locked in position with proper fasteners.
Platform and Platform Attachment Points	Verify platform operates properly during lift and stow modes without obstruction(s). Verify all welds on carriage brackets, lifting frame and platform mounting brackets are in proper order. Verify platform mounting brackets are properly fastened to both sides of the platform with the appropriate bolts.
Handrail and Hand-rail attachment	Verify handrail pivots properly and all fasteners are properly tightened on models so equipped.
RAISE PLATFORM (VEHICLE FLOOR LEVEL)	
Bridge Plate and Bridge Plate Operation	Verify bridge plate functions properly during deploy and stow operations without obstruction(s), and that the lift platform stops at vehicle floor level. Verify the pneumatic springs and snap rings are present and seated properly.
LOWER PLATFORM (GROUND LEVEL)	
Rollstop and Rollstop Operation	Verify rollstop operates properly on contact with the ground. Verify rollstop opens, closes and locks properly without obstructions. Verify roll stop return springs are in proper order, if so equipped.

TABLE 3-1: MAINTENANCE SCHEDULE	
SERVICE POINT	**DESCRIPTION**
STOWING LIFT	
Proper Stow Level	Verify lift seeks proper stow level (see Chapter V, Repair).
Torque Limit Clutch	Torque Limit Clutch overloads properly at end of travel.
BI-WEEKLY SAFETY CHECK (or @ 140 - 180 cycles of operation)	
Labeling, Decals, and Cleaning	Verify that the Rated Load Capacity decal is affixed properly, clearly visible, and legible. Replace if necessary. Verify that all Operating Instruction decals are affixed properly, clearly visible, and legible. Replace if necessary. Verify that serial number is clearly marked, legible, and visible. After washing vehicle, verify that points requiring lubrication are lubricated (see Chapter V, Repair). • Rollstop pivot points and springs. • Handrail slam locks and pivot points. • Bridgeplate pivot points, actuator pivot points, and cam followers (see Chapter V, Repair).
Stow/Deploy Drive Mechanism	Verify there are no obstructions in the side channels
THREE MONTH SAFETY CHECK (or @ 900 - 1000 cycles of operation)	
Stow Limit	Verify the lift will seek the proper level when stow mode is selected. Check limit switch settings and adjust if necessary (see Chapter V, Repair).
Drive Chains and Shafts	Spray lubricant, Curtisol Red Grease #88167, on final and primary drive chains and wipe clean any excess grease from drive chains and surrounding areas.
Main Lifting Arm and Bridgeplate Pivot Points	Spray lubricant, Curtisol Red Grease #88167, on ball and socket joints at lifting arms, bridgeplate pivot points and rod endpoints. Wipe clean any excess grease from parts and surrounding areas.
Hydraulic Fluid Level	Verify that the hydraulic fluid level is maintained at the required "full" level. Add only Texaco 01554 Aircraft Hydraulic Oil (or equivalent U.S. mil spec H5606G oil).
ANNUAL SAFETY CHECK (or @ 3600 - 4000 cycles of operation)	
Stow/Deploy Drive Mechanism	Verify that the torque limit clutch operates within recommended tolerances (see Chapter V, Repair).
Cam Followers	Grease cam followers with an approved grease and wipe clean any excess grease from cam followers and surrounding areas.
Drive Chains and Shafts	Check drive chain tension and adjust if necessary. Verify that spur gears and final drive sprocket are securely pinned to main drive shaft. Verify that torque limit clutch and final drive sprocket are securely pinned to idler shaft. Spray lubricant, Curtisol Red Grease #88167, on drive chains and wipe clean any excess grease from drive chains and surrounding areas.
Hydraulic Pump Unit	Extract, refill, extract again, and refill Hydraulic Pump Unit to the required "full" line at rear of pump using Texaco 01554 Aircraft Hydraulic Oil (or equivalent U.S. mil spec H5606G oil). Refer to Chapter V, Repair of this manual for disassembly instructions of hydraulic fittings and/or lines.
Hydraulic Cylinder/ Flow Control Valve/ Hoses, Lines and Seals	If hydraulic fluid is low, inspect the following for evidence of leaks: • Hydraulic Cylinder and Flow Control Valve. • Verify that hydraulic hoses are not damaged. • Verify that all seals are seated properly and all fittings are tightly secured.

SEVEN YEAR SAFETY CHECK (or @ 36,000 - 38,000 cycles of operation)	
UP/DOWN Switch	Replace UP/DOWN Switch.
STOW/DEPLOY Switch	Replace OUT/IN Switch.
Pump Motor Brush Assembly	Replace pump motor brushes per instructions in Chapter V, Repair of this manual.
TEN YEAR SAFETY CHECK	
*RICON CORP. strongly recommends that this lift be refit after five years of use.	
END OF TABLE	

B. TROUBLESHOOTING

The troubleshooting guides are designed to provide logical starting points to locate general problems that could occur with the lift. However, not all possible problems or combinations of problems are listed. The guides do not incorporate routine safety precautions or preliminary procedures and assume that the vehicle battery is fully charged and the battery terminals/connectors are clean and tight. For troubleshooting the lift, refer to the following sections:

⚠ WARNING!

THE TROUBLESHOOTING GUIDES DO NOT INCORPORATE ROUTINE SAFETY PRECAUTIONS OR PRELIMINARY PROCEDURES. A TRAINED, AUTHORIZED RICON SERVICE TECHNICIAN MUST PERFORM TROUBLESHOOTING DURING THE RICON WARRANTY PERIOD. AFTER THE WARRANTY PERIOD, IT IS RECOMMENDED THAT TROUBLESHOOTING CONTINUE TO BE PERFORMED BY AN AUTHORIZED RICON SERVICE TECHNICIAN.

1. INTERLOCK INDICATOR DIAGNOSTICS

The purpose of an interlock system is to interfere with the operation of the lift if an unsafe condition is present. When interlock systems are added to the lift, the light is an indication whether or not the interlock is operating properly. The light is placed within the electrical system so that no matter which interlock system/method is used, the light will be ON when the interlock allows operation of the lift and OFF when the interlock has disabled the lift. When there is no interlock system installed, the light stays illuminated at all times.

On all lift assemblies **without** the optional door operator, there is a light-assembly installed in the position where the door operator circuit breaker would normally be mounted. The light indicates when power is being supplied to the signal portion of the electrical system. The signal portion of the electrical system is the most complicated, and hardest to troubleshoot part of the lift, the light will aid in diagnosing electrical problems. Refer to **Table 3-2**:

TABLE 3-2: INTERLOCK INDICATOR TROUBLESHOOTING GUIDE	
SYMPTOM	**POSSIBLE CAUSE**
Light is not lit; lift does not operate.	Control system circuit breaker is tripped.
	Interlock system is not allowing power to the lift due to an unsafe condition or a faulty interlock.
Light is not lit; lift operates.	Light needs to be replaced.
Light is lit; lift works in an unsafe condition.	Interlock is not functioning.
Light is lit; lift does not operate.	There is a problem with the electrical system, either with the power or the signal side. Both will have to be checked, but start with the power side since it is less complicated.
END OF TABLE	

2. LIFT OPERATIONAL TROUBLESHOOTING

TABLE 3-3: OPERATIONAL TROUBLESHOOTING GUIDE			
SYMPTOM		**POSSIBLE CAUSE**	**REMEDY**
ROLLSTOP DOES NOT OPEN		Obstruction of rollstop release latch.	Raise lift and remove obstruction.
NO LIFT OPERATION		Manufacturer's Interlock Circuitry.	Check manufacturers interlock circuitry.
		Control System Circuit Breaker tripped.	Reset circuit breaker.
		Main Circuit Breaker tripped.	Reset circuit breaker.
IN OR OUT FUNCTIONS	Abnormal Operation.	Obstruction in lift carriage.	Remove obstruction and check for any damage
	No Operation.	Control System Circuit Breaker tripped.	Reset circuit breaker.
		IN/OUT Motor Circuit Breaker tripped.	Reset circuit breaker.
UP OR DOWN FUNCTIONS	Abnormal Operation.	Obstruction in lifting frame.	Remove obstruction and check for any damage
		Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
	No Operation.	Control System Circuit Breaker tripped.	Reset circuit breaker.
		Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
		Hydraulic hose or fitting leak.	Contact an authorized Ricon service technician for repair.
MANUAL FUNCTIONS	Abnormal Operation.	Obstruction in lifting frame.	Remove obstruction and check for any damage
		Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
	No Operation.	Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
		Hydraulic hose or fitting leak.	Contact an authorized Ricon service technician for repair.
END OF TABLE			

TABLE 3-4: MAINTENANCE TROUBLESHOOTING GUIDE

FUNCTION	SYMPTOM	POSSIBLE CAUSE	REMEDY
Platform OUT/ DEPLOY	Platform does not deploy when the OUT switch is pressed. Lift does NOT make noise.	Vehicle safety interlock not properly engaged.	Engage safety interlock
		Control System circuit breaker tripped.	Reset circuit breaker.
		IN/OUT Motor circuit breaker tripped.	
		Lift Main circuit breaker tripped.	Reset circuit breaker (located in engine/battery compartment).
		Vehicle Safety Interlock Circuit failure.	Verify proper operation of Vehicle Safety Interlock Circuit. Repair as necessary.
		Platform Level Switch Harness not connected properly.	Verify proper connection of Platform Level Switch Harness (connection to On-Board electric box).
		Main Harness not connected properly.	Verify proper connection of Main Harness to On-Board electric box, pull-box terminal strip, and Lift Control Box terminal strip.
		Spider Harness not connected properly.	Verify proper connection of Spider Harness connector to On-Board electric box).
		Seek switch not actuated.	Verify proper adjustment of Stow Level switches. Adjust if required.
		Control Pendant electrical connector not connected properly.	Verify proper connection.
		IN/OUT motor electrical connectors not connected properly.	Verify proper connection.
		IN/OUT switch failure.	Verify proper electrical operation. Replace if required.
		Out (CROUT) Relay failure.	Replace relay.
		In (CRIN) relay failure.	
		Seek switch failure.	Verify proper electrical operation of Seek switch. Replace Seek switch and verify proper Stow Level switch adjustment if required.
		Control System circuit breaker tripped.	Reset circuit breaker.
		IN/OUT Motor circuit breaker tripped.	
		Lift Main circuit breaker tripped.	Reset circuit breaker (located in engine/battery compartment).
		OUT Relay Arc Suppression diode failure.	Verify operation of Arc Suppression Diode. Replace circuit board in On-Board electric box if required.
		IN/OUT motor failure.	Replace motor.
		Drive chain broken or missing.	Verify presence, tension and operation of drive chains. Replace if required.
		Obstruction blocking platform (possible foreign object on step or in lift cassette).	Inspect front of platform for possible obstruction. Remove any obstruction present.

	Platform does not deploy when the OUT switch is pressed. Lift makes continuous "clicking" or "knocking" noise.	Platform was previously stowed too high within cassette.	Open manual down valve to release hydraulic pressure (and lower platform). Close manual down valve and again try to deploy platform. Verify proper adjustment of Stow Level switches. Adjust Stow Level switches if required.
		Torque Limit Clutch too loose.	Adjust Torque Limit Clutch.
Platform DOWN	Platform does not lower when DOWN switch is pressed.	Platform not fully deployed.	Deploy platform fully.
		Hydraulic hose not properly connected to hydraulic cylinder.	Verify proper connection of hydraulic hose to hydraulic cylinder (hydraulic Quick-Connect).
		OUT switch not adjusted properly.	Verify proper adjustment of switch.
		Down Solenoid Valve electrical connector not connected properly.	Verify proper connection.
		UP/DOWN switch failure.	Verify proper electrical operation of switch. Replace if required.
		OUT switch failure.	Verify proper electrical operation of switch. Replace if required.
		Obstruction of Flow Control Valve.	Flush hydraulic system
		Down Solenoid Valve (DWNSV) failure.	Replace solenoid valve.
	Platform does not lower manually.	Hydraulic hose not properly connected to hydraulic cylinder.	Verify proper connection.
		Obstruction of Flow Control Valve.	Flush hydraulic system.
Platform UP	Platform does not rise when UP switch is pressed. No pump motor spin noise is emitted by Hydraulic Power Unit.	Platform not fully deployed.	Deploy platform fully.
		Hydraulic Pump Motor electrical connectors not connected properly.	Verify proper connection.
		Platform Level Switch Harness not connected properly.	Verify proper connection of Platform Level Switch Harness connector (connection to On-Board electric box).
		TOP switch not adjusted properly.	Verify proper adjustment.
		UP/DOWN switch failure.	Replace switch.
		TOP switch failure.	Verify proper electrical operation. Replace if required.
		Pump Contactor (CRPMP) failure.	Replace contactor.
		Hydraulic Pump Motor failure.	Replace Hydraulic Power Unit.
	Platform does not rise when UP switch is pressed. Pump motor spin noise is emitted by Hydraulic Power Unit.	Hydraulic Manual Release Valve is open.	Close Manual Release Valve fully.
		Hydraulic hose not properly connected to hydraulic cylinder.	Verify proper connection of hydraulic hose to cylinder (hydraulic Quick-Connect).
		Obstruction of Flow Control Valve.	Flush hydraulic system.
		Down Solenoid Valve failure.	Replace solenoid valve.
		Contamination of Hydraulic manual Back-Up Pump.	Flush hydraulic system.
		Hydraulic Manual Back-Up Pump failure.	Replace Hydraulic Power Unit.

	Platform does rise when UP switch is pressed, but lowers when switch is released.	Hydraulic Manual Release Valve is partially open.	Close Manual Release Valve.
		Down Solenoid Valve failure.	Replace solenoid valve.
		Contamination of Hydraulic Manual Back-Up Pump.	Flush hydraulic system.
		Hydraulic Manual Back-Up Pump failure.	Replace Hydraulic Power Unit.
Platform IN/ STOW	Platform does not stow when IN and IN-LOCKOUT switches are pressed. Lift does NOT make noise.	IN Relay failure.	Replace relay.
		IN Relay Arc Suppression Diode failure.	Replace circuit board in On-Board electric box.
		OUT Relay failure.	Replace relay.
	Platform attempts to stow too low when IN and IN-LOCKOUT switches are pressed.	Improper operation sequence.	Use correct operating sequence.
		STO1 switch not adjusted properly.	Verify proper adjustment of switch.
		STO2 switch not adjusted properly.	
		TOP switch not adjusted properly.	
		Hydraulic Pump Motor electrical connector not connected properly.	Verify proper connection.
		STO1 switch failure.	Replace switch.
		STO2 switch failure.	
		TOP switch failure.	Replace switch.
		Pump Contactor failure.	Replace contactor.
		Hydraulic Pump Motor failure.	Replace Hydraulic Power Unit.
		Hydraulic Pump failure.	
	Platform attempts to stow too high when IN switch is pressed.	STO1 switch not adjusted properly.	Verify proper adjustment of switch.
		STO2 switch not adjusted properly.	
		Down Solenoid Valve electrical connector.	Verify proper connection.
		STO1 switch failure.	Replace switch.
		STO2 switch failure.	
		Obstruction of Flow Control Valve.	Flush hydraulic system.
		Down Solenoid Valve failure.	Replace solenoid valve.
	Platform does not stow when IN switch is pressed. Lift makes continuous "clicking" or "knocking" noise.	Platform not stowing at proper level.	Verify platform stow level adjustment and operation.
		Obstruction blocking movement of platform (foreign object in lift cassette, hydraulic hose and main harness tangle).	Inspect front of platform for possible obstruction. Remove any obstruction present.
		Torque Limit Clutch too loose.	Verify proper adjustment of Torque Limit Clutch.
	Platform oscillates vertically while attempting to stow.	Platform Stow Level switches (STO1 and STO2 and Seek) not adjusted properly. (Switches may be too far apart.)	Verify proper adjustment switches.

END OF TABLE

C. ELECTRICAL WIRING DIAGRAM

1. DIAGRAM LEGENDS

a. COLOR CODES

TABLE 3-5: COLOR CODE DEFINITIONS			
LETTER	**COLOR**	**LETTER**	**COLOR**
BK	Black	R/BK	Red w/ Black
BL	Blue	VI	Violet
BR	Brown	VI/BK	Violet w/ Black
GN	Green	W	White
GN/BK	Green w/ Black	W/BK	White w/ Black
GY	Grey	W/O	White w/ Orange
O	Orange	Y	Yellow
O/BK	Orange w/ Black	Y/BK	Yellow w/ Black
R	Red		
END OF TABLE			

b. Connectors

Refer to **Figure 3-1**. The standard electrical connectors used by Ricon are Molex .062" Series. These connectors have terminal numbers stamped onto the rear. Use these numbers and colors to identify all wires.

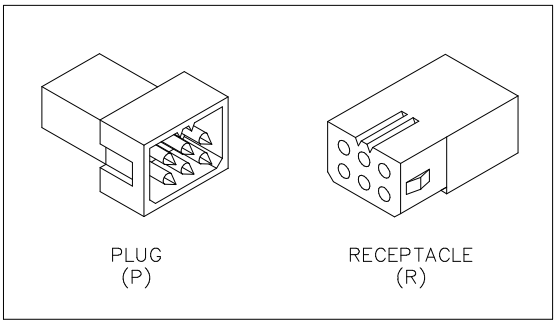

FIGURE 3-1: MOLEX CONNECTORS

c. Labels

+VDC(rating)	Supply voltage (12 or 24 volt). Circuit rating is also given.
C OUT	Carriage out signal.
CRRO	Rollstop Open Control Relay
CRIN	In Control Relay.
CROUT	Out Control Relay.
CRPMP	Pump Control Relay.
CRRC	Rollstop Close Control Relay
CS	Carriage stow signal.
CS1–CS3	Control switches located on Interior & Exterior Control Panels.
CTR	Cycle counter.
DWN SQ	Down Seqence – Lift lowering, followed by flap opening.
DWNSV	Down Solenoid Valve.
RS O SG	Rollstop Open Signal
RS O	Rollstop Open – Provides power to rollstop motor.
RS C	Rollstop Close – Provides power to rollstop motor.
RS C SG	Rollstop Close Signal
GND	Ground (Electrical).
GRND	Ground Switch.
I/O COM	Common terminal of IN/OUT switch
I/O M I	IN/OUT Motor In – Power to the IN side of the IN/OUT motor.
I/O M O	IN/OUT Motor Out – Power to the OUT side of the IN/OUT motor.
I/O MOT	IN/OUT Motor.
IN	In function.
OUTSW	Out Switch.
OUT	Out Signal.
P UP SG	Pump UP Signal – Signal to the pump solenoid.
PMOT	Pump Motor.
RSMOT	Roll Stop Motor.
RSTP	Roll Stop Switch.
SEEK	Seek level detector – Determines the level at which the lift will stop when raising or lowering the lift while stowing. Horizontal platform travel is only permitted while th SEEK level is detected. To prevent the disabling of horizontal platform travel while the platform is still in the mounting frame, the SEEK detection range is wider than the range of physically possible horizontal travel heights. When properly adjusted, the detection range center coincides with the center of the horizontal travel path. Switches STO1 and STO2 are used to define a "tighter" range around this center.
STO1	Bottom of STOW range detector. If while stowing or deploying the lift the platform is ABOVE this detection range, the platform will lower. The intersection of ranges STO1 & STO2 define the normal traveling height.
STO2	Top of STOW range detector. If while stowing or deploying the lift the platform is BELOW this detection range, the platform will rise. The intersection of ranges STO1 & STO2 define the normal traveling height.
STWD	Carriage Stowed Switch.
TOP	Top of travel detector.
U/D COM	Common terminal of the UP/DOWN switch.
UP SQ	UP Sequence – Signal which enables the UP sequence (flap up followed by platform up).
UP	Up function.
DWN	Down function.
PCSOL	Power Cut–off Solenoid.
MTR IN SG	Motor In Signal.
MTR OUT SG	Motor Out Signal.
UPA	Up Attempt.
RST O SG	Rollstop Open Signal.
RST C SG	Rollstop Close Signal.

d. Symbols

Figure 3-2 shows symbols used on the electrical wiring diagrams.

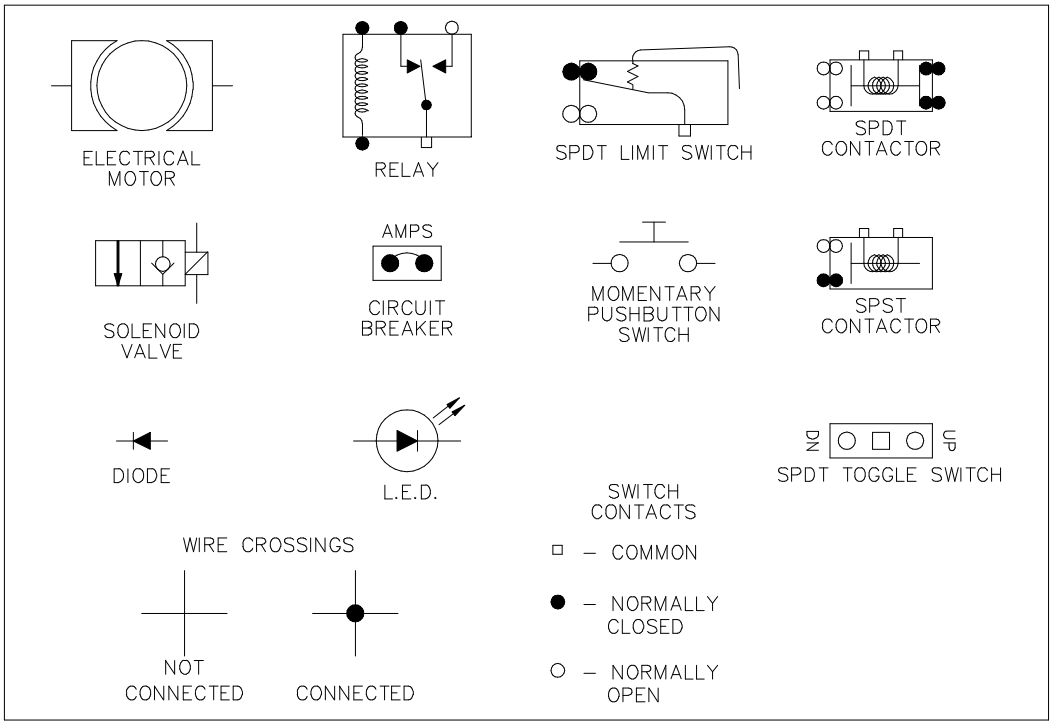

FIGURE 3-2: DIAGRAM SYMBOLS

2. LIMIT SWITCH STATE DESCRIPTION

Refer to **Figure 3-3**. The limit switch actuation diagram shows the state of all limit switches as the platform travels from ground level, to stowing level, and to vehicle floor level. The solid (") line indicates the normally CLOSED portion of the switch is operational, while the two thin lines (=) indicates the normally OPEN portion of the switch is operational. The dotted lines (" " ") are used to show the switch states beyond the normal travel boundaries of the platform. This is useful in showing the operation of the TOP switches, which change states at vehicle floor level. For proper operation of the lift, the SEEK, STO1, and STO2 switch actuations must overlap as shown.

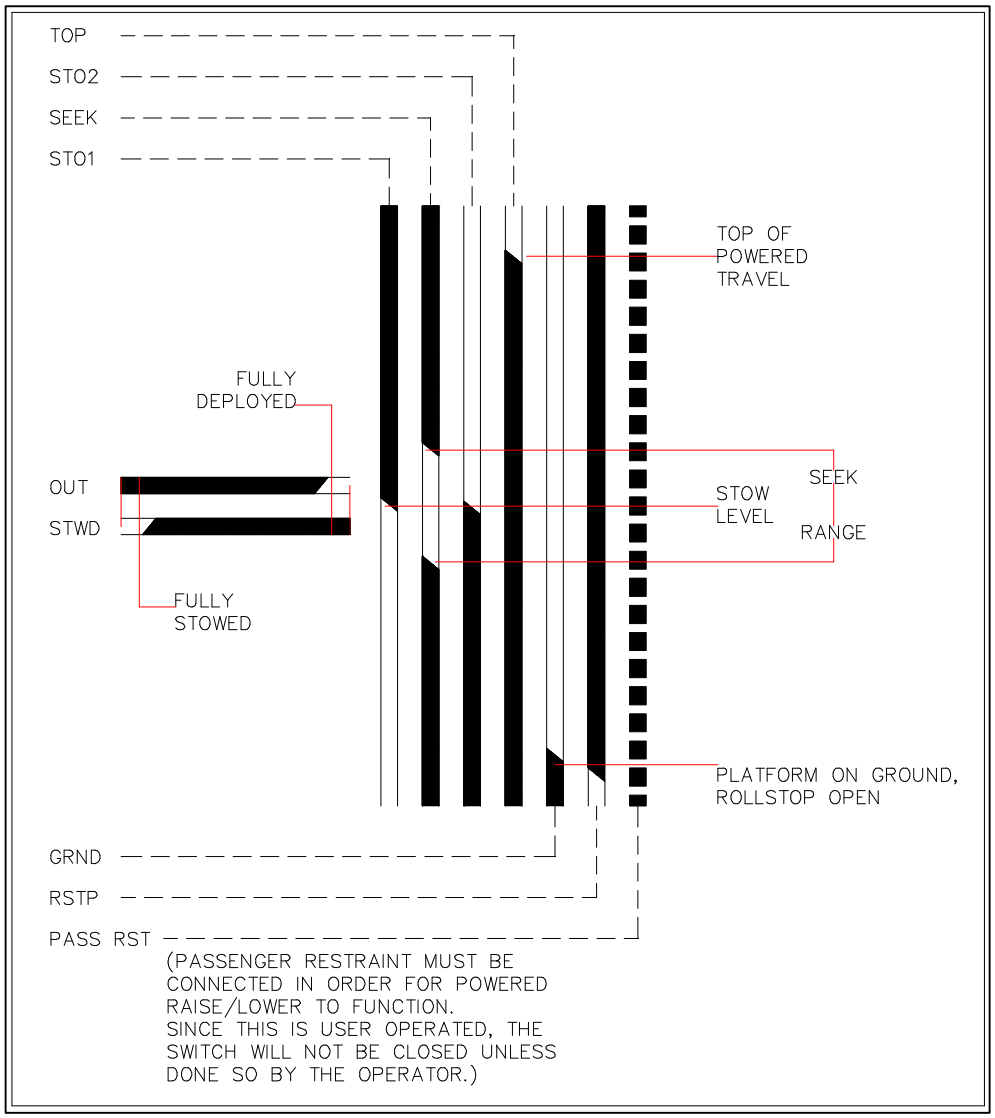

FIGURE 3-3: LIMIT SWITCH ACTUATION DIAGRAM

3. WIRING DIAGRAMS

Refer to following pages.

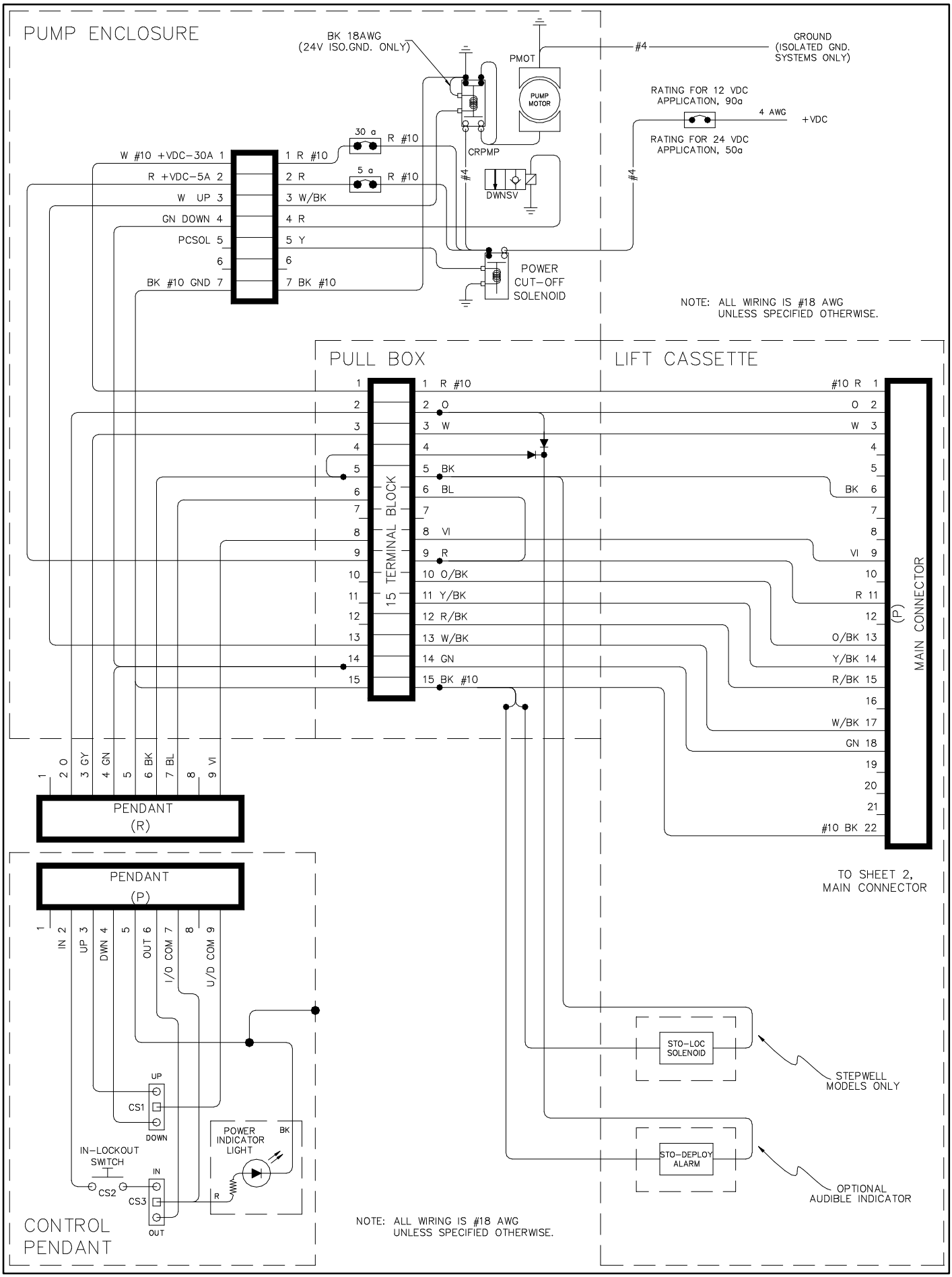

FIGURE 3-4: WIRING DIAGRAM – SHEET 1 OF 3

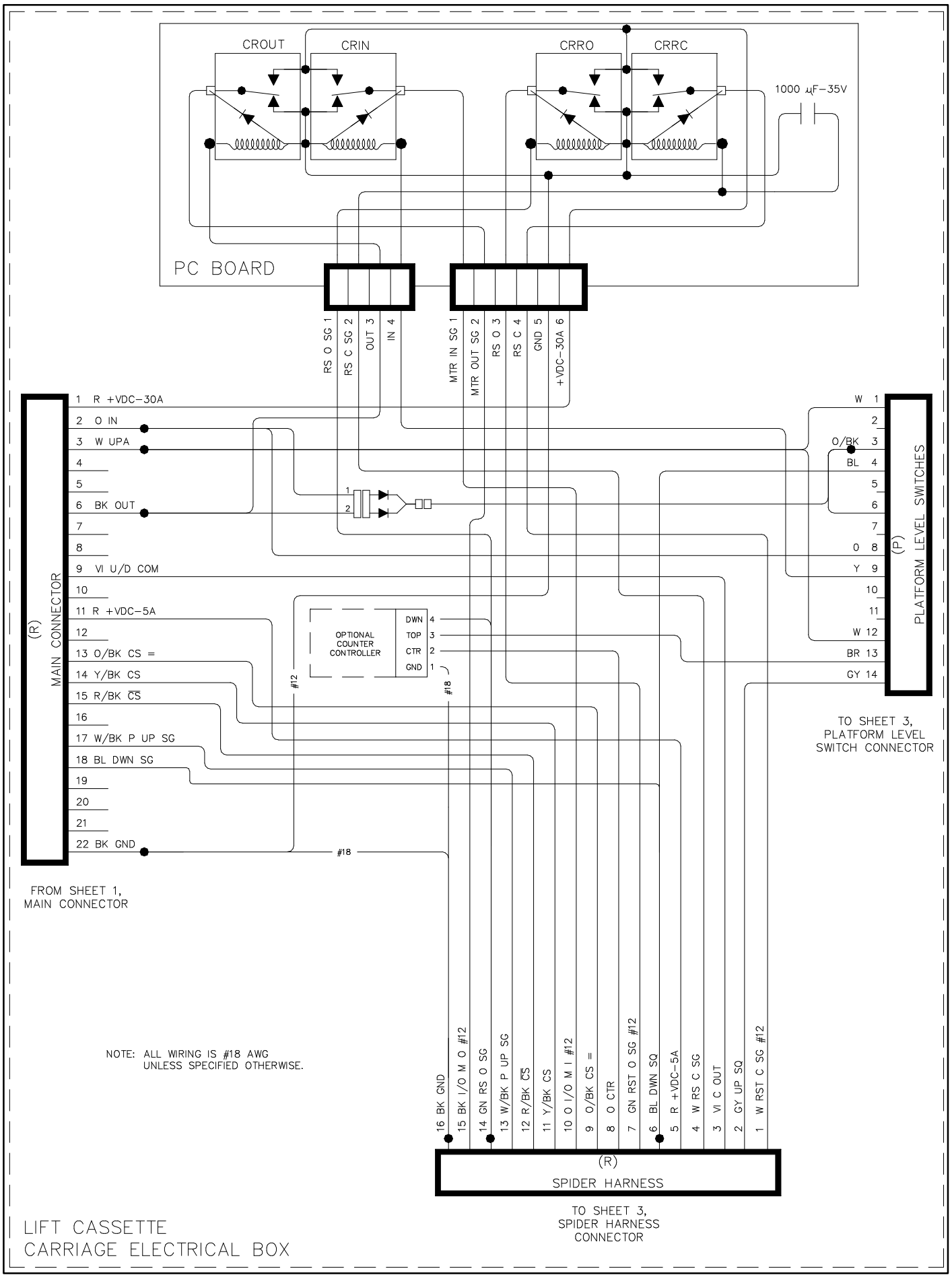

FIGURE 3-5: WIRING DIAGRAM – SHEET 2 OF 3

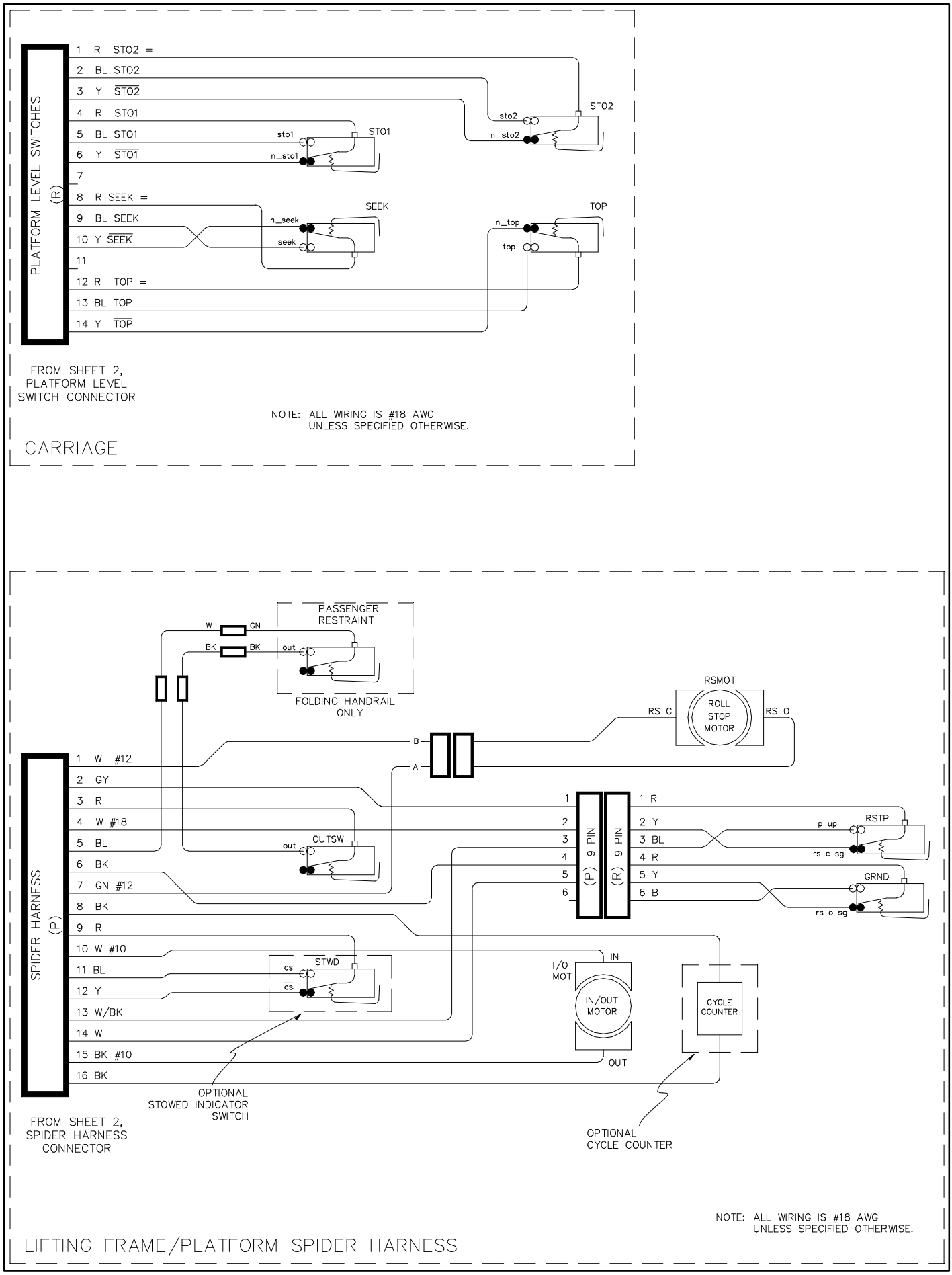

FIGURE 3-6: WIRING DIAGRAM – SHEET 3 OF 3

IV. MAJOR LIFT SYSTEMS REPAIR

A. LIFT SERVICE ACCESS

Refer to **Figure 4-1**. Access to the internal components of the RICON Mirage F9B Series Export Use Wheelchair and Standee Lift for service is from the underside of the unit. The service access panel is located at the front end of the enclosure just behind the step riser from which the lift extends. To gain access to the underside, remove the retaining bolts (4 ea.) along the front and rear edges of the panel, and remove panel from the lift.

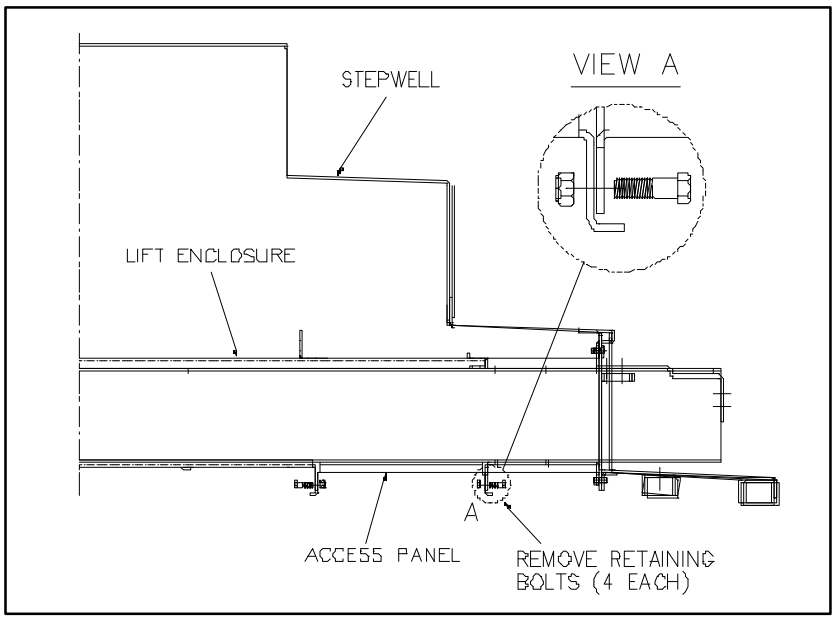

FIGURE 4-1: LIFT SERVICE ACCESS

The lifting system is operable whenever the hydraulic pump unit is activated either electrically or manually. While the pump unit functions to create hydraulic pressure as hydraulic fluid is pumped into the hydraulic cylinder, this hydraulic cylinder, in correlation with the lifting arm structure, allows the lift platform to be raised and lowered.

B. TRAVELING FRAME

- **REMOVAL**

1. Refer to **Figure 4-2**.

NOTE: The traveling frame assembly is large and heavy. Removal of the assembly requires at least two people.

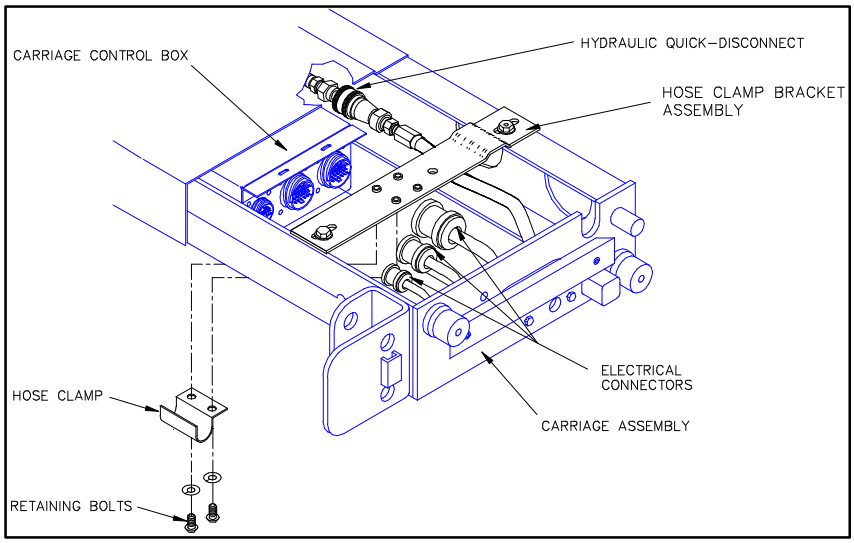

FIGURE 4-2: CARRIAGE ASSEMBLY

2. Fully deploy the lift.
3. Gain access to underside of lift.
4. Disable electric power to lift.
5. Adjust the torque limit clutch to allow easy movement of the lift carriage. This is accomplished by slackening the locking nut and adjusting nut on the clutch (see Section K regarding clutch adjustment).

6. Pull the traveling frame out of the lift enclosure a few inches. This will allow access, from below, to the bolts fastening the hose clamp bracket assembly to the carriage assembly.
7. Remove bolts fastening the hose clamp bracket assembly to the carriage assembly.
8. Disconnect the hydraulic quick-disconnect from the hydraulic cylinder.
9. Disconnect main electrical cable from the carriage control box.
10. Refer to **Figure 4-3**. Remove the two bolts fastening each carriage stop block to the mounting frame channel. These bolts are accessible from under the vehicle.
11. If possible, place a small cart or table in front of the lift enclosure, with a height slightly lower than the bottom of the platform at stow level. This will provide a close surface onto which the traveling frame can be placed after removal.
12. Move the traveling frame out of the lift enclosure a few inches, and lift the hose clamp bracket assembly up out of the carriage assembly and place the hose clamp bracket assembly atop the lift enclosure. The main hydraulic hose and main electrical cable should now be free of the carriage. The hose and cable will remain with the lift enclosure after the traveling frame is removed.
13. Pull the traveling frame out of the lift enclosure, while providing support to the traveling frame. The traveling frame should be removed with a worker providing support to each side of the assembly.

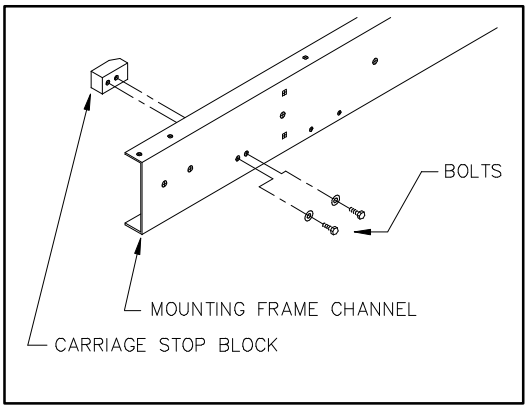

FIGURE 4-3: STOP BLOCK BOLTS

- INSTALLATION

Installation of the traveling frame is performed by repeating the removal steps in reverse order, with a few minor considerations. The main hydraulic hose, and main electrical cable need to be pulled out the front of the lift enclosure before inserting the traveling frame. After insertion of the traveling frame, the hose and cable need to be routed through the carriage in the same orientation they were in before removal, and the hose retaining bracket needs to be mounted to the carriage before the traveling frame is retracted to the stowed position.

C. PLATFORM

- REMOVAL

1. Fully deploy the lift.
2. Raise lift platform to vehicle floor level.
3. Refer to **Figure 4-4**. Remove the snap-ring fastening the bridge plate pneumatic spring to the lifting frame. Fold the bridgeplate over onto the lift platform, rotate the bridgeplate pneumatic springs parallel to the platform, and secure the bridge plate and pneumatic springs to the platform with a small rope or strap.
4. If possible, place a small cart or table in front of the lift, under the lift platform, and lower the platform down onto the cart.
5. Disable electric power to the lift.
6. Remove the platform mounting pin retaining bolts from both sides of the platform.
7. Remove guide blocks from the platform mounting brackets, both sides.
8. Remove the lower of the two platform mounting pins from the platform mounting brackets. This will free the lower parallel arms. The arms will drop out of the platform mounting brackets. At this point, the platform will be free to rotate about the upper mounting pins. Support the platform such that it maintains a horizontal orientation. These pins are easily removed by placing a small pry bar between the platform and the end of the pin, and pushing the pin out of the platform mounting bracket until the inside end of the pin is flush with bracket. The pin can then be pulled out of the mounting bracket.

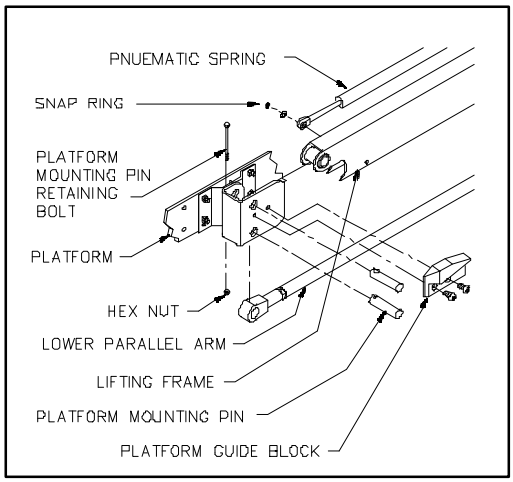

FIGURE 4-4: DISCONNECT BRIDGEPLATE

⚠ CAUTION!

Do not damage the surface of the pin during removal. If the pins outer surface is damaged (pitted or grooved) during removal, it should be discarded and replaced with a new pin.

9. Remove the upper pins in the platform mounting brackets. These pins are moved in a manner similar to the removal of the lower parallel arm pins.
10. The platform is now free and can be removed from the lifting frame.

- INSTALLATION

Installation of the platform is performed by repeating the removal steps in reverse order, with a few minor considerations. The platform mounting pins can be driven into place using a soft heavy hammer. If the pins do not drive into the brackets easily, check that the bracket and lifting frame holes are properly aligned.

D. BRIDGEPLATE LUBRICATION AND ADJUSTMENT

- LUBRICATION

1. Fully deploy the lift.
2. Raise the lift platform to a comfortable working height.
3. Refer to **Figure 4-5**. Lubricate the bridgeplate stirrup assembly cam followers using light grease, such as Curtisol Red Grease #88167. Wipe clean any excess grease.

- ADJUSTMENT

The Bridgeplate deployment is controlled by the bridgeplate pneumatic spring and hex link. To adjust the length of the spring, refer to Section II of this manual.

NOTE: This adjustment is only to be performed after the vertical travel and threshold gap have been set.

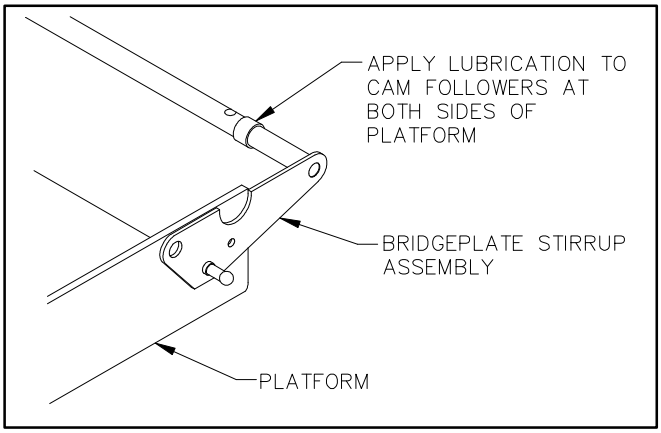

FIGURE 4-5: BRIDGEPLATE LUBRICATION DETAIL

E. ROLLSTOP LUBRICATION

1. Using the control pendant, deploy the platform ®/OUT and support the platform.
2. At the vehicle battery/engine compartment, disconnect the cable from the battery positive terminal.
3. Remove the platform left and right side channel covers.
4. At the rollstop manual control knob, use a 1/8" punch and small hammer to remove the knob retaining roll pin. Remove the control knob.
5. Remove the right and left manual release bracket assemblies.
6. Refer to **Figure 4-6**. Lubricate the pivot points of the rollstop mechanism on both sides of the platform using light grease (Curtisol Red Grease No.88167). Wipe away excess grease.
7. Reinstall the platform side channel covers.

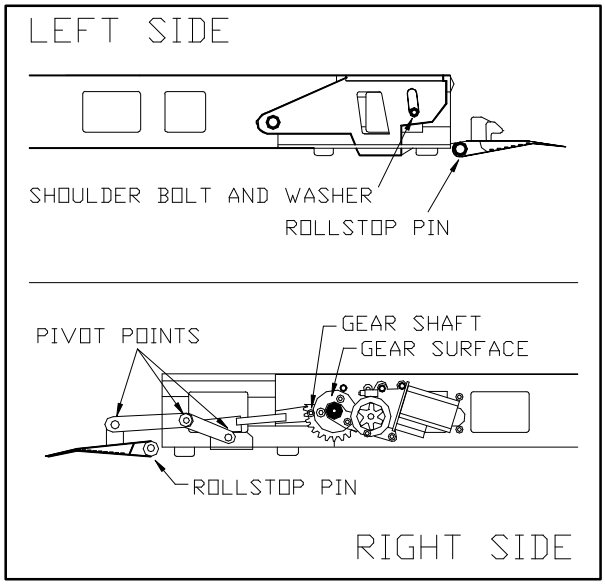

FIGURE 4-6: ROLLSTOP LUBRICATION POINTS

⚠ WARNING!

- WEAR PROTECTIVE CLOTHING AND EYE PROTECTION AT ALL TIMES. BATTERIES CONTAIN ACID THAT CAN BURN. IF ACID COMES INTO CONTACT WITH SKIN, IMMEDIATELY FLUSH AFFECTED AREA WITH WATER AND WASH WITH SOAP.
- DO NOT SMOKE OR USE OPEN FLAME IN THE VICINITY OF BATTERY. ALWAYS WORK IN PROPERLY VENTILATED AREA.
- DO NOT LAY ANYTHING ON TOP OF A BATTERY.

8. At the vehicle battery/engine compartment, connect the cable to the battery positive (+) terminal.
9. Remove platform support and stow the lift.

F. LIFTING FRAME

- REMOVAL

1. Fully deploy the lift.
2. Raise the lift platform to a comfortable working height.
3. Disable electric power to lift.
4. Remove the lift platform as described in Section C.1.
5. Raise the lifting frame as far as possible using the manual backup pump.
6. Refer to **Figure 4-7**. Remove the cotter pin retaining the pivot pins to the carriage.
7. Remove the lower parallel arms from the carriage by removing the lower pivot pin on either side of the carriage. The pivot pin can be removed by driving the pin out of the carriage with a drift and a hammer.
8. Loosen the setscrews retaining the lifting frame/cylinder pin.
9. Remove lifting frame/cylinder pin by driving it out of the carriage with a drift and hammer.
10. Loosen the setscrews retaining the center pivot pin in the carriage.
11. Raise the lifting frame as far as it will go with your hand. Have an assistant hold the lifting frame in this orientation.

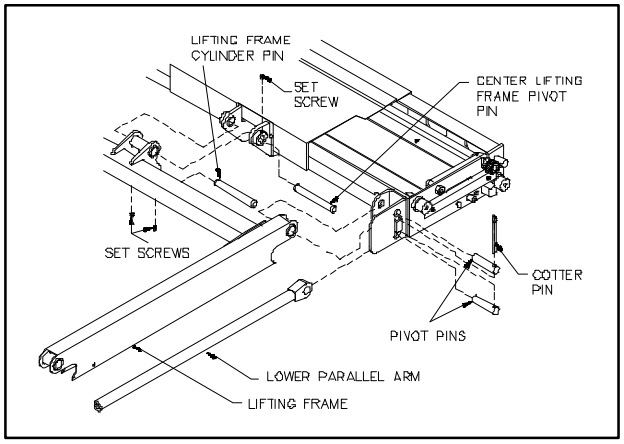

FIGURE 4-7: LIFTING FRAME REMOVAL

12. Remove the outer lifting frame pivot pins from the carriage by driving them out with a drift and hammer.
13. Remove the center lifting frame pivot pin from the carriage by driving it out with a drift and hammer while providing support for the lifting frame.
14. Pull the lifting frame away from the carriage.

- INSTALLATION

Installation of the lifting frame is performed by repeating the removal steps in reverse order, with a few minor considerations. Setscrews should be replaced using loc-TITE blue and tightened during installation. The pivot pins can be driven into place using a soft heavy hammer. If the pins do not drive into the brackets easily, check to be sure that the bracket and lifting frame holes are properly aligned.

G. DEPLOYMENT SYSTEM

The deployment system of the lift moves the platform and lifting frame out of and into the lift cassette. The following sections describe the major components of the deployment system, how they operate, how to remove and replace them, and, , how to adjust them. Refer to **Figures 4-8** and **4-9** for part identification.

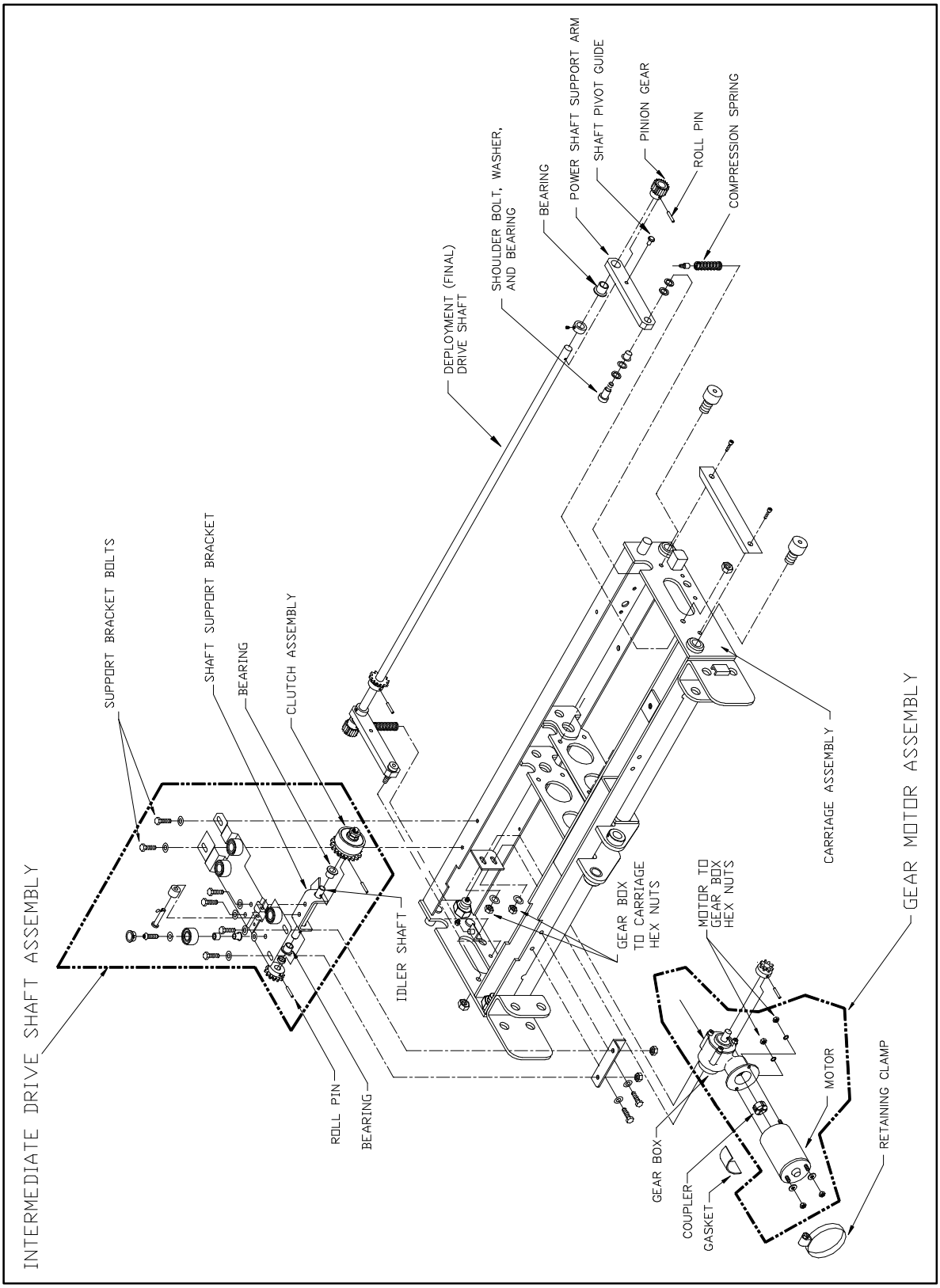

FIGURE 4-8: LIFT DEPLOYMENT SYSTEM REFERENCE DIAGRAM

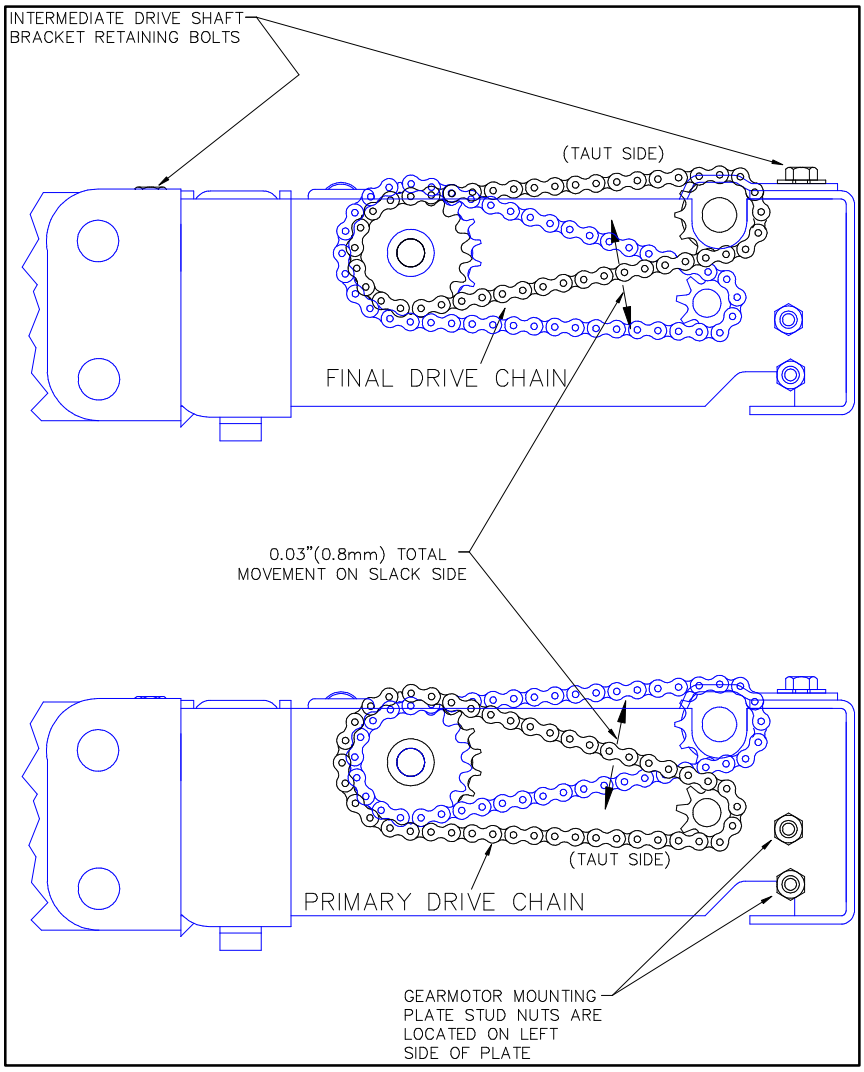

FIGURE 4-9: DRIVE CHAIN ADJUSTMENT DIAGRAM

H. DEPLOYMENT SYSTEM STOW/DEPLOY MOTOR

The Stow/Deploy Motor functions to power the deployment system. The stow/deploy motor receives electrical power from the electrical control box with a polarity, which indicates a direction of movement. The motor rotates, turning the input shaft to the gearbox. The gearbox reduces the output of the stow/deploy motor to a usable speed, and increases the torque correspondingly. The motor's rotation of the gearbox input shaft drives the gearbox output shaft. The output shaft of the gearbox drives the primary drive chain.

- **REMOVAL**

1. Fully deploy the lift and gain access to the underside of the lift (see Section A.).
2. Move the carriage assembly forward or backward using the **OUT** or **IN** function to orient the primary drive chain master link near the bottom-center of the chain for removal.
3. Disconnect electric power to the lift.
4. Loosen, but do not remove, nuts fastening the gearbox to the lift carriage.
5. Remove the motor leads located at the platform end of the motor.
6. Remove motor retaining clamp fastening motor to intermediate drive shaft mounting bracket.
7. Slide the gear motor assembly toward the lift platform.
8. Remove the primary drive chain master link and primary drive chain.
9. Remove the nuts and lock washers fastening the gearbox to the lift carriage with one hand, while supporting the gear motor assembly with the other hand.
10. Remove the gear motor assembly from the carriage.
11. Remove the nuts and washers fastening the motor to the gearbox (these are located on the mating flange of the gearbox).
12. Separate the motor from the gearbox by pulling them apart, being careful not to damage or loose the rubber coupler mating the motor output shaft to the gearbox input shaft.

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- INSTALLATION

1. Install coupler mating the gearbox input shaft to the motor output shaft onto the gearbox input shaft.
2. Place motor output shaft onto the coupler and twist motor to its proper alignment position. Push the motor studs through the gearbox holes until the motor surface and gearbox flange are in contact.

   To achieve proper alignment of the motor and gearbox:

   a. Hold motor with electrical connector studs pointing towards you, and the output shaft pointing away from you.
   b. Rotate motor about its shaft so that the electrical connectors are on the bottom.
   c. Hold gearbox with input shaft pointing towards you, and output shaft pointing to the right.
   d. Align motor studs with holes in gearbox flange.
3. Install the lock washers and nuts onto the motor studs, tightening the nuts until the washers are fully locked.
4. Place the gear motor assembly into the lift carriage, with the gearbox studs placed through the slots in the mounting tab welded to the carriage.
5. Install the lock washers and nuts that fasten the gearbox onto the carriage. Leave the nuts loose enough such that the gear motor assembly position can still be adjusted.
6. Install the motor retaining clamp, being sure to replace the vibration isolation gasket between the Stow/Deploy motor and the intermediate drive shaft mounting bracket. Allow enough slack to permit drive chain adjustment.
7. Install the primary drive chain connecting the gearbox to the clutch assembly (see Section J.2).
8. Connect the motor electrical connectors using the nuts and washers removed during removal of the motor.

I. GEARBOX

The gearbox reduces the output of the Stow/Deploy motor to a usable speed, and increases the torque correspondingly. The motor's rotation of the gearbox input shaft drives the gearbox output shaft. The output shaft of the gearbox drives the primary drive chain. Removal and installation of this part are found in the previous section, under Stow/Deploy Motor Removal and Installation.

J. DRIVE CHAINS

The driveline from the gearbox to the final drive system (gear rack and pinion) consists of a primary drive chain, and intermediate drive shaft, and a secondary drive chain. The chains transfer power from the gearbox, through the clutch mechanism, to the final drive shaft. The primary drive chain is driven by the gearbox and drives a sprocket mounted to the housing of the clutch mechanism. The final drive chain is driven by the intermediate drive shaft and drives a sprocket mounted on the final drive shaft.

- REMOVAL

1. FINAL DRIVE CHAIN

a. Fully deploy the lift and gain access to the underside of the lift (see Section A).
b. Move the carriage assembly forward or backward using the OUT or IN function to orient the final drive chain master link near the bottom-center of the chain for removal.
c. Disconnect electric power to the lift.
d. Loosen the nuts fastening the gearbox to the lift carriage.
e. Loosen the bolts fastening the intermediate drive shaft mounting bracket to the carriage. The front bolt is accessible from the top of the lift unit. The rear bolt is accessible from below through the access panel. Place an open end wrench over the top of the intermediate drive shaft mounting bracket.
f. Move the gear motor assembly away from the lift platform. A small pry bar may be inserted between the motor and the front of the carriage to gain leverage.

NOTE: DO NOT FORCE THE GEAR MOTOR**.** If it does not move easily, loosen the retaining studs or the motor retaining clamp to attain more movement.

g. Remove the final drive chain master link and final drive chain.

2. PRIMARY DRIVE CHAIN

a. Fully deploy lift and gain access to the underside of the lift (see Section A).
b. Move the master link of the primary drive chain to the bottom of the chain by pressing the OUT button. With the final drive chain removed, the intermediate drive shaft will rotate.

NOTE: If both chains are being removed, electric power to lift will need to be restored in order for the OUT button to move the chain.)

c. Disconnect electric power to the lift.
d. Loosen the motor retaining clamp that fastens the stow/deploy motor to the intermediate drive shaft mounting bracket.

e. Loosen the nuts fastening the gearbox to the lift carriage.
f. Move the gear motor assembly away from the lift platform. A small pry bar may be inserted between the motor and the front of the carriage to gain leverage.

NOTE: DO NOT FORCE THE GEAR MOTOR**.** If it does not move easily, loosen the retaining studs or the motor retaining clamp to attain more freedom movement.

g. Remove the primary drive chain master link and primary drive chain.

- **INSTALLATION**

1. FINAL DRIVE CHAIN

a. Install the final drive chain over the sprocket on the final drive shaft and over the sprocket on the intermediate drive shaft. (This should be done with the intermediate drive shaft mounting bracket in such a position that the final drive chain will be slack.)
b. Install the master link into the final drive chain.
c. Adjust the final drive chain (see Section J.3.a).

2. PRIMARY DRIVE CHAIN

a. Install primary drive chain over sprocket on gearbox output shaft, and over clutch assembly.
b. Install master link into primary drive chain. (This should be done with the gear motor assembly and intermediate drive shaft mounting bracket in such positions that the primary drive chain will be slack.)
c. Adjust the primary drive chain (see Section J.3.b).

- **ADJUSTMENT**

NOTE: When adjusting both drive chains, the final drive chain adjustment should be set first. This allows for tightening of the intermediate drive shaft mounting bracket. The primary drive chain adjustment may then be set.

1. FINAL DRIVE CHAIN

a. Loosen the bolts fastening the intermediate drive shaft mounting bracket to the lift carriage.
b. Loosen the nuts fastening the gear motor assembly to the lift carriage.
c. Make sure that the motor retaining clamp fastening the motor to the intermediate drive shaft mounting bracket is tight.
d. Move the intermediate drive shaft mounting bracket and gear motor assembly toward the lift platform. A small pry bar may be inserted between the gearbox and the back of the carriage to gain leverage.

NOTE: DO NOT FORCE THE GEAR MOTOR. If it does not move easily, loosen the gear motor assembly retaining nuts to attain more freedom of movement.

e. Adjust tension in the final drive chain.
f. Tighten the bolts fastening the intermediate drive shaft bracket to the lift carriage.
g. Adjust the primary drive chain (see next section) after adjusting the final drive chain.

2. PRIMARY DRIVE CHAIN

a. Loosen the motor retaining clamp.
b. Loosen the nuts fastening the gearbox to the lift carriage (if not already loose).
c. Move the gear motor assembly, relative to the intermediate drive shaft, away from the lift platform. A small pry bar may be inserted between the motor and the front of the carriage, but care must be exercised not to damage the motor electrical connectors.
d. Adjust the primary drive chain tension.
e. Tighten the nuts fastening the gear motor to the lift carriage.
f. Tighten the motor retaining clamp.

K. DEPLOYMENT SYSTEM TORQUE LIMIT CLUTCH

Refer to **Figure 4-10.** The clutch mechanism allows the traveling portion of the lift to come to a complete stop without stalling the Deploy/Stow motor. Torque limit clutch overload occurs normally at both extremes of travel and is characterized by a loud clicking noise. The Torque Limit Clutch is set at the factory. However, there is a "break-in" period that varies with usage, which makes adjustment necessary after approximately 500 cycles.

Proper stowing and deployment of the lift depend on the proper setting of the torque limit clutch. The torque limit clutch should be set so the lift stows and deploys normally without overloading prematurely.

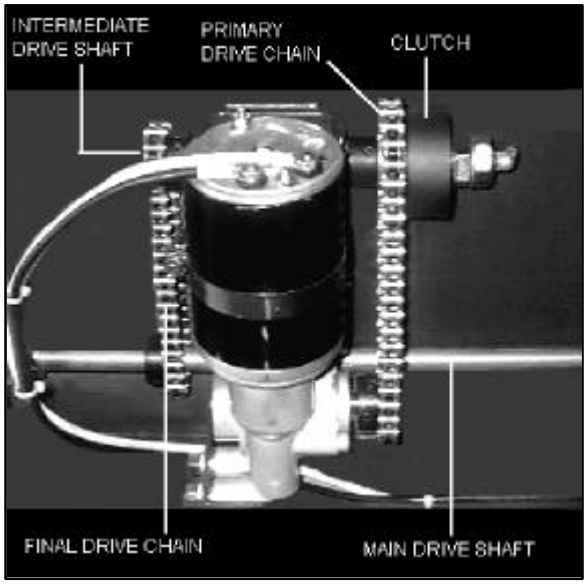

FIGURE 4-10: TORQUE LIMIT CLUTCH

- **CLUTCH REMOVAL**
  1. Fully deploy lift and gain access to the underside of the lift (see Section A).
  2. Remove the final drive chain.
  3. Remove the gear motor assembly.
  4. Remove the bolts fastening the intermediate drive shaft mounting bracket to the lift carriage.
  5. Slide the intermediate drive shaft mounting bracket away from the lift platform.
  6. Drop the end of the intermediate drive shaft mounting bracket closest to the lift platform down into the carriage assembly.
  7. Remove the intermediate drive shaft mounting bracket down through the carriage by sliding it forward and twisting it to clear the carriage assembly.
  8. Place the intermediate drive shaft mounting bracket flat side down onto a workbench.
  9. Remove the roll pin fastening the clutch assembly to the intermediate drive shaft by driving the pin out with a small drift or punch and a light hammer.
  10. Slide the clutch assembly off the intermediate drive shaft. Twisting the clutch assembly relative to the drive shaft may ease removal.

- **CLUTCH INSTALLATION**
  1. Slide clutch assembly onto the intermediate drive shaft (mounted to intermediate drive shaft mounting bracket). Twisting clutch assembly relative to the drive shaft may ease removal.
  2. Drive roll pin through clutch assembly and intermediate shaft using a light hammer and a small drift.
  3. Place intermediate drive shaft mounting bracket onto carriage by inserting the bracket up through the carriage. This may require twisting the bracket relative to the carriage, and inserting the rear end of the bracket over the carriage first, then sliding the bracket rearward, and finally placing the front of the bracket over the carriage while sliding forward. Be sure that the bracket is placed in the correct orientation (with the clutch assembly located closer to the lift platform.
  4. Insert the bolts and lock washers fastening the intermediate drive shaft mounting bracket into the appropriate slots in the motor mounting bracket and holes in the lift carriage. Tighten sufficiently lock the washers.
  5. Install the gear motor assembly.
  6. Install the drive chains.
  7. Adjust the drive chains.

- **CLUTCH ADJUSTMENT**

1. Fully deploy lift and gain access to the underside of the lift (see Section A).
2. Remove the final drive chain.
3. Measure the clutch breakaway torque. A torque wrench that retains the maximum reading (i.e. Snap-On "Torqometer" part number TE100FU or equivalent) fitted with a Ricon Torque Wrench Adapter is required. The proper torque should be set to 10.5 - 11.5 ft.lbs.
4. Engage the sprocket on the intermediate drive shaft with the Torque Wrench Adapter in preparation of turning the intermediate shaft.
5. Slowly torque the sprocket until the clutch overloads (be sure that the direction of turn is properly indicated by the torque wrench maximum reading indicator). Maximum torque will be at the point where the clutch first begins to slip.
6. Refer to **Figure 4-11**. Adjust the torque limit clutch if required.
7. Loosen the 15/16" locking nut.
8. Adjust the clutch in small increments. Clockwise to increase torque, counter-clockwise to decrease torque. Check the breakaway torque each time.
9. Tighten locking nut to 40-50 lbs. ft-lbs.
10. Install the final drive chain (see Section J.3.a).

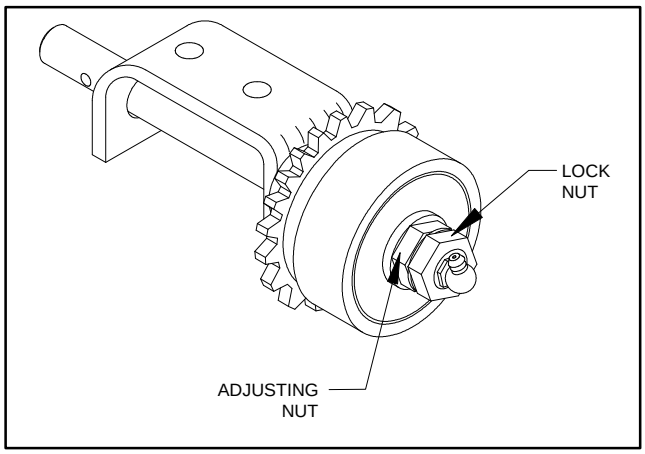

FIGURE 4-11: TORQUE LIMIT CLUTCH ADJUSTMENT

L. DEPLOYMENT SYSTEM DRIVE SHAFTS

The drive shafts transfer power between the drive chains, and from the drive chains to the final drive system (gear rack and pinion). The intermediate drive (idler) shaft, mounted on the intermediate drive shaft support bracket, is driven by the clutch mechanism. The intermediate drive shaft carries a sprocket, which drives the final drive chain. The drive shafts must be periodically removed in order to replace the bushings on which the shafts rotate.

- **REMOVAL**

1. INTERMEDIATE DRIVE SHAFT (IDLER) AND BUSHING REMOVAL

a. Remove the clutch assembly.
b. Remove the intermediate drive shaft by sliding it out of the intermediate drive shaft mounting bracket.
c. Remove the press bushings from mounting bracket and renew if necessary.

2. FINAL DRIVE SHAFT AND BUSHING REMOVAL

a. Remove the carriage from the lift cassette.
b. Remove the drive chains.
c. Remove intermediate drive shaft mounting bracket. This is described in Section K.1.
d. Remove final drive shaft compression springs: rotate shaft support arms away from carriage (upward).
e. Remove the bolts fastening the power shaft support arms to the lift carriage.
f. Remove the final drive shaft and power shaft support arms from the carriage.
g. Remove the pinion gears from the ends of the final drive shaft.
h. Slide the power shaft support arms off the final drive shaft.
i. Press the bushings out of the power shaft support arms.

- **INSTALLATION**

1. FINAL DRIVE SHAFT AND BUSHING INSTALLATION

a. Press bushings into the power shaft support arms, with the bushing flange located toward the inside of the power shaft support arms.
b. Slide the power shaft support arms onto the final drive shaft.
c. Install pinion gears onto the final drive shaft.
d. Fasten power shaft support arms to lift carriage using the hardware that was removed.

e. Place compression springs onto tabs of carriage. Rotate the power shaft support arms down onto the springs, making sure that both ends of the springs are located around the spring retention tabs.
f. Replace the final drive chain.
g. Install intermediate drive shaft mounting bracket.
h. Insert the lift carriage into the lift cassette.

2. INTERMEDIATE DRIVE SHAFT INSTALLATION

a. Press bushings into intermediate drive shaft mounting bracket, with the bushing flange located toward the outside of the bracket.
b. Slide intermediate drive shaft through bushings. Be sure to place the shaft in the correct orientation. (Hold the bracket with the shaft mount close to you and pointing down. The clutch end of the intermediate shaft should be to the right side of the bracket.)
c. Install the clutch assembly onto the intermediate shaft, and intermediate drive shaft support bracket on the lift carriage.

M. DEPLOYMENT SYSTEM GEAR RACK AND PINION

The gear rack and pinion make up the final drive system of the lift. The pinion gear is mounted on the final drive shaft, and the gear rack is mounted to the mounting frame of the lift cassette. The final drive shaft is driven by the final drive chain. The rotation of the final drive shaft turns the pinion gears meshing with the gear rack. This rotation imparts a "push" on the traveling frame, which moves the traveling frame out of, or into the lift cassette.

- REMOVAL

1. PINION GEAR

a. Remove the final drive shaft from the lift (see Section L.1.b), if not done.
b. Remove the roll pin fastening the pinion gears to the final drive shaft by driving the pin out with a small drift or punch and a light hammer.
c. Slide the pinion gears off the final drive shaft.

2. GEAR RACK

This should not be necessary for normal maintenance issues. The replacement of the gear rack requires disassembly of the lift enclosure cassette. The re-assembly of the cassette requires careful alignment of the mounting frame. This procedure is best performed at the manufacturer using the proper assembly fixture.

- INSTALLATION

1. PINION GEAR

a. With the final drive shaft installed in the power shaft support arms, slide the pinion gear onto the final drive shaft, making sure the gear is oriented properly.
b. Drive roll pins into pinion gear using a small drift or punch and a light hammer.
c. Install the final drive shaft.

2. GEAR RACK

This should not be necessary for normal maintenance issues. The replacement of the gear rack requires disassembly of the lift enclosure cassette. The re-assembly of the cassette requires careful alignment of the mounting frame. This procedure is best performed at the manufacturer using the proper assembly fixture.

N. HYDRAULIC SYSTEM

The hydraulic system of the lift consists of three major components, the hydraulic pump, hydraulic cylinder, and hydraulic hoses. The following sections describe the major components and how to care for them.

- HYDRAULIC POWER UNIT FLUID FLUSH AND RENEWAL

1. Deploy lift fully.
2. Manually release the hydraulic pressure by opening the manual release valve. (This will lower the lift platform).
3. Loosen clamp fastening the tank to the pump.
4. Carefully pull tank off the bottom of the pump, and empty the tank into a proper waste fluid container.
5. Replace tank on the bottom of the pump and tighten the tank clamp.
6. Remove the plug on the top of the tank. Fill the tank with new hydraulic fluid. Fill only with Texaco 1554 aircraft hydraulic fluid (or equivalent U.S. mil spec H5606G oil).
7. Close manual release valve.
8. Raise lift platform to vehicle level and lower platform to ground level. Repeat this cycle three times.

9. Manually release the hydraulic pressure by opening the manual release valve.
10. Repeat the above procedure to empty the pump tank and replace hydraulic fluid (steps **d** through **f**).
11. Close manual release valve.
12. Bleed hydraulic system if necessary (see Section N.5).

- **HYDRAULIC PUMP MOTOR**

Refer to **Figure 4-12**.

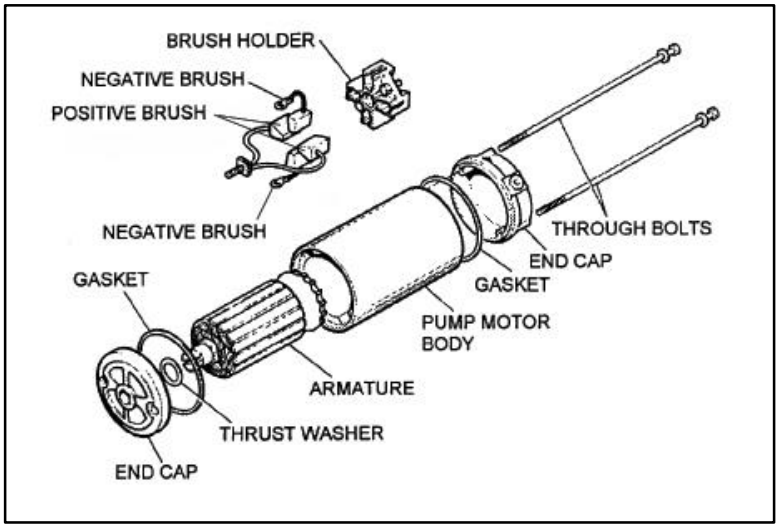

FIG 4-12: HYDRAULIC PUMP ELECTRICAL MOTOR

1. REMOVAL

a. Make sure that the lift is in its stowed position.
b. Disable electric power to the lift.
c. Release hydraulic pressure by opening manual release valve.
d. Disconnect pump electrical connectors.
e. Disconnect hydraulic hose from the quick-connect fitting located in the center of the lift carriage.
f. Remove pump motor from the hydraulic pump by removing the two bolts that pass down through the top of the pump motor to the pump unit. Use caution when removing the pump motor, as the bolts that fasten the motor to the pump also fasten the end caps to the motor housing.

2. OVERHAUL

a. Remove the end caps from the motor, being careful not to damage the gasket. Lightly tapping the side of the end caps with a soft hammer may ease removal of the caps.
b. Remove the armature from the motor housing, making note of the orientation of the armature relative to the housing before disassembly, i.e., which end of the armature goes toward which end of the housing.
c. Remove old graphite dust from shaft, body, armature, and end caps using a solvent such as Varsol.
d. Remove two hex screws fastening the negative brushes to the brush holder. These brushes are independently fastened.
e. Remove the negative brush set from the brush holder, making note of the position of the negative brushes within the brush holder.
f. Remove the motor terminal stud attaching the remaining two brushes to the brush holder, making note of the position of the insulation washers on the terminal stud.
g. Remove the positive brush set from the brush holder, making note of the position of the positive brushes within the brush holder.
h. Lubricate the bearings in both end caps very lightly. There should be no free oil after lubrication, as the oil can interfere with the operation of the armature.
i. Reassemble the brush set with the new brushes by placing the springs into the cavities, and placing the new brushes on top of the springs. Make sure that the positive and negative brushes are placed in the correct cavities.
j. Replace the terminal stud, insulation washer, and two hex screws fastening the brush sets to the brush holder. Make sure the insulation washers are in the same position on the terminal stud as they were before disassembly.

k. Place the brush holding tool (Ricon Part #V2-SH-115T) over the brushes, slowly advancing the tools over the brushes while pressing the brushes into the brush cavities. Make sure the brush holder tool slot is toward the inside of the end cap.

l. Insert the armature into the motor housing, making sure the armature is oriented properly (as noted during disassembly).

m. Reassemble the end caps onto the motor housing while maintaining alignment as indicated by the alignment marks. Make sure that the thrust washer is correctly located on the motor output shaft, and the gaskets are located between the end caps and the motor housing.

n. Orient the motor in a vertical position, with the brush end of the motor towards the top.

o. Push down on the end cap containing the brushes, and slowly remove the brush holding tool.

p. Insert the two bolts through the motor housing.

q. Install the motor on the pump unit (see next section), being careful to hold the end caps onto the motor housing.

3. INSTALLATION

a. Place the pump motor onto the pump body while holding the motor assembly together.

b. Turn the motor housing to align the attaching bolts with the bolt holes in the pump body.

c. Tighten the bolts that fasten the motor to the pump body until the lock washers are fully locked. Do not over tighten and strip the pump body.

d. Connect the hydraulic hose from the pump unit to the quick-connect fitting.

e. Connect the electrical connectors to the pump unit.

⚠ CAUTION!
Make sure that the positive cable is connected to the pump motor, and, if configured for 24 volts, that the negative cable is connected to the body of the pump unit. If configured for 12 volts, make sure the negative cable is connected to the bare metal of the vehicle chassis.

f. Enable electric power to the lift.

g. Raise the lift platform to the vehicle floor level.

h. Check all hydraulic connections for leaks. Tighten as required.

i. Bleed the hydraulic system if necessary (see Section N.5).

- HYDRAULIC CYLINDER

1. REMOVAL

a. Deploy the lift fully and gain access to the underside of the lift carriage (see Section A).

b. Raise lift platform to vehicle floor level.

c. Refer to **Figure 4-13**. Remove the 0.25" diameter rollpin fastening the trunnion to the end of the hydraulic cylinder rod by driving the pin out with a small drift and a hammer.

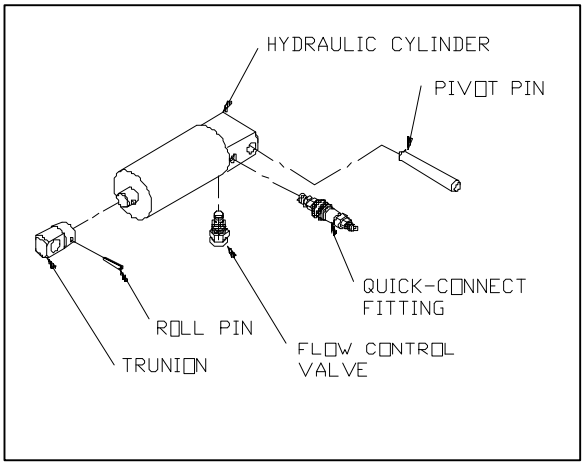

FIGURE 4-13: HYDRAULIC CYLINDER

d. Retract the cylinder rod. Using either the manual release valve or one of the lift control pendant, lower the lift platform to ground level.

e. Remove the trunnion from the lift cylinder. Manually raise the lift platform and lifting frame. Place a small table or cart under the platform to provide support. The table or cart should be nominally the height of stow level. The act of lifting the platform and lifting frame will have removed the trunnion from the cylinder rod.

f. Gain access to the hydraulic Quick-connect via underneath the lift carriage. Refer to **Figure 4-14**. Move the traveling frame into the lift enclosure far enough to have clear access to the hydraulic Quick-connect.

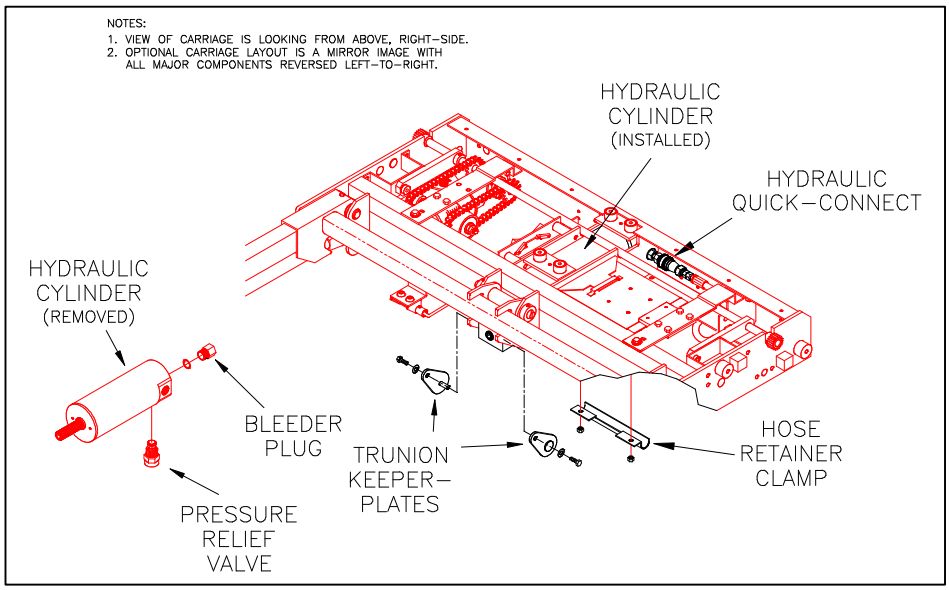

FIGURE 5-14: HYDRAULIC COMPONENTS

g. Disconnect the main hydraulic hose from the hydraulic cylinder. Remove system hydraulic pressure by opening the manual release valve, and disconnect the hydraulic Quick-connect.

h. Remove the hydraulic fitting from the lift cylinder. The male portion of the hydraulic Quick-connect and the nipple adapter must be removed from the hydraulic cylinder by unscrewing the nipple (turn in a counter-clockwise direction).

NOTE: This operation will result in the spilling of some hydraulic fluid. Have rags on hand to clean-up any fluid spilled.

i. Remove the cylinder pivot pin. Loosen the setscrew fastening the cylinder pivot pin. The screw is located in the rear of the hydraulic cylinder. The setscrew can be accessed through the lower of the two 0.50" diameter holes located in the center of the carriage rear cross member. Remove the pivot pin by driving it out with a small drift and a hammer.

j. Remove the hydraulic cylinder from the lift carriage.

NOTE: The hydraulic cylinder piston must be fully retracted to facilitate removal:

- Move the cylinder as far as possible toward the rear of the lift carriage.
- Push the rear of the cylinder upward and rotate the front of the cylinder down and out of the lift carriage.

2. INSTALLATION

a. Twist the cylinder rod into the proper alignment:

- Insert a small rod (a screwdriver will suffice) through the rollpin hole in the end of the cylinder rod.
- Twist the cylinder rod such that the rollpin hole is parallel to the cylinder pivot pin hole (the 0.75" diameter hole at the rear of the cylinder).

b. Place the hydraulic cylinder into the lift carriage:

NOTE: The hydraulic cylinder piston must be fully retracted to facilitate installation of cylinder into the lift carriage.

- Insert the rear end of the hydraulic cylinder into the carriage.
- Push the rear end of the cylinder up as far as possible, and rotate the front of the cylinder up into the carriage.

c. Insert the cylinder pivot pin:

- Place pin through the 0.75" diameter hole in carriage center plates and hydraulic cylinder. If the pin does not fit through the cylinder, unscrew the setscrew located in the rear of the hydraulic cylinder.
- Tighten the setscrew located in the rear of the hydraulic cylinder.

d. Install the hydraulic quick-connect into the hydraulic cylinder.
e. Screw the nipple adapter and the male portion of the hydraulic Quick-connect into the right side of the hydraulic cylinder. The fitting should be located through the hole in the carriage center plates directly in front of the cylinder pivot pin. The threads should be sealed with teflon pipe sealant (preferably not tape).
f. Remove system hydraulic pressure by opening the manual release valve, and connect the hydraulic hose to the hydraulic Quick-connect.
g. Insert the cylinder rod into the trunnion.
- Hold the trunnion and cylinder rod in alignment.
- Extend the cylinder rod by manually pumping the hydraulic backup pump.
h. Using either the manual backup pump or the pendant, raise the lift to vehicle floor level.
i. Using a small drift and a light hammer, drive the rollpin into place through trunnion and the cylinder rod.
j. Stow the lift (see Operator Manual, Chapter II).

- **MAIN HYDRAULIC HOSE**

1. REMOVAL

a. Remove the traveling frame from the lift cassette.
b. Remove the two bolts fastening the hose retainer clamp to the topside of the traveling frame.
c. Disconnect the main hydraulic hose from e quick-connect fitting inside the lift carriage.
d. Remove the main hydraulic hose from the lift enclosure.

2. INSTALLATION

a. Locate the hydraulic hose through the hole in the top of the lift cassette.
b. Fasten the main hydraulic hose to the quick-connect fitting inside the lift carriage.
c. Fasten the hose retainer clamp to the top cover using the two bolts previously removed. The hose retainer clamp should clamp the hydraulic hose and electrical cable to the underside of the top of the lift enclosure. The clamp should cover the yellow tape marks on both the hose and the cable.
d. Fasten the hose retainer panel shield to the underside of the top cover with new rivets.
e. Install the traveling frame into the lift cassette (see Section B.2).
f. Enable electric power to the lift.
g. Deploy the lift and raise the lift platform to the vehicle floor level.
h. Check the hydraulic connections and lift enclosure for leaks. Tighten as required.
i. Bleed the hydraulic system if necessary (see Section N.5).

- **BLEEDING HYDRAULIC SYSTEM**

The hydraulic system of the lift may have air introduced into the system after some maintenance procedures have been performed. When air does enter the hydraulic system, the hydraulic system may appear to soften. This is most noticeable when loading or unloading the platform at vehicle floor level. The air in the hydraulic system must then be removed. The following procedure to remove the air from the system is commonly referred to as "bleeding".

The following procedure is most easily performed by two people and can be very messy.

a. Fully deploy the lift and gain access to the underside of the lift carriage.
b. Locate the air bleeder valve on the top side of the lift cylinder let air and hydraulic fluid out of the cylinder.

NOTE: This step will cause oil loss. Have dry rags on hand to clean-up spilled hydraulic fluid.

c. Close the air bleeder valve.
d. Repeat the previous three steps until the fluid coming does not contain any air bubbles.
e. Verify that the air bleeder valve is fully closed.

O. ELECTRICAL CONTROL SYSTEM

Electrical lift control is provided by three major control circuits. This section provides a description of how the circuits operate, and where applicable, how they are adjusted.

- **LIFT MODE ENABLE CIRCUIT** (Out Switch)

Refer to **Figure 4-15**. The LIFT mode (Raise and Lower functions) of the lift control circuit is meant to be active only when the lift is completely deployed. A limit switch labeled OUT fastened to a spring loaded plunger located inside the carriage on the right side senses when the lift is completely deployed. The switch changes state when the plunger encounters the carriage stop on the right side of the enclosure.

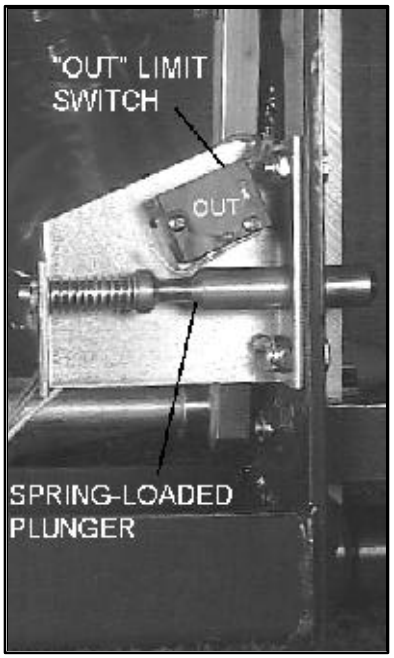

FIGURE 4-15: OUT SWITCH

In the event that the OUT switch is replaced, its function must be verified to prevent damage to the switch and to assure proper operation.

NOTE: When replacing the OUT switch, be sure that the lift is completely deployed and the spring plunger is in its retracted position.

ADJUSTMENT:

a. Gain access to "OUT" switch and plunger. The OUT switch is accessible from underneath the lift.

b. Locate switch relative to the spring plunger.

c. With the lift deployed, the plunger will be extended, exposing the switch flag to the narrowest part of the plunger. Manually depress and hold the plunger in the retracted position, then slide the switch along the adjustment slots until a click is heard.

NOTE: Locating the switch too close to the plunger may cause damage to the switch.

d. Verify operation of switch. Move the lift carriage to a point where the plunger is completely extended and off the carriage stop (use the "IN" and "OUT" functions as required). Change the mode switch to Lift and operate a function either "UP" or "DOWN". Proper operation is verified if these functions do not operate with the plunger in the extended position.

- **AUTOMATIC STOW HEIGHT CONTROL**

Description:

Refer to **Figure 4-16**. All F9B Series Wheelchair Lifts are equipped with an automatic stow leveling circuit to align the lift platform at the proper stowing level upon completion of a lifting cycle. The automatic stow level control system is comprised of a switch plate, three switches and a control cam. The control cam is mechanically linked to the lifting frame via the control rod and slides along a slot in the switch plate as the lift platform moves up and down. The system is located inside the carriage on the left side of the hydraulic cylinder. To replace any of the switches, refer to LIMIT SWITCH REPLACEMENT. The stow level control limit switches are accessible from underneath the lift. Please note that access to the stow level limit switches is not required to check the operation of the automatic stow level alignment system.

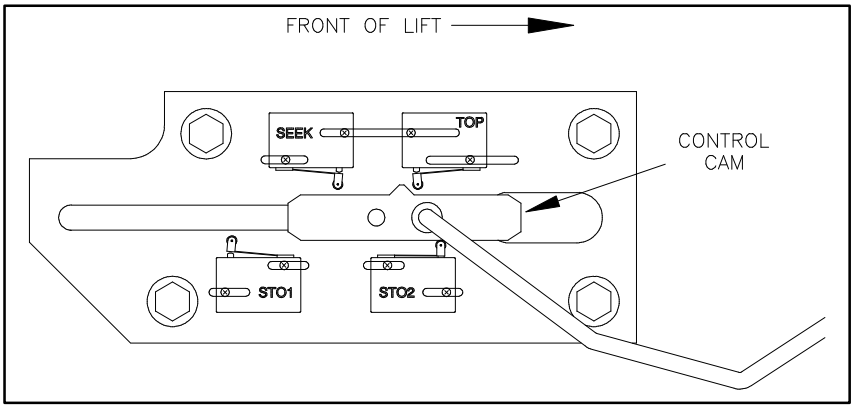

FIGURE 4-16: LIMIT SWITCH PLATE ASSEMBLY

1. STOW HEIGHT ADJUSTMENT

The automatic stow level alignment system permits proper platform location when approaching stow level from above or below. To check the alignment switch settings, refer to **Figure 4-17** and the following paragraphs:

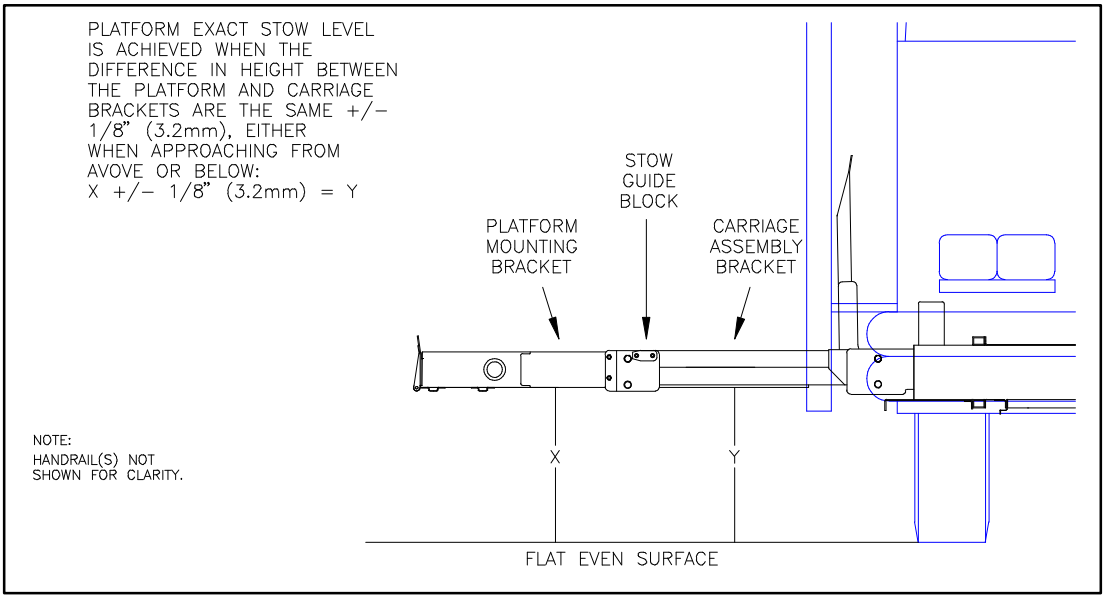

FIGURE 4-17: STOW LEVEL ALIGNMENT

a. Stow Height from Floor Level

1) Fully deploy the lift.
2) Raise the lift to the vehicle floor level.
3) Using the control pendant, press and hold the STOW switch. Observe the platform lower and stop at the stow level and then release the stow switch.
4) The exact stow level is achieved when the lifting frame is parallel with the lift guide rails. This can be verified by measuring from a flat even surface up to the bottoms of both the platform mounting bracket and the carriage bracket.
5) If adjustment is required, refer to ADJUSTMENT OF AUTOMATIC STOW LEVEL (STO1). If adjustment is not required, refer to the next procedure, STOW LEVEL FROM GROUND LEVEL ALIGNMENT CHECK.

b. Stow Height from Ground Level

1) Fully deploy the lift.
2) Lower the lift to ground level.
3) Using the control pendant, press and hold the STOW and switch. Observe the platform rise and stop at the stow level and then release the stow switch.
4) The exact stow level is achieved when the bottom of the stow guide block is between 0.03" - 0.06" above the top of the guide rail.
5) If adjustment is required, refer to ADJUSTMENT OF AUTOMATIC STOW LEVEL (STO2). If adjustment is not required, refer to the next procedure, AUTOMATIC STOW LEVEL SEEK RANGE CHECK.

2. STOW LEVEL ALIGNMENT ADJUSTMENT

NOTE: While adjusting the position of STO1 and/or STO2, if the two switches become too far apart, the platform will oscillate such that the control cam will bounce between the positions of STO1 and STO2. If this occurs during the adjustment of one of the switches, move the other switch toward the one being adjusted and repeat the adjustment process.

a. Stow Level - STO1

1) Fully deploy the lift.
2) Loosen retaining screws on switch STO1 so that the switch will slide along with light tapping.
3) Lower lift platform to the stow level.
4) Move STO1 to achieve proper stow level as required, tapping the switch toward the back of the unit to lower the stow level or tap toward the front to raise the stow level.
5) Refer to Stow Level From Vehicle Floor Level. Verify proper adjustment.

6) Stow the lift.

b. Stow Level - STO2

1) Fully deploy the lift.
2) Loosen retaining screws on switch STO2 so that the switch will slide along with light tapping.
3) Lower lift platform toward to the stow level.
4) Move STO2 to achieve proper stow level as required, tapping the switch toward the back of the unit to lower the stow level or tap the switch toward the front of the unit to raise the stow level.
5) Refer to STOW HEIGHT FROM GROUND LEVEL. Verify proper adjustment.
6) Stow the lift.

c. Stow Level Seek Range - SEEK

1) Fully deploy the lift.
2) Adjust Seek range as required by moving the switch toward the back of the unit to decrease the distance or moving the switch toward the front to increase the distance.
3) Refer to AUTOMATIC STOW LEVEL SEEK RANGE CHECK. Verify proper adjustment.
4) At the underside of the lift, raise and hold the service access panel up, and install the two retaining bolts and lock-nuts to the front edge of the panel.
5) Stow the lift.

- VERTICAL TRAVEL LIMIT

1. ALIGNMENT CHECK

a. Fully deploy the lift.
b. Raise the lift to the vehicle floor level.
c. The platform travel limit should be set so that the platform top surface is between 1" and 1.6" above the vehicle floor.
d. If adjustment is required, refer to the next procedure ADJUSTMENT OF TOP SWITCH.

2. TOP SWITCH ADJUSTMENT

a. Fully deploy the lift.
b. Move TOP to achieve proper platform level as required, tapping the switch toward the rear to lower the platform or toward the front to raise the platform.
c. Refer to VERTICAL TRAVEL LIMIT ALIGNMENT CHECK. Verify proper adjustment.
d. At the underside of the lift, raise and hold the service access panel up, and install the two retaining bolts and lock-nuts to the front edge of the panel.
e. Stow the lift.

- LIMIT SWITCH REPLACEMENT

1. Refer to LIFT SERVICE ACCESS.
2. At the switch, cut the leads to the switch leaving enough wire coming of sufficient length to be spliced. Strip the wire ends 1/4" - 3/8".
3. Cut the leads of the replacement switch to length. This length should be equal to the length of wire coming out of the removed switch. Strip the ends of the switch wires 1/4" - 3/8".
4. Slide a 1" long piece of heat shrink (of the appropriate diameter) around each wire. The heat shrink should be temporarily placed near the connector.
5. Solder each of the leads from the original switch to the corresponding lead on the replacement switch. Match the leads color for color.
6. Slide the heat shrink tubing over the soldered connections and shrink with a heat gun.
7. Remove the original switch from the lift and loosely mount the replacement switch in its place using the existing hardware.
8. Refer to the appropriate ALIGNMENT CHECK procedure.

- PUMP MOTOR CONTACTOR

The pump motor contactor switches the power to the hydraulic pump unit. The contactor is located on the hydraulic pump unit bracket, which also holds two circuit breakers. The bracket is located on top of the hydraulic pump motor.

- **CIRCUIT PROTECTION DEVICES**

The lift contains three circuit protection devices. The first circuit breaker is a 90 Amp breaker located near the power source or battery. When this breaker is tripped, the lever of the breaker is in a position extending away from the body of the breaker. To reset this breaker it is necessary to remove the two screws fastening the cover to the lower half of the power converter. The lever on the circuit breaker can then be pushed closed (flush with the body of the breaker) to reset the breaker.

⚠ **CAUTION!**
DO not attempt to trip the circuit breaker manually. Doing so will damage the breaker.

The other two circuit breakers are rated at 30 Amp and 5 Amp. These two breakers are located on the pump contactor mounting bracket. The breakers have their rating marked on the red buttons on top. When either of these breakers is tripped, the red button will extend out of the breakers housing about 1/8". To reset either of these breakers, simply push the red button into the housing.

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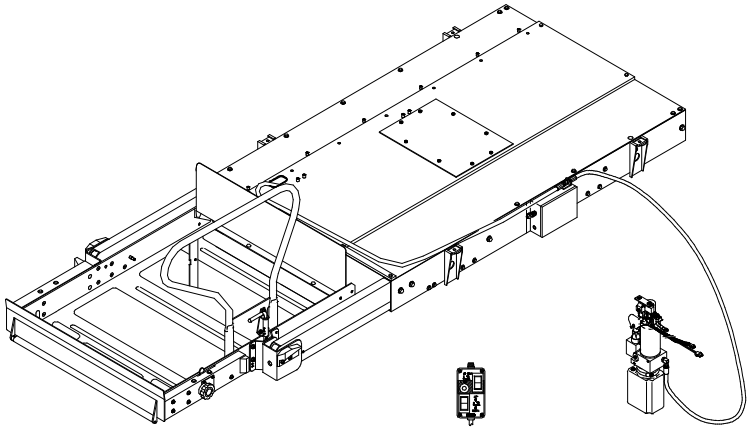
V. SPARE PARTS

This chapter contains parts diagrams and lists for the RICON Mirage F9B Series Export Use Wheelchair and Standee Lift. The parts diagrams are 3D exploded views of lift components, with individual components referenced by numbers. Each accompanying parts list contains the part reference number, description, quantity used, and the Ricon stock number. For parts identification, locate the part on the appropriate drawing and note the reference number. The parts list that accompanies each drawing will list the stock number of the desired part. For the part numbers of the lift decals, refer to Decal Locations and Part Numbers figure in Chapter II of this manual.



LIFT MODEL AND KIT NUMBERS	
PRODUCT NUMBER	F9B050-E340110 and F9B050-E340111
DOCUMENTATION KIT NUMBER	F9B-D000
PRODUCTION DECAL SET NUMBER	11746
SPARE DECAL KIT NUMBER	26023

PARTS DIAGRAM **PAGE**

MONARCH HYDRAULIC POWER UNIT
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 – PRESENT

DATE: 03/08/00
DWG. F9BXX000
REV. A

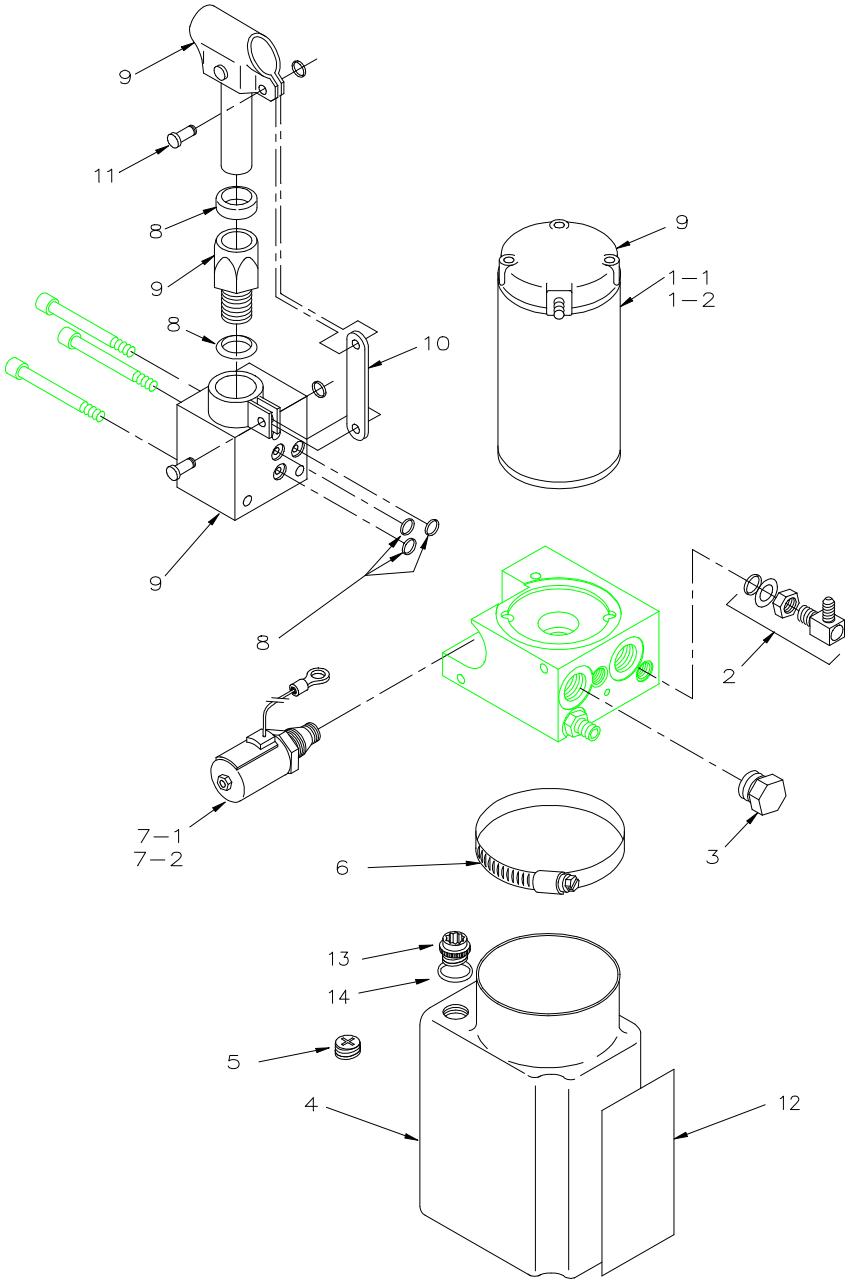


FIGURE 5-1: MONARCH HYDRAULIC POWER UNIT

FIGURE 5-1: MONARCH HYDRAULIC POWER UNIT
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 - PRESENT

REF	DESCRIPTION	QTY	PART NO
1-1	MOTOR ASSY., 12V, 3" MONARCH PUMP	1	V2-SH-115
1-2	MOTOR ASSY., 24V, 3" MONARCH PUMP	1	V2-SH-116
2	FITTING, "L" 1/4 SAE O-RING BOSS 1/4" JIC	1	V2-SH-011
3	PLUG, 3/4-16 CAVITY, w/o-RING	2	V2-SH-001
4	RESERVOIR, RICON POWER UNIT, PLASTIC	1	V2-SH-108
5	PLUG, RESERVOIR, BREATHER FILLER	1	V2-SH-106
6	CLAMP HOSE	1	V2-SH-109
7-1	HYD. POPPET VALVE ASSY., 12V DELTROL	1	V2-SH-105
7-2	HYD. POPPET VALVE ASSY., 24V DELTROL	1	V2-SH-136
8	SEAL KIT, MANUAL BACK-UP PUMP.	1	V2-SH-220
9	BACK-UP PUMP, MANUAL w"out HANDLE	1	V2-SH-210
10	BRACKET, TENSION LINK, MONARCH PUMP.	1	V2-SH-149
11	PIN & RETAINING RING-BACKUP PUMP	2	V2-SH-017
12	DECAL, OIL LEVEL WARNING	1	32-10-154
13	PLUG,3/8"NPT,PLASTIC	1	10333
14	O-RING,#13,NITRILE,.43ID	1	24013
*	KIT, PUMP MOTOR BRUSH SET	1	V2-SH-115B

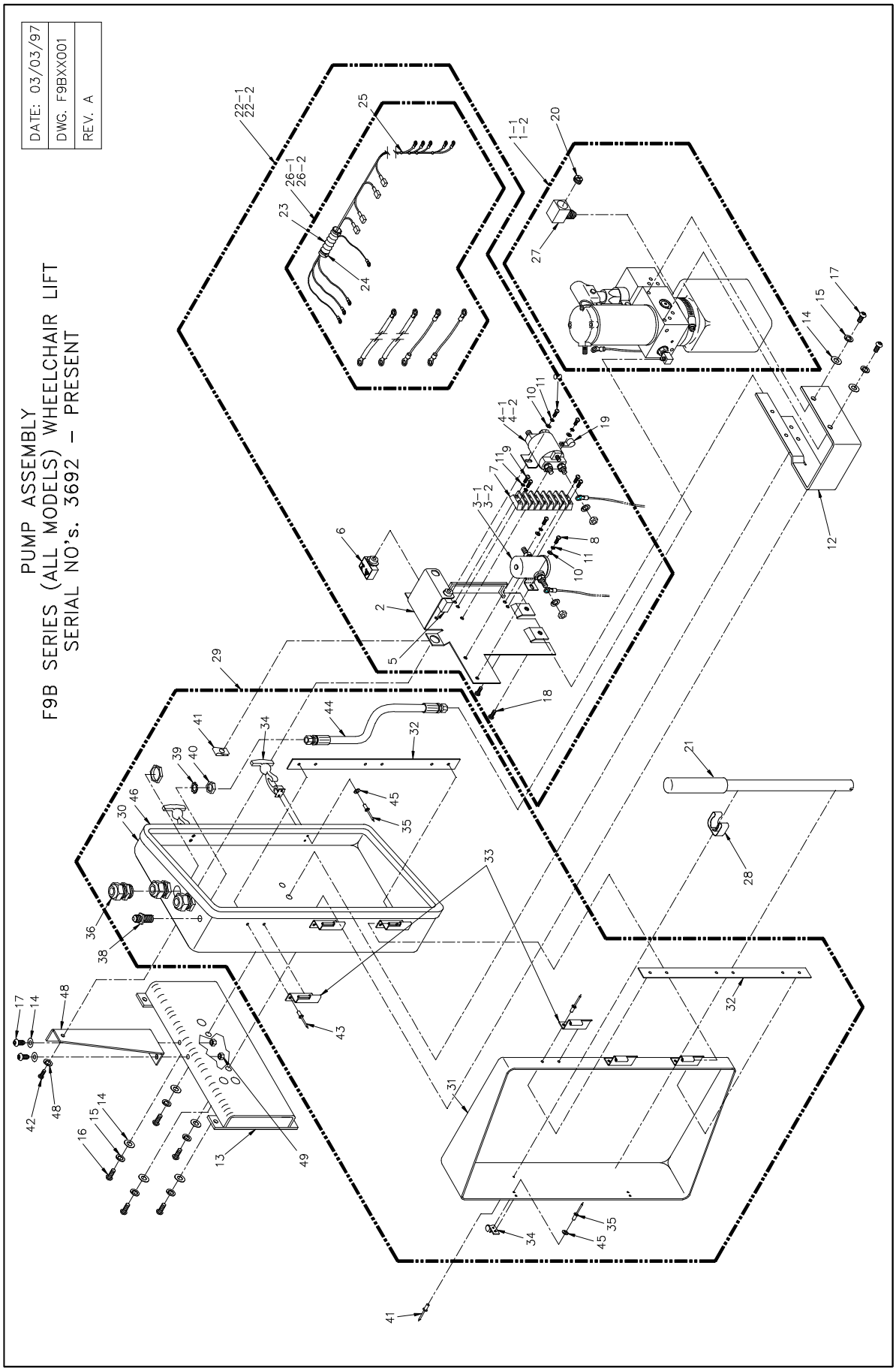


FIGURE 5-2: PUMP ASSEMBLY

FIGURE 5-2: PUMP ASSEMBLY
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 - PRESENT

REF	DESCRIPTION	QTY	PART NO
1-1	HYD PWR UNIT - NO TOP, VV RES, 2000PSI 12V	1	PMP 12000307
1-2	HYD PWR UNIT - NO TOP, VV RES, 2000PSI 24V	1	PMP 24000307
2	PLATE-WASSY SOLENOID	1	F9-0360
3-1	SOLENOID, SINGLE POLE SINGLE THROW, 12V	1	26444
3-2	SOLENOID, SINGLE POLE SINGLE THROW, 24V	1	264492
4-1	SOLENOID-12V, DP LARGE	1	26447
4-2	SOLENOID-24V DP LARGE	1	26450
5	CIRCUIT BREAKER, 5 AMP.	1	26511
6	CIRCUIT BREAKER, 30 AMP	1	26510
7	TERMINAL STRIP-7 TERM	1	265680
8	MS-10-32 X 0.313 PAN PHIL SST (BAG OF TEN)	4	15923
9	MS-10-32 X 0.75 PAN PHIL	4	28147
10	WASHER-#10 FLAT SST	4	282715
11	WASHER-#10 SPLIT LOCK SST	8	282725
12	BRACKET-PUMP MOUNTING.	1	F9-0204
13	BRACKET-PUMP MOUNTING, WASSY	1	UV-PF-945
14	WASHER-0.32 ID X 0.75 OD X0.080 SST	9	282776
15	WASHER-5/16 SPLIT LOCK	7	282785
16	SCS-5/16-24 X 0.75 BTN SKT SST	5	28702
17	SCS-5/16-18 X 0.75 BTN SKT SST.	4	282285
18	SCS-10-32 X 0.50 BTN SKT SST	2	28156
19	CABLE CLAMP, 3/8"	1	25516
20	PLUG, RESERVOIR, BREATHER FILLER	1	V2-SH-106
21	HANDLE, MANUAL BACKUP PUMP	1	V2-SH-111
22-1	SOLENOID PLATE ASSY-12V	1	F9-0358
22-2	SOLENOID PLATE ASSY-24V	1	F9-0370
23	CONDUIT PLASTIC ½	0.17	27200
24	CABLE TIE-5.5" (NAT)	2	25520
25	CABLE TIE-4.0" (NAT)	9	25519
26-1	HARNESS-ASSY PUMP SOLENOID PLATE 12V	1	F9-0243
26-2	HARNESS-ASSY PUMP SOLENOID PLATE 24V	1	F9-0246
27	ADPTR-L JICM/NPSM 90 LARGE	1	V2-SH-013
28	CLIP-EMERGENCY TOOLS	2	25543
29	PUMP ENCLOSURE ASSY**	1	F9-0371
30	BASE-PUMP ENCLOSURE	1	F9-0216
31	DOOR-PUMP ENCLOSURE	1	F9-0217
32	PLATE REINFORCEMENT-PUMP ENCLOSURE	2	F9-0255
33	HINGE-2.50 X 2.00 SST	6	F9-0218
34	LATCH, DRAW-FLEXIBLE T-HANDLE	2	25089
35	RIVET-1/8 X 3/8 BLIND AL (BAG OF TEN)	8	14490
36	STRAIN RELIEF, STR THRU, LIQ TIGHT	3	26284
37	RIVET, BLIND, 5/32 X .19-.25 (ASD 5-4) (BAG OF TEN)	2	15910
38	ADPTR-STR 7/16M 7/16M JIC/JIC BHD 2.08L	1	V2-SH-981
39	WASHER-7/16 EXTERNAL STAR SST	1	282915
40	NUT-HEX 7/16-20 PLATED JAM	1	14-10-107
41	SPRING NUT, 1/4 X 20, SST	1	283105
42	SCS-1/4-20 X 0.625 BTN SKT SST	1	281955
43	RIVET-BLIND AL, 3/16 X 0.45	12	28704
44	HOSE ASSY., 11" X 1/4 JIC X 1/4 JIC	1	F9-0333
45	WASHER #8 FLAT (BAG OF TEN)	8	15917
46	SEAL, DOOR-7/16 X 53/64	5.33	26679
47	WASHER-1/4 FLAT SST	1	282735
48	BRACKET - STIFFNER	1	F9-0378
49	NUT -5/16-18-NYLON	2	28314

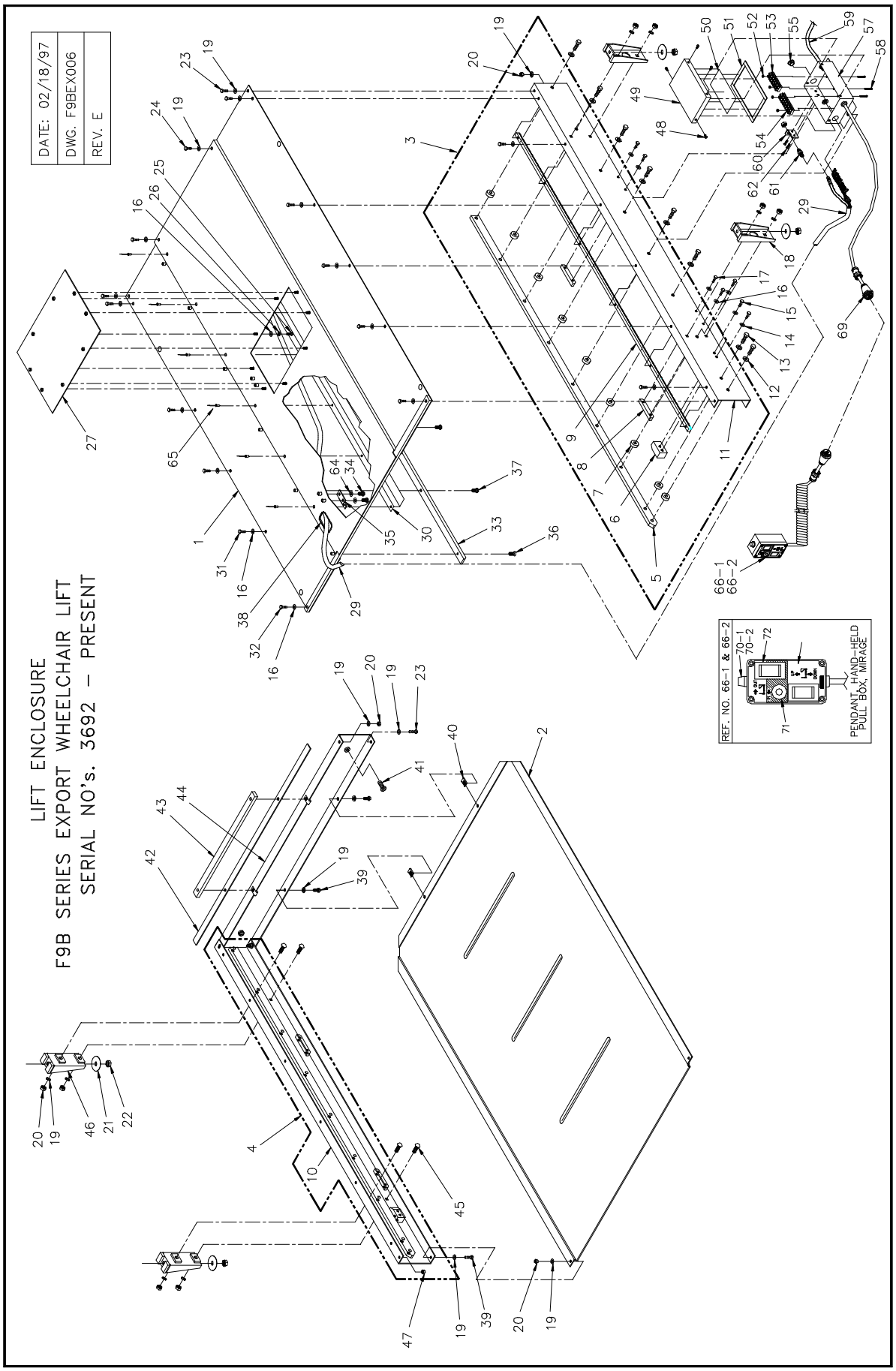


FIGURE 5-3: LIFT ENCLOSURE

FIGURE 5-3: LIFT ENCLOSURE
F9B SERIES EXPORT WHEELCHAIR LIFT
SERIAL NO's. 3692 - PRESENT

REF	DESCRIPTION	QTY	PART NO
1	COVER-ASSY.,TOP, F9B050	1	F9-0410
2	COVER, BOTTOM, F9B050	1	F9-0411
3	ASSY., MECH., RH., CHANNEL	1	UV-MF-710
4	ASSY., MECH., LH., CHANNEL	1	UV-MF-709
5	RAIL, STAINLESS GUIDE	2	UV-MF-708
6	CARRIAGE STOP	2	UV-MF-044
7	SPACER, 0.40 THICK	18	UV-MF-002
8	BOTTOM COVER RETAINER	4	UV-MF-046
9	GEAR RACK, 16 DP, 1/2 FACE	2	UV-MF-707
10	CHANNEL, 61.50 LH.- F9004	1	UV-MF-703
11	CHANNEL, 61.50 RH.- F9004	1	UV-MF-704
12	WASHER 3/8 FLAT	18	28283
13	BOLT-HEX 3/8-16 X 1.00 GR5	18	28235
14	WASHER 5/16 SPLIT LOCK	4	28278
15	BOLT-HEX 5/16-18 X 0.50 GR5	4	14-08-108
16	WASHER 1/4 FLAT SAE	20	28273
17	BOLT-HEX 1/4-20 X 0.625 GR5	12	28164
19	WASHER 5/16 FLAT SAE	14	28277
20	NUT-HEX 5/16-18, NYLON INSERT	4	28314
23	BOLT-HEX 5/16-18 X 7/8 GR5 SST.	4	282165
24	BOLT-HEX 5/16-18 X 1.25	2	28223
25	SOCKET BUTTON, 1/4-20 X 5/8	8	28162
26	WASHER 1/4 SPLIT LOCK	16	28274
27	COVER, BRAKE COMP., ACCESS HOLE, ASSY.	1	UV-MF-037
29	HARNESS-MAIN WITH HYDRAULIC F9B050	1	F9-0414
30	GUIDE-HOSE	1	F9-0409
31	BOLT-HEX, 1/4-20 X 0.50 GR5	18	28165
32	BOLT-HEX, 1/4-20 X 1.00 GR5 (BAG OF TEN)	2	14493
33	RAIL-ALIGNMENT	1	F9-0408
34	CARRIAGE BOLT, 1/4-20 X 0.625 GR5	4	14-07-108
35	BRACKET, HOSE /CABLE CLAMP	2	F9-0026
36	SCS-1/4 X 0.75 FLAT SKT SST (BAG OF TEN)	1	15948
37	MS. 1/4 X 0.625 PHIL PAN	5	281631
38	GROMMET, CATERPILLAR, 1/8	1	26646
39	BOLT-HEX 5/16-18 X 0.75 (BAG OF TEN)	4	15901
40	NUT-SPEED U-TYPE 5/16-18	4	28674
41	BUMPER, ADJUSTABLE, SHORT	2	UV-MF-096
42	GASKET, TOP COVER	1	UV-MF-033
43	SHIM, TOP COVER	1	UV-MF-047
44	ASSY., WELD, REAR CHANNEL	1	UV-MF-095
46	ASSY., WELD INSTALLATION BRACKET	2	UV-IN-102
47	NUT-HEX, 1/4-20 PLATED, THIN NYLON	4	14-08-304
48	SCS-10-32 X 0.50 BTN SKT SST	4	28156
49	COVER, PULLBOX.	1	UV-MF-063
50	DECAL-PULLBOX TO PUMP WIRING DIAGRAM	1	26249
51	TAPE, WEATHER STRIP ½ W X 1/8 THK	.03	06-06-177
52	NUT-HEX 6-32	4	28301
53	TERMINAL STRIP 7 TERM., 10-18 GA	1	26566
54	TERMINAL STRIP 8 TERM., 10-18 GA	1	26567
55	HOSE PLUG, HEYCO	1	26285
56	STRAIN RELIEF, STR., THRU., LIQ. TIGHT	1	26284
57	WELD ASSY., PULLBOX	1	UV-MF-160
58	MS-6-32 X 0.75 PAN PHIL	4	28053
59	HARNESS, PUMP TO PULLBOX, 26 FT..	1	UV-ES-219
60	BRACKET-BULKHEAD FITTING	1	F9-0412
61	ADPTR-STR 7/16 M JIC/JIC BHD 2.08L	1	V2-SH-981
61-1	PENDANT-ASSY., F9A, 12V	1	F9-0375
62	SCS-10-32 X 0.375 FLAT SKT SST	2	28951
63	BOLT CS 1/4 20 X 0.625 HEX SST	10	281645
64	WASHER 1/4 SPLIT LOCK SST	10	282745
65	RIVET, BLIND 3/16 X 0.45 DOME	6	28704
66-2	PENDANT-ASSY., F9A, 24V	1	F9-0372
67	PLUG, MALE 9-PIN AMP #206708	1	26467
68	AMP 9-PIN STRAIN RELIEF	1	26468
69	HARNESS-PULLBOX TO PENDANT, F9B	1	F9-0386
70-1	LIGHT-LIFT ARMED INDICATOR	1	UL-ES-034

70-2	LIGHT-LIFT ARMED INDICATOR, 24V	1	V2-ES-016
71	SWITCH-ASSY, WIRES AND TERMINAL	1	264117
72	SWITCH-SPDT ROCKER MOM CROSS SERRATED	2	264115

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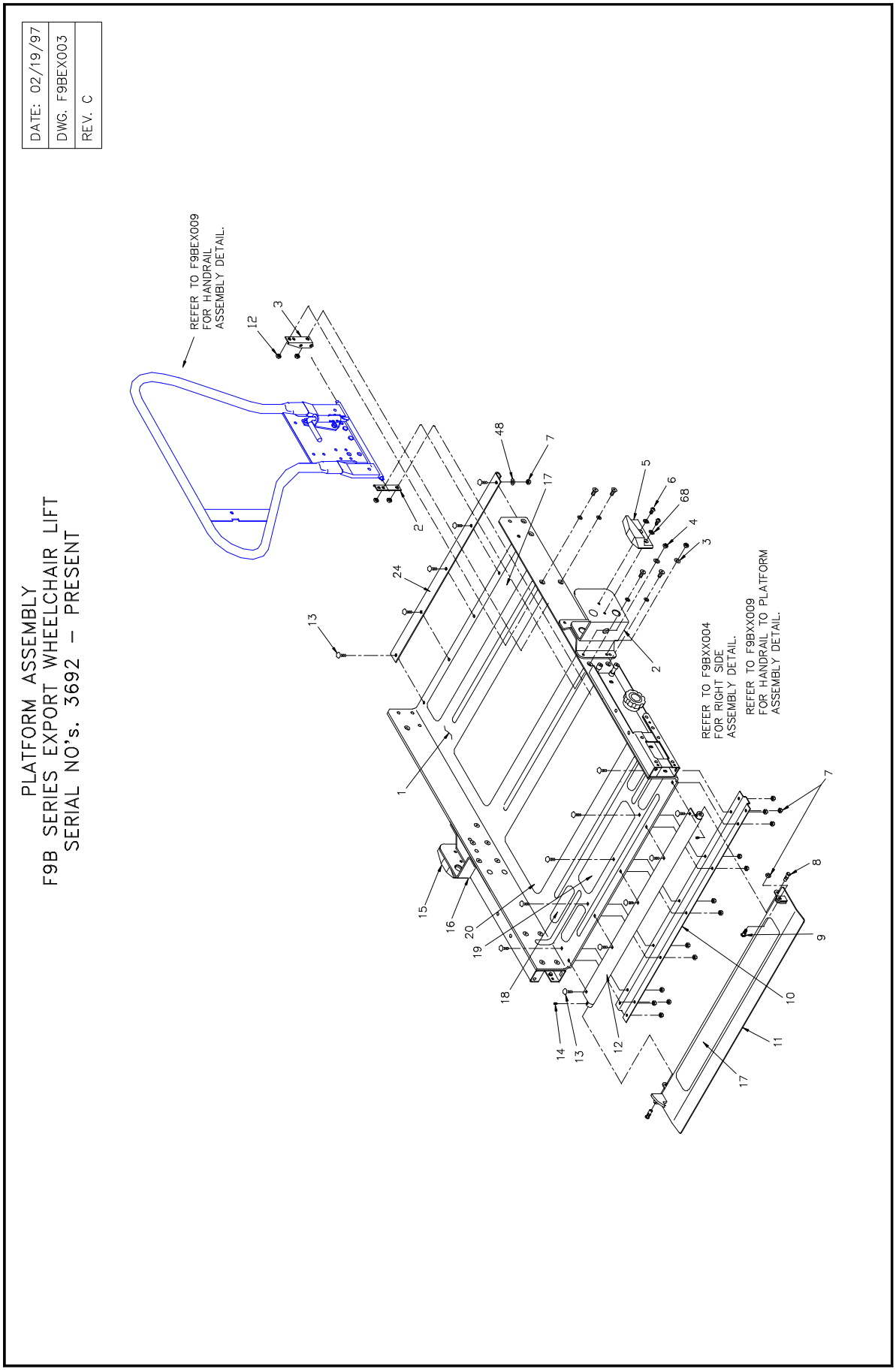

FIGURE 5-4: PLATFORM ASSEMBLY

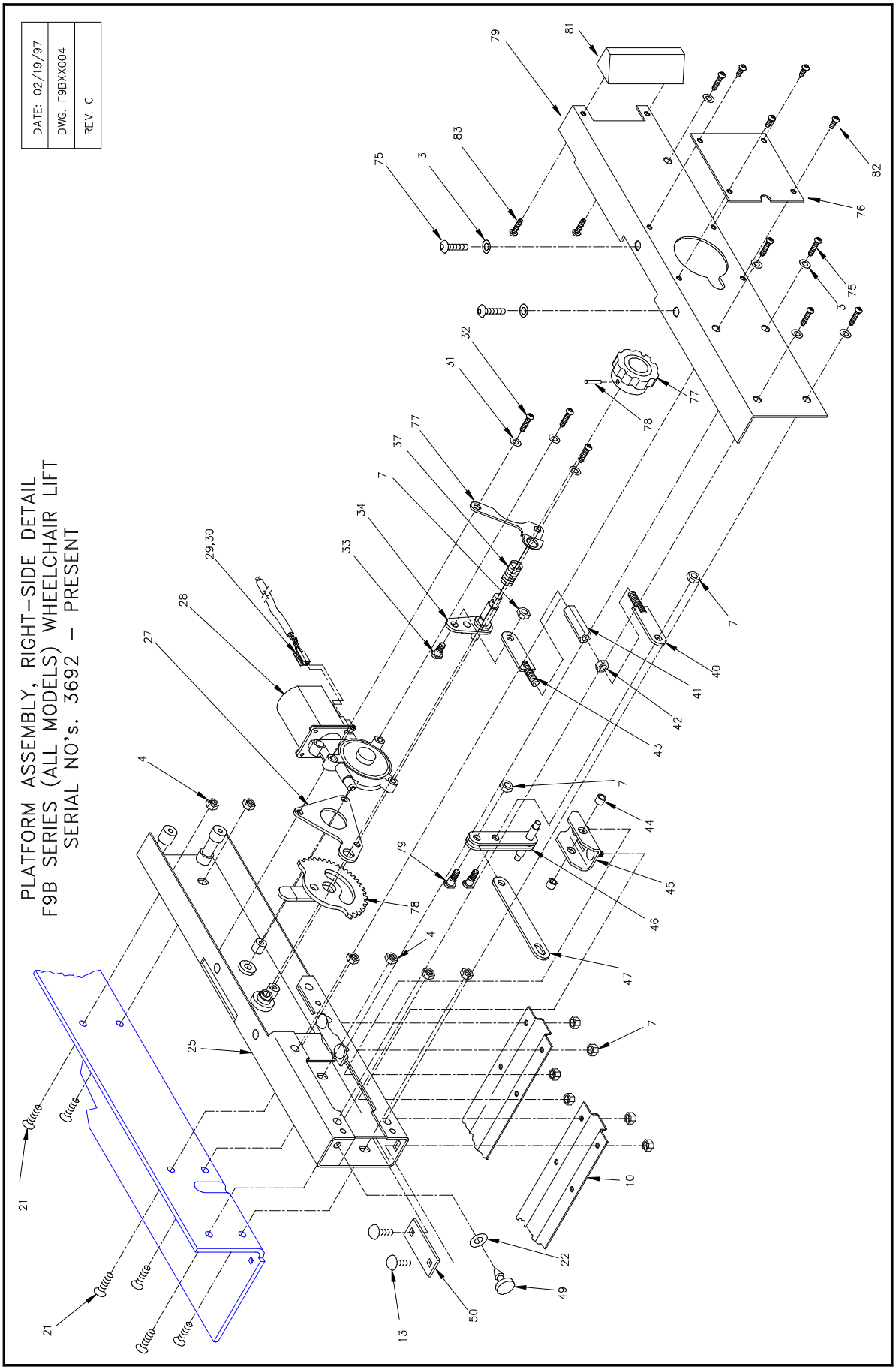

FIGURE 5-5: PLATFORM ASSEMBLY, RIGHT SIDE DETAIL

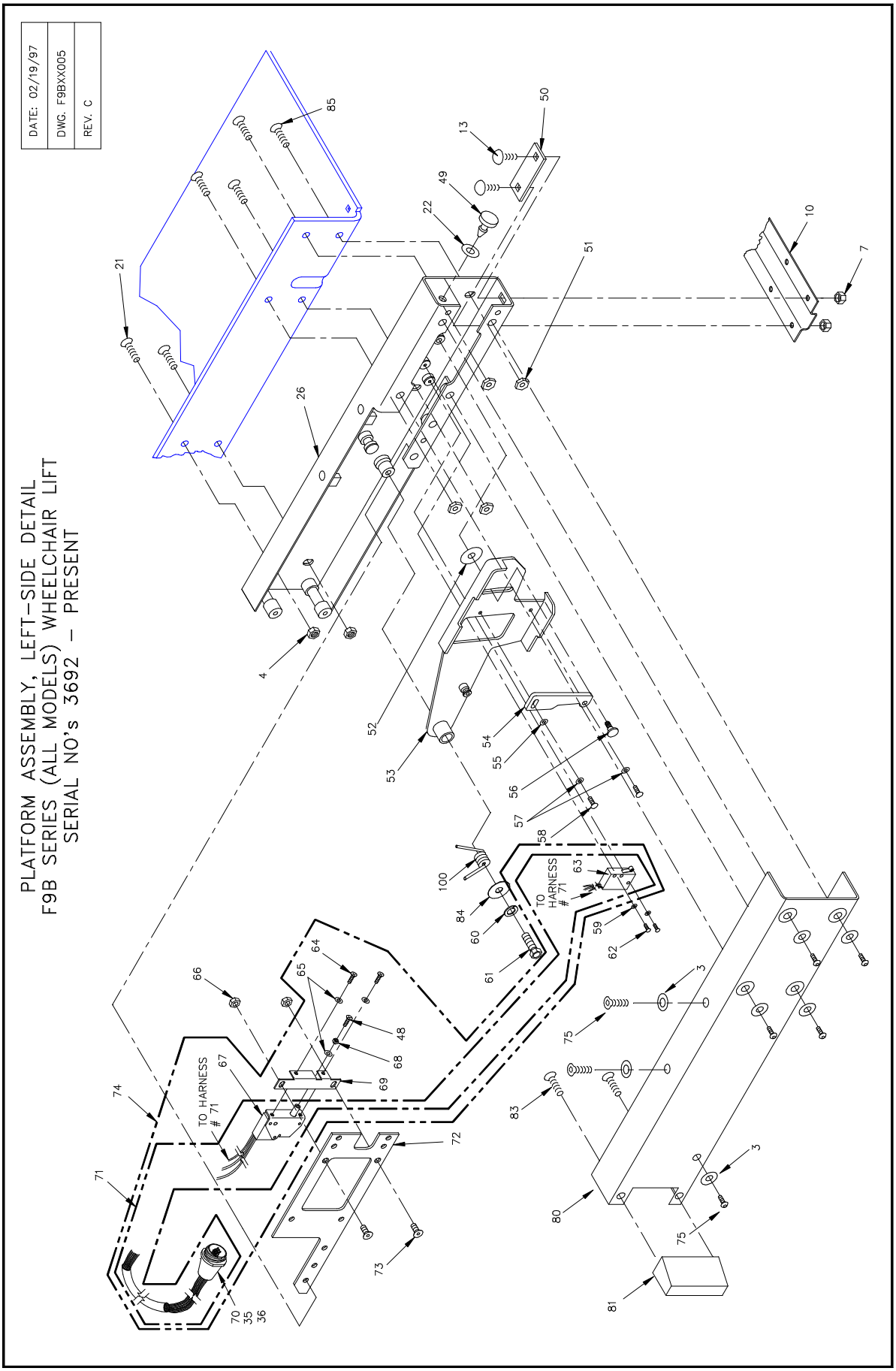

FIGURE 5-6: PLATFORM ASSEMBLY, LEFT SIDE DETAIL

FIGURES 5-4, 5-5, 5-6: PLATFORM ASSEMBLY
F9B SERIES EXPORT (AND ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 - PRESENT

REF	DESCRIPTION	QTY	PART NO
1	PLATFORM, 32.25 X 47.00, PRS. SW	1	UV-PF-224
2	ASSY., PLATFORM MOUNT, RH., TRAIN LIFT	1	UV-PF-808
3	WASHER, FLAT, 0.32 ID X 0.75 OD X 0.080 SST.	12	282776
4	NUT-HEX, 5/16-18, JAM, NYLON INSERT, SST.	12	283146
5	BLOCK, GUIDE, PLATFORM MOUNT, RH.	1	UV-DS-029
6	SOCKET BUTTON, 5/16-18 X 3/4 SST.	10	282285
7	BLOCK, PLATFORM GUIDE, RH. SW-T	1	UV-PF-927
8	BOLT-HEX, 5/16-18 X 1 1/2, SST.	8	282175
9	BLOCK, PLATFORM GUIDE, LH. SW-T	1	UV-PF-926
10	HANDRAIL, WELD ASSEMBLY, RH.	1	UV-PF-498
11	SHIM, HANDRAIL 0.50 THK.	4	UV-PF-881
12	NUT-HEX, 1/4-20, NYLON INSERT, SST.	23	283095
13	PIN-CLEVIS, 5/16 OD X 1.00, SST.	2	UV-PI-016
14	BOLT, SHOULDER, 0.250 X 0.313 OD, PRS	3	UV-PF-899
15	STIFFENER, RIB, PRS., SW	2	UV-PF-235
16	ROLLSTOP- WASSY., PRS.	1	F9-0510
17	STIFFENER, TUBE, PRS. PIVOT, WELD ASSY., SW	1	UV-PF-231
18	BOLT, CARRIAGE, 1/4-20 X 3/4, SST.	33	14-07-108
19	SOCKET SET, 1/4-20 X 1/4, SST.	2	282005
20	HANDRAIL, WELD ASSEMBLY, LH.	1	UV-PF-497
21	BLOCK GUIDE, PLATFORM MOUNT, LEFT	1	UV-DS-028
22	ASSY., PLATFORM MOUNT, LH. TRAIN LIFT	1	UV-PF-811
23	SAFETY TREAD, 25 1/2 X 3, SAFETY YELLOW	3	25664
24	SAFETY TREAD, 5.50 X 1.50, SAFETY YELLOW	4	25674
25	SAFETY TREAD, 12.75 X 3.00, SAFETY YELLOW	1	25673
26	SAFETY TREAD, 25 1/2 X 12.00, OCEAN GREY	2	25661
27	SOCKET FLAT, 5/16-18 X 3/4 SST.	24	282245
28	SOCKET SET, 10-24 X 1/4, SST.	2	281005
29	BUSHING, STIRRUP PIVOT	2	UV-PF-039
30	WASHER, FENDER 0.31 ID X 1.25 OD X 0.05, SST.	3	283715
31	BOLT, SHOULDER 3/8X 3/8	2	28375
32	ROD END, (M) LH. THD. R1700	2	25501
33	NUT-HEX, 3/8-24 LEFT HAND THREAD	2	28320
34-1	ASSY., WELD, ACTUATOR, LINK ARM, B-PLATE	2	UV-PF-423
34-2	ASSY., WELD, B-PLATE, ACTUATOR, LONG TRAVEL	2	UV-PF-429
35	WASHER, NYLON, 0.375 ID X 0.630 X 0.032	2	28562
36	ASSY., WELD, BRIDGEPLATE, STIRRUP, RH.	1	UV-PF-903
37	ROLLER, B-PLATE, CAM FOLLOWER, TRAIN LIFT	2	UV-PF-842
38	ROD, B-PLATE ACTUATOR RETAINER	1	UV-PF-772
39	WASHER, 1/4 FLAT, SAE., SST.	5	282735
40	SOCKET FLAT, 5/16-18 X 1.00, SST.	2	282251
41	STIFFENER, PLATFORM REAR, SW-T	1	UV-PF-898
42	SOCKET BUTTON, 1/4-20 X 5/8, SST.	2	281955
43	WASHER, ADAPTER, STIRRUP	2	UV-PF-424
44	ROD, B-PLATE CAM FOLLOWER, ACTUATOR	1	UV-PF-770
45	ASSY., WELD, BRIDGEPLATE STIRRUP,LH.	1	UV-PF-904
46	BRACKET, PIVOT, BRIDGEPLATE	2	UV-PF-768
47	SOCKET BUTTON, 1/4-20 X 1/2 SST.	2	281965
48	SHIM, PLATFORM MOUNT, GUIDE BLOCK	2	UV-PF-728
49	NUT, S.S. TEE, 5/16 OD X 1/4 L NECK (BAG OF TEN)	2	14485
55	GUIDE, BRIDGEPLATE. BLUE BIRD	2	UV-PF-766
56	SPRING, UNFOLD KICKOUT	2	25436
57	RETAINER, BP. RETURN SPRING, WELD ASSY.	2	UV-PF-421
58	SOCKET BUTTON, 5/16-18 X 3/4, SST.	2	282285
59	BOLT-HEX 5/16-18 X 1 1/4	8	28223
60	CHANNEL, HOUSING, RH. WELD ASSY., PRS., SW	1	UV-PF-227
61	CHANNEL, HOUSING, LH. WELD ASSY., PRS., SW	1	UV-PF-229
62	NUT-HEX, 5/16-18, NYLON INSERT, SST.	16	283145
63	GEAR, PRS.	1	UV-PF-880
64	PLATE, KEEPER, PRS., GEAR	1	UV-PF-875
65	GEAR MOTOR, DELCO PH3, 9T RH. MED-TORQ.	1	25486
66	TERMINAL, CONNECTOR-2 CIRCUIT, PACK-CON	1	25481
67	TERMINAL, PACK-CON SERIES 1, HD. FEM	2	26551
68	WASHER, 1/4 SPLIT LOCK, SST.	3	282745
69	SOCKET, BUTTON, 1/4-20 X 1.13, SST.	3	281985

70	BOLT-SHOULDER PRS.	1	UV-PF-937
71	RELEASE TRIGGER, WELD ASSY., PRS.	1	UV-PF-889
72	NUT-HEX, 1/4-20, JAM, NYLON INSERT, SST.	13	283096
73	SPRING, MANUAL RELEASE TRIGGER, PRS.	1	UV-SP-019
74	WASHER, 1/2 ID D/SHAPE X 1.00 OD X 0.30	1	282825
75	BRACKET, MANUAL RELEASE, RH., WELD ASSY.	1	UV-PF-804
76	COVER, PRS., SW	2	UV-PF-225
77	KNOB, PWR. ROLLSTOP, MIRAGE	1	UV-PF-936
78	ROLL PIN, 1/8 X 1 1/4, SST.	1	28355
79	LINK, GEAR, WELD ASSEMBLY, RH.	1	UV-PF-892
80	LINK, HEX, ADJUSTABLE, PRS	1	UV-PF-863
81	NUT-HEX, JAM, 5/16-18, SST.	1	283154
82	LINK, GEAR, WELD ASSEMBLY, LH. THD.	1	UV-PF-893
83	BUSHING, PIVOT SHAFT, PRS.	2	UV-PF-883
84	BRACKET, MTG., COMP. LINK, WELD ASSY.	1	UV-PF-894
85	LINK, COMPENSATOR, WELD ASSY., PRS.	1	UV-PF-888
86	LINK, ROLLSTOP, PRS.	1	UV-PF-860
87	MS. 6-32 X 5/8 PHIL PAN, SST.	1	280575
88	BUMPER, RUBBER B-1220	2	V2-AC-86
89	KEEPER, REINFORCEMENT	4	UV-PF-855
90	BRACKET, MANUAL RELEASE, LH., WELD ASSY.	1	UV-PF-802
91	MS. SOC., FLAT HD., 5/16-18 X 0.50, SST.	4	282252
92	T-NUT 5/16-18, SST.	4	UV-PF-934
93	WASHER, NYLON, 0.315 ID X 1.156 OD X 0.062	1	28632
94	FOOT, PRS. ACTUATOR, WELD ASSY.	1	UV-PF-909
95	CAM, PRS. SWITCH ACTUATOR	1	UV-PF-918
96	WASHER #10 FLAT SAE., SST.	1	282715
97	SHOULDER SCREW, FLAP LATCH	1	UL-PF-034
98	WASHER #10 SPLIT LOCK, SST.	2	282725
99	MS.SOC., BUTTON, 10-24 X 3/8, SST.	2	281435
100	SPRING, LH., ROLLSTOP ACTUATOR RETURN	1	UV-SP-002
101	WASHER, 5/16 SPLIT LOCK, SST.	1	282785
102	BOLT-HEX, 5/16-18 X 3/4, SST.	1	282205
103	MS. 4-40 X 5/8, PHIL PAN	2	28031
104	WASHER #4, SPLIT LOCK	2	28266
105	LIMIT SWITCH, SEALED, PRS.	1	264103
106	MS. 6-32 X 1/4, PHIL PAN HD., SST.	2	280425
107	WASHER #6, SPLIT LOCK, SST.	2	282685
108	NUT-HEX 10-24, NYLON INSERT, SST.	2	283055
109	PLUNGER SWITCH, SEALED, TAPPED 6-32	1	264102
110	NUT-HEX 6-32, SST.	1	283012
111	BRACKET, MOUNTING, LIMIT SWITCH, PRS.	1	UV-PF-911
112	RECEPTACLE, 9 PIN WO/FLANGE	1	26472
113	HARNESS, ROLLSTOP SWITCH	1	UV-ES-221
114	PLATE, REINF. LH., WELD ASSY., PRS., SW-T	1	UV-PF-908
115	SOCKET, FLAT 10-24 X 1/2, SST.	2	28137
116	ASSY., HARNESS, ROLLSTOP SWITCH	1	UV-ES-852
117	MS. SOC. BUTTON 5/16-18 X 1/2, SST.	1	282287
118	PLATE-PRS MANUAL RELEASE F9B	1	F9-0443
119	BRACKET, SPRING RETAINER F9B	1	F9-0470
120	GEAR-WASSY PRS F9B	1	F9-0452
121	COVER - PRS RH F9B	1	F9-0441
122	BLOCK-PRS COVER	2	F9-0437
123	SCS-10-32 X 0.50 BTN SKT S	4	28156
124	SMS #8 X ½ PHIL PAN HD TE (BAG OF TEN)	4	15961

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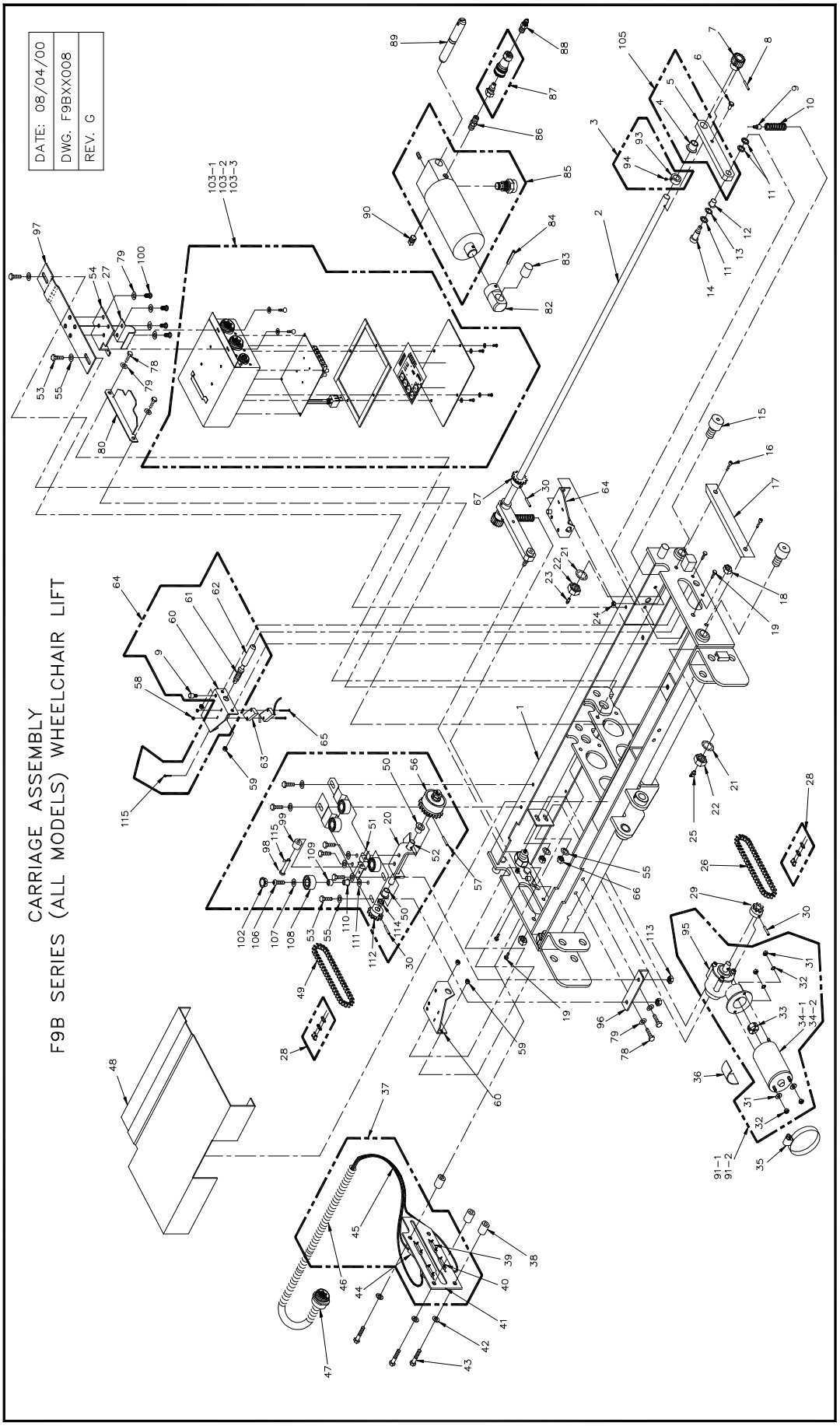

FIGURE 5-7: CARRIAGE ASSEMBLY

FIGURE 5-7: CARRIAGE ASSEMBLY
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT

REF	DESCRIPTION	QTY	PART NO
1	CARRIAGE, WELD ASSEMBLY	1	F9-0435
2	SHAFT, DEPLOYMENT DRIVE	1	UV-DS-204
3	COLLAR, 5/8 ID W/SET SCREW	2	UV-BU-007
4	BEARING, DU 0.625 ID X 0.719 OD X 0.38 FL	2	UV-BU-014
5	ARM, POWER SHAFT, SUPPORT	2	UV-DS-051
6	GUIDE, DRIVE SHAFT, PIVOT	2	UV-DS-014
7	GEAR 1.125 PD., 0.63 FACE WIDTH	2	UV-DS-005
8	PIN, "SPIROL", 5/32 X 1.00	3	28418
9	BUTTON, SPRING SUPPORT	3	UV-DS-003
10	SPRING, COMPRESSION, 0.44ID	2	254537
11	WASHER, 0.50 ID X 0.75 OD X 0.06, NYLON	6	14-18-308
12	BUSHING NYLINER, 0.50 X 0.50	2	25298
13	WASHER, 1/2, WAVE	2	28261
14	BOLT, SHOULDER, 0.50 X 0.75	2	28381
15	CAM, FOLLOWER	4	40-20-006
16	SCREW, CAP, SOCKET, 5/16-18 X 3/4	4	282289
17	GUIDE, CARRIAGE	2	UV-DS-027
18	NUT-HEX, 3/8-16 JAM, NYLON INSERT	2	283185
19	BOLT-HEX, 1/4-20 X 5/8 GR5	6	28164
20	BRACKET-WASSY IDLER SHAFT SUPPORT	1	F9-0476
21	WASHER, 3/4, STAR, INTERNAL (BAG OF TEN)	4	15925
22	NUT-HEX, 3/4-16 JAM (BAG OF TEN)	4	15924
23	GREASE FITTING, STRAIGHT PRESS IN	2	21-02-012
24	NUT-HEX, 5/16-18 PLATED, THIN NYLON	2	14-08-305
25	FITTING, GREASE, 65 DEG PRESS-IN	2	21-02-011
26	CHAIN, PRIMARY DRIVE	1	F9-0418
27	CLAMP-HOSE	1	F9-0481
28	LINK, MASTER	2	25043
29	SPROCKET,SYNC #35, 8 TOOTH	1	F9-0450
30	PIN, "SPIROL", 5/32 X 1.25	3	28417
31	WASHER, STAR, INTERNAL, #10	4	28249
32	NUT-HEX, 10-32	4	28306
33	COUPLING, ACTUATOR	1	23596
34-1	MOTOR, 1/4 HP., 12 VDC., SHORT SHAFT	1	25477
34-2	MOTOR, 1/4 HP., 24 VDC., SHORT SHAFT	1	25478
35	CLAMP, HOSE	1	22-10-044
36	GASKET, RUBBER, 1.00 X 2.00 X 1/8	1	UV-DS-016
37	ASSY, SWITCH PLATE	1	F9-0385
38	SPACER, ELECT., PLATE, STAND OFF	3	UV-ES-026
39	BLOCK, SWITCH RETAINER	4	UL-AC-011
40	SMS., #4 X 1.00 PHIL FLAT, TYPE AB, ZINC	8	28036
41	PLATE, SWITCH	1	F9-0173
42	WASHER, FLAT, 5/16 SAE.	8	28277
43	BOLT-HEX, 5/16-18 X 1 1/2 GR5	4	28217
44	SWITCH, LIMIT SEALED, PRE-WIRED	5	264104
45	ASSY, HARNESS SWITCH PLATE	1	F9-0343
46	CONDUIT, PLASTIC 1/2	12	27200
47	PLUG, AMP. CONNECTOR, RECEPTACLE, 14 PIN	1	26254
48	COVER, CARRIAGE CENTER	1	F9-0438
49	CHAIN, SECONDARY DRIVE	1	F9-0429
50	BUSHING, 08FDU06 ½" X 3/8"	2	25384
51	BRACKET-WASSY., MOTOR MNT/ROLLER MNT	1	F9-0495
52	IDLER, SHAFT, 0.50 OD X 5.0	1	F9-0427
53	CS-5/16-18X0.75 HEX SST	6	282205
54	BRACKET-CARRIAGE ELECT BOX MTG, FRONT	1	F9-0421
55	SEE #42		
56	CLUTCH, TORQUE LIMIT	1	UV-DS-202
57	OIN, SPIROL-5/32X 1 1/4	1	28417
58	NUT-HEX, 4-40 NYLON INSERT	2	28297
59	NUT-HEX, 1/4-20 PLATED, THIN NYLON	9	14-08-304
60	BRACKET, MOUNTING, MICRO SWITCH	3	UV-DS-106
61	SPRING, 1.25 X 0.468 SPR. STL.	2	UV-SP-009
62	PLUNGER, MICRO SWITCH	2	UV-DS-105
63	BLOCK, LIMIT SWITCH	2	V2-ES-79
64	ASSY, PLUNGER	2	UV-ES-112
65	MS. 4-40 X 1/8 PHIL PAN	2	280325
66	NUT-HEX, 5/16-18	2	28313
67	SPROCKET, #35, 12 TEETH, 0.625 BORE	1	UV-DS-002

78	BOLT-HEX, 5/16-18 X 1/2	4	14-02-108
79	WASHER, SPLIT LOCK 5/16	4	28278
80	BRACKET-CARRIAGE ELECT BOX MTG, BACK	1	F9-0420
82	TRUNION, HYDRAULIC CYLINDER	1	UV-SH-010
83	BEARING, DU 0.75 ID X 0.875 OD X 0.38 FL	2	UV-BU-005
84	ROLLPIN, 1/4 X 1 1//2	1	283615
85	HYDRAULIC CYLINDER, MIRAGE LIFT	1	UV-SH-007
86	NIPPLE-HEX, 1/4 X 1 3/8	1	V2-SH-29
87	FITTING, QUICK-DISCONNECT, 1/4	1	UV-SH-003
88	ADAPTER, STRAIGHT, 1/4 NPT. MALE	1	V2-SH-84
89	PIN, 0.75 OD X 5.00	1	UV-PI-003
90	PLUG, HEX SOC., 1/4 NPT	1	V2-SH-620
91-1	GEAR-MOTOR-ASSY'S 12V	1	UV-DS-205
91-2	GEAR-MOTOR-ASSY'S 24V	1	UV-DS-207
92	DECAL, PC. BOARD LAYOUT	1	26211
93	SOCKET SET 10-24 X 1/4	2	28139
94	COLLAR SET SCREW	2	R5-AC-503
95	GEAR, BOX	1	UV-DS-200
96	BRACKET-MOTOR MNT./ROLLER MNT.	1	F9-0430
97	PLATE ASSY, CARRIAGE ELECT BOX MTG.	1	F9-0423
98	PIN-CLEVIS 0.313X1.00, D HEAD SST	1	F9-0069
99	ROLLER-RAIL	1	F9-0248
100	SCS-5/16 X 0.625 SKT SST (BAG OF TEN)	2	15901
101	NUT 10-32 NYLON	1	28307
102	PLUG 0.78 1 DIA HOLE, 0.62 MATL BLAK PLASTIC	4	28945
103-1	ONBOARD CONTROL BOX, MIRAGE 12V	1	10931
103-2	ONBOARD CONTROL BOX, MIRAGE 24V (DOMESTIC ONLY)	1	10953
103-3	CONTROL BOX, MIRAGE 24V (EXPORT ONLY)	1	18020
105	LINK, DRIVE SHAFT, PIVOT ASSEMBLY	1	UV-DS-052
106	SCS-5/16 X 0.75 BTN SKT SST	4	28229
107	WASHER-5/16 X 0.75 OD X FLAT BR7	4	28630
108	ROLLER-ALIGNMENT	4	F8-0120
109	BUSHING-ALIGNMENT	4	F8-0121
110	BUSHING-08FDU06, ½ "X 3/8"	4	25384
111	WASHER-0.32 ID X 0.59 OD X 0.006	4	28630
112	SPROCKET, WASSY. 17T, #35, .50 BORE	1	F9-0406
113	NUT-5/16-18 NYLON SST	2	283145
114	SPACER, INTERMEDIATE DRIVE SHAFT	1	F9-0064
115	COTTER PIN FOR # 98 (BAG OF TEN)	2	15930

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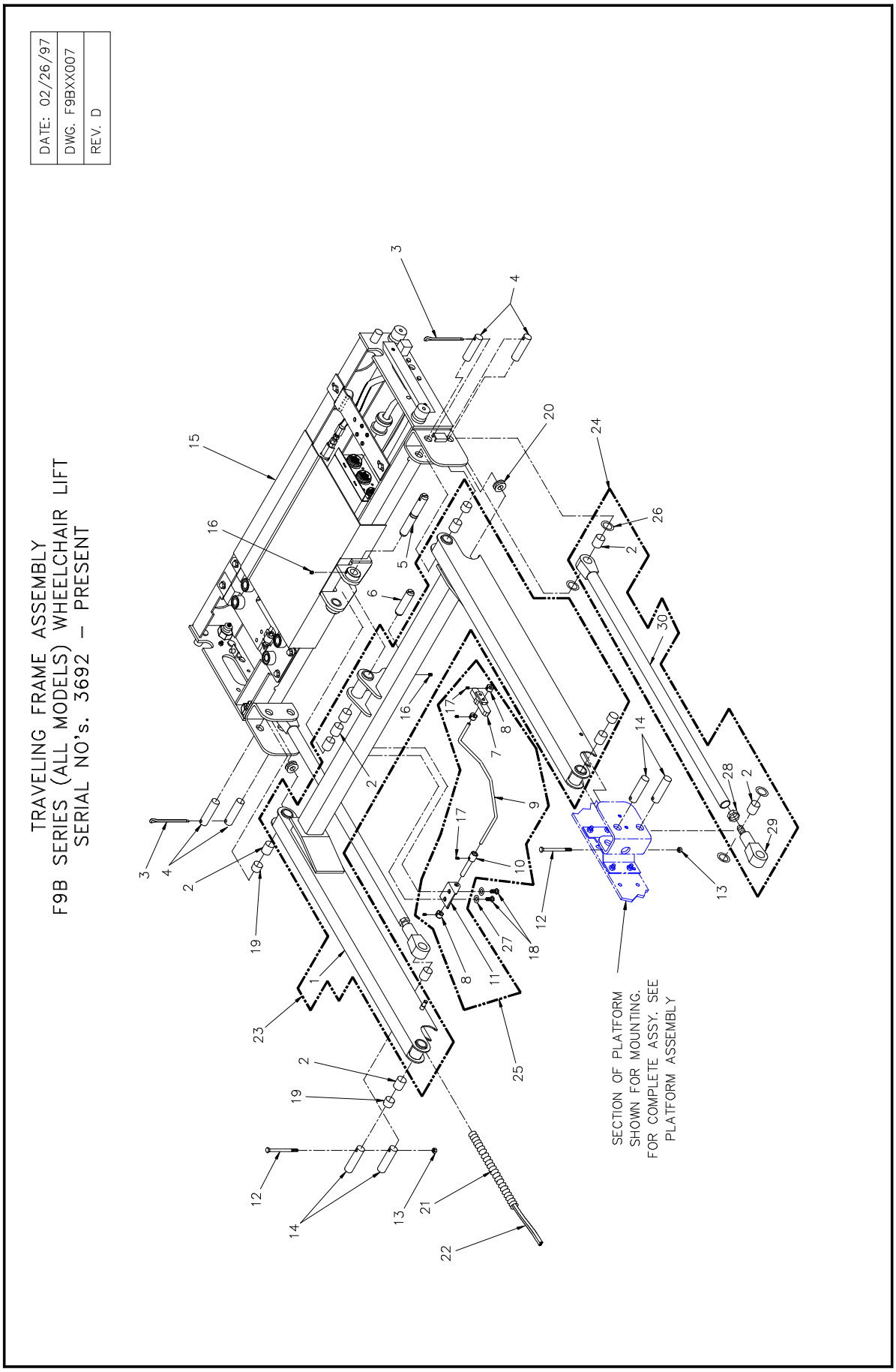


FIGURE 5-8: TRAVELING FRAME ASSEMBLY

FIGURE 5-8: TRAVELING FRAME ASSEMBLY
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 – PRESENT

REF	DESCRIPTION	QTY	PART NO
1	LIFT FRAME WLDT, COATED, RED	1	UV-LF-200
2	BEARING, DU .750 ID X 8.75 OD X 1.00	9	UV-BU-005
3	PIN, COTTER .25 X 3.50	2	14-33-860
4	PIN, .75 OD X 2.740	4	UV-PI-002
5	PIN, .75 OD X 5.00	1	UV-PI-003
6	PIN, .75 OD X 2.830	1	UV-PI-004
7	BLOCK- SWITCH ACTUATOR CAM	1	F9-0206
8	COLLAR, .25 ID X .63 OD X .38	3	V3-BU-15
9	ROD, SWITCH CAM ACTUATOR	1	F9-0557
10	COLLAR, ACTUATOR ROD	1	UV-ES-036
11	BRACKET, F9000 SERIES ELECTRICAL SYSTEM	1	UV-ES-027
12	BOLT-HEX,1/4 X 3.50	2	281765
13	NUT- 1/4 - 20 JAM NYLON SST	4	283096
14	SET SCREW, 1/4 - 20 X .25	2	28200
15	CARRIAGE- ASSEMBLY, F9B050 COMMON COMP.	1	F9B0XX-XXXXX1X
16	PIN, .750 X 3.125	4	UV-PI-006
17	SCREW, SOCKET SET, 10-32 X 1/4 SST	4	28155
18	SOCKET BUTTON, 5/16 - 18 X ½ SST	2	282287
19	BEARING, DU .75 ID X 8.75 OD X .63	4	UV-BU-006
20	GROMMET, 1.06 OD X .50 ID X .25 GROOVE	2	26645
21	SPRING, CONDUIT	2	UV-SP-025
22	HARNESS, ASSY., SPIDER, w/ POWER ROLLSTOP	1	F9-0158
23	ASSEMBLY, LIFTING FRAME 25-5/8"	1	UV-LF-502
24	ASSEMBLY, MECHANICAL LOWER P-ARM 25 - 5/8"	2	UV-LF-211
25	ASSEMBLY, ACTUATOR ROD F9B050	1	F9-0453
26	SPACER - 59	8	VT-BU-42
27	WASHER- 5/16 SPLIT LOCK	2	28278
28	NUT-HEX 9/16 - 18 JAM	2	28366
29	ARM, LOWER PARALLEL, ADJUSTABLE	2	UV-LF-015
30	WASSY-ARM PARALLEL, FIXED	2	UV-LF-212

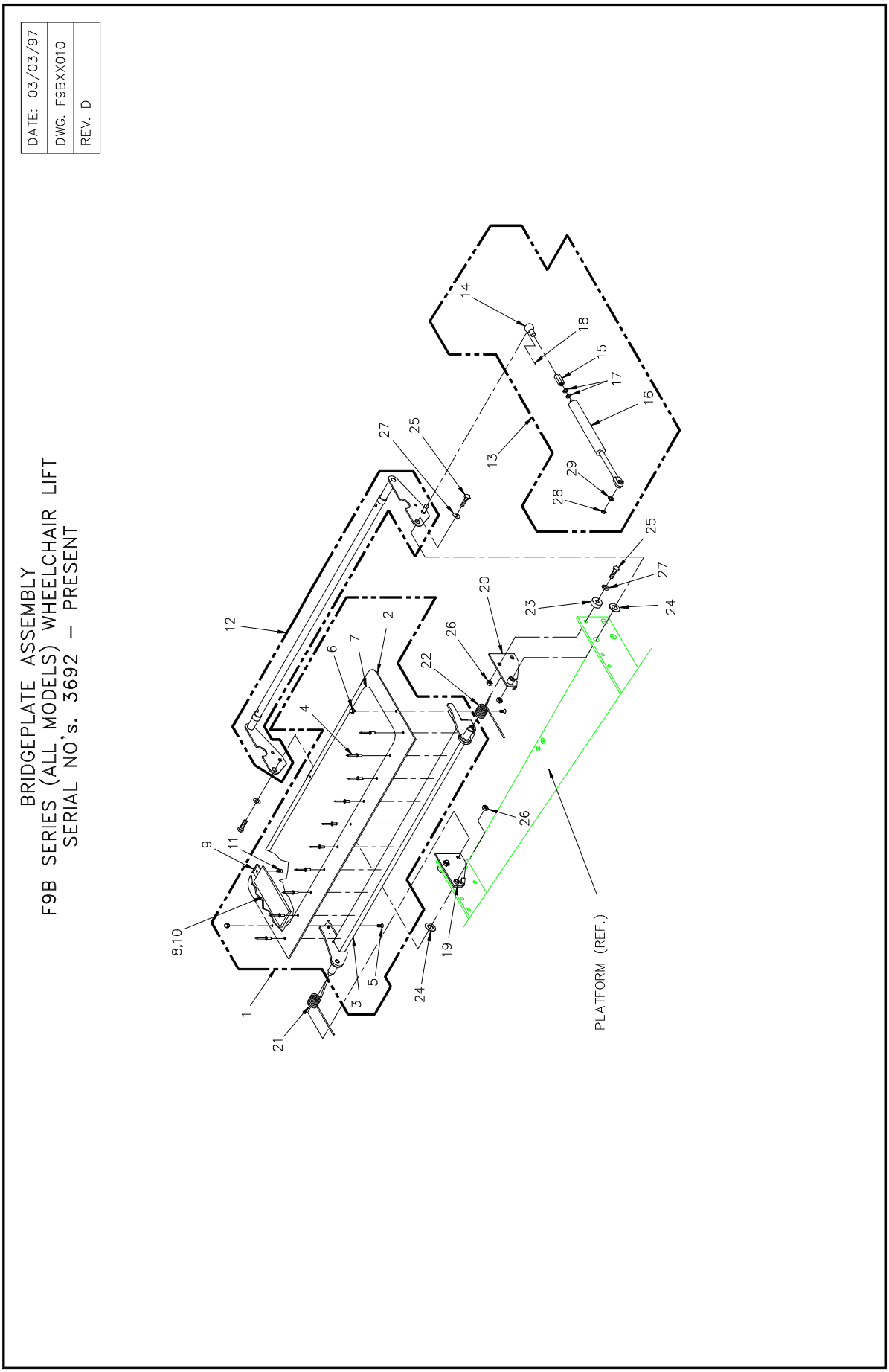


FIGURE 5-9: BRIDGEPLATE ASSEMBLY

FIGURE 5-9: BRIDGEPLATE ASSEMBLY
F9B SERIES (ALL MODELS) WHEELCHAIR LIFT
SERIAL NO's. 3692 – PRESENT

REF	DESCRIPTION	QTY	PART NO
1	BRIDGEPLATE-ASSY	1	F9-0291
2	PLATE-BLANK BRIDGEPLATE 9", L-UTS	1	F9-0288
3	FRAME-WASSY., BRIDGEPLATE	1	F9-0295
4	RIVET, BLIND AL, 3/16 X 3/8 #AD66BS (BAG OF TEN)	10	15918
5	SCS-10-24 X 0.50 FLAT SKT SST	2	28137
6	NUT-10-24 HEX ACORN	2	28296
7	SAFETY TREAD, 25 ½ X 7, SAFETY	1	25665
8	BLOCK-BRIDGEPLATE GUIDE BUMPER	1	F9-0290
9	SKID-BRIDGEPLATE	3	UL-BA-021
10	TAPE-ADHESIVE TRANSFER, 10MIL, 1" THK	.5	263110
11	MS-10-24 X 0.25 FLAT PHIL UNDER CUT	3	28106
12	STIRRUP-WASSY., BRIDGEPLATE	1	F9-0294
13	ROD-ASSY., BRIDGEPLATE ACTUATOR 7" UTS	2	F9-0559
14	BALL SKT-M8 X 9.5, R5MM, 19MM, ZINC	1	25494
15	EXTENSION LINK-GAS STRUT, 0.63	1	UV-PF-078
16	SPRING-PNEUTMATIC, 100 LBF (C16-12745)	1	UV-SP-006
17	WASHER- 5/16 FLAT	2	28277
18	CLIP-BALL RETAINER, 10MM SUSPA	2	UV-SP-015
19	BKT-B-PLATE WASSY., L.H.	1	UV-PF-308
20	BKT-B-PLATE WASSY, MOUNT	1	UV-PF-309
21	SPRING-L.H., B-PLATE RETURN RED	1	UV-SP-010
22	SPRING-R.H., B-PLATE RETURN RED	1	UV-SP-011
23	BUSHING-.75OD X .32ID X .38	2	UV-PF-312
24	WASHER- 0.578ID X 1.067 X 0.062 NYLON	2	28575
25	CS-5/16-18 X 1.25 HEX (BAG OF TEN)	4	14499
26	NUT-5/16-18 NYLON	4	28314
27	WASHER- 5/16 FLAT	4	28277
28	SNAP RING, 5/16" EXTERNAL	1	14-31-030
29	WASHER-0.328ID X 0.56OD X 0.030 SST	1	28566

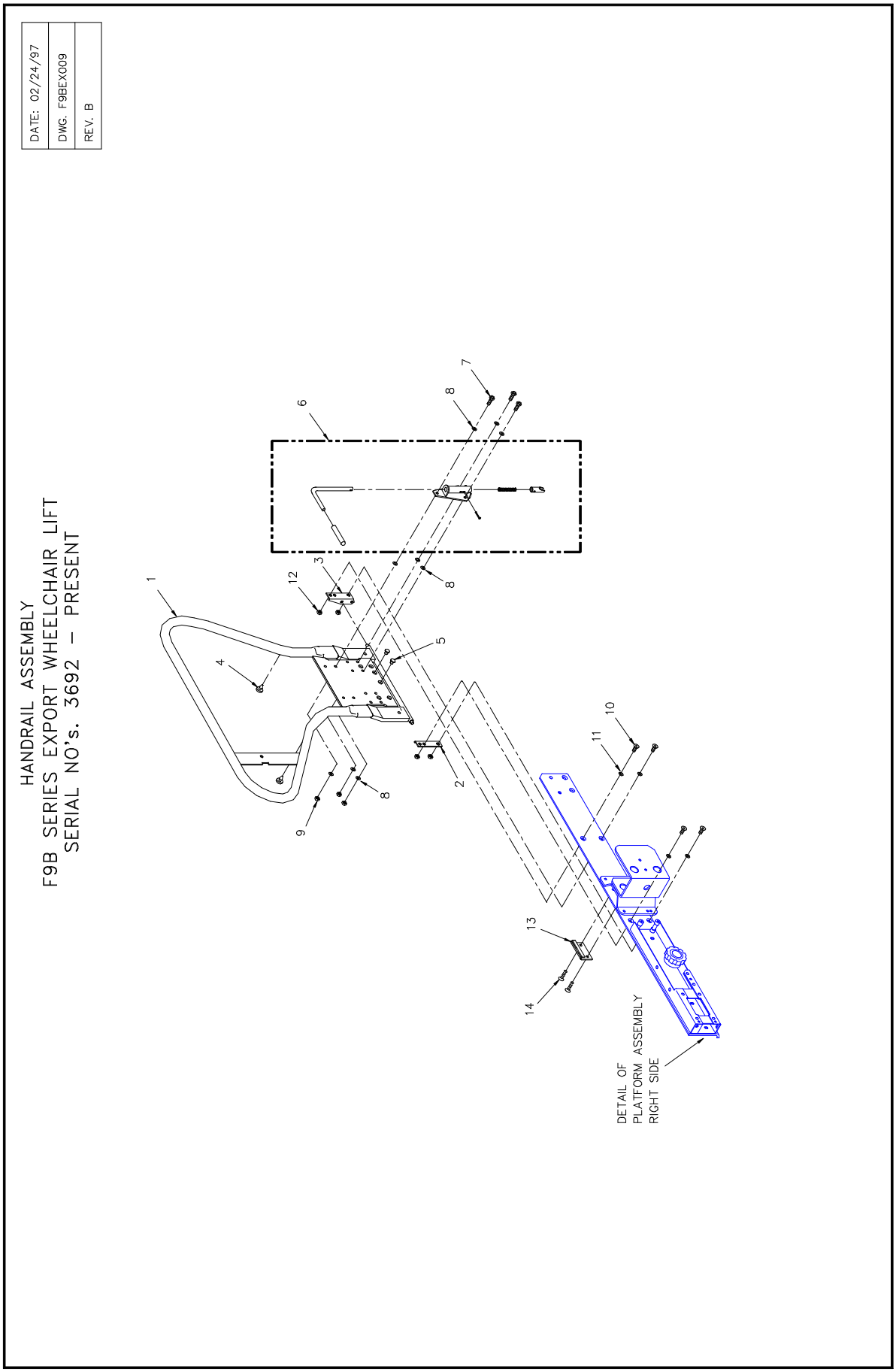


FIGURE 5-10: HANDRAIL ASSEMBLY

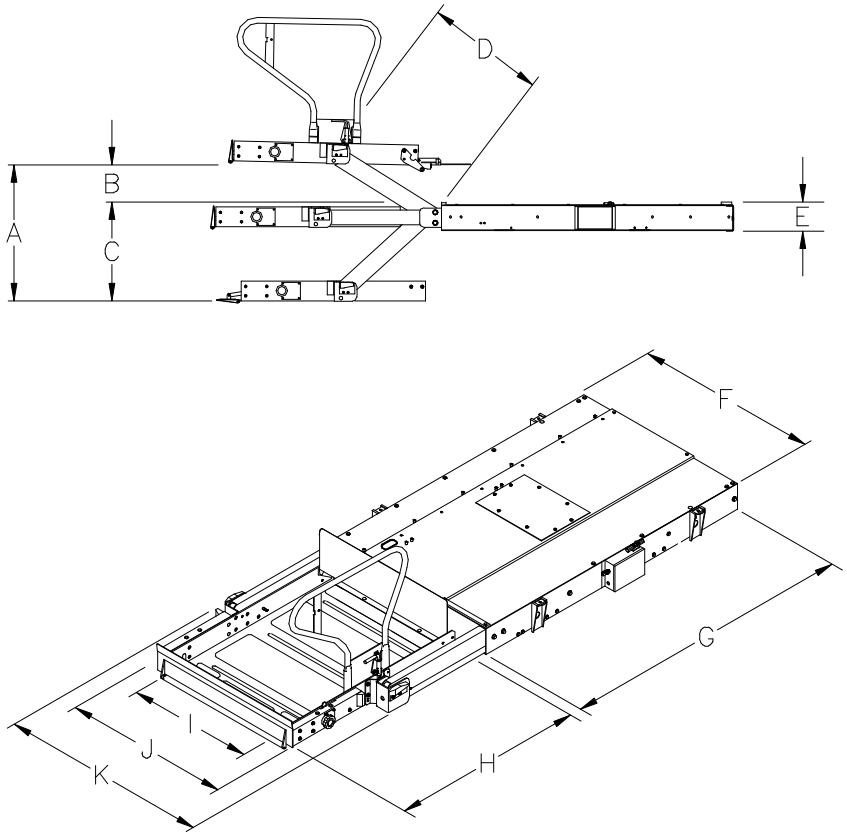
FIGURE 5-10: HANDRAIL ASSEMBLY
F9B SERIES EXPORT WHEELCHAIR LIFT
SERIAL NO's. 3692 – PRESENT

REF	DESCRIPTION	QTY	PART NO
1	HANDRAIL, WELD ASSEMBLY R.H.	1	F9-0283
2	BRACKET-HANDRAIL PIVOT, R.H.	1	F9-0248
3	BRACKET-HANDRAIL PIVOT, L.H.	1	F9-0249
4	BUMPER-RUBBER B-1220	2	V2-AC-86
5	BUMPER-0.63 OD X 0.31 THK RUBBER	2	284081
6	MECH ASSY-LATCH	1	UV-PF-107
7	CS-1/4-20 X 0.75 HEX SST	3	281665
8	WASHER-1/4-20 FLAT SST	9	282735
9	NUT-1/4-20 JAM NYLON SST	3	283096
10	MS-5/16-18 X 3/4 FLAT SKT SST	4	282245
11	WASHER-0.32 ID X 0.75 OD X 0.080 SST	4	282776
12	NUT-5/16-18 JAM NYLON SST	4	283146
13	PLATE-HANDRAIL LOCK, STRIKER	1	F9-0256
14	SCS-1/4-20 X 0.75 FLAT SKT SST	2	28184

APPENDIX 1
LIFT SPECIFICATIONS

F8100 SERIES EXPORT USE WHEELCHAIR AND STANDEE LIFT

Power.....electro-hydraulic motor	**Rated load capacity .....660 lbs.**
Pump rating - 12 volts DC .....1800 psi, 1250 watt	**Manual backup (up) ..... hand pump**
Pump rating - 24 volts DC .....1800 psi, 1250 watt	**Manual backup (down) ..... pressure release valve**
Hydraulic cylinders..... 3.0", single acting	**Weight.....approx. 425lbs**



DIMENSIONS, inches

MODEL	A	B	C	D	E	F	G	H	I	J	K
F9B	Floor-to-ground travel	Travel Above	Travel Below	Arm Length	Stowed Height	Stowed Width	Stowed Length	Usable Platform Length	Usable Platform Width	Clear Entry Width	Traveling Frame Width
	38.0	13.5	24.5	25.6	7.0	42.0	62.7	40.0	31.8	31.8	41.4

RICON